CHLOROTHALONIL (081)

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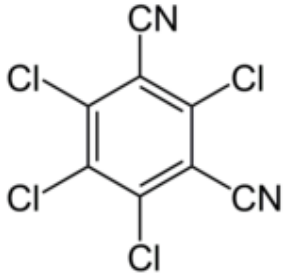
EXPLANATION

Chlorothalonil is a non-systemic fungicide first evaluated by JMPR in 1974 and a number of times subsequently. It was recently reviewed for toxicology by the 2009 JMPR within the periodic review program of the CCPR. For the parent substance an ADI of 0-0.02 mg/kg bw and an ARfD of 0.6 mg/kg bw were established. In addition to the parent substance an ADI of 0-0.008 mg/kg bw and an ARfD of 0.03 mg/kg bw were established for the metabolite SDS-3701. In the 2010 JMPR chlorothalonil was scheduled for periodic review for the residues and the metabolite R611965 for toxicological evaluation.

IDENTITY

ISO common name	Chlorothalonil
Chemical name	
IUPAC:	tetrachloroisophthalonitrile
CAS:	2,4,5,6-tetrachloro-1,3-benzenedicarbonitrile
CIPAC No.	288
CAS No.	1897-45-6
Structural formula	
Molecular formula	$C_8Cl_4N_2$
Molecular mass	265.9 g/mol

Specifications

Specifications for chlorothalonil were developed by FAO (FAO, 2005, CLTA10_257) in 2004 followed by consideration of supporting information in 2005 and 2007. Special consideration is required on the latest FAO specifications for chlorothalonil, limiting the amount for hexachlorobenzene (HBC) to a maximum of 0.04 g/kg. There may be implications for HCB in animal commodities, if chlorothalonil contains higher levels of this impurity.

PHYSICAL AND CHEMICAL PROPERTIES

Table 1 Physical and chemical properties

Property	Results	Method (test material)	Reference
Melting point	252.1 °C	OECD 102 (EEC A.1) pure active ingredient (99.6%)	Gallacher A.C., 1994, CLTA10_001
Boiling point	347 °C	OECD 103 pure active ingredient (99.5%)	Walter G.P., 2004, CLTA10_002
Temperature of decomposition or sublimation	Not relevant, no decomposition or sublimation observed during the melting point determination		
Relative density	1.735 g per cm^3	OECD 109 (EEC A.3) pure active ingredient. (99.8%)	Gallacher A.C., 1994, CLTA10_001
Vapour pressure	7.62×10^{-8} kPa at 25 °C	pure active ingredient (99.7%)	Szalkowski M.B., 1981, CLTA10_003
Henry´s Law Coefficient	2.5×10^{-2} Pa m^3 mol^{-1} at 25 °C	Calculated	Lorence P.J., 1994, CLTA10_004
Physical state and colour	Pure: white crystalline solid or powder Techn.: white or tan powder	visual pure active ingredient (99.7%) visual technical active ingredient (98.9%)	Gallacher A.C., 1994, CLTA10_001
Odour	Pure: slightly musty Techn.: no odour	olfactoric pure active ingredient (99.7%) olfactoric technical active ingredient (98.9%)	Gallacher A.C., 1994, CLTA10_001
Spectra active substance	The maxima and molar extinctions in UV were determined to be: 303 nm, 313 nm and 325 nm (ε = 804, 1670 and 2270, respectively).	pure active ingredient (99.6%)	Hambrick A.A., 1994, CLTA10_005
Solubility in water including effect of pH	0.81 mg/L at 25 °C (independent of pH)	OECD 105 pure active ingredient (99.6%)	Lorence P.J., 1990, CLTA10_006
Solubility in organic solvents	The solubility in different organic solvents at 25°C was determined to be: - acetone 20.9 g/L - 1,2-dichloroethane 22.4 g/L - ethyl acetate 13.8 g/L - n-heptane 0.2 g/L - methanol 1.71 g/L - xylene 74.4 g/L	In house pure active ingredient (99.0%)	Lorence P.J., 1994, CLTA10_007
Partition coefficient n-octanol / water	log P_{ow}: 2.94 at 25 °C (independent of pH)	OECD 107 pure active ingredient (99.0%)	Lorence P.J., 1995, CLTA10_008
Hydrolysis rate	pH 5 at 22 °C stable (> 49 days) pH 7 at 22 °C stable (> 49 days) pH 9 at 22 °C DT_{50} = 38	OECD 111 pure active ingredient (99.8 / 98.0%)	Szalkowski M.B., Stallard D.E., 1976, CLTA10_009
Photochemical degradation	At pH 5 and 25 °C the DT_{50} = 64.7 days with 12 hours sunlight / day	OECD 101 radiolabelled pure active ingredient (99.0%)	Nelsen T.R., Marks A.F., 1987, CLTA10_010

Property	Results	Method (test material)	Reference
Quantum yield	1.4×10^{-3}	pure active ingredient (99.5%)	Wollerton C., Walter G.P., 2000, CLTA10_011
Dissociation constant	Not applicable–chlorothalonil is a neutral molecule that does not dissociate to ionic species in aqueous solution.		

Hydrolysis of chlorothalonil

Hydrolysis studies were carries out by Grout S. (2002, CLTA10_242). Solutions of ^{14}C-phenyl-labelled chlorothalonil (nominal concentration 5 mg/L) were prepared in ammonium citrate buffer at pH 4, 5 and 6. These solutions were subjected to conditions representative of pasteurisation (pH 4, 90 °C for 20 minutes), baking, brewing and boiling (pH 5, 100°C for 60 minutes) and sterilisation (pH 6, 120 °C for 20 minutes). Additional experiments were also performed at pH 4 at 120 °C and pH 6 at 90 °C for 20 minutes to investigate which of pH or temperature was the key variable in hydrolytic degradation of chlorothalonil.

At pH 4, 120 °C the levels of the main degradation products were 17.1% and 2.3% for SDS-3701 and R613636, whereas at pH 6, 90 °C the levels are 5.3% and 2.8% respectively.

At pH 6 and at 120 °C, using an ammonium citrate buffer, an artefact was generated which accounted for 27.7% of the applied radioactivity. When a sodium acetate buffer was used, this artefact was not formed. The artefact was identified as 4-amino-2,5,6-trichloroisophthalonitrile. Due to the additional functional group it is clear from the structure that it could not be produced via direct aqueous hydrolysis of chlorothalonil. The amino substituent on the benzene ring was assumed to arise as a consequence of using an ammonium salt in the citrate buffer system. A summary of the measured analytes is presented in the following table:

Table 2 Summary of radioactive residues in reaction mixtures treated with ^{14}C-phenyl labelled chlorothalonil

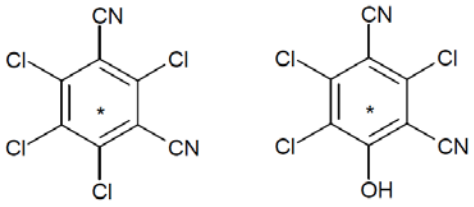
Conditions	Reaction Vessel 01JH059/	Radioactive recovery (%)	Residue (%)					
			chloro-thalonil	SDS-3701	R613636	Artefact	Unknowns	Remainder
pH 4	1	92.8	89.4	2.0	-	-	-	1.6
90 °C	2	124.1	120.6	1.8	-	-	-	1.7
	Mean	108.5	105.0	1.9	-	-	-	1.7
pH 5	4	111.0	82.9	20.9	3.9	1.1	-	2.3
100 °C	5	102.3	78.1	17.4	2.9	1.6	-	2.3
	Mean	106.7	80.5	19.2	3.4	1.4	-	2.3
pH 6	10	109.5	3.1	46.2	23.9	26.7	5.8	3.8
120 °C	11	110.3	3.0	48.7	22.2	28.6	5.9	1.9
	Mean	109.9	3.1	47.5	23.1	27.7	5.9	2.9
pH 4, 120 °C	12	95.0	73.4	17.1	2.3	0.4	0.4	1.3
pH 6, 90 °C	15	96.6	85.0	5.3	2.8	2.1	0.4	1.0
pH 6	16	102.2	20.9	62.9	51.8	-	1.8	0.5
120 °C	17	102.8	31.2	54.4	14.5	-	1.6	0.5
	Mean	102.5	26.1	58.7	15.2	-	1.7	0.5

FORMULATIONS

Chlorothalonil is available in numerous commercial formulations in many countries. It is available in a range of formulation types: DP, KL, SC, SE and WP. It may be formulated mixed with other pesticides such as azoxystrobin, fludioxonil, mandipropamid and propiconazole.

METABOLISM AND ENVIROMENTAL FATE

Metabolism studies were conducted using ^{14}C-chlorothalonil or ^{14}C-SDS-3701, one of the main metabolites. The position of the label for both substances is presented in the following figure:

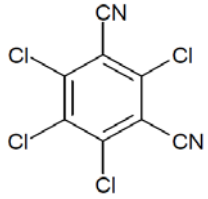
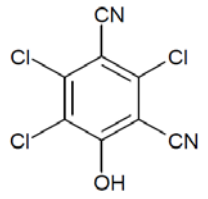
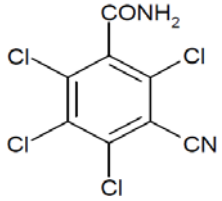


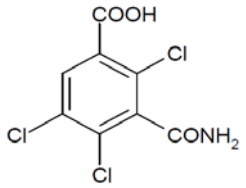
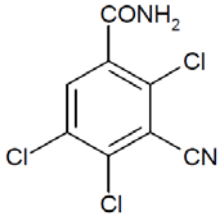
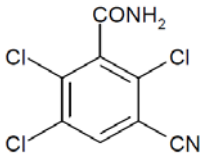
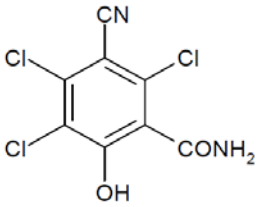
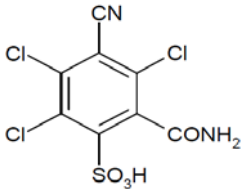
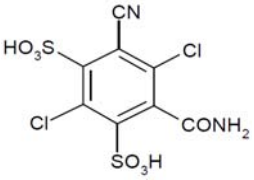
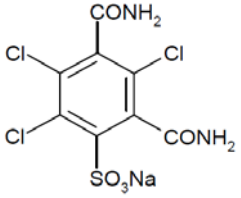
Chlorothalonil SDS-3701

* = Position of ^{14}C-label.

Chemical names, structures and code names of metabolites and degradation products of chlorothalonil are shown below.

Table 3 Known metabolites of chlorothalonil

Code Number (ISK reference number)	Description/Denomination (IUPAC Name)	Study metabolite identified in	Structure
R044686, chlorothalonil (SDS 2787)	Parent Tetrachloroisophthalonitrile		
SDS 3701 (R182281, CNIL/02)	2,5,6-trichloro-4-hydroxyisophthalonitrile	Aerobic soil metabolism Field soil degradation Hydrolysis Photolysis Primary Plant metabolism Secondary Plant metabolism Animal metabolism	
R613636 (SDS 19221, CNIL/03)	2,4,5,6-tetrachloro-3-cyanobenzamide	Aerobic soil metabolism Hydrolysis	

Code Number (ISK reference number)	Description/Denomination (IUPAC Name)	Study metabolite identified in	Structure
R611965 (SDS 46851, CNIL/04)	3-carbamyl-2,4,5-trichlorobenzoic acid	Aerobic soil metabolism Field soil degradation Secondary crop metabolism	
R611966 (SDS 47523, CNIL/05)	2,4,5-trichloro-3-cyano benzamide	Aerobic soil metabolism	
R611967 (SDS 47524, CNIL/06)	2,5,6-trichloro-3-cyano benzamide	Aerobic soil metabolism	
R611968 (SDS 47525, CNIL/07)	2,4,5-trichloro-3-cyano-6-hydroxybenzamide	Aerobic soil metabolism	
R417888 (CNIL/10)	2-carbamyl-3,5,6-trichloro-4-cyanobenzenesulfonic acid	Aerobic soil metabolism	
R419492 (CNIL/12)	4-carbamyl-2,5-dichloro-6-cyano benzene-1,3-disulfonic acid	Aerobic soil metabolism	
R471811 (CNIL/13)	sodium 2,4-bis-carbamyl-3,5,6-trichlorobenzenesulfonate	Aerobic soil metabolism	

Animal metabolism

The Meeting received metabolism studies on laboratory animals using chlorothalonil and studies on poultry or lactating goats using both ^{14}C-chlorothalonil or ^{14}C-SDS-3701.

The studies indicate that chlorothalonil as well as its metabolite SDS-3701 are taken up by livestock animals. The metabolic pattern observed is very limited with SDS-3701 the only detected residue in all matrices.

In lactating goats the ratio between fatty and other tissues was even. A separation of whole milk into skim milk and cream was not performed. A major part of the radioactivity was found associated with high-mass molecules (46000–54000 Da). In eggs most of the radioactivity was found in the yolk.

Laboratory animals

The metabolic fate of orally administered chlorothalonil in rats, dogs and mice was reported by the 2009

JMPR (JMPR, 2009):

"In rats given a single oral dose of chlorothalonil at 1.5–50 mg/kg bw, absorption was about 31%, with 17–21% being excreted in the bile and about 8–12% being excreted in the urine. At 200 mg/kg bw, excretion in the bile (8%) and the urine (5%) was lower, suggesting that saturation of absorption was occurring. In females, biliary excretion was lower (-20%) and urinary excretion was higher (about +35%) than in males. Urinary excretion in mice and dogs was about 5–10% and 1.4%, respectively. In rats, the highest tissue concentrations were found in the kidney, probably due to binding to kidney proteins. Chlorothalonil is metabolized via initial glutathione conjugation and subsequent enzymatic processing of the di-and triglutathion substituents via the mercapturic acid and cysteine conjugate β-lyase pathways yielding N-acetyl cysteine, cysteinyl-glycine and S-methyl-derivates."

Lactating goats

Chlorothalonil

In a study by Duane W.C. and Doran T.J. (1990, CLTA10_030) five lactating goats were divided into a control (1 animal), low dose and high dose group (2 animals each weighting 50 to 60 kg). The animals were treated orally with daily doses of 6 or 60 mg ^{14}C-chlorothalonil for 8 days, equivalent to nominal dry-matter based dose rates of 3.0 and 30 ppm in the diet and actual rates of 3.1 and 3.2 ppm (low dose) and 30 and 31 ppm (high dose). Milk samples were collected twice daily and urine and faeces were collected daily throughout the study. The goats were sacrificed within 8–10 hours of the final dose and muscle, fat, liver and kidney samples were collected for quantification of radioactivity and further analysis.

Analysis of the total radioactive residues (TRR) was carried out using liquid scintillation counting (LSC).

Milk was diluted with ethanol then acidified with concentrated sulphuric acid. Extractions were then carried out with non-polar solvents (hexane and diethyl ether). The combined organosoluble fractions were partitioned between hexane and acetonitrile prior to further analysis.

Liver and kidney samples were extracted on ice with concentrated sulphuric acid/acetone (1:40 v/v). After removal of the acetone, the residual material was partitioned with non-polar solvents (hexane and diethyl ether) prior to further analysis. The kidney was also subjected to an alternative extraction procedure using buffered physiological saline (0.05 M potassium phosphate in 0.9% sodium chloride, pH 7.0). The buffered extracts were analysed by gel permeation chromatography (Sephadex G-75) and HPLC.

The overall radioactive recoveries expressed as a percentage of the total dose ranged from 67.0% to 73.4% in the four individual goats (mean values 68% for the low dose and 70% for the high dose, see Table 4).

Table 4 TRR in lactating goats - recovery of administered dose of ^{14}C-chlorothalonil

Sample	Low dose–3 ppm diet % recovered (mean)	High dose–30 ppm diet % recovered (mean)
Faeces	60–61 (61)	60–65 (63)
Urine	6.1–7.1 (6.6)	6.2–7.5 (6.9)
Muscle	0.091–0.10 (0.10)	0.080 (0.08)
Fat	0.063–0.10 (0.08)	0.048–0.062 (0.06)
Liver	0.16–0.20 (0.18)	0.14–0.17 (0.16)
Kidney	0.089–0.081 (0.09)	0.072–0.075 (0.07)
Milk	0.15–0.18 (0.17)	0.11–0.39 (0.25)
Total	68.0 (68.0)	67.0–73.4 (70.2)

The TRR levels found in commodities relevant for trade or consumption are summarised in Table 5.

Table 5 TRR levels found in animal tissues of lactating goats dosed with 3 or 30 ppm ^{14}C-chlorothalonil in the diet

Sample	3 ppm diet Residue levels mg/kg	30 ppm diet Residue levels mg/kg
Muscle	0.004	0.032–0.034
Fat	0.004–0.005	0.030–0.038
Liver	0.071–0.085	0.68–0.73
Kidney	0.20–0.24	2.1–2.3
Milk	0.005–0.015	0.03–0.19

Analysis of milk, liver and kidney samples showed no detectable residues of chlorothalonil. SDS-3701 was found in milk, liver and kidney. In the low dose group, levels of SDS-3701 were < 0.01 mg/kg in milk, liver and kidney. Levels of SDS-3701 in the high dose group were < 0.01–0.05 mg/kg (9–58% TRR–average 30%) in milk, 0.03–0.04 mg/kg (3–6% TRR) in liver and 0.05–0.07 mg/kg (2–3% TRR) in kidney. A separation of whole milk into skim milk and cream was not performed.

Although no other specific metabolites could be identified, complex mixtures of components were found in the samples. Almost all the remaining radioactivity (< 0.01 and 0.01–0.07 mg/kg in low and high dose, respectively) were characterised as components with a molecular weight of 46000-54000 Da (characteristic for proteins).

Table 6 Summary of metabolites and characterised radioactivity in tissues and milk of lactating goats dosed with ^{14}C-chlorothalonil

Compound	3 mg/kg diet mg/kg parent equivalents (% TRR)			30 mg/kg diet mg/kg parent equivalents (% TRR)		
	Milk	Liver	Kidney	Milk	Liver	Kidney
TRR [mg/kg]	0.005–0.015	0.08	0.2–0.24	0.03–0.19	0.7	2.1–2.3
Not extracted	0.002–0.006 (36–56%)	0.03 (31–36%)	0.09–0.1 (43–44%)	0.01–0.07 (28–48%)	0.2–0.3 (30–44%)	0.7–0.8 (35–38%)

Compound	3 mg/kg diet mg/kg parent equivalents (% TRR)			30 mg/kg diet mg/kg parent equivalents (% TRR)		
	Milk	Liver	Kidney	Milk	Liver	Kidney
Organosoluble		0.01–0.02 (17–31%)	0.02–0.03 (12–15%)		0.13–0.14 (18–21%)	0.2–0.27 (10–12%)
Acetonitrile soluble						
SDS-3701	0.001–0.007 (30–45%)			< 0.01–0.05 (9–58%)	0.03–0.04 (3–6%)	0.05–0.07 (2–3%)
others	0.0001–0.002 (0–30%			< 0.001–0.04 (0–23%)	0.1	0.09–0.12 (4–6%)
Hexane soluble	0.001–0.002 (8–16%)	4	0.001–0.01 (0.6–4%)	0.003–0.05 (7–28%)	0.03	0.06–0.1 (3–4%)
Aqueous soluble		0.02 (21–31%)	0.04–0.06 (19–25%)		0.2 (25–28%)	0.6–1.1 (29–48%)
Total conjugate					0.2	0.34–0.36 (15–17%)
High molecular mass						0.36 (17%)

SDS-3701

In a comparable study on ruminants conducted by Ku H.S. (1990, CLTA10_031) lactating goats were treated orally with daily doses of 0.4 or 4 mg ^{14}C-SDS-3701 for 9 days, equivalent to nominal dose rates of 0.2 and 2.0 ppm in the diet and actual rates of 0.24 and 0.29 ppm (low dose) and 2.4 and 2.5 ppm (high dose). Milk samples were collected twice daily and urine and faeces daily throughout the study. The goats were sacrificed within 8 hours of the final dose and muscle, fat, liver and kidney were collected for quantification of radioactivity and further analysis.

The overall radioactive recoveries expressed as a percentage of the total dose ranged from 62% to 71% in the four individual goats (mean values 65% for the low dose and 68% for the high dose, see Table 7). Analysis of the total radioactive residues (TRR) was carried out using liquid scintillation counting (LSC).

Table 7 TRR in lactating goats - recovery of administered dose of ^{14}C-SDS-3701

Sample	Low dose–0.2 ppm diet % recovered	High dose–2.0 ppm diet % recovered
Faeces	16.9–17.5 (17.2)	16.6–18.7 (17.7)
Urine	6.4–6.5 (6.5)	8.7–9.8 (9.3)
Muscle	4.7–6.0 (5.4)	3.7–4.4 (4.1)
Fat	3.5 (3.5)	1.8–1.9 (1.9)
Liver	2.1–2.2 (2.2)	1.6–2.1 (1.9)
Kidney	0.9–1.1 (1.0)	0.4–0.7 (0.6)
Milk	13.0–18.0 (15.5)	15.1–22.6 (18.9)
Total	62.2–67.7 (65.0)	65.5–71.0 (68.3)

Radioactivity excreted in urine and faeces accounted for 6–10% and 17–19%, respectively, of the total dose. Overall steady state equilibrium of milk residue concentrations was achieved by day 5 in the evening milk. The radioactive residue was extracted readily from tissues and milk and only small amounts of radioactivity remained in the post-extraction solid. TRR levels found in the various tissues and milk are summarised in Table 8.

Table 8 TRR levels found in animal tissues of lactating goats dosed with 3 or 30 mg/kg ^{14}C-SDS-3701 in the diet

Sample	0.2 ppm diet Residue levels mg/kg SDS-3701 equivalents	2.0 ppm diet Residue levels mg/kg SDS-3701 equivalents
Muscle	0.01–0.02	0.11–0.13
Fat	0.01–0.02	0.08
Liver	0.07	0.57–0.77
Kidney	0.17–0.26	0.82–1.35
Milk	0.01–0.15	0.08–1.0

The vast majority of the radioactivity (> 90%) partitioned into dichloromethane and over 90% of this fraction was identified as unchanged SDS-3701. No other ^{14}C-residue was identified in the milk or tissue samples.

Laying hens

Chlorothalonil

The metabolic fate of ^{14}C-chlorothalonil was investigated on laying hens by Capps T.M. (1983, CLTA10_027). Hens were treated orally with daily doses for a period of 21 days at rates equivalent to 2, 6 and 20 ppm in the diet. Eggs were collected daily, separated into whites and yolk, pooled according to dose level and test day, and frozen until analysis. At the end of the 21-day dosing period the hens were sacrificed at scheduled intervals. Combined samples of muscle (adductor, cardial and pectoral), liver, skin and fat were collected and frozen for subsequent analysis.

Samples of egg yolks, whites and tissues were combusted and analysed by LSC. No radioactive residues were above the limit of quantification (in any of the egg white samples or in the egg yolk samples from the 2 and 6 mg/kg dose treatments. Total residues in egg yolks were 0.035–0.047 mg/kg in samples from the 20 mg/kg dose rate collected on treatment days 13–17 and the data indicated that residue levels had plateaued within the period of dosing.

Residue levels in all tissues except liver were below the limit of quantification. The total residue levels in livers from the 6 and 20 mg/kg treatments (sacrificed within 6 hours of the final dose) were 0.098 and 0.05 mg/kg respectively. Analysis of samples from hens sacrificed at later time points indicated that within 3 days the residues depurated below the LOQ of the LSC method.

Further extraction and identification or characterisation of the radioactive residues was not conducted.

SDS-3701

In a comparable study also conducted by Capps T.M. (1983, CLTA10_028, amended by Nelsen T.R., 1984, CLTA10_029) hens were treated orally with daily doses of ^{14}C-SDS-3701 for a period of 21 days at rates equivalent to 0.1, 0.3 and 1.0 ppm in the diet. Eggs were collected daily, separated into whites and yolk, pooled according to dose level and test day and frozen until analysis. At the end of the 21-day dosing period the hens were sacrificed at scheduled intervals. Combined samples of muscle (adductor, cardial and pectoral), liver, skin and fat were collected and frozen for subsequent analysis.

Samples of egg yolks, whites and tissues were homogenized, combusted and analysed by LSC. Egg yolks from day 20 of the high dose group were extracted with acetonitrile/water (3:1), partitioned with hexane to remove oils and fats, and then partitioned with dichloromethane. The dichloromethane fraction was analysed by reverse phase HPLC. TRR levels found in tissues and eggs are presented in Table 9.

Table 9 TRR in hen tissues and eggs after dosing with ^{14}C-SDS-3701 for 21 days

Sample	Low dose 0.1 ppm diet	Medium dose 0.3 ppm diet	High dose 1.0 ppm diet
Egg whites	nd	nd	nd
Egg yolks	0.044 (day 21)	0.119 (day 21)	0.415 (day 16)
Pectoral muscle	nd	nd	nd
Cardial muscle	nd	0.55	0.154
Adductor muscle	nd	nd	nd
Fat	nd	nd	nd
Skin	nd	nd	37
Liver	0.056	0.269	0.782

n.d. Not detected

Egg yolks from the highest dose level group (1 ppm) collected on the 20th day of the test were subjected to further analysis. It was shown that the vast majority (84.5%) of the yolk residue partitioned into the dichloromethane fraction. Analysis of this fraction by HPLC showed that 81.5% TRR was due to unchanged SDS-3701. The identity of SDS-3701 was confirmed by methylation with diazomethane followed by further HPLC, GC and GC-MS analysis. No further metabolites were identified in the egg yolks.

Cardial muscle and liver were not further investigated concerning the composition of radioactivity.

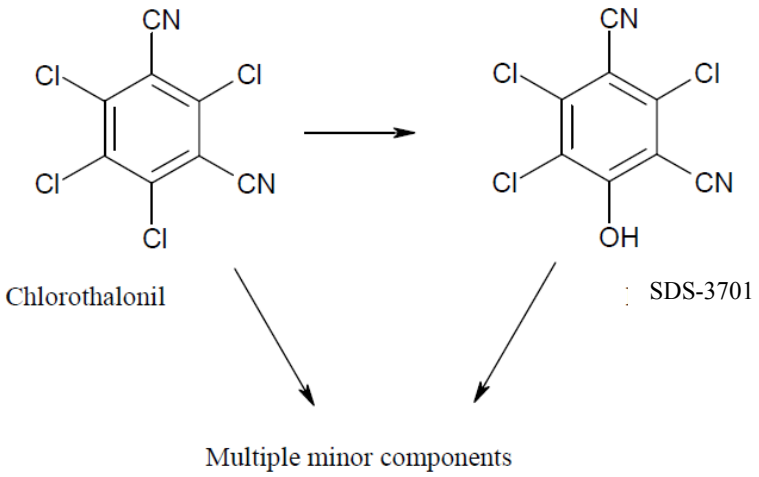


Figure 1Proposed metabolic pathway of chlorothalonil in livestock animals

Plant metabolism

The fate of chlorothalonil in plants was investigated following foliar application of ^{14}C-radiolabelled active substance as foliar application to lettuce, tomatoes, carrots, celery and snap beans.

In all matrices unchanged chlorothalonil was identified as the major residue. The only metabolite identified was SDS-3701, which was present in amounts of < 10% of the TRR in edible parts and up to 12% of the TRR in non-edible parts of the plants. The remaining radioactivity

consisted of numerous polar metabolites at individual amounts too low for further investigation. A proposal on the metabolic pathway of chlorothalonil in plants is presented in Figure 2.

Lettuce

In a study conducted by Nelsen, T.R. (1985, CLTA10_032) lettuce, grown in pots in growth chambers, received four foliar applications of ^{14}C-chlorothalonil, from 22 days post-emergence at 4–5 day intervals, at 1.75 kg ai/ha per application. Two plants were harvested 1, 3, 7, 10, 14 and 21 days after the final application.

The total radioactive residues were determined by combustion/LSC. Individual plant samples were extracted with acetone/0.3M hydrochloric acid (4:1). Following removal of acetone, the residual aqueous sample was partitioned with diethyl ether and the organosoluble fraction analysed by HPLC and GC-MS.

The mean TRR were 118 mg/kg at PHI 1 day, increasing to 170 mg/kg at PHI 3 days and declining slightly to 158 mg/kg after 21 days (see Table 10).

Table 10 Total radioactive residues in lettuces

PHI [Days]	Range of TRR in individual plants [mg/kg parent equivalents] (mean residue)
1	99, 137 (118)
3	168, 172 (170)
7	150, 154 (152)
10	131, 147 (139)
14	131, 175 (153)
21	134, 200 (158)

One of the samples collected at each sampling date was analysed for the composition of radioactivity. The results are presented in the following table.

Table 11 Composition of radioactive residues in lettuce treated with ^{14}C-chlorothalonil

PHI [days]	Chlorothalonil		SDS-3701		Water soluble		Unextracted	
	% TRR	mg/kg	% TRR	mg/kg	% TRR	mg/kg	% TRR	mg/kg
1	89.2	88	1.5	1.5	5.6	5.5	1.0	1.0
3	87.1	146	0.9	1.5	5.6	9.4	4.5	7.6
7	88.2	136	1.4	2.2	7.0	10.8	2.0	3.1
10	89.8	132	1.5	2.2	4.7	6.9	2.4	3.5
14	88.8	155	1.8	3.1	5.3	9.3	2.4	4.2
21	87.1	117	2.0	2.7	4.9	6.6	3.6	4.8

Unextracted residues accounted for a maximum of 4.5% of the TRR and were independent of the PHI. The majority of the residue partitioned from aqueous solution into diethyl ether and analysis by HPLC and GC-MS showed that the principal organosoluble component was parent chlorothalonil, which accounted for at least 87% of the TRR in each sample. SDS-3701 accounted for up to 2% of the TRR. Parent chlorothalonil and SDS-3701 together accounted for > 97% of the organosoluble fraction in each of the samples analysed. The polar water-soluble residue, which did not partition into diethyl ether, accounted for between 4.7 and 7.0% TRR (approx 5–11 mg/kg).

Tomatoes

The metabolism of chlorothalonil in tomatoes was investigated by Nelson, T.R. and Duane, W.C. (1988, CLTA10_033). Tomato plants grown in pots in a growth chamber were treated three times, at

intervals of one week, with ^{14}C-chlorothalonil at 2.3 kg ai/ha. At intervals of 1, 7 and 14 days after the third application, tomato fruit and vines were harvested for analysis.

Tomato fruit were either frozen whole or alternatively rinsed with dichloromethane to remove surface residues. Samples of fruit which had been surface treated with dichloromethane were extracted with acetone/3M hydrochloric acid (4:1). Following removal of the acetone, the residual aqueous sample was partitioned with diethyl ether. The organic fractions were analysed by HPLC and the aqueous fractions examined by a range of techniques to further identify the residues.

One tomato fruit, harvested 7 days after the final chlorothalonil treatment, was dissected during the course of the extraction procedure to examine the distribution of residues between the skin and pulp.

Vine samples were chopped, extracted with acidified acetone and partitioned with diethyl ether to provide a preliminary analysis for comparison with the fruit.

The mean TRR in the fruit was 2.6 mg/kg at PHI 1 day, declining slightly to 0.7 mg equiv./kg after 7 days and 0.6 mg equiv./kg after 14 days .

Extraction of fruit showed that 56–75% of the total residue was present in the dichloromethane rinse. Separate analysis of the fruit dissected into skin and pulp portions after an organic solvent surface rinse, showed that the majority of the unextracted residue was associated with the skin and the majority of the water-soluble residue was associated with the pulp.

The major identified component of the total organosoluble fraction was parent chlorothalonil, which accounted for 56–76% and 41–73% of the total residue in fruit and vines respectively. The metabolite SDS-3701 was identified as a minor component of the organosoluble fractions but represented < 4% of the residue in fruit and a maximum of 8% of the residue in vines. The residue levels of chlorothalonil and SDS-3701 are presented in Table 12.

Table 12 Distribution of ^{14}C residues in tomato fruit and vines

Sample	TRR	Organosoluble (Dichloromethane surface rinse / diethyl ether partition)			Aqueous	Unextracted
	[mg/kg parent equivalents]	[% TRR]	Chlorothalonil [% TRR]	SDS-3701 [%TRR]	[% TRR]	[% TRR]
Fruit 1 day	2.6	79.2 (75.0/4.2)	76	1.5	18.9	2.0
Fruit 7 days	0.7	58.9 (55.6/3.5)	56	1.4	31.9	9.1
Fruit 14 days	0.6	64.5 (61.2/3.3)	58	3.3	31.5	4.2
Vines 1 day	20.6	80.0 (n.p./80.0)	73	3.5	13.3	6.8
Vines 7 days	12.7	66.8 (n.p./66.8)	54	7.9	19.1	13.6
Vines 14 days	14.0	55.5 (n.p./55.5)	41	7.9	29.7	14.9

n.p. Not performed

Carrots

In a study by Nelson, T.R. (1987, CLTA10_034) carrot plants grown in pots in growth chambers received three foliar applications of ^{14}C-chlorothalonil at intervals of 7 days at 1.6 kg ai/ha. At intervals of 1, 7, 14 and 21 days after the final application, replicate samples were harvested and separated into foliage and roots.

Immediately after each harvest, two or three carrots were rinsed with dichloromethane to remove surface residues. A similar organic solvent washing procedure was carried out on corresponding foliage samples. Roots and foliage were extracted with acidified acetone (acetone/3M hydrochloric acid, 15:1 for roots and 3:1 for foliage). After removal of the acetone, the aqueous

solution was extracted with diethyl ether and/or ethyl acetate and the fractions then subjected to further analysis. Total radioactive residues were determined by LSC.

The radioactive residues in the roots were lower compared to the foliage. The surface rinse of roots removed 0.02 mg/kg of the residue from the day 1 root and up to 0.01 mg/kg from samples at the later time points. Identification of the radioactivity in the rinse revealed > 70% chlorothalonil.

One replicate from the 21 day PHI root samples, which had a TRR of 0.051 mg/kg, was further processed and the organosoluble fractions analysed by reverse phase HPLC to quantify levels of chlorothalonil and SDS-3701. For a summary of TRR levels found in roots and foliage of carrots refer to Table 13.

Table 13 Total radioactive residues in carrot root and foliage (range of replicates, mean in brackets)

PHI [Days]	Carrot Root	Carrot Foliage
	TRR [mg equiv./kg]	TRR [mg equiv./kg]
1	0.037–0.121 (0.07)	29.5–40.2 (35.9)
7	0.020–0.022 (0.02)	16.9–22.7 (19.8)
14	0.012–0.017 (0.01)	33.3–39.3 (36.3)
21	0.022–0.051 (0.04)	9.7–16.0 (12.9)

The rinsed residues from foliage samples were analysed for all sampling dates. In these samples a large part of the TRR remained unextracted (39–46%). In the organic extract chlorothalonil and SDS-3701 were identified as relevant metabolites (see Table 14).

Table 14 Composition of residues in carrot roots and foliage

Sample	TRR	Chlorothalonil		SDS-3701		Aqueous		Unextracted	
	[mg equiv./kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]
Carrot Root, 21 day PHI	0.051	45.1	0.023	3.9	0.002	15.7	0.008	25.5	0.013
Carrot foliage, 1 day PHI	13.49	13.7	1.85	3.4	0.49	31.1	4.2	42.1	5.7
Carrot foliage, 7 day PHI	2.56	15.3	0.39	2.4	0.06	29.8	0.76	43.7	1.1
Carrot foliage, 14 day PHI	2.77	9.0	0.25	4.3	0.12	30.5	0.84	45.9	1.3
Carrot foliage, 21 day PHI	2.52	4.0	0.1	12.1	0.3	29.1	0.73	39.1	0.99

Note: absolute amounts in mg/kg were calculated by evaluator

Celery

For the investigation of the metabolism of chlorothalonil celery plants grown outdoors were sprayed with 12 applications of formulated ^{14}C-chlorothalonil at 2.5 kg ai/ha per treatment at intervals of 6–8 days (Huhtanen K.L., 1992, CLTA10_035). Plants were harvested at intervals of 7 and 21 days after the final application and separated into stalks and foliage.

Plant tissues were processed by grinding with dry ice and then extracted with either acetone/1M hydrochloric acid (4:1) or acetone/0.03M phosphate buffer pH 6–7 (4:1). After removal of the acetone, the aqueous solution was partitioned with diethyl ether and both fractions were then analysed by a range of techniques, including TLC and HPLC to identify and characterise the residues. Total radioactive residues were identified using LSC.

The total radioactive residues in the foliage (mean of 206 mg/kg at PHI 7 days; 61 mg/kg at PHI 21 days) were higher than those in the edible stalk (mean of 1.8 mg/kg at PHI 7 days; 1.2 mg/kg at PHI 21 days). Residue levels decreased with increasing PHI in both sample types.

Chromatographic analyses showed that the principal and only significant component of the organosoluble fractions from both the stalks and foliage was parent chlorothalonil (see Table 15). The metabolites SDS-3701 and R611965 were not detected (LOD 0.01 mg/kg in stalk). Further analysis of the organosoluble radioactivity from the stalk samples revealed that it consisted of a large number of minor residues.

Table 15 Distribution of ^{14}C Residues in celery following fractionation

Sample	TRR	Diethyl ether partition				Aqueous		Unextracted	
	[mg equiv./kg]	[% TRR]	[mg/kg]	Chlorothalonil [% TRR]	Chlorothalonil [mg equiv./kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]
Stalks 7 days	1.0–4.6 (1.8)	29–59	0.29–2.7	27–55	0.28–2.57	21–36	0. 25–0.95	21–35	0.33–0.95
Stalks 21 days	0.7–1.4 (1.2)	18–46	0.13–0.60	10–42	0.08–0.55	30–53	0.39–0.65	24–29	0.22–0.38
Foliage 7 days	161–263 (206)	72–80	117–209	72–80	116–206	10–14	22–34	8–14	14–23
Foliage 21 days	52–78 (61)	47–60	24–47	42–58	22–45	21–30	15–16	19–24	11–15

The polar water-soluble extracts were analysed extensively in an attempt to characterise and identify the radioactive components. The polar residues derived from both the stalks and foliage were separated into four fractions (varying from weakly to strongly acidic components) by anion exchange chromatography (DEAE Sephadex A-25). These were further analysed by HPLC and TLC, which showed that all fractions contained numerous components. A method analysing extracts specifically for the mono- and di-glutathione conjugates of chlorothalonil was used but the presence of these compounds could not be confirmed. A tentative identification of the di-glutathione conjugate in the stalk, suggested that it was present at a maximum level of 0.02 mg/kg.

Polar residues were also treated with hydrolytic enzymes, including a protease, β-glucosidase and cellulase, and with hydrochloric acid (up to 3M at 60 °C) but this did not result in release of significant non-polar compounds and also failed to simplify the polar mixture.

Post extraction solids from the stalks and foliage were also subjected to hydrolysis by enzymes (β-glucosidase and cellulose) and hydrochloric acid (3M and 12M at 60 °C). On average, the solids from the stalks contained 28.2% TRR, 0.57 mg/kg and the hydrolysis procedures released, on average, about a third (0.20 mg/kg) of this residue. TLC analysis of the solubilised components indicated a highly complex mixture of components.

Snap bean

In a study by Huhtanen K.L. (1993, CLTA10_036) snap (green) beans grown outdoors were sprayed with 4 applications of formulated ^{14}C-chlorothalonil prepared at 2.47 kg ai/ha at weekly intervals from the early bloom stage up to when the immature beans had grown to a length of 7.5 to 8 cm. The plants were harvested at intervals of 7 and 28 days after the final application and separated into bean and foliage samples.

Samples of beans and leaves/foliage were extracted with acetone/1M hydrochloric acid (4:1). After removal of the acetone, the extracts were partitioned with diethyl ether and then subjected to a range of analytical procedures to characterise and identify the residues. In a separate procedure to determine the quantity and nature of surface residues, samples of fresh whole beans were immersed in acetone prior to further processing. Total radioactive residues were identified using LSC.

The total radioactive residues in the foliage (mean of 154 mg/kg at PHI 7 days; 90 mg/kg at PHI 28 days) were higher than those in the edible beans (mean of 1.0 mg/kg at PHI 7 days; 1.8 mg/kg at PHI 28 days). Residue levels decreased with increasing PHI in both sample types.

Analysis of the organosoluble fractions by HPLC showed that chlorothalonil was the only significant component in both the bean and foliage samples. Chromatographic analyses indicated the presence of minor components with the appropriate retention times for SDS-3701 and R611965, however levels were too low for definitive identification or quantification (LOQ 0.02 mg/kg and 0.03 mg/kg for SDS-3701 and R611965 respectively). Numerous other minor organosoluble ^{14}C-residues, each amounting to < 0.025 mg/kg, were resolved by TLC analysis. The separate extraction procedure which employed an acetone wash of whole beans, showed that 96% of the total radioactivity was removed by this method. The amounts of chlorothalonil identified are summarised in Table 16.

Table 16 Distribution of ^{14}C Residues in beans and foliage following fractionation

Sample	TRR	Diethyl ether partition				Aqueous		Unextracted	
	[mg equiv./kg]	[% TRR]	[mg/kg]	Chlorothalonil [% TRR]	Chlorothalonil [mg equiv./kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]
Beans 7 days	0.90–1.2 (1.0)	28–35	0.25–0.38	20–31	0.18–0.28	50–54	0.46–0.59	14–19	0.12–0.23
Beans 28 days	1.0–3.1 (1.8)	14–19	0.15–0.60	3.3–14	0.03–0.43	57–60	0.58–1.75	23–28	0.26–0.75
Foliage 7 days	106–217 (154)	77–85	82–185	77–82	82–174	13–18	20–28	2–4	4–6
Foliage 28 days	31–159 (90)	33–75	10–119	33–70	10–111	19–50	15–31	6–17	5–9

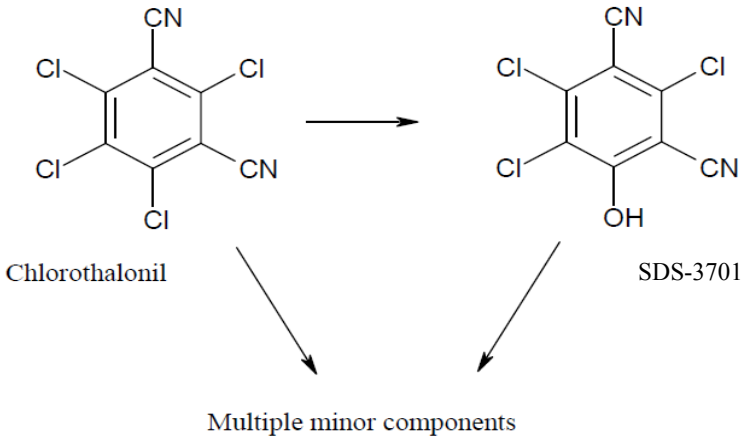


Figure 2 Proposed metabolic pathway for chlorothalonil in plants

Environmental fate in soil

For the investigation of the environmental fate of chlorothalonil the Meeting received studies on photolysis on soil, the aerobic soil metabolism and the behaviour in confined and field rotational crops. While no photolytic degradation of chlorothalonil or SDS-3701 could be observed, the degradation in soil was fast with estimated DT50 values between 0.3 and 1.9 days, resulting in various metabolites.

Confined rotational crop studies revealed an uptake of the metabolite R611965 into follow plants. SDS-3701 was identified at minor amounts of up to 3.5% of the total radioactive residue, while no chlorothalonil could be identified in any sample. This result is confirmed by rotational crop field studies, which show low to non-detectable residues for chlorothalonil and SDS-3701.

Photolysis on soil

A study was carried out by Szalkowski M.B. (1975, CLTA10_043) to determine if chlorothalonil or its major soil metabolite, SDS-3701 photolytically degrade on soil surfaces. Stability to photolysis was examined in five soils (two silt loams and three silty clay loams.

Water slurries of each soil type were applied to TLC plates to a thickness of 0.46 mm. The plates were air-dried and ^{14}C-chlorothalonil or ^{14}C-SDS-3701 separately applied to the bottom of the plates. After evaporation of the benzene solvent, the samples were exposed to an artificial light source for the equivalent of 168 twelve-hours-of-sunlight days. The radiation from the light source was > 99% at 290 nm or longer. After exposure, the plates were placed in a developing chamber containing 100 cm^{3}water and developed to a distance of 13 cm from the origin. The plates were air dried and X-ray film was exposed for 4 days. Extracts were analysed by normal phase silica TLC after partitioning with isopropyl ether.

No unextracted residues of chlorothalonil or SDS-3701 were formed in soil upon exposure to artificial sunlight for the equivalent of 168 days. Extractability, as determined by a direct comparison of extracted radioactivity with known applied radioactivity was 97% or greater for both compounds. No loss of radioactivity due to volatility was observed.

Determination of radioactive distribution indicated that 97% of the chlorothalonil and 84% of SDS-3701 could be recovered unreacted.

Soil metabolism

Aerobic soil metabolism

The aerobic soil metabolism of chlorothalonil was investigated in four soil types using ^{14}C-chlorothalonil. The metabolism was rather complex showing oxidation and glutathione conjugations at various position of the molecule. The proposed metabolic pathway is presented in Figure 3.

Ref: Gibbings, E.L., 2001, CLTA10_040
Test material: ^{14}C-chlorothalonil — Dose rate: 1 mg/kg
Duration: 120 days — Temp: 20 °C
Moisture: 32% maximum holding capacity — Soil: 18 Acres, loam
pH: 5.4 — Organic carbon: 4.5%
Half-life (parent): 1 day — ^{14}C accountability: 87.4–99.2%
% chlorothalonil remaining: 1.2% after 120 days — % mineralisation: 13.5% after 120 days
% unextractable: 33.1% after 120 days

Metabolites	Max (% of dose)	Day
SDS-3701	8.1	7
R613636	1.7	3
R611965	4.1	14
R611966	3.0	14
R417888	14.1	14
R419492	4.0	58
R471811	6.6	92
Unknowns	14.4	3

Ref: Gibbings, E.L., 2001, CLTA10_040
Test material: ^{14}C-chlorothalonil — Dose rate: 1 mg/kg
Duration: 120 days — Temp: 20 °C

Moisture: 20% maximum holding capacity
Soil: Chamberlain´s Farm, loamy sand
pH: 6.8
Organic carbon: 3.2%
Half-life (parent): 0.3 days
^{14}C accountability: 91.6–100.6%
% chlorothalonil remaining: 0.2% after 120 days
% mineralisation: 23.8% after 120 days
% unextractable: 39.9% after 120 days

Metabolites	Max (% of dose)	Day
SDS-3701	25.3	7
R613636	2.0	3
R611965	4.3	14
R611966	3.2	1
R417888	5.8	7
R419492	2.9	92
R471811	3.8	120
Unknowns	16.8	3

Ref: Gibbings, E.L., 2001, CLTA10_040
Test material: ^{14}C-chlorothalonil
Dose rate: 1 mg/kg
Duration: 120 days
Temp: 20 °C
Moisture: 21% maximum holding capacity
Soil: ERTC, sandy loam
pH: 5.9
Organic carbon: 1.3%
Half-life (parent): 1.3 days
^{14}C accountability: 87.6–101.5%
% chlorothalonil remaining: 1.7% after 120 days
% mineralisation: 6.3% after 120 days
% unextractable: 23.7% after 120 days

Metabolites	Max (% of dose)	Day
SDS-3701	20.8	3
R613636	2.3	14
R611965	6.0	30
R611966	2.0	3
R417888	12.3	30
R419492	12.4	120
R471811	2.0	120
Unknowns	17.1	3

Ref: Gibbings, E.L., 2001, CLTA10_040
Test material: ^{14}C-chlorothalonil
Dose rate: 1 mg/kg
Duration: 120 days
Temp: 20 °C
Moisture: 21% maximum holding capacity
Soil: Munster, loamy sand
pH: 4.8
Organic carbon: 2.5%
Half-life (parent): 1.9 days
^{14}C accountability: 86.2–99.5%
% chlorothalonil remaining: 1.1% after 120 days
% mineralisation: 11.8% after 120 days
% unextractable: 25.7% after 120 days

Metabolites	Max (% of dose)	Day
SDS-3701	6.3	3
R613636	1.8	7
R611965	13.2	30
R611966	4.0	7
R417888	11.7	14
R419492	6.4	92
R471811	3.2	120
Unknowns	14.8	30

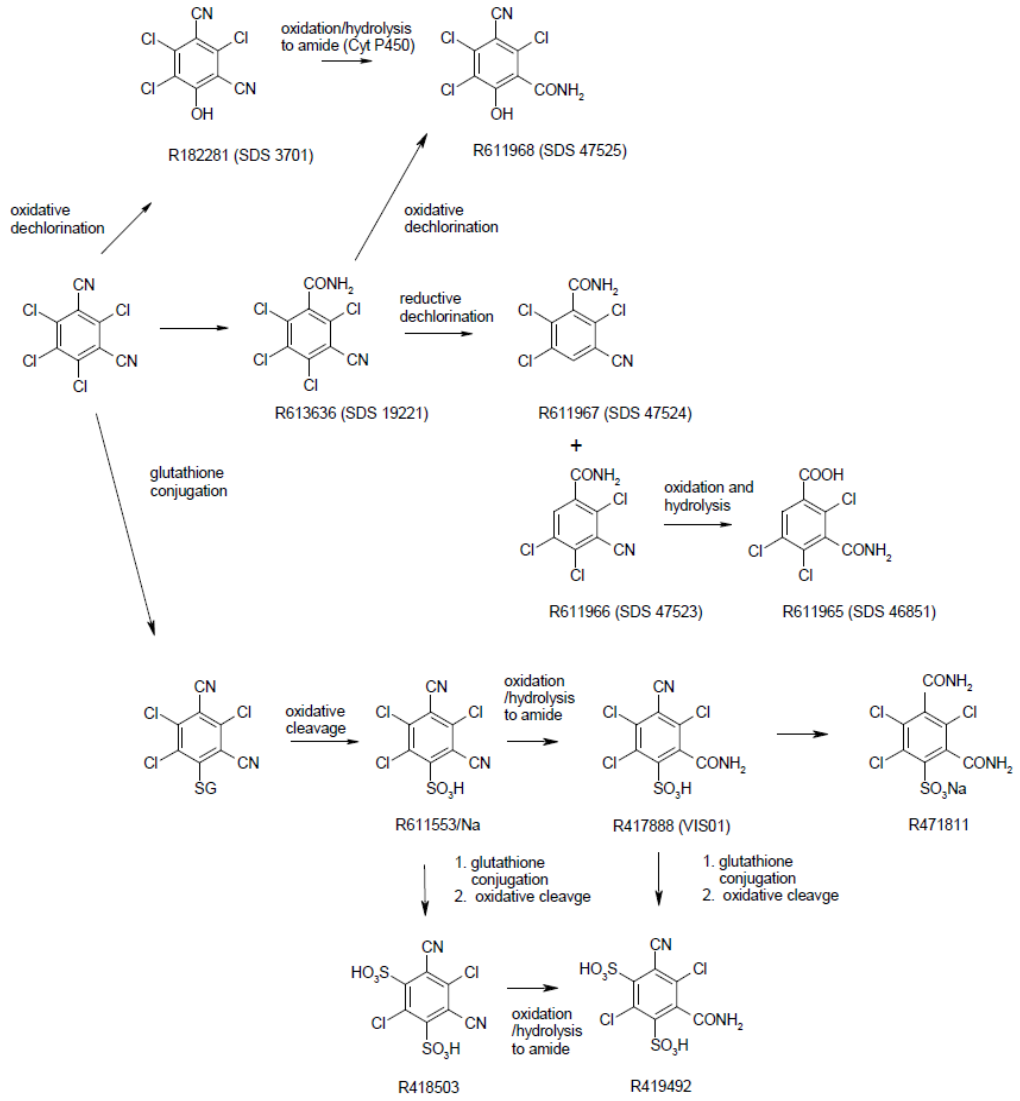


Figure 3 Proposed aerobic metabolic pathway of chlorothalonil in soil

Confined rotational crop studies

In a confined rotational crop study by Nelson, T.R. (1983, CLTA10_037) treated soil was aged aerobically in the dark under controlled temperature conditions. After 30 and 88 days of aerobic ageing, 4 kg sub samples of soil were transferred to plant pots. Based on the dimensions of the pots, the concentration of chlorothalonil was equivalent to a surface application of approximately 12 kg ai/ha. Duplicate pots were planted with seeds of lettuce, carrots and spring wheat. After germination of the seeds, the pots were transferred into a greenhouse and the plants were grown to maturity.

Mature crops were harvested and separated into appropriate commodities (wheat grain, chaff and straw; carrot tops and roots; lettuce) then frozen and ground in an analytical mill for combustion analysis with LCS detection. Samples of crop commodities were extracted twice with acetone/0.3M hydrochloric acid (4:1). The acetone was removed and the remaining aqueous fraction was partitioned twice with diethyl ether. Both fractions were then subjected to further analytical techniques, including

reverse phase HPLC, to characterise and identify the residues. Total radioactive residues found in the various samples are presented in Table 17.

Table 17 Total radioactive residues in rotational crops

Crop	Residue–30 day interval	Residue–88 day interval
	TRR mg/kg	TRR mg/kg
Lettuce	3.3	1.0
Carrot Root	1.0	0.9
Carrot Top	2.2	3.2
Wheat Grain	3.3	21.6
Wheat Straw	51.9	63.8
Wheat Chaff	7.8	43.9

Extraction rates of radioactivity were relatively good leaving unextracted solids from 2.8 to 22.6% of the TRR. Except for wheat grain and straw more than 90% of the total radioactivity was extracted. The separation of the total extracted radioactivity for all samples is presented in Table 18.

Table 18 Distribution of residue in crops after diethyl ether partition

Crop	% Extracted Radioactivity in Diethyl Ether Fraction	
	30 Day Interval	88 Day Interval
Lettuce	62.0 [a]	50.2
Carrot Root	70.1 [a]	67.1
Carrot Top	55.9 [a]	46.3
Wheat Grain	78.5	68.1
Wheat Straw	45.7	46.1

[a] Mean of two replicates

The organosoluble fractions were analysed by reverse phase HPLC. The major metabolite in all crop parts was found to be the trichloro acid amide R611965, which was also identified as a soil metabolite. This compound accounted for almost all the organosoluble radioactive residue (85–99%). Several samples contained SDS-3701 at very low levels (3–6% of the organosoluble residue). No parent chlorothalonil was detected in any of the samples.

The water soluble residues were further examined using a range of techniques. Enzyme treatments (including cellulase, hemicellulase, glucosidase and protease) failed to liberate significant amounts of organosoluble components. Acid (up to 6M hydrochloric under reflux) and base (2M sodium hydroxide under reflux) hydrolysis techniques were similarly unsuccessful. Harsher methods (acidic butanol, 4 day reflux) released higher proportions of organosoluble radioactivity, which were shown to contain R611965 and SDS-3701 together with the butyl ester of R611965 and the butyl ether of SDS-3701.

A total overview of the amounts of all metabolites identified in the samples is presented in Table 19.

Table 19 Distribution of radioactivity in rotational crops

Crop	TRR	Organosoluble				Water Soluble			
		R611965		SDS-3701		R611965		SDS-3701	
(Rotational interval, days)	mg/kg	%	mg/kg	%	mg/kg	%	mg/kg	%	mg/kg
Lettuce (30)	3.3 [a]	61.7	2.0	n.d.	n.d.	n.a.	n.a.	n.a.	n.a.
Lettuce (88)	0.9	39.6	0.36	2.3	0.02	5.0	0.05	5.8	0.05

Crop	TRR	Organosoluble				Water Soluble			
		R611965		SDS-3701		R611965		SDS-3701	
(Rotational interval, days)	mg/kg	%	mg/kg	%	mg/kg	%	mg/kg	%	mg/kg
Carrot Root (30)	1.0 [a]	63.1	0.63	1.9	0.02	n.a.	n.a.	n.a.	n.a.
Carrot Root (88)	1.0	55.5	0.56	n.d.	n.d.	9.4	0.09	5.6	0.06
Carrot Top (30)	2.2 [a]	45.0	0.99	2.5	0.06	n.a.	n.a.	n.a.	n.a.
Carrot Top (88)	4.6	29.3	1.3	2.0	0.09	6.3	0.29	9.3	0.43
Wheat Grain (30)	3.6	62.9	2.3	n.d.	n.d.	n.a.	n.a.	n.a.	n.a.
Wheat Grain (88)	20.8	59.2	12	n.d.	n.d.	16.9	3.5	1.9	0.40
Wheat Straw (30)	57.4	47.3	27	n.d.	n.d.	13.5	7.7	11.9	6.8
Wheat Straw (88)	48.8	37.3	18	2.4	1.2	14.6	7.1	7.5	3.7

[a] Mean of two replicates

n.d. Not detected

n.a. Not analysed

Field crop rotation studies

A field crop rotation study for chlorothalonil at three location in the USA was conducted by Dillon, K.A. (1983, CLTA10_038). At each of three locations soil was treated with eight applications at a rate of 2.5 kg ai/ha. Into these treated plots, secondary crops were planted back at different intervals after the final soil application. At each location spinach, snap beans, carrots and wheat were planted as the secondary crops. Samples were harvested at maturity and analysed for residues of SDS-3701 and R611965 (see Table 20).

Table 20 Summary of SDS-3701 and R611965 residues in follow crops planted in the United States

Location	Rotational Crop	Rotation Interval (days)	PHI (days)	Mean Residue (mg/kg)	
				SDS-3701	R611965
Georgia (Tifton)	Spinach	14	93	0.02	2.15
		30	98	0.05	1.05
		60	117	0.05	1.82
		90	149	0.19	2.20
		372	441	< 0.01	< 0.05
	Snap beans	14	93	< 0.01	0.19
		30	98	< 0.01	0.15
		60	117	< 0.01	0.22
		90	149	< 0.01	1.00
		372	-	Na	na

Location	Rotational Crop	Rotation Interval (days)	PHI (days)	Mean Residue (mg/kg)	
				SDS-3701	R611965
	Carrot Tops	14	93	< 0.01	0.23
		30	98	< 0.01	0.26
		60	117	0.02	0.36
		90	149	0.02	0.65
		372	449	0.03	< 0.01
	Carrot Roots	14	93	< 0.01	0.13
		30	98	0.02	0.10
		60	117	0.03	0.38
		90	149	0.02	0.59
		372	449	< 0.01	< 0.01
	Wheat Grain	14	229	< 0.01	0.17
		30	229	< 0.01	0.23
		60	246	< 0.01	0.68
		90	252	< 0.01	0.58
		372	603	< 0.01	0.01
	Wheat Straw	14	229	0.01	3.15
		30	229	< 0.01	5.03
		60	246	0.04	10.35
		90	252	0.02	6.74
		372	603	< 0.01	< 0.05
Texas (Donna)	Spinach	14	121	0.01	< 0.05
		30	121	0.02	< 0.05
		60	156	0.04	< 0.05
		90	170	0.03	< 0.05
		382	474	< 0.01	< 0.05
	Snap beans	14	92	< 0.01	0.03
		30	111	< 0.01	0.15
		60	137	< 0.01	0.74
	Carrot Tops	14	153	0.02	0.03
		30	170	0.04	0.04
		60	217	0.02	0.02
		382	527	< 0.01	< 0.01
	Carrot Roots	14	153	0.01	0.02
		30	170	0.02	0.02
		60	217	0.03	0.02
		382	527	< 0.01	< 0.01
	Wheat Grain	382	573	< 0.01	< 0.01
	Wheat Straw	382	573	0.02	< 0.05

Location	Rotational Crop	Rotation Interval (days)	PHI (days)	Mean Residue (mg/kg)	
				SDS-3701	R611965
California (El Centro)	Spinach	14	111	0.03	< 0.05
		30	111	0.01	< 0.05
		60	147	0.05	< 0.05
		90	158	0.02	< 0.05
		450	494	< 0.01	< 0.05
	Snapbeans	30	179	< 0.01	0.02
		60	158	< 0.01	0.02
		90	170	< 0.01	0.03
	Carrot Tops	14	154	0.02	0.03
		30	154	0.02	0.03
		60	154	0.03	0.02
		90	172	0.04	0.02
	Carrot Roots	14	154	0.02	< 0.01
		30	154	0.01	< 0.01
		60	154	0.03	0.02
		90	172	0.02	0.01
		450	556	< 0.01	0.02
	Wheat Grain	14	165	< 0.01	< 0.01
		30	172	< 0.01	0.03
		408	556	< 0.01	0.06
	Wheat Straw	14	165	0.08	0.07
		30	172	0.03	0.18
		408	556	0.01	0.37

In a second field crop rotation study (Rose, C.A., 1991, CLTA10_039) conducted at twelve locations in the United States primary crops were treated with multiple applications of chlorothalonil and then harvested at commercial maturity. Into the vacated plots, secondary crops were planted back at intervals following harvest of the primary crop. At each location up to ten secondary crops were planted covering root and bulb crops, fruiting vegetables and cucurbits, leafy vegetables and oil bearing/bean crops. At maturity, samples were harvested and analysed for residues of chlorothalonil, SDS-3701 and R611965 (see Table 21).

Table 21 Summary of chlorothalonil, SDS-3701 and R611965 residues in follow crops planted in the United States

Location	Rotational Crop	Rotation Interval (days)	PHI (days)	Mean Residue (mg/kg)		
				Chlorothalonil	SDS-3701	R611965
Georgia (Donalsonville)	Primary Crop–Peanuts. 10 applications at 1.3 kg ai/ha					
	Turnip Tops	34	60	< 0.01	< 0.01	0.59
	Turnip Roots	34	90	< 0.01	< 0.01	0.10
	Cabbage	34	180	< 0.01	< 0.01	< 0.03
	Wheat Grain	34	253	< 0.01	< 0.01	< 0.03
	Wheat Straw	34	253	0.02	< 0.02	0.05

Location	Rotational Crop	Rotation Interval (days)	PHI (days)	Mean Residue (mg/kg)		
				Chlorothalonil	SDS-3701	R611965
	Corn	180	320	< 0.01	< 0.01	< 0.03
	Summer Squash	222	291	0.02	< 0.01	< 0.03
	Peanut Vines	222	376	0.22	< 0.01	< 0.03
	Sweet Potato	222	390	< 0.01	< 0.01	< 0.03
	Soya bean	253	414	< 0.01	< 0.01	< 0.03
	Cotton Seed	253	414	< 0.01	< 0.01	< 0.03
Texas	Primary Crop–Cucumbers. 8 applications at 2.5 kg ai/ha					
(Donna)	Spinach	13	100	< 0.01	< 0.01	< 0.03
	Carrot Roots	13	175	< 0.01	0.02	0.03
	Carrot Tops	13	175	0.02	0.02	0.10
	Onions	13	175	0.02	< 0.01	< 0.03
	Cucumbers	99	190	< 0.01	< 0.01	0.14
	Bell Peppers	99	228	0.01	< 0.01	< 0.03
	Sorghum Grain	99	228	< 0.01	< 0.01	< 0.03
	Sorghum Forage	99	228	< 0.01	0.04	0.26
	Cotton Seed	99	277	< 0.01	< 0.01	< 0.03
Oklahoma	Primary Crop–Peanuts. 8 applications at 1.3 kg ai/ha					
(Eakly)	Wheat Grain	59	260	< 0.01	< 0.01	< 0.03
	Wheat Straw	59	260	< 0.01	< 0.02	< 0.03
	Potatoes	179	282	< 0.01	< 0.01	< 0.03
	Corn	220	290	< 0.01	< 0.01	< 0.03
	Peanut Nutmeat	260	380	< 0.01	< 0.01	< 0.03
	Peanut Hulls	260	380	0.02	< 0.01	< 0.03
	Sorghum	260	380	0.01	< 0.01	< 0.03
	Cotton Seed	260	422	< 0.01	< 0.01	< 0.03
	Cucumbers	262	330	< 0.01	< 0.01	< 0.03
California	Primary Crop–Tomatoes. 8 applications at 2.3 kg ai/ha					
(Fresno)	Lettuce	31	163	< 0.01	< 0.01	< 0.03
	Wheat Forage	31	177	0.01	< 0.02	0.08
	Broccoli	31	185	< 0.01	< 0.01	0.18
	Carrot Roots	31	185	< 0.01	< 0.01	< 0.03
	Carrot Tops	31	185	< 0.01	< 0.01	< 0.03
	Wheat Grain	31	224	< 0.01	< 0.01	0.04
	Wheat Straw	31	224	< 0.01	< 0.02	0.19
	Onions	31	224	< 0.01	< 0.01	< 0.03
	Sugar beet Roots	31	290	< 0.01	< 0.01	< 0.03
	Sugar beet Tops	31	290	< 0.01	< 0.01	0.07
	Tomatoes	177	318	0.01	< 0.01	< 0.03
	Cotton Seed	177	360	0.03	0.01	0.04

Location	Rotational Crop	Rotation Interval (days)	PHI (days)	Mean Residue (mg/kg)		
				Chlorothalonil	SDS-3701	R611965
North Dakota	Primary Crop–Potatoes. 8 applications at 1.2 kg ai/ha					
(Grand Forks)	Lettuce	257	315	< 0.01	0.02	< 0.03
	Soya Bean	259	385	< 0.01	< 0.01	< 0.03
	Potatoes	nr	350	< 0.01	< 0.01	0.04
	Sugar beet Roots	nr	385	0.03	< 0.01	< 0.03
	Wheat Grain	nr	333	< 0.01	< 0.01	< 0.03
	Wheat Straw	nr	333	< 0.01	0.02	< 0.03
	Cabbage	nr	350	< 0.01	< 0.01	< 0.03
California	Primary Crop–Broccoli. 9 applications at 1.3 kg ai/ha					
(Greenfield)	Radishes	197	238	< 0.01	< 0.01	0.10
	Spinach	197	248	< 0.01	< 0.01	0.11
	Broccoli	197	290	< 0.01	< 0.01	0.14
	Lettuce	197	290	< 0.01	< 0.01	< 0.03
	Potatoes	197	302	< 0.01	< 0.01	0.33
	Carrot Roots	197	309	< 0.01	< 0.01	< 0.03
	Wheat Grain	197	314	< 0.01	< 0.01	0.26
	Wheat Straw	197	314	< 0.01	< 0.02	0.23
	Sugar beet Roots	197	363	0.01	< 0.01	0.13
	Celery	197	413	< 0.01	< 0.01	< 0.03
	Fresh Peas	223	297	< 0.01	< 0.01	0.08
	Dry Peas	223	309	< 0.01	< 0.01	< 0.03
Idaho	Primary Crop–Potatoes. 8 applications at 1.3 kg ai/ha					
(Minidoka)	Wheat Grain	221	370	< 0.01	< 0.01	< 0.03
	Wheat Straw	221	370	< 0.01	< 0.02	0.09
	Sugar beet Roots	221	374	< 0.01	< 0.01	< 0.03
	Sugar beet Tops	221	374	< 0.01	< 0.01	< 0.03
	Potatoes	245	376	< 0.01	< 0.01	< 0.03
	Carrot Roots	249	344	< 0.01	< 0.01	< 0.03
	Carrot Tops	249	344	< 0.01	< 0.01	< 0.03
	Dry Peas	249	351	< 0.01	< 0.01	< 0.03
	Pea Fodder	249	351	0.06	0.07	< 0.03
	Rape Seed	249	370	< 0.01	< 0.01	< 0.03
	Bean Hay	269	374	0.09	< 0.02	0.11
	Dry Beans	269	374	< 0.01	< 0.01	< 0.03
Georgia	Primary Crop–Peanuts. 11 applications at 1.2 kg ai/ha					
(Parrot)	Wheat Grain	83	270	< 0.01	< 0.01	< 0.03
	Wheat Straw	83	270	< 0.02	< 0.02	< 0.03
	Corn	208	328	< 0.01	< 0.01	< 0.03
	Sorghum	240	328	0.02	< 0.01	< 0.03

Location	Rotational Crop	Rotation Interval (days)	PHI (days)	Mean Residue (mg/kg)		
				Chlorothalonil	SDS-3701	R611965
Georgia	Primary Crop–Peanuts. 6 applications at 1.2 kg ai/ha					
(Plains)	Wheat Grain	90	279	< 0.01	< 0.01	< 0.03
	Collards	204	286	0.01	< 0.01	< 0.03
	Corn	214	351	< 0.01	< 0.01	< 0.03
	Sorghum	280	392	0.03	< 0.01	< 0.03
	Cotton Seed	280	429	< 0.01	< 0.01	< 0.03
New York	Primary Crop–Potatoes. 12 applications at 1.2 kg ai/ha					
(Phelps)	Oat Grain	179	282	< 0.01	< 0.01	0.40
	Oat Straw	179	282	< 0.01	< 0.02	2.95
	Corn	199	348	< 0.01	< 0.01	0.13
	Spinach	229	320	< 0.01	< 0.01	0.80
	Cabbage	229	320	< 0.01	< 0.01	< 0.03
	Carrot Tops	229	320	< 0.01	< 0.01	0.31
	Carrot Roots	229	320	< 0.01	< 0.01	0.23
	Tomatoes	229	327	< 0.01	< 0.01	0.06
	Winter Squash	229	341	< 0.01	< 0.01	1.05
	Soya Bean	229	362	< 0.01	< 0.01	0.09
	Onions	229	391	< 0.01	< 0.01	< 0.03
	Potatoes	236	362	< 0.01	< 0.01	0.64
Louisiana	Primary Crop–Soya Beans. 3 applications at 1.7 kg ai/ha					
(Rosa)	Rice	194	322	< 0.01	< 0.01	< 0.03
Maryland	Primary Crop–Tomatoes. 8 applications at 2.5 kg ai/ha					
(Salisbury)	Wheat Grain	61	300	< 0.01	< 0.01	< 0.03
	Cantaloupes	284	341	< 0.01	< 0.01	< 0.03
	Lima Beans	284	381	< 0.01	< 0.01	< 0.03
	Tomatoes	284	381	< 0.01	< 0.01	< 0.03
	Carrot Tops	284	402	< 0.01	< 0.01	0.16
	Carrot Roots	284	402	< 0.01	< 0.01	< 0.03
	Beet Tops	284	402	< 0.01	< 0.01	0.33
	Beet Roots	284	402	< 0.01	< 0.01	0.20
	Corn	284	402	< 0.01	< 0.01	0.05
	Soya Beans	284	420	< 0.01	< 0.01	< 0.03
	Turnip Tops	284	420	0.01	0.01	0.49

Field dissipation studies

Two studies investigating the dissipation of chlorothalonil under field conditions are available. One field trial was carried out in Canada during 1993 and 1994 (Rose, C.A., 1995, CLTA10_045) and the other field trial was conducted in Georgia, USA between 1986 and 1988 (Balle, 1988, CLTA10_046).

In both field dissipation studies the same formulation of chlorothalonil was applied onto bare soil. In the Canadian study the application rate was 3 × 2 kg ai/ha with 10 days interval between application. For the American study the application rate was 10 × 1.26 kg/ha. Soil samples were

collected at intervals and analysed for chlorothalonil. The residues levels of chlorothalonil and SDS-3701 found in the upper 15 cm soil layer are summarised in the following table.

Table 22 Rate of dissipation of chlorothalonil in soil under field conditions

Days after last treatment	Chlorothalonil	SDS-3701
	mg/kg in soil	mg/kg in soil
Canada, 3 × 2 kg ai/ha		
0	0.38	0.02
4	0.36	0.01
7	0.51	0.03
14	0.23	0.02
21	0.12	< 0.01
29	0.17	0.01
46	0.08	0.04
62	0.13	0.04
75	0.07	0.04
270	0.01	0.02
303	< 0.01	0.02
329	0.02	0.05
358	< 0.01	0.06
389	< 0.01	0.06
420	< 0.01	0.07
452	< 0.01	0.03
USA, 10 × 1.26 kg ai/ha (two plots)		
0	0.19, 0.21	0.15, 0.13
7	0.27, 0.14	0.05, 0.03
14	0.43, 0.13	0.23, 0.08
29	0.06, 0.07	0.13, 0.17
35	0.01	0.08
60	0.04	0.11
90	0.04	0.06
120	< 0.01	0.05
180	0.03	0.04
222	0.05, < 0.01	0.08, 0.02
253	< 0.01	< 0.01
291	< 0.01	0.02
320	< 0.01	0.02
340	< 0.01	0.04
378	< 0.01	0.02
390	< 0.01	0.02
414	< 0.01	0.03
450	0.01	0.03
540	< 0.01	0.04

RESIDUE ANALYSIS

Analytical methods

A number of analytical methods have been reported for the analysis of chlorothalonil, SDS-3701 and R613636 in plant matrices. The basic approach employs extraction by homogenisation with acetone/sulphuric acid solution and column clean-up against C18 SPE. Residues are determined either by gas-chromatography (GC) with mass-selective detectors (MS) or electron capture detectors (ECD). Recent methods also use liquid chromatography (LC) in combination with tandem mass spectroscopy

(MS/MS). Validated LOQs for chlorothalonil, SDS-3701 and R613636 were 0.01 mg/kg for plant matrices.

In addition, a stability study on chlorothalonil residues during the extraction and with 1 month of storage of the extracts was submitted showing an average recovery of 92% under addition of sulphuric acid (0.1 M) at 10% v/w.

For animal commodities one method measuring SDS-3701 in bovine muscle, liver, kidney and fat as well as in milk and eggs was reported based on LC-MS/MS technique. For this method a LOQ of 0.01 mg/kg was validated.

Samples of plant origin

Reference: Robinson N.J., 2000 (CLTA10_053), modified by Lister N., 2000 (CLTA10_054)
Method: SOP RAM 320/01
Commodities: avocado, barley (grain, forage, straw), cabbage, carrot, grape, leek, lentil, lettuce, melon, onion, orange (peel, pulp), pea (dry), pear, plum, potato, soya bean, strawberry, sugar beet (root), tomato
Analytes: chlorothalonil
LOQ: 0.01 mg/kg
Determination: GC-MSD
Description: Crops with significant water content are prepared using the addition of 0.1M sulphuric acid. Residues of chlorothalonil from these crops are then extracted by homogenisation with acetone: 5M sulphuric acid (95: 5 v/v). Dry crops e.g. straw are prepared by chopping in a knife mill (without acid) and dry seed crops e.g. grains and pulses are not prepared prior to use but are analysed whole. Residues of chlorothalonil from straw are extracted as for watery crops and residues of chlorothalonil in dry seed crops are extracted into acetone: 5M sulphuric acid (95: 5 v/v) by surface washing. After centrifugation an aliquot of each extract is cleaned-up using a C18 solid phase extraction procedure. Final determination is by gas chromatography using mass selective detection (GC-MSD).
Modifications by Lister N.: Instead of the surface washing technique a homogenisation technique is used. Also the acid strength used during watery crop preparation was changed to 1 M sulphuric acid.

Reference: Croucher A., 2001 (CLTA10_055)
Method: SOP RAM 320/02
Commodities: cucumber, orange, wheat (grain)
Analytes: chlorothalonil
LOQ: 0.01 mg/kg
Determination: GC-MSD
Description: see SOP RAM 320/01

Reference: Hargreaves S.L., 2002 (CLTA10_056); Hargreaves S.L., 2003 (CLTA10_057); Hill S.E., 2002 (CLTA10_058) and Atkinson S., 2003 (CLTA10_059)
(Method) SOP RAM 365/01 and 365/02
Commodities: apple, banana (peel, pulp), cabbage, carrot, cauliflower, cereals (grain, forage, straw), cucumber, French beans, grape, leek, melon (peel, pulp), olive, onion, orange (peel, pulp), pea (fresh, dry), peach, peanut, potato (foliage, tuber), strawberry, tomato
Analytes: chlorothalonil and SDS-3701
LOQ: 0.01 mg/kg
Determination: GC-MSD

Description: Crops with significant water content are prepared using the addition of 1M sulphuric acid. Residues of chlorothalonil and SDS-3701 from these crops are then extracted by homogenisation with acetone: 5M sulphuric acid (95: 5 v/v). Dry crops e.g. straw are prepared by chopping in a knife mill (without acid) and dry seed crops e.g. grains and pulses are not prepared prior to use but are analysed whole. Residues from straw are extracted as for watery crops and residues in dry seed crops are extracted into acetone: 5M sulphuric acid (95: 5 v/v). After centrifugation an aliquot of each extract is partitioned into toluene and where necessary for analysis a C8 solid phase extraction procedure is employed. Final determination is by gas chromatography using mass selective detection (GC-MSD).

Reference: Chaggar S., 2005 (CLTA10_060, CLTA10_061)
Method: SOP RAM 464/01
Commodities: beer, peanut oil, pearled barley, tomato puree, wheat flour
Analytes: R613636
LOQ: 0.01 mg/kg
Determination: LC-MS/MS (m/z 282.91 to 239.75 and 282.91 to 42.1)
Description: Processed crop commodities are extracted by homogenisation with acetone:5M sulphuric acid solution (95:5 v/v). The extracts are centrifuged and aliquots diluted with ultra-pure water and are cleaned-up using a solid phase extraction (SPE) procedure. Final determination is by high performance liquid chromatography with triple quadrupole mass spectrometric detection (LC-MS-MS) using two separate transitions.

Reference: Ballee D.L., 1988 (CLTA10_062)
Method: RAM 3136-88-0138-MD-001
Validation: Asparagus (Ballantine L.G., 1992, CLTA10_063)
Maize (grain, grain dust, grits, meal, flour, starch, presscake) (Fitzgerald T.J., 1993, CLTA10_064)
Maize (seed, stover) (Kenyon R.G., 1983, CLTA10_065)
Sweet corn (ears, forage) (Dillon K.A., 1996, CLTA10_066)
Almonds (nutmeat, hulls) (King C., 1995, CLTA10_067)
Almonds (nutmeat, hulls) (Stallard D.E., 1982, CLTA10_068)
Peanuts (nutmeat, hulls) (King C., 1993, CLTA10_069)
Analytes: chlorothalonil, SDS-3701, R611965
LOQ:

chlorothalonil:	0.01 mg/kg	(almonds)
	0.03 mg/kg	(asparagus, maize, peanuts, sweet corn)
SDS-3701:	0.01 mg/kg	(almonds)
	0.03 mg/kg	(asparagus, maize, peanuts, sweet corn)
R611965:	0.06 mg/kg	(peanuts)
	0.08 mg/kg	(asparagus)

Determination: GC-ECD
Description: For the determination of Chlorothalonil, processed crop commodities are extracted by homogenisation with acetone:10M sulphuric acid solution (95:5 v/v) or acetonitrile. The solvent is evaporated and the filtrate cleaned-up in one of the following ways:
1. The acetone is evaporated and the pH adjusted to 4.5 using sodium hydrogen carbonate, washed with petroleum ether and the phases allowed to separate. The petroleum ether layer is concentrated and purified by column chromatography.
2. The acetone is evaporated and the filtrate is partitioned between a water: petroleum ether solution (5:1 v/v). The petroleum ether layer is removed and a second water wash is performed. The combined petroleum ether extracts are concentrated and purified by column chromatography.

3. The acetonitrile is diluted with water and added to a petroleum ether:10 M sulphuric acid solution (5:1, v/v). The petroleum ether layer is removed and the aqueous layer washed with a further 50 ml portion of petroleum ether. The petroleum ether layers are combined, evaporated to dryness and purified by column chromatography.
Final determination is by gas chromatography using electron capture detection (GC-ECD).

Reference: Ballee D.L., 1981 (CLTA10_070), Ballee D.L., 1981 (CLTA10_071) and Nelson T.R., 1984 (CLTA10_072)
(Method) no specific name
Commodities: celery
Analytes: chlorothalonil
LOQ: 0.03 mg/kg
Determination: GC-ECD
Description: For the determination of Chlorothalonil in celery, processed crop commodities are extracted by homogenisation with dichloromethane. The solvent is evaporated and the sample purified by column chromatography. Final determination is by gas chromatography using electron capture detection (GC-ECD).

Table 23 Recoveries of chlorothalonil in samples of plant origin

Reference (Author, Year)	Fortification levels (mg/kg)	Mean recovery (%)	Relative standard deviation (%)	No.	Range of recoveries (%)		Matrix/Analyte
					Low	High	
Robinson N.J., 2000 (CLTA10_053) and Lister N., 2000 (CLTA10_054)	0.01	88	17	9	66	108	Pear/ chlorothalonil
	0.1	84	10	6	77	94	
	1.0	92	9	4	80	100	
	0.01	97	2	4	94	99	Plum/ chlorothalonil
	0.1	94	11	3	74	92	
	1.0	99	na	2	95	102	
	0.01	90	5	4	93	94	Strawberry/ chlorothalonil
	0.1	88	na	2	88	88	
	1.0	82	na	2	81	83	
	0.01	90	3	4	87	93	Grape/ chlorothalonil
	0.1	85	na	2	83	86	
	1.0	82	na	2	80	83	
	0.01	104	2	5	103	107	Orange peel/
	0.1	88	2	3	87	90	chlorothalonil
	1.0	889	na	2	88	90	
	0.01	80	5	5	74	83	Orange pulp/ chlorothalonil
	0.1	81	3	3	79	84	
	1.0	92	na	2	91	93	
	0.01	95	5	4	87	98	Avocado/ chlorothalonil
	0.1	88	na	2	86	89	
	1.0	89	na	2	89	89	
	0.01	98	5	4	91	103	Potato/ chlorothalonil
	0.1	95	na	2	91	98	
	1.0	94	na	2	93	95	
	0.01	84	5	5	78	89	Carrot/ chlorothalonil
	0.1	85	4	3	81	88	

Reference (Author, Year)	Fortification levels (mg/kg)	Mean recovery (%)	Relative standard deviation (%)	No.	Range of recoveries (%)		Matrix/Analyte
					Low	High	
	1.0	91	na	2	91	91	
	0.01	96	4	5	92	100	Onion/ chlorothalonil
	0.1	95	3	3	93	99	
	1.0	112	na	2	107	117	
	0.01	77	2	5	75	78	Cabbage/ chlorothalonil
	0.1	99	3	3	97	102	
	1.0	92	5	5	84	97	
	0.01	76	6	5	71	82	Lettuce/ chlorothalonil
	0.1	83	6	3	78	87	
	1.0	91	na	2	90	91	
	0.01	72	2	5	70	74	Leek/ chlorothalonil
	0.1	87	1	3	86	88	
	1.0	101	na	2	99	102	
	0.01	88	7	6	80	94	Pea, dry/ chlorothalonil
	0.1	87	na	2	86	88	
	1.0	86	na	2	85	86	
	0.01	80	4	5	75	84	Lentils, dry/ chlorothalonil
	0.1	76	3	3	73	78	
	1.0	84	na	2	80	87	
	0.01	81	7	5	73	89	Tomato/ chlorothalonil
	0.1	76	3	3	74	78	
	1.0	80	na	2	78	82	
	0.01	99	1	5	98	100	Melon/ chlorothalonil
	0.1	96	2	3	84	98	
	1.0	98	na	2	94	101	
	0.01	86	3	5	83	89	Sugar beet, root/
	0.1	82	1	3	81	82	chlorothalonil
	1.0	92	na	2	89	94	
	0.01	80	10	5	66	84	Barley, grain/ chlorothalonil
	0.1	74	5	3	70	77	
	1.0	86	na	2	86	86	
	0.01	88	5	5	84	94	Barley, straw/ chlorothalonil
	0.1	73	21	3	56	83	
	1.0	79	na	2	78	79	
	0.01	78	5	5	74	84	Barley, forage/ chlorothalonil
	0.1	74	8	3	68	79	
	1.0	84	na	2	79	89	
	0.01	87	7	5	82	97	Soya bean/ chlorothalonil
	0.1	91	3	3	88	93	
	1.0	102	na	2	101	103	
Croucher A. 2001 (CLTA10_055)	0.01	85	10	5	73	94	Cucumber/ chlorothalonil
	5.0	83	7	5	76	94	
	0.01	89	9	5	76	98	Wheat, grain/ chlorothalonil
	0.1	104	9	5	97	120	
	0.01	95	10	5	85	110	Orange/ chlorothalonil
	5.0	90	10	5	83	104	

Reference (Author, Year)	Fortification levels (mg/kg)	Mean recovery (%)	Relative standard deviation (%)	No.	Range of recoveries (%)		Matrix/Analyte
					Low	High	
Hargreaves S.L.,	0.01	95	2	5	92	98	Apple/
2002	1.0	78	4	5	75	81	chlorothalonil
(CLTA10_056)	0.01	105	2	5	103	109	Peach/
and	1.0	100	8	5	91	111	chlorothalonil
Hargreaves S.L.,	0.01	88	6	5	82	94	Grape/
2003	1.0	100	3	5	96	103	chlorothalonil
(CLTA10_057)	0.01	93	5	5	88	100	Strawberry/
and	1.0	99	6	5	91	106	chlorothalonil
Hill S.E.,	0.01	92	4	5	86	95	Orange, peel/
2002	1.0	88	4	5	83	91	chlorothalonil
(CLTA10_058)	0.01	85	9	5	72	92	Orange, pulp/
	1.0	94	3	5	92	98	chlorothalonil
	0.01	81	4	5	77	85	Olive/
	1.0	78	2	5	76	80	chlorothalonil
	0.01	95	2	5	92	97	Banana, peel/
	1.0	101	3	5	96	105	chlorothalonil
	0.01	101	1	5	99	103	Banana, pulp/
	1.0	105	4	5	99	110	chlorothalonil
	0.01	88	4	5	84	92	Peanut/
	1.0	89	3	5	85	91	chlorothalonil
	0.01	95	9	5	81	99	Potato, foliage/
	1.0	91	8	5	81	110	chlorothalonil
	0.01	72	6	5	66	77	Potato, tuber/
	1.0	96	4	5	92	101	chlorothalonil
	0.01	100	3	5	97	104	Carrot/
	1.0	99	5	5	90	104	chlorothalonil
	0.01	96	3	5	94	100	Onion/
	1.0	96	8	5	84	105	chlorothalonil
	0.01	94	2	5	90	96	Cabbage/
	1.0	93	4	5	87	96	chlorothalonil
	0.01	108	4	5	103	114	Cauliflower/
	1.0	101	4	5	97	107	chlorothalonil
	0.01	89	9	5	79	99	Leek/
	10	93	4	5	90	97	chlorothalonil
	0.01	92	9	5	80	102	Pea, fresh/
	0.1	86	6	5	77	91	chlorothalonil
	0.01	96	4	5	90	102	Pea, dry/
	0.1	104	3	5	99	107	chlorothalonil
	0.01	79	11	5	69	87	French bean/
	1.0	82	4	5	77	87	chlorothalonil
	0.01	79	3	5	77	82	Tomato/
	1.0	85	1	5	84	86	chlorothalonil
	0.01	100	9	5	91	113	Melon, peel/
	1.0	92	6	5	87	113	chlorothalonil
	0.01	100	14	5	90	124	Melon, pulp/
	0.1	86	8	5	75	92	chlorothalonil

Reference (Author, Year)	Fortification levels (mg/kg)	Mean recovery (%)	Relative standard deviation (%)	No.	Range of recoveries (%)		Matrix/Analyte
					Low	High	
	0.01	86	8	5	79	94	Cereal, grain/
	0.1	106	2	5	102	109	chlorothalonil
	0.01	90	4	5	85	94	Cereal, straw/
	10	95	2	5	93	97	chlorothalonil
	0.01	101	4	5	95	104	Cereal, forage/
	10	98	4	5	93	103	chlorothalonil
	0.01	88	5	5	86	96	Apple/
	1.0	86	8	5	75	93	SDS-3701
	0.01	72	11	5	64	85	Peach/
	0.1	100	10	5	91	116	SDS-3701
	0.01	101	9	5	92	111	Grape/
	1.0	85	4	5	80	90	SDS-3701
	0.01	95	3	5	91	98	Strawberry/
	1.0	96	3	5	92	100	SDS-3701
	0.01	103	6	5	95	109	Orange, peel/
	1.0	94	4	5	89	98	SDS-3701
	0.01	88	9	5	77	96	Orange, pulp/
	0.1	99	3	5	97	104	SDS-3701
	0.01	87	7	5	80	94	Olive/
	0.1	91	3	5	89	95	SDS-3701
	0.01	90	4	5	86	96	Banana, peel/
	1.0	104	3	5	99	107	SDS-3701
	0.01	108	3	5	105	112	Banana, pulp/
	0.1	104	5	5	96	108	SDS-3701
	0.01	94	2	5	91	97	Peanut/
	0.1	95	3	5	93	101	SDS-3701
	0.01	105	3	5	102	109	Potato, foliage/
	10	88	5	5	83	93	SDS-3701
	0.01	99	2	5	97	101	Potato, tuber/
	0.1	89	6	5	82	97	SDS-3701
	0.01	92	2	5	90	94	Carrot/
	0.1	90	2	5	88	93	SDS-3701
	0.01	90	5	5	84	94	Onion/
	0.1	89	8	5	81	96	SDS-3701
	0.01	83	4	5	79	86	Cabbage/
	1.0	90	7	5	81	96	SDS-3701
	0.01	101	10	5	86	114	Cauliflower/
	1.0	104	4	5	99	108	SDS-3701
	0.01	93	5	5	90	99	Leek/
	10	78	6	5	75	87	SDS-3701
	0.01	84	8	5	74	92	Pea, fresh/
	0.1	78	16	5	62	91	SDS-3701
	0.01	100	2	5	96	102	Pea, dry/
	0.1	109	3	5	104	111	SDS-3701
	0.01	109	1	5	107	110	French bean/
	1.0	100	5	5	95	108	SDS-3701
	0.01	93	6	5	86	100	Tomato/

Reference (Author, Year)	Fortification levels (mg/kg)	Mean recovery (%)	Relative standard deviation (%)	No.	Range of recoveries (%)		Matrix/Analyte
					Low	High	
	1.0	102	3	5	95	105	SDS-3701
	0.01	76	4	5	72	81	Melon, peel/
	1.0	96	6	5	72	104	SDS-3701
	0.01	91	12	5	77	103	Melon, pulp/
	0.1	79	10	5	74	92	SDS-3701
	0.01	97	1	5	95	98	Cereal, grain/
	0.1	96	1	5	95	97	SDS-3701
	0.01	105	5	5	97	111	Cereal, straw/
	10	101	8	5	92	111	SDS-3701
	0.01	79	9	5	70	85	Cereal, forage/
	10	94	4	5	92	100	SDS-3701
Atkinson S., 2003 (CLTA10_059)	0.01	85	3	5	83	88	Wheat, grain/
	0.1	87	2	5	85	88	chlorothalonil
	0.01	89	6	5	85	98	Cucumber/
	5.0	107	2	5	105	110	chlorothalonil
	0.01	99	3	5	103	109	Orange/
	5.0	106	3	5	98	109	chlorothalonil
	0.01	95	2	5	93	97	Wheat, grain/
	0.1	90	2	5	88	93	SDS-3701
	0.01	96	3	5	92	99	Cucumber/
	5.0	92	1	5	90	93	SDS-3701
	0.01	95	4	5	92	101	Orange/
	5.0	100	4	5	94	104	SDS-3701
Chaggar S., 2005 (CLTA10_060, CLTA10_061) m/z 282.91 to 239.75	0.01	106	4	5	101	112	Pearled barley/
	0.1	96	4	5	89	100	R613636
	0.01	100	2	5	96	102	Wheat flour/
	0.1	90	4	5	86	95	R613636
	0.01	96	7	5	88	102	Beer/
	0.1	95	2	5	93	98	R613636
	0.01	108	4	5	104	114	Peanut oil/
	0.1	109	5	5	100	113	R613636
	0.01	87	9	5	79	97	Tomato puree/
	0.1	93	5	5	87	97	R613636
Chaggar S., 2005 (CLTA10_060, CLTA10_061) m/z 282.91 to 42.1	0.01	107	9	5	97	120	Pearled barley/
	0.1	104	3	5	100	107	R613636
	0.01	92	10	5	82	105	Wheat flour/
	0.1	90	4	5	86	94	R613636
	0.01	94	6	5	88	102	Beer/
	0.1	95	8	5	84	102	R613636
	0.01	110	7	5	101	121	Peanut oil/
	0.1	104	3	5	101	109	R613636
	0.01	82	5	5	77	89	Tomato puree/
	0.1	87	4	5	87	91	R613636
Ballee D.L., 1988 (CLTA10_062), and	0.03	99	7	4	89	107	Asparagus/
	0.6	106	8	4	96	112	chlorothalonil
	2.0	101	na	1	na	na	
	0.03	74	7	3	70	82	Asparagus/

Reference (Author, Year)	Fortification levels (mg/kg)	Mean recovery (%)	Relative standard deviation (%)	No.	Range of recoveries (%)		Matrix/Analyte
					Low	High	
Ballantine L.G., 1992, (CLTA10_063)	0.05	75	na	1	na	na	SDS-3701
	0.2	89	23	4	70	118	
	0.4	110	na	1	na	na	
	0.08	85	19	4	62	108	Asparagus/
	0.2	71	10	3	64	82	R611965
	0.4	81	na	1	na	na	
Ballee D.L., 1988 (CLTA10_062), and Fitzgerald T.J., 1993, (CLTA10_064)	0.03	99	2	3	97	100	Maize, grain/
	0.1	95	na	2	90	99	chlorothalonil
	1.0	105	na	1	na	na	
	0.03	98	5	3	93	103	Maize, grain dust/
	0.1	112	na	1	na	na	chlorothalonil
	0.2	105	na	1	na	na	
	1.0	103	na	1	na	na	
	0.03	100	3	3	97	103	Maize, grits/
	0.1	98	na	1	na	na	chlorothalonil
	0.3	103	na	1	na	na	
	1.0	95	na	1	na	na	
	0.03	94	5	3	90	100	Maize, meal/
	0.08	96	na	1	na	na	chlorothalonil
	0.1	88	na	1	na	na	
	1.0	88	na	1	na	na	
	0.03	102	2	3	100	103	Maize, flour/
	0.1	95	na	1	na	na	chlorothalonil
	0.2	110	na	1	na	na	
	1.0	101	na	1	na	na	
	0.03	101	2	3	100	103	Maize, starch/
	0.1	92	na	1	na	na	chlorothalonil
	0.4	100	na	1	na	na	
	1.0	100	na	1	na	na	
	0.03	82	2	4	80	83	Maize, presscake/
	0.1	86	4	3	83	91	chlorothalonil
	1.0	96	na	1	na	na	
	0.03	99	3	4	97	103	Maize, crude oil/
	0.1	99	na	2	98	100	chlorothalonil
	0.12	97	na	1	na	na	
	1.0	102	na	1	na	na	
	0.03	102	9	4	93	113	Maize, refined oil/
	0.1	111	na	2	108	113	chlorothalonil
	0.2	95	na	1	na	na	
	2.0	95	na	1	na	na	
	0.03	88	4	3	83	90	Maize, grain/
	0.1	93	na	2	90	96	SDS-3701
	0.5	86	na	1	na	na	
	0.03	88	5	3	83	93	Maize, grain

Reference (Author, Year)	Fortification levels (mg/kg)	Mean recovery (%)	Relative standard deviation (%)	No.	Range of recoveries (%)		Matrix/Analyte
					Low	High	
							dust/
	0.1	87	na	1	na	na	SDS-3701
	0.2	105	na	1	na	na	
	0.5	96	na	1	na	na	
	0.03	93	12	3	83	107	Maize, grits/
	0.1	91	na	1	na	na	SDS-3701
	0.3	103	na	1	na	na	
	0.5	82	na	1	na	na	
	0.03	92	9	3	87	103	Maize, meal/
	0.08	94	na	1	na	na	SDS-3701
	0.1	98	na	1	na	na	
	0.5	100	na	1	na	na	
	0.03	106	12	3	93	113	Maize, flour/
	0.1	117	na	1	na	na	SDS-3701
	0.3	110	na	1	na	na	
	0.5	126	na	1	na	na	
	0.03	89	3	3	87	93	Maize, starch/
	0.1	89	na	1	na	na	SDS-3701
	0.4	98	na	1	na	na	
	0.5	94	na	1	na	na	
	0.03	88	7	4	83	97	Maize, presscake/
	0.1	82	1	3	81	83	SDS-3701
	0.5	94	na	1	na	na	
	0.03	79	7	4	73	87	Maize, crude oil/
	0.1	90	na	2	89	91	SDS-3701
	0.14	79	na	1	na	na	
	0.5	88	na	1	na	na	
	0.03	93	8	4	87	103	Maize, refined oil/
	0.08	96	na	1	na	na	SDS-3701
	0.1	98	na	1	na	na	
	0.5	116	na	1	na	na	
	1.2	103	na	1	na	na	
Ballee D.L.,	0.05	80	na	1	na	na	Maize, seed/
1988	0.1	75	na	2	70	80	chlorothalonil
(CLTA10_062),	1.0	78	na	1	na	na	
and	0.1	85	na	2	80	90	Maize, stover/
Kenyon R.G.,	1.0	89	9	3	82	99	chlorothalonil
1983,	10	82	na	1	na	na	
(CLTA10_065)	0.03	67	na	1	na	na	Maize, seed/
	0.05	80	na	2	80	80	SDS-3701
	0.5	78	na	1	na	na	
	0.05	90	na	2	80	100	Maize, stover/
	0.1	80	na	2	70	90	SDS-3701
Ballee D.L.,	0.01	80	na	2	80	80	Sweet corn, ears/

Reference (Author, Year)	Fortification levels (mg/kg)	Mean recovery (%)	Relative standard deviation (%)	No.	Range of recoveries (%)		Matrix/Analyte
					Low	High	
1988	1.0	82	na	2	79	85	chlorothalonil
(CLTA10_062),	0.01	110	na	2	100	120	Sweet corn, forage/
and	1.0	86	na	1	na	na	chlorothalonil
Dillon K.A.,	75	104	na	1	na	na	
1996,	0.01	95	na	2	80	110	Sweet corn, ears/
(CLTA10_066)	0.5	84	na	2	84	84	chlorothalonil
	0.01	95	na	2	90	100	Sweet corn, forage/
	0.5	74	na	2	70	78	chlorothalonil
Ballee D.L.,	0.01	93	5	4	90	100	Almond, nutmeat/
1988	0.03	87	na	1	na	na	chlorothalonil
(CLTA10_062),	0.05	85	1	3	84	86	
and	0.1	95	na	1	na	na	
King C.,	1.0	78	na	1	na	na	
1995,	0.01	85	6	4	80	90	Almond, hulls/
(CLTA10_067)	0.1	88	na	1	na	na	chlorothalonil
	0.5	82	na	2	76	88	
	1.0	73	na	1	na	na	
	2.0	78	na	1	na	na	
	0.01	93	10	4	80	100	Almond, nutmeat/
	0.03	70	na	1	na	na	SDS-3701
	0.05	91	15	3	74	100	
	0.5	84	na	1	na	na	
	0.01	85	13	4	70	100	Almond, hulls/
	0.03	83	na	1	na	na	SDS-3701
	0.05	98	na	1	na	na	
	0.1	98	na	1	na	na	
	0.5	92	na	2	82	102	
Ballee D.L.,	0.05	72	na	2	74	70	Almond, nutmeat/
1988	0.1	82	na	2	78	85	chlorothalonil
(CLTA10_062),	1.0	94	na	2	93	95	
and	0.1	79	na	2	76	82	Almond, hulls/
Stallard D.E.,	1.0	87	na	2	82	91	chlorothalonil
1982,	10	78	na	2	78	78	
(CLTA10_068)	0.05	94	na	2	92	96	Almond, nutmeat/
	0.25	82	na	2	76	87	SDS-3701
	0.5	92	na	2	88	95	
	0.05	74	na	2	72	76	Almond, hulls/
	0.2	73	na	2	71	74	SDS-3701
	0.5	69	na	2	69	69	
Ballee D.L.,	0.03	91	13	5	73	107	Peanut, nutmeat/
1988	0.1	91	12	6	79	110	chlorothalonil

Reference (Author, Year)	Fortification levels (mg/kg)	Mean recovery (%)	Relative standard deviation (%)	No.	Range of recoveries (%)		Matrix/Analyte
					Low	High	
(CLTA10_062),	0.03	111	9	5	100	120	Peanut, hulls/
and	2.0	95	7	6	86	105	chlorothalonil
King C.,	0.03	90	20	5	73	120	Peanut, nutmeat/
1993,	0.1	83	12	4	73	100	SDS-3701
(CLTA10_069)	0.5	72	na	1	na	na	
	0.03	106	14	5	87	123	Peanut, hulls/
	0.5	111	12	4	100	126	SDS-3701
	1.0	96	na	1	na	na	
	2.0	79	na	1	na	na	
	0.06	91	13	5	73	100	Peanut, nutmeat/
	0.1	74	na	1	na	na	R611965
	0.2	87	29	3	65	120	
	1.0	104	na	1	na	na	
	0.06	89	17	5	75	107	Peanut, hulls/
	0.5	99	18	6	74	120	R611965
Ballee D.L.,	0.05	120	na	1	na	na	Celery/
1981	0.1	100	na	2	80	120	chlorothalonil
(CLTA10_070)	0.5	80	na	1	na	na	
	1.5	93	na	2	85	101	
Ballee D.L., 1981	0.5	106	na	2	100	112	Celery/
(CLTA10_071)	3.0	112	8	3	105	123	chlorothalonil
Nelson T.R., 1984	0.03	107	na	1	na	na	Celery/
(CLTA10_072)	5.0	89	na	1	na	na	chlorothalonil

na not applicable

In addition to the validation data a study on the stability of chlorothalonil during the extraction and the storage of the extracts was submitted.

Reference: Lister N., 2000 (CLTA10_239)
Commodities: barley (grain, forage, straw), cabbage, carrot, leek, lentil, melon, onion, orange, pea, peach, potato, strawberry, sugar beet (root), tomato
Analytes: chlorothalonil
Material and Method: In this study the storage stability of chlorothalonil in fortified samples ready for analysis was investigated following storage at -18 °C for a period of up to 4 weeks. In presence with sulphuric acid (0.1M; 10% v/w) samples were fortified with stocking solution to 1 mg/kg residues level and homogenised for sample extraction. Analysis was conducted before freezing and after 4 weeks of storage of the extracts. For each commodity three replicate samples were analysed and averaged.

Table 24 Stability of chlorothalonil residues during homogenisation and in stored extracts under addition of sulphuric acid (0.1 M) at 10% v/w

Reference (Author, Year)	Storage interval	Uncorrected residue found (mg/kg)	Mean recovery (% fortification)	Matrix
Lister N., 2000 (CLTA10_239)	0 28 d	0.87 0.95	109	Peach (chlorothalonil)
	0 28 d	0.95 1.02	107	Strawberry (chlorothalonil)
	0 28 d	0.94 0.98	104	Orange (chlorothalonil)
	0 28 d	1.01 1.12	111	Potato (chlorothalonil)
	0 28 d	1.00 1.16	116	Carrot (chlorothalonil)
	0 28 d	0.92 0.97	105	Onion (chlorothalonil)
	0 28 d	0.87 0.91	104	Cabbage (chlorothalonil)
	0 28 d	0.96 0.94	98	Leek (chlorothalonil)
	0 28 d	0.92 0.91	99	Pea (chlorothalonil)
	0 28 d	0.89 na	-	Leek (chlorothalonil)
	0 28 d	0.96 0.90	94	Tomato (chlorothalonil)
	0 28 d	0.98 1.01	103	Melon (chlorothalonil)
	0 28 d	0.93 1.19	126	Sugarbeet (chlorothalonil)
	0 28 d	0.83 0.92	109	Barley, straw (chlorothalonil)
	0 28 d	0.99 0.99	100	Barley, forage (chlorothalonil)
	0 28 d	0.85 na	-	Barley, grain (chlorothalonil)

Samples of animal origin

Reference: Robinson N.J., 2003 (CLTA10_073), McGill C., 2002 (CLTA10_074) and Brice A., 2003 (CLTA10_075)
(Method) SOP RAM 384/01
Commodities: muscle (bovine), liver (bovine), kidney (bovine), fat (bovine), milk, eggs
Analytes: SDS-3701
LOQ: 0.01 mg/kg
Determination: LC-MS/MS
Description: Residues of SDS-3701 are extracted by homogenisation with acetone:5M sulphuric acid (95:5 v/v) from muscle, liver and kidney, with acetonitrile:5M sulphuric acid (95: 5 v/v) from fat, with acetonitrile from milk and with acetonitrile:water (3:1 v/v) from eggs. Extracts are centrifuged and an aliquot cleaned-up using a C18 solid phase extraction procedure. Final determination is by high performance liquid chromatography with triple quadrupole mass

spectrometric detection (LC-MS-MS).

Table 25 Recoveries of chlorothalonil in samples of animal origin

Reference (Author, Year)	Fortification levels (mg/kg)	Mean recovery (%)	Relative standard deviation (%)	No.	Range of recoveries (%)		Matrix/Analyte
					Low	High	
Robinson N.J., 2003 (CLTA10_073),	0.01	103	3	5	99	107	Muscle, bovine/
McGill C., 2002 (CLTA10_074) and	0.1	94	7	5	83	99	SDS-3701
Brice A., 2003 (CLTA10_075)	0.01	88	6	5	83	94	Fat, bovine/
	0.1	86	4	5	82	89	SDS-3701
	0.01	97	5	5	92	101	Kidney, bovine/
	0.1	97	10	5	88	111	SDS-3701
	0.01	91	8	5	79	100	Liver, bovine/
	0.1	91	3	5	89	95	SDS-3701
	0.01	81	7	5	72	87	Milk/
	0.1	92	10	5	83	107	SDS-3701
	0.01	75	5	5	71	81	Eggs/
	0.1	100	7	5	92	109	SDS-3701
	0.01	84	4	5	80	88	Muscle, bovine/
	0.1	78	7	5	70	84	SDS-3701 (ILV)
	0.01	75	14	5	63	80	Milk/
	0.1	72	8	5	66	78	SDS-3701 (ILV)
	0.01	71	8	5	64	76	Eggs/
	0.1	78	16	5	56	87	SDS-3701 (ILV)

Stability of pesticides in stored analytical samples

Reference: King C., 1995 (CLTA10_229)
Commodities: Cherry
Analytes: chlorothalonil, SDS-3701
Material and Method: In this study the stability of incurred residues on cherries during freezer storage was investigated for a period of up to 6 years. Subsamples of cherries from a single trial were collected and stored until analysis. Re-analysing of identical samples was not conducted.

Reference: Rose C., 1995 (CLTA10_230)
Commodities: Potato
Analytes: chlorothalonil, SDS-3701
Material and Method: In this study the stability of incurred residues on potatoes during freezer storage was investigated for a period of up to 6 years. Subsamples of potato tubers from a single trial were collected and stored until analysis. Re-

analysing of identical samples was not conducted.

Reference: Rose C., 1996 (CLTA10_231)
Commodities: Carrots
Analytes: chlorothalonil, SDS-3701
Material and Method: In this study the stability of incurred residues in carrots during freezer storage was investigated for a period of up to 6 years. Subsamples of carrots (whole plants) from a single trial were collected and stored until analysis. Re-analysing of identical samples was not conducted.

Reference: King C., 1995 (CLTA10_232)
Commodities: Celery
Analytes: chlorothalonil, SDS-3701
Material and Method: In this study the stability of incurred residues in celery during freezer storage was investigated for a period of up to 6 years. Subsamples of celery from a single trial were collected and stored until analysis. Re-analysing of identical samples was not conducted.

Reference: Kenyon R.G., 1995 (CLTA10_233)
Commodities: Wheat grain
Analytes: chlorothalonil, SDS-3701
Material and Method: In this study the stability of incurred residues in wheat grain during freezer storage was investigated for a period of up to 6 years. Subsamples of grain from a single trial were collected and stored until analysis. Re-analysing of identical samples was not conducted. .

Reference: King C., 1996 (CLTA10_234)
Commodities: Almond hulls and nutmeat
Analytes: chlorothalonil, SDS-3701 (<LOQ in nutmeat)
Material and Method: In this study the stability of incurred residues in almonds (hulls and nutmeat) during freezer storage was investigated for a period of up to 6 years. Subsamples from a single trial were collected and stored until analysis. Re-analysing of identical samples was not conducted.

Reference: Wiedmann J.L., 1996 (CLTA10_235)
Commodities: Cucumbers
Analytes: chlorothalonil, SDS-3701 (<LOQ)
Material and Method: In this study the stability of incurred residues in cucumber during freezer storage was investigated for a period of up to 6 years. Subsamples of cucumbers from a single trial were collected and stored until analysis. Re-analysing of identical samples was not conducted.

Reference: Hayes P.C., 1996 (CLTA10_236)
Commodities: Tomato
Analytes: chlorothalonil, SDS-3701
Material and Method: In this study the stability of incurred residues in tomatoes during freezer storage was investigated for a period of up to 6 years. Subsamples of tomatoes from a single trial were collected and stored until analysis. Re-analysing of identical samples was not conducted.

Reference: King C., 1995 (CLTA10_237)
Commodities: Peanut nutmeat
Analytes: chlorothalonil, SDS-3701
Material and Method: In this study the stability of incurred residues in peanuts during freezer storage was investigated for a period of up to 6 years. Subsamples of peanuts

from a single trial were collected and stored until analysis. Re-analysing of identical samples was not conducted.

Reference: Dvorak R.S., 1995 (CLTA10_238)
Commodities: Soya beans
Analytes: chlorothalonil, SDS-3701
Material and Method: In this study the stability of incurred residues in soya beans during freezer storage was investigated for a period of up to 6 years. Subsamples of soya beans from a single trial were collected and stored until analysis. Re-analysing of identical samples was not conducted.

Reference: Lister N., 2001 (CLTA10_240)
Commodities: barley (forage, straw), carrot, head cabbage, leek, lentil, melon, onion, orange, pea, peach, potato, strawberry, sugar beet (root), tomato
Analytes: chlorothalonil
Material and Method: In this study the storage stability of chlorothalonil in fortified samples was investigated following storage at -18 °C for a period of up to 1 year. In the presence of sulphuric acid (0.1M; 10% v/w) homogenised or cut (straw) duplicate samples were fortified with stock solution to 1 mg/kg residues level. Analysis was conducted before freezing and after 3, 6 and 12 months of storage. For each commodity at least three replicate samples were analysed and averaged.

Reference: King C., 1995 (CLTA10_241)
Commodities: bovine fat, muscle, milk and liver
Analytes: SDS-3701
Material and Method: In this study the storage stability of chlorothalonil in fortified samples of bovine animal tissues and milk was investigated for a period of one year. Duplicate samples from each sample material were fortified at levels from 0.2 (muscle, fat) to 1 mg/kg (liver, milk) with SDS-3701 and frozen at -18 °C.

Table 26 Freezer storage stability of incurred chlorothalonil residues in plant and animal commodities

Reference (Author, Year)	Storage interval	Uncorrected residue found (mg/kg)	Matrix [a]
King C., 1995 (CLTA10_229)	0	10.76	Cherry (chlorothalonil)
	1 d	15.71	
	7 d	14.68	
	30 d	13.18	
	86 d	20.15	
	195 d	10.03	
	272 d	9.65	
	363 d	17.97	
	545 d	16.87	
	727 d	21.49	
	910 d	16.01	
	1091 d	24.35	
	1269 d	16.77	
	1457 d	22.21	
	1637 d	14.90	
	1919 d	23.94	
	1994 d	11.66	
	2178 d	20.53	

Reference (Author, Year)	Storage interval	Uncorrected residue found (mg/kg)	Matrix [a]
	0	0.03	Cherry (SDS-3701)
	1 d	0.04	
	7 d	0.02	
	30 d	0.03	
	86 d	0.03	
	195 d	0.03	
	272 d	0.06	
	363 d	0.06	
	545 d	0.06	
	727 d	0.03	
	910 d	0.04	
	1091 d	0.03	
	1269 d	0.03	
	1457 d	0.05	
	1637 d	0.04	
	1919 d	0.05	
	1994 d	0.05	
	2178 d	0.05	
Rose C., 1995 (CLTA10_230)	0	1.75	Potato, tuber (chlorothalonil)
	1 d	2.18	
	7 d	1.47	
	30 d	1.81	
	90 d	1.32	
	180 d	2.73	
	270 d	1.13	
	363 d	1.83	
	549 d	0.42	
	572 d	0.67	
	577 d	0.66	
	631 d	1.06	
	633 d	0.82	
	714 d	1.70	
	869 d	1.40	
	1099 d	0.38	
	1135 d	1.20	
	1292 d	0.74	
	1448 d	0.98	
	1682 d	0.84	
	1794 d	1.50	
	2024 d	1.42	
	2155 d	1.49	
	0	0.27	Potato, tuber (SDS-3701)
	1 d	0.21	
	7 d	0.25	
	30 d	0.18	
	90 d	0.13	
	180 d	0.19	
	270 d	0.28	
	363 d	0.2	
	549 d	0.16	
	572 d	0.14	
	631 d	0.19	
	714 d	0.37	
	869 d	0.23	
	891 d	0.14	
	1099 d	0.14	
	1135 d	0.13	
	1292 d	0.15	
	1448 d	0.14	
	1682 d	0.16	
	1794 d	0.24	
	2024 d	0.23	
	2155 d	0.23	

Reference (Author, Year)	Storage interval	Uncorrected residue found (mg/kg)	Matrix [a]
Rose C., 1996 (CLTA10_231)	0	1.84	Carrots (chlorothalonil)
	1 d	1.11	
	7 d	1.55	
	33 d	1.02	
	90 d	1.00	
	180 d	1.41	
	271 d	1.32	
	363 d	1.22	
	546 d	1.41	
	729 d	1.78	
	894 d	0.93	
	1123 d	1.63	
	1305 d	1.07	
	1463 d	1.85	
	1699 d	1.61	
	1806 d	1.22	
	2044 d	1.32	
	2170 d	2.19	
	0	0.10	Carrots (SDS-3701)
	1 d	0.09	
	7 d	0.09	
	33 d	0.10	
	90 d	0.08	
	180 d	0.12	
	271 d	0.06	
	363 d	0.10	
	546 d	0.09	
	729 d	0.12	
	894 d	0.08	
	1123 d	0.07	
	1305 d	0.13	
	1463 d	0.09	
	1699 d	0.11	
	1806 d	0.10	
	2044 d	0.09	
	2170 d	0.13	
King C., 1995 (CLTA10_232)	0	4.01	Celery (chlorothalonil)
	2 d	5.80	
	8 d	6.23	
	29 d	8.78	
	92 d	6.82	
	182 d	8.26	
	281 d	4.61	
	365 d	10.85	
	547 d	7.45	
	730 d	7.61	
	912 d	6.56	
	1115 d	4.36	
	1267 d	5.22	
	1460 d	7.84	
	1645 d	5.07	
	1856 d	8.00	
	1990 d	5.64	
	2255 d	9.19	
	0	0.01	Celery (SDS-3701)
	2 d	0.02	
	8 d	0.01	
	29 d	0.10	
	92 d	0.07	
	182 d	0.04	
	281 d	0.02	
	365 d	0.12	
	547 d	0.02	
	730 d	0.03	

Reference (Author, Year)	Storage interval	Uncorrected residue found (mg/kg)	Matrix [a]
	912 d	0.03	
	1115 d	0.03	
	1267 d	0.03	
	1460 d	0.05	
	1645 d	0.05	
	1856 d	0.09	
	1990 d	0.03	
	2255 d	0.06	
Kenyon R.G., 1995 (CLTA10_233)	0	44.28	Carrots (chlorothalonil)
	1 d	44.35	
	7 d	51.68	
	30 d	54.28	
	91 d	43.33	
	179 d	49.06	
	273 d	47.15	
	362 d	45.16	
	544 d	45.53	
	728 d	39.94	
	901 d	38.13	
	1095 d	41.60	
	1274 d	47.87	
	1468 d	41.47	
	1639 d	49.99	
	1826 d	42.75	
	2007 d	38.10	
	2212 d	47.21	
	0	0.18	Carrots (SDS-3701)
	1 d	0.15	
	7 d	0.18	
	30 d	0.18	
	91 d	0.12	
	179 d	0.13	
	273 d	0.13	
	362 d	0.14	
	544 d	0.21	
	728 d	0.16	
	901 d	0.14	
	1095 d	0.19	
	1274 d	0.19	
	1468 d	0.14	
	1639 d	0.16	
	1826 d	0.15	
	2007 d	0.17	
	2212 d	0.16	
King C., 1996 (CLTA10_234)	0	0.24	Almond nutmeat (chlorothalonil)
	1 d	0.34	
	7 d	0.18	
	28 d	0.17	
	99 d	0.13	
	182 d	0.14	
	276 d	0.11	
	378 d	0.11	
	553 d	0.26	
	730 d	0.09	
	910 d	0.17	
	1139 d	0.08	
	1281 d	0.08	
	1460 d	0.10	
	1646 d	0.10	
	1828 d	0.12	
	1999 d	0.10	
	2247 d	0.13	

Reference (Author, Year)	Storage interval	Uncorrected residue found (mg/kg)	Matrix [a]
	0	55.81	Almond hulls (chlorothalonil)
	1 d	37.75	
	7 d	40.06	
	27 d	53.57	
	98 d	60.99	
	181 d	60.76	
	281 d	62.13	
	377 d	53.21	
	546 d	54.74	
	728 d	71.60	
	905 d	81.25	
	1130 d	60.14	
	1278 d	53.16	
	1466 d	63.18	
	1641 d	66.03	
	1829 d	50.59	
	1995 d	57.35	
	2242 d	75.01	
	0	0.50	Almond hulls (SDS-3701)
	1 d	0.41	
	7 d	0.43	
	27 d	0.41	
	98 d	0.56	
	181 d	0.58	
	281 d	0.44	
	377 d	0.63	
	546 d	0.26	
	728 d	0.65	
	905 d	0.86	
	1132 d	0.63	
	1278 d	0.60	
	1467 d	0.63	
	1641 d	0.68	
	1829 d	0.58	
	1991 d	0.80	
	2243 d	0.73	
Wiedmann J.L., 1996 (CLTA10_235)	0	0.91	Cucumbers (chlorothalonil)
	1 d	1.25	
	7 d	2.32	
	28 d	1.42	
	91 d	1.32	
	182 d	1.56	
	276 d	1.31	
	360 d	0.60	
	552 d	2.15	
	727 d	0.39	
	805 d	1.59	
	910 d	1.07	
	1098 d	1.76	
	1296 d	1.06	
	1463 d	1.23	
	1645 d	0.88	
	1899 d	0.32	
	1994 d	0.28	
	2199 d	1.08	
Hayes P.C., 1996 (CLTA10_236)	0	8.83	Tomatoes (chlorothalonil)
	1 d	10.81	
	7 d	15.51	
	30 d	10.32	
	92 d	10.37	
	174 d	11.16	
	274 d	9.54	
	363 d	9.60	
	546 d	10.68	

Reference (Author, Year)	Storage interval	Uncorrected residue found (mg/kg)	Matrix [a]
	723 d	7.99	
	916 d	9.70	
	1100 d	10.41	
	1275 d	10.98	
	1449 d	8.76	
	1645 d	7.10	
	1837 d	11.59	
	2043 d	9.85	
	2190 d	6.57	
	0	0.06	Tomatoes (SDS-3701)
	1 d	0.04	
	7 d	0.07	
	30 d	0.04	
	92 d	0.05	
	174 d	0.04	
	274 d	0.02	
	363 d	0.06	
	546 d	0.05	
	723 d	0.04	
	916 d	0.06	
	1100 d	0.09	
	1275 d	0.05	
	1449 d	0.04	
	1645 d	0.05	
	1837 d	0.04	
	2043 d	0.02	
	2190 d	0.03	
King C., 1995 (CLTA10_237)	0	13.00	Peanut nutmeat (chlorothalonil)
	3 d	12.74	
	8 d	12.92	
	29 d	15.40	
	84 d	14.84	
	175 d	13.33	
	268 d	8.25	
	302 d	8.10	
	330 d	7.27	
	364 d	6.74	
	428 d	10.00	
	487 d	12.18	
	547 d	10.48	
	603 d	8.76	
	666 d	7.74	
	729 d	8.55	
	904 d	10.73	
	1127 d	8.24	
	1255 d	8.39	
	1451 d	7.87	
	1641 d	7.65	
	1834 d	7.97	
	1981 d	9.34	
	2243 d	9.28	
	0	0.06	Peanut nutmeat (SDS-3701)
	3 d	0.08	
	8 d	0.10	
	29 d	0.13	
	84 d	0.15	
	175 d	0.08	
	268 d	0.18	
	302 d	0.24	
	331 d	0.28	
	364 d	0.19	
	428 d	0.31	
	490 d	0.45	
	547 d	0.32	

Reference (Author, Year)	Storage interval	Uncorrected residue found (mg/kg)	Matrix [a]
	610 d 666 d 730 d 907 d 1127 d 1260 d 1456 d 1642 d 1834 d 1981 d 2243 d	0.32 0.35 0.34 0.39 0.36 0.50 0.57 0.70 .065 1.15 0.98	
Dvorak R.S., 1995 (CLTA10_238)	0 1 d 7 d 34 d 87 d 181 d 272 d 363 d 542 d 723 d 913 d 1092 d 1280 d 1498 d 1623 d 1801 d 2057 d 2275 d	11.31 16.19 31.62 13.15 26.08 22.14 19.36 12.91 15.59 10.91 13.72 11.47 21.11 18.88 17.80 11.80 21.22 21.60	Soya beans (chlorothalonil)
	0 1 d 7 d 34 d 87 d 181 d 272 d 363 d 542 d 723 d 913 d 1092 d 1280 d 1498 d 1623 d 1801 d 2057 d 2275 d	0.02 0.04 0.03 0.07 0.07 0.04 0.08 0.08 0.06 0.04 0.09 0.05 0.11 0.08 0.11 0.07 0.17 0.16	Soya beans (SDS-3701)

[a] Sample were taken from a treated field and selected randomly for analysis after the indicated storage time.

Table 26a Freezer storage stability of chlorothalonil residues in spiked plant and animal commodities

Reference (Author year)	Storage interval	Residue measured [mg/kg]	Residues remained, %	Average residue remained, %	Matrix
Lister N., 2001 (CLTA10_240)	0 3 months 6 months 12 months	0.91, 0.89, 0.96 0.83, 0.89, 0.82 0.80, 0.84, 0.88 1.02, 0.98, 0.97	91, 89, 96 83, 89, 82 80, 84, 88 102, 98, 97	92 85 84 99	Peach (chlorothalonil)
	0 3 months 6 months 12 months	0.96, 0.94, 0.95 0.91, 0.90, 0.83 0.84, 0.89, 0.84 0.99, 0.96, 0.88	96, 94, 95 91, 90, 83 84, 89, 84 99, 96, 88	95 88 86 94	Strawberry (chlorothalonil)

Reference (Author year)	Storage interval	Residue measured [mg/kg]	Residues remained, %	Average residue remained, %	Matrix
	0 3 months 6 months 12 months	0.93, 0.95, 0.91 0.83, 0.87, 0.81 0.89, 0.95, 0.82 0.91, 0.92, 0.81	93, 95, 91 83, 87, 81 89, 95, 82 91, 92, 81	93 84 89 86	Orange (chlorothalonil)
	0 3 months 6 months 12 months	1.00, 0.94, 0.96 0.88, 0.82, 0.78 0.77, 0.78, 0.79, 0.94, 0.97, 0.96 0.81, 0.84, 0.82	100, 94, 96 88, 82, 78 77, 78, 79, 94, 97, 96 81, 84, 82	97 83 87 86	Potato (chlorothalonil)
	0 3 months 6 months 12 months	0.94, 0.94, 0.91 0.86, 0.78, 0.70 0.87, 0.92, 0.98 0.85, 0.92, 0.95	94, 94, 91 86, 78, 70 87, 92, 98 85, 92, 95	93 78 92 94	Carrot (chlorothalonil)
	0 3 months 6 months 12 months	0.99, 0.92, 0.98 0.69, 0.89, 0.81 0.82, 0.87, 0.88 0.95, 0.90, 0.89	99, 92, 98 69, 89, 81 82, 87, 88 95, 90, 89	96 80 86 91	Bulb onion (chlorothalonil)
	0 3 months 6 months 12 months	0.97, 0.97, 1.01 0.86, 0.82, 0.86 0.91, 0.94, 0.86 0.87, 0.92, 0.96	97, 97, 101 86, 82, 86 91, 94, 86 87, 92, 96	98 85 90 92	Head cabbage (chlorothalonil)
	0 3 months 6 months 12 months	0.93, 0.92, 0.92 0.66, 0.82, 0.85 0.85, 0.88, 0.82 0.82, 0.66, 0.65, 0.86, 0.82, 0.71, 0.81, 0.84, 0.78, 0.80, 0.76, 0.81	93, 92, 92 66, 82, 85 85, 88, 82 82, 66, 65, 86, 82, 71, 81, 84, 78, 80, 76, 81	92 77 85 77	Leek (chlorothalonil)
	0 3 months 6 months 9 months 12 months	0.93, 0.91, 0.88 0.75, 0.75, 0.76 0.63, 0.65, 0.64, 0.61, 0.63, 0.62 0.51, 0.53, 0.63 0.60, 0.56, 0.51	93, 91, 88 75, 75, 76 63, 65, 64, 61, 63, 62 51, 53, 63 60, 56, 51	91 75 63 56 56	Pea (chlorothalonil)
	0 3 months 6 months 12 months	0.88, 0.92, 0.89 0.86, 0.83, 0.85 0.76, 0.80, 0.82 0.79, 0.78, 0.76	88, 92, 89 86, 83, 85 76, 80, 82 79, 78, 76	90 85 79 78	Lentil (chlorothalonil)
	0 3 months 6 months 12 months	0.88, 0.96, 0.92 0.88, 0.85, 0.84 0.90, 0.83, 0.96 0.89, 0.95, 0.84	88, 96, 92 88, 85, 84 90, 83, 96 89, 95, 84	92 86 90 89	Tomato (chlorothalonil)
	0 3 months 6 months 12 months	0.94, 0.94, 0.94 0.90, 0.88, 0.92 0.87, 0.99, 0.91 0.84, 0.89, 0.92	94, 94, 94 90, 88, 92 87, 99, 91 84, 89, 92	94 90 92 88	Melon (chlorothalonil)
	0 3 months 6 months 12 months	0.85, 0.87, 0.83 0.86, 0.79, 0.82 0.94, 0.85, 0.97 0.89, 0.84, 0.95	85, 87, 83 86, 79, 82 94, 85, 97 89, 84, 95	85 82 89 89	Sugarbeet (chlorothalonil)
	0 3 months 6 months 9 months 12 months	0.72, 0.76, 0.72 0.76, 0.73, 0.86 0.70, 0.69, 0.66, 0.69, 0.70, 0.71 0.59, 0.59, 0.61 0.53, 0.51, 0.55	72, 76, 72 76, 73, 86 70, 69, 66, 69, 70, 71 59, 59, 61 53, 51, 55	73 78 69 60 53	Barley, straw (chlorothalonil)
	0	0.92, 0.95, 0.87	92, 95, 87	91	Barley, forage

Reference (Author year)	Storage interval	Residue measured [mg/kg]	Residues remained, %	Average residue remained, %	Matrix
	3 months 6 months 12 months	0.77, 0.81, 0.83 0.79, 0.82, 0.81 0.80, 0.84, 0.82	77, 81, 83 79, 82, 81 80, 84, 82	80 81 82	(chlorothalonil)
King C., 1995 (CLTA10_241)	0 1 d 7 d 14 d 1 month 2 months 3 months 6 months 9 months 12 months	0.19, 0.16, 0.20, 0.18 0.19, 0.21, 0.20, 0.20 0.24, 0.20, 0.18, 0.17 0.18, 0.16, 0.18, 0.17 0.17, 0.17, 0.18, 0.19 0.20, 0.18, 0.19, 0.18 0.18, 0.19, 0.18, 0.19 0.16, 0.16, 0.16, 0.15 0.20, 0.20, 0.21, 0.21 0.16, 0.17, 0.16, 0.16	95, 80, 100, 90 95, 105, 100, 100 120, 100, 90, 85 90, 80, 90, 85 85, 85, 90, 95 100, 90, 95, 90 90, 95, 90,95 80, 80, 80, 75 100, 100, 105, 105 80, 85, 80, 80	90 100 100 85 90 95 95 80 105 80	Bovine muscle (SDS-3701)
	0 1 d 7 d 14 d 1 month 2 months 3 months 6 months 9 months 12 months	0.20, 0.21, 0.20, 0.20 0.20, 0.20, 0.19, 0.20 0.22, 0.19, 0.21, 0.20 0.19, 0.21, 0.22, 0.19 0.18, 0.17, 0.17, 0.17 0.17, 0.17, 0.18, 0.16 0.16, 0.17, 0.16, 0.15 0.16, 0.14, 0.17, 0.17 0.15, 0.20, 0.21, 0.19 0.22, 0.20, 0.22, 0.23	100, 105, 100, 100 100, 100, 95, 100 110, 95, 105, 100 95, 105, 110, 95 90, 85, 85, 85 85, 85, 90, 80 80, 85, 80, 75 80, 70, 85, 85 75, 100, 105, 95 110, 100, 110, 115	100 100 105 100 85 85 80 80 95 110	Bovine fat (SDS-3701)
	0 1 d 7 d 14 d 1 month 2 months 3 months 6 months 9 months 12 months	0.95, 0.94, 0.89, 1.01 0.81, 0.87, 0.84, 0.94 0.61, 0.71, 0.82, 0.73 0.78, 1.04, 0.81, 0.93 0.80, 0.80, 0.83, 0.94 0.63, 0.76, 0.74, 0.79 0.79, 0.71, 0.82, 0.88 0.73, 0.77, 0.80, 0.73 0.78, 0.68, 0.62, 0.45 0.74, 0.57, 0.75,	95, 94, 89, 101 81, 87, 84, 94 61, 71, 82, 73 78, 104, 81, 93 80, 80, 83, 94 63, 76, 74, 79 79, 71, 82, 88 73, 77, 80, 73 78, 68, 62, 45 74, 57, 75, 61	95 87 72 89 84 73 80 76 63 67	Bovine liver (SDS-3701)

Reference (Author year)	Storage interval	Residue measured [mg/kg]	Residues remained, %	Average residue remained, %	Matrix
		0.61			
	0	0.92, 0.87, 0.88, 0.95	92, 87, 88, 95	91	Milk (SDS-3701)
	1 d	1.03, 0.95, 0.96, 0.94	103, 95, 96, 94	97	
	7 d	0.99, 0.91, 0.95, 0.95	99, 91, 95, 95	95	
	14 d	1.13, 1.01, 0.99	113, 101, 99	104	
	1 month	0.95, 1.01, 1.15, 1.08	95, 101, 115, 108	105	
	2 months	0.92, 0.94, 0.98, 0.98	92, 94, 98, 98	96	
	3 months	1.11, 1.14, 1.09, 1.11	111, 114, 109, 111	111	
	6 months	1.15, 1.15, 1.15, 1.17	115, 115, 115, 117	117	
	9 months	1.03, 1.06, 1.03, 1.03	103, 106, 103, 103	104	
	12 months	1.06, 1.04, 1.09, 1.09	106, 104, 109, 109	107	

[a] residue not measured. Nominal level of stocking solution

[b] sample lost during work-up

USE PATTERN

Chlorothalonil is a non-systemic protectant fungicide. The Meeting received numerous uses involving foliar spray applications mainly before harvest.

Table 27 List of registered uses

Crop	Country	Application detail						
		Form	Type	kg ai/ha	kg ai/hL	L/ha	No.	PHI days
Almonds	Australia	SC 50%	foliar spray	2.3	0.12	2000		7
Almonds	United States	SC 50%	foliar spray	3.4	0.12		Max. 21 kg ai/ha and year	150
Apple	Brazil	WG 83%	foliar spray		0.12	500	5	14
Apple	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	15
Apple	Japan	WG 72%	foliar spray		0.072		3	45
Apple	Moldavia	SC 50%	foliar spray	1.3	1.6	800	4	21
Apricot	Australia	SC 50%	Foliar spray	2.3	0.12	2000		7
Apricot	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	15
Apricot	Moldavia	SC 50%	foliar spray	1	0.13	800	2	21
Apricot	Spain	SC 50%	foliar spray	1.5	0.15	1000	3	15
Asparagus	Japan	SC 40%	foliar spray		0.04		3	1
Asparagus	Japan	SC 53%	foliar spray (aerial)	1.06	3.3	32	3	7
Asparagus	UK	SC 40%	foliar spray	1	0.2	500	2	application before senescence
Asparagus	United States	SC 50%	foliar spray	3.4			Max. 10 kg ai/ha and year	190

Crop	Country	Application detail						
		Form	Type	kg ai/ha	kg ai/hL	L/ha	No.	PHI days
Banana	Australia	SC 50%	foliar spray	2.3				1
Banana	Brazil	SC 50%	foliar spray (ground + aerial)	1	0.2	500		0
Barley	Ireland	SC 50%	foliar spray	1	0.45	220	2	Latest treatment: BBCH 59
Barley	Japan	DP 10%	soil incorporation	30			1	
Barley	Spain	SC 50%	foliar spray		0.15			15
Barley	United Kingdom	SC 50%	foliar spray	1	0.5	200	2	Latest treatment: BBCH 51
Bean, field	United Kingdom	SC 50%	foliar spray	1.5	0.75	200	2	56
Bean, snap	United States	SC 50%	foliar spray	2.5			Max. 10 kg ai/ha and year	7
Beans	Australia	SC 50%	foliar spray	1.7				7
Beans	Brazil	SC 50%	foliar spray (ground + aerial)	1.5				14
Beans	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	7
Beans	Slovenia	SC 50%	foliar spray	1.5	0.3	500	2	7
Beans (pulses)	Japan	WP 60%	foliar spray		0.075		3	14
Beans (pulses)	Spain	SC 50%	foliar spray	1.5	0.15	1000	2	15
Beans (pulses)	United States	SC 50%	foliar spray	1.7			Max. 6.7 kg ai/ha and year	14
Beetroot	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	10
Blackberry	Ireland	SC 50%	foliar spray	2.5	0.13	2000	4	3
Blueberry	Spain	SC 50%	foliar spray		0.15			10
Blueberry	United States	SC 50%	foliar spray	3.4			Max. 10 kg ai/ha and year	42
Broccoli	Australia	SC 50%	foliar spray	2.7				7
Broccoli	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	7
Broccoli	Japan	SC 40%	foliar spray		0.04		2	21
Broccoli	Nether-lands	SC 50%	foliar spray	1		200	3	14
Broccoli	Spain	SC 50%	foliar spray		0.15			15
Broccoli	United Kingdom	SC 50%	foliar spray (protected)	1.25	0.63	200	2	seedling treatment
Broccoli	United Kingdom	SC 50%	foliar spray	1.5	0.15	1000	2	7
Broccoli	United States	SC 50%	foliar spray	1.7			Max. 14 kg ai/ha and year	7
Broccoli (Brassica group)	Slovenia	SC 50%	foliar spray	1.5	0.3	500	2	7
Broccoli, Chinese	United States	SC 50%	foliar spray	1.7			Max. 14 kg ai/ha and year	7
Brussels sprouts	Australia	SC 50%	foliar spray	2.7				7
Brussels sprouts	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	7

Crop	Country	Application detail						
		Form	Type	kg ai/ha	kg ai/hL	L/ha	No.	PHI days
Brussels sprouts	Ireland	SC 50%	foliar spray	1.5	0.15	1000	6	7
Brussels sprouts	Nether-lands	SC 50%	foliar spray	1.5		200	5	14
Brussels sprouts	Spain	SC 50%	foliar spray		0.15			10
Brussels sprouts	United Kingdom	SC 50%	foliar spray (protected)	1.25	0.63	200	2	seedling treatment
Brussels sprouts	United Kingdom	SC 50%	foliar spray	1.5	0.15	1000	2	7
Brussels sprouts	United States	SC 50%	foliar spray	1.7			Max. 14 kg ai/ha and year	7
Brussels sprouts (Brassica group)	Slovenia	SC 50%	foliar spray	1.5	0.3	500	2	7
Bulb onion	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	10
Bulb onion	Ireland	SC 50%	foliar spray	1	0.5	200	6	14
Bulb onion	Slovenia	SC 50%	foliar spray	1.25	0.25	500	5	14
Bulb onion	Spain	SC 50%	foliar spray		0.15			10
Bulb onion	United Kingdom	SC 50%	foliar spray	1	0.5	200	6	14
Cabbage	Australia	SC 50%	foliar spray	2.7				7
Cabbage	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	7
Cabbage	Ireland	SC 50%	foliar spray	1.5	0.15	1000	2	7
Cabbage	Spain	SC 50%	foliar spray		0.15			10
Cabbage	United Kingdom	SC 50%	foliar spray (protected)	1.25	0.63	200	2	seedling treatment
Cabbage	United Kingdom	SC 50%	foliar spray	1.5	0.15	1000	2	7
Cabbage	United States	SC 50%	foliar spray	1.7			Max. 14 kg ai/ha and year	7
Cabbage (Brassica group)	Slovenia	SC 50%	foliar spray	1.5	0.3	500	2	7
Cabbage, Chinese	Japan	WG 65%	foliar spray		0.065		2	7
Cabbage, Chinese	United States	SC 50%	foliar spray	1.7			Max. 14 kg ai/ha and year	7
Cabbage, head	Japan	AE 0.3%	foliar spray		0.03		2	3
Cabbage, head	Japan	WG 50%	foliar spray		0.05		2	14
Cabbage, head	Nether-lands	SC 50%	foliar spray	1		200	3	14
Carrot	Australia	SC 50%	foliar spray	1.4				7
Carrot	Brazil	SC 50%	foliar spray (ground + aerial)		0.2	900		7
Carrot	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	7
Carrot	Japan	SC 53%	foliar spray		0.071		5	7
Carrot	Slovenia	SC 50%	foliar spray	1.5	0.3	500	4	21
Carrot	Spain	SC 50%	foliar spray	1.5	0.15	1000	3	15
Cauliflower	Australia	SC 50%	foliar spray	2.7				7
Cauliflower	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	7

Crop	Country	Application detail						
		Form	Type	kg ai/ha	kg ai/hL	L/ha	No.	PHI days
Cauliflower	Ireland	SC 50%	foliar spray	1.5	0.15	1000	2	7
Cauliflower	Nether-lands	SC 50%	foliar spray	1		200	3	14
Cauliflower	Spain	SC 50%	foliar spray		0.15			10
Cauliflower	United Kingdom	SC 50%	foliar spray (protected)	1.25	0.63	200	2	seedling treatment
Cauliflower	United Kingdom	SC 50%	foliar spray	1.5	0.15	1000	2	7
Cauliflower	United States	SC 50%	foliar spray	1.7			Max. 14 kg ai/ha and year	7
Cauliflower (Brassica group)	Slovenia	SC 50%	foliar spray	1.5	0.3	500	2	7
Celeriac	Nether-lands	SC 50%	foliar spray	1.9		200	5	28
Celery	Australia	SC 50%	foliar spray	1.4				1
Celery	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	7
Celery	Japan	SC 40%	foliar spray		0.04		2	21
Celery	Slovenia	SC 50%	foliar spray	1.5	0.3	500	3	21
Celery	Spain	SC 50%	foliar spray		0.15			10
Celery	United Kingdom	SC 50%	foliar spray	1.5	0.15	1000	3	7
Celery	United States	SC 50%	foliar spray	2.5			Max. 20 kg ai/ha and year	7
Celery leaves	Nether-lands	SC 50%	foliar spray	1.9		200	5	28
Celery, blanched	Nether-lands	SC 50%	foliar spray	1.9		200	5	28
Cereals	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	15
Cherry	Australia	SC 50%	foliar spray	2.3	0.12	2000		7
Chervil	Spain	SC 50%	foliar spray		0.15			3
Chick-pea	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	7
Chick-pea	Spain	SC 50%	foliar spray	1.5	0.15	1000	2	15
Chives	Spain	SC 50%	foliar spray		0.15			10
Citrus	Brazil	SC 50%	foliar spray (ground + aerial)		0.15	10 L per plant	2	7
Coriander	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	3	3
Cranberry	United States	SC 50%	foliar spray	5.5			Max. 17 kg ai/ha and year	50
Cucumber	Brazil	SC 50%	foliar spray (ground + aerial)		0.2	900		7
Cucumber	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	3
Cucumber	Ireland	SC 50%	foliar spray (protected)		0.11		2	3
Cucumber	Japan	FU 28%	smoking	11.2 g per 100m³			8	1
Cucumber	Japan	WG 65%	foliar spray		0.065		3	1
Cucumber	Moldavia	SC 50%	foliar spray	0.9	0.13	600	5	20

Crop	Country	Application detail						
		Form	Type	kg ai/ha	kg ai/hL	L/ha	No.	PHI days
Cucumber,	Moldavia	SC 50%	foliar spray (protected)	2	0.25	600	3	3
Cucumber	Nether-lands	SC 50%	foliar spray (protected)	2.25	0.15	1500	3	3
Cucumber	Slovenia	SC 50%	foliar spray	1.5	0.19	800	3	7
Cucumber	Spain	SC 50%	foliar spray	2.25	0.15	1500	3	3
Cucumber	United Kingdom	SC 50%	foliar spray (protected)		0.11		2	2
Cucurbits	Australia	SC 50%	foliar spray	1.9				1
Cucurbits	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	3
Cucurbits	United States	SC 50%	foliar spray	2.5			Max. 18 kg ai/ha and year	0
Cucurbits, non-edible peel	Spain	SC 50%	foliar spray	2.25	0.15	1500	3	3
Currant	Ireland	SC 50%	foliar spray	2.1	1.1	2000	3	28
Currant	Spain	SC 50%	foliar spray		0.15			10
Currant	United Kingdom	SC 50%	foliar spray	2.5	0.13	2000	4	28
Eggplant	Brazil	SC 50%	foliar spray (ground + aerial)		0.2	900		7
Eggplant	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	3
Eggplant	Japan	WG 65%	foliar spray		0.065		4	1
Eggplant	Spain	SC 50%	foliar spray		0.15			3
Endive	Australia	SC 50%	foliar spray	1.7				1
Garlic	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	10
Garlic	Japan	SC 40%	foliar spray		0.04		6	7
Garlic	Spain	SC 50%	foliar spray		0.15			10
Garlic	United Kingdom	SC 40%	foliar spray	1	0.5	200	2	14
Garlic	United States	SC 50%	foliar spray	2.5			Max. 17 kg ai/ha and year	7
Gherkin	Nether-lands	SC 50%	foliar spray (protected)	2.25	0.15	1500	3	3
Gherkin	Spain	SC 50%	foliar spray	2.25	0.15	1500	3	3
Gherkins	Slovenia	SC 50%	foliar spray	1.5	0.3	500	3	3
Globe artichoke	Australia	SC 50%	foliar spray	1.7				1
Gooseberry	Ireland	SC 50%	foliar spray	2.5	0.13	2000	3	28
Gooseberry	United Kingdom	SC 50%	foliar spray	2.5	0.13	2000	4	28
Grapes	Australia	SC 50%	foliar spray	1.7	0.15			14
Grapes	Brazil	SC 50%	foliar spray (ground + aerial)		0.2	3 L per plant		7
Grapes	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	15
Grapes	Japan	SC 40%	foliar spray		0.02		3	60
Grapes	Moldavia	SC 50%	foliar spray	1	0.13		4	21
Grapes	Slovenia	SC 50%	foliar spray	1.5	0.25	600	2	28

Crop	Country	Application detail						
		Form	Type	kg ai/ha	kg ai/hL	L/ha	No.	PHI days
Grassland	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	n.s.
Grassland	United States	SC 50%	foliar spray	1.7			Max. 5 kg ai/ha and year	14 [c]
Hazelnuts	United States	SC 50%	foliar spray	3.4	0.12	940	Max. 10 kg ai/ha and year	120
Hops	Ireland	SC 50%	foliar spray	3	0.6	500	free	7
Hops	United Kingdom	SC 50%	foliar spray	1.8	0.36	500		10
Leek	Australia	SC 50%	foliar spray	1.7				1
Leek	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	10
Leek	Nether-lands	SC 50%	foliar spray	1.5		250	5	14
Leek	Slovenia	SC 50%	foliar spray	1.25	0.25	500	5	14
Leek	Spain	SC 50%	foliar spray	1.5	0.15	1000	3	10
Leek	United States	SC 50%	foliar spray	2.5			Max. 7.6 kg ai/ha and year	14
Lentils	Australia	SC 50%	foliar spray	1.4				14 [d]
Lettuce	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	7
Lettuce, head	Japan	SC 40%	foliar spray		0.04		3	14
Lettuce, leaf	Japan	SC 40%	foliar spray		0.04		2	21
Maize	United States	SC 50%	foliar spray	1.7			Max. 10 kg ai/ha and year	14 [b]
Mango	United States	SC 50%	foliar spray	2.9			Max. 27 kg ai/ha and year	21
Melon	Brazil	SC 50%	foliar spray (ground + aerial)		0.2	900		7
Melon	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	3
Melon	Nether-lands	SC 50%	foliar spray (protected)	2.25	0.15	1500	3	3
Melon, except watermelon	Japan	WG 65%	foliar spray		0.065		3	3
Mint	United States	SC 50%	foliar spray	1.1			Max. 3.4 kg ai/ha and year	80
Mushrooms	United States	SC 50%	foliar spray	1.2			Max. 0.18 kg ai/ha and year	5
Nectarine	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	15
Nectarine	Japan	SC 40%	foliar spray		0.04		2	1
Nectarine	Spain	SC 50%	foliar spray	1.5	0.15	1000	3	15
Oat	Japan	DP 10%	soil incorporation	30			1	
Oilseed rape	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	7
Oilseed rape	United Kingdom	SC 50%	foliar spray	1.5	0.75	200	2	Latest treatment: BBCH 50
Okra	Australia	SC 50%	foliar spray	1.7				1
Okra	Ivory Coast [f]	SC 72%	foliar spray	1.0			2	2
Onion, bulb	Australia	SC 50%	foliar spray	1.7				14

Crop	Country	Application detail						
		Form	Type	kg ai/ha	kg ai/hL	L/ha	No.	PHI days
Onion, bulb	Japan	SC 53%	foliar spray		0.071		6	7
Onion, bulb	Nether-lands	SC 50%	foliar spray	0.5		200	6	7
Onion, bulb	Nether-lands	SC 50%	foliar spray	1.0		200	5	14
Onion, bulb	United Kingdom	SC 40%	foliar spray	1	0.5	200	2	14
Onion, bulb	United States	SC 50%	foliar spray	2.5			Max. 17 kg ai/ha and year	7
Onion, Chinese	Japan	WG 65%	foliar spray		0.065		3	14
Onion, spring	United Kingdom	SC 40%	foliar spray	1	0.5	200	2	14
Onion, spring	United States	SC 50%	foliar spray	2.5			Max. 7.6 kg ai/ha and year	14
Onion, Welsh	Japan	WG 65%	foliar spray		0.065		2	14
Papaya	Brazil	WG 83%	foliar spray		0.21	800	5	7
Papaya	Costa Rica	SC 50%	foliar spray	1.8				7
Papaya	Ivory Coast [f]	SC 72%	foliar spray	1.4			6	3
Papaya	Japan	SC 40%	foliar spray		0.04		5	1
Papaya	Mexico	SC 50%	foliar spray	3.6				0
Papaya	United States	SC 50%	foliar spray	2.5			Max. 7.6 kg ai/ha and year	0
Parsley	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	3	3
Parsley	Nether-lands	SC 50%	foliar spray	1.9		200	5	28
Parsley	Spain	SC 50%	foliar spray		0.15			3
Parsnip	United States	SC 50%	foliar spray	1.7			Max. 6.7 kg ai/ha and year	10
Passion fruit	United States	SC 50%	foliar spray	1.7			Max. 8.4 kg ai/ha and year	7
Pea, combining	United Kingdom	SC 50%	foliar spray	1.5	0.75	200	2	42 [a]
Peach	Australia	SC 50%	foliar spray	2.3	0.12	2000		7
Peach	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	15
Peach	Japan	WP 60%	foliar spray		0.086		3	3
Peach	Japan	SC 40%	foliar spray		0.04		6	1
Peach	Moldavia	SC 50%	foliar spray	1	0.13	800	2	21
Peach	Spain	SC 50%	foliar spray	1.5	0.15	1000	3	15
Peanut	Brazil	SC 50%	foliar spray (ground + aerial)	1.75				14
Peanut	Australia	SC 50%	foliar spray	1.4				Not required [d]
Peanut	Japan	SC 40%	foliar spray		0.08		4	14

Crop	Country	Application detail						
		Form	Type	kg ai/ha	kg ai/hL	L/ha	No.	PHI days
Peanut	United States	SC 50%	foliar spray	1.3			Max. 10 kg ai/ha and year	14 [d]
Pear	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	15
Pear	Japan	WG 72%	foliar spray		0.072		3	30
Pear	Moldavia	SC 50%	foliar spray	1.3	0.16	800	3	21
Peas	Australia	SC 50%	foliar spray	1.4				7 [d]
Peas	Slovenia	SC 50%	foliar spray	1.5	0.3	500	2	7
Peas (pulses)	Spain	SC 50%	foliar spray	1.5	0.15	1000	2	15
Peas (pulses)	United States	SC 50%	foliar spray	1.7			Max. 6.7 kg ai/ha and year	14
Pepper	Australia	SC 50%	foliar spray	1.7				1
Peppers, bell	Brazil	SC 50%	foliar spray (ground + aerial)		0.2	900		7
Pepper	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	3
Peppers, bell	Japan	SC 40%	foliar spray		0.04		3	1
Pepper	Spain	SC 50%	foliar spray		0.15			3
Peppers	Slovenia	SC 50%	foliar spray	1.5	0.3	500	2	7
Persimmon, Japanese	Japan	SC 53%	foliar spray		0.035		3	30
Pistachio	United States	SC 50%	foliar spray	2.5			Max. 25 kg ai/ha and year	14
Plum	Australia	SC 50%	foliar spray	2.3	0.12	2000		1
Plum	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	15
Plum	Moldavia	SC 50%	foliar spray	1.3	0.16	800	2	21
Pome fruit	Spain	SC 50%	foliar spray		0.15			15
Potato	Australia	SC 50%	foliar spray	1.3				Not required [d]
Potato	Brazil	SC 50%	foliar spray (ground + aerial)	1.75	0.2	900		7
Potato	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	3	10
Potato	Ireland	SC 50%	foliar spray	1.5	0.68	220	5	7
Potato	Japan	SC 53%	foliar spray	1.06	0.42	250	5	7
Potato	Moldavia	SC 50%	Foliar spray	0.9	0.13	600	5	20
Potato	Slovenia	SC 50%	foliar spray	1.5	0.3	500	4	14
Potato	Spain	SC 50%	foliar spray		0.15			15
Potato	United Kingdom	SC 50%	foliar spray (aerial)	1.5	2.5	60	5	7
Potato	United Kingdom	SC 50%	foliar spray	1.5	0.68	220	5	7
Potato	United States	SC 50%	foliar spray	1.3			Max. 13 kg ai/ha and year	7
Pumpkins (except Zucchini)	Japan	WG 65%	foliar spray		0.065		3	7
Quince	Japan	SC 40%	foliar spray		0.04		4	30
Radish	Australia	SC 50%	foliar spray	1.7				1

Crop	Country	Application detail						
		Form	Type	kg ai/ha	kg ai/hL	L/ha	No.	PHI days
Rape seed	Ireland	SC 50%	foliar spray	1.5	0.75	200	2	Latest treatment: BBCH 50
Raspberry	Ireland	SC 50%	foliar spray	2.5	0.13	2000	4	3
Rhubarb	Australia	SC 50%	foliar spray	2.2	0.11	2000		7
Rice	Brazil	SC 50%	foliar spray (ground + aerial)	1.5				15
Rice	Japan	SC 40%	drench after sowing	0.63 g [e]	0.13	0.5 l [e]	2	
Rye	Japan	DP 10%	soil incorporation	30			1	
Shallot	Australia	SC 50%	foliar spray	1.7				1
Shallot	Nether-lands	SC 50%	foliar spray	1.0		200	5	28
Shallot	Spain	SC 50%	foliar spray		0.15			10
Shallot	United Kingdom	SC 40%	foliar spray	1	0.5	200	2	14
Shallot	United States	SC 50%	foliar spray	2.5			Max. 7.6 kg ai/ha and year	14
Soya bean	Brazil	SC 50%	foliar spray (ground + aerial)	1.5				7
Soya bean	Japan	WG 50%	foliar spray		0.05		2	21
Soya bean	Japan	DP 5%	dusting		2		2	21
Soya bean	United States	SC 50%	foliar spray	1.9			Max. 5 kg ai/ha and year	42 [d]
Spinach	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	7
Stone fruit	United States	SC 50%	foliar spray	3.5	0.12	940	Max. 17 kg ai/ha and year	0
Strawberry	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	3	7
Strawberry	Ireland	SC 50%	foliar spray	3	0.15	2000	4	3
Strawberry	Slovenia	SC 50%	foliar spray	1.5	0.3	500	3	7
Strawberry	Spain	SC 50%	foliar spray		0.15			10
Strawberry	United Kingdom	SC 50%	foliar spray	3	0.15	2000	4	14
Sugar beet	Japan	SC 40%	foliar spray		0.04		3	45
Sweetcorn	Australia	SC 50%	foliar spray	1.7				1
Sweetcorn	United States	SC 50%	foliar spray	1.7			Max. 10 kg ai/ha and year	14 [b]
Tomato	Australia	SC 50%	foliar spray	1.7				1
Tomato	Brazil	SC 50%	foliar spray (ground + aerial)		0.2	900		7
Tomato	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	3
Tomato	Ireland	SC 50%	foliar spray (protected)		0.11		2	3
Tomato	Japan	FU 28%	smoking	11.2 g per 100 m³			4	1

Crop	Country	Application detail						
		Form	Type	kg ai/ha	kg ai/hL	L/ha	No.	PHI days
Tomato	Japan	WG 65%	foliar spray		0.065		4	1
Tomato	Moldavia	SC 50%	foliar spray	1.3	0.16	800	3	21
Tomato	Nether-lands	SC 50%	foliar spray (protected)	2.25	0.15	1500	3	3
Tomato	Slovenia	SC 50%	foliar spray, indoor	1.5	0.19	800	4	7
Tomato	Slovenia	SC 50%	foliar spray	1.5	0.3	500	4	7
Tomato	Spain	SC 50%	foliar spray		0.15			3
Tomato	United Kingdom	SC 50%	foliar spray (protected)		0.11		2	2
Tomato	United States	SC 50%	foliar spray	2.4			Max. 17 kg ai/ha and year	0
Triticale	Japan	DP 10%	soil incorporation	30			1	
Triticale	Spain	SC 50%	foliar spray		0.15			15
Watercress	Australia	SC 50%	foliar spray	1.7				1
Watermelon		WG 65%	foliar spray		0.065		3	7
Watermelon	Brazil	SC 50%	foliar spray (ground + aerial)		0.2	900		7
Watermelon	Cyprus	SC 50%	foliar spray	1.5	0.15	1000	4	3
Wheat	Brazil	SC 50%	foliar spray (ground + aerial)	1.5				30
Wheat	Ireland	SC 50%	foliar spray	1	0.45	220	2	Latest treatment: BBCH 71
Wheat	Japan	DP 10%	soil incorporation	30			1	
Wheat	Moldavia	SC 50%	Foliar spray	1.0	0.13	600	2	30
Wheat	Nether-lands	SC 50%	foliar spray	1		200	2	35
Wheat	Spain	SC 50%	foliar spray		0.15			15
Wheat	United Kingdom	SC 50%	foliar spray	1	0.45	220	Max. 1.5 kg ai per year	Latest treatment: BBCH 71
Yams	Japan	SC 40%	foliar spray		0.04		6	30
Zucchini	Japan	WP 60%	foliar spray		0.03		3	3

a No feeding allowed

b No utilization of forage or silage

c No grazing. Feeding of treated plant after harvest of seeds allowed

d No feeding or grazing allowed

e Nursery boxes: 30*60*30 cm

f No official label confirmation provided

RESIDUES RESULTING FROM SUPERVISED TRIALS ON CROPS

Residue levels and application rates were reported as chlorothalonil, except when noted otherwise. When residues were not detected they are shown as below the LOQ, e.g., < 0.1 mg/kg. Residues, application rates and spray concentrations have generally been rounded to two significant figures. HR and STMR values from the trials conducted according to maximum GAP have been used for the estimation of maximum residue levels. These results are underlined.

Laboratory reports included method validation including batch recoveries with spiking at residue levels similar to those occurring in samples from the supervised trials. Dates of analyses or duration of residue sample storage were also provided. Field reports provided data on the sprayers used and their calibration, plot size, residue sample size and sampling date. Although trials included control plots, no control data are recorded in the tables except where residues in control samples exceeded the LOQ. Residue data are recorded unadjusted for % recovery.

Table 28 Chlorothalonil - supervised residue trials

Commodity	Indoor/Outdoor	Treatment	Origin	Table
Peaches	Outdoor	Foliar spray	Italy, Portugal, Spain	Table 29
Plums	Outdoor	Foliar spray	Italy, Spain	Table 30
Blueberries	Outdoor	Foliar spray	United States	Table 31
Cranberries	Outdoor	Foliar spray	United States	Table 32
Currants	Outdoor	Foliar spray	United Kingdom	Table 33
Grapes	Outdoor	Foliar spray	France, Germany, Hungary, Spain, United States	Table 34
Strawberries	Outdoor	Foliar spray	Spain	Table 35
Strawberries	Protected	Foliar spray	France, United Kingdom	Table 36
Bananas	Outdoor	Foliar spray	Columbia, Costa Rica, Guatemala, Honduras, Mexico, Panama	Table 37
Mangoes	Outdoor	Foliar spray	United States	Table 38
Papaya	Outdoor	Foliar spray	Brazil, Ivory Coast	Table 39
Bulb onions	Outdoor	Foliar spray	United Kingdom	Table 40
Spring onions	Outdoor	Foliar spray	Italy, United Kingdom	Table 41
Leek	Outdoor	Foliar spray	France, Italy, United Kingdom	Table 42
Brussels sprouts	Outdoor	Foliar spray	France, Germany, Spain, Switzerland, United Kingdom	Table 43
Head cabbage	Outdoor	Foliar spray	Switzerland	Table 44
Cauliflower	Outdoor	Foliar spray	France, Italy, Switzerland, United Kingdom	Table 45

Commodity	Indoor/Outdoor	Treatment	Origin	Table
Courgettes	Outdoor	Foliar spray	United Kingdom	Table 46
Cucumbers	Outdoor	Foliar spray	Italy, United States	Table 47
Cucumbers	Protected	Foliar spray	France, Germany	Table 48
Melons	Outdoor	Foliar spray	France, Italy, Spain	Table 49
Melons	Protected	Foliar spray	France, Italy, Spain	Table 50
Winter squash	Outdoor	Foliar spray	United States	Table 51
Okra	Outdoor	Foliar spray	Ivory Coast	Table 52
Peppers	Outdoor	Foliar spray	Brazil	Table 53
Tomatoes	Outdoor	Foliar spray	United States	Table 54
Sweet corn	Outdoor	Foliar spray	United States	Table 55
Carrots	Outdoor	Foliar spray	France, Germany, Spain, United Kingdom	Table 56
Potatoes	Outdoor	Foliar spray	France, Germany, Spain, United Kingdom	Table 57
Asparagus	Outdoor	Foliar spray	Germany, Greece, United States	Table 58
Celery	Outdoor	Foliar spray	United States	Table 59
Green beans	Outdoor	Foliar spray	United Kingdom	Table 60
Beans (pulses)	Outdoor	Foliar spray	France, Spain, United Kingdom	Table 61
Chickpeas (pulses)	Outdoor	Foliar spray	Italy, Spain	Table 62
Soya beans	Outdoor	Foliar spray	United States	Table 63
Maize	Outdoor	Foliar spray	United States	Table 64
Almonds	Outdoor	Foliar spray	United States	Table 65
Pistachios	Outdoor	Foliar spray	United States	Table 66
Peanuts	Outdoor	Foliar spray	United States	Table 67
Sweet corn forage	Outdoor	Foliar spray	United States	Table 68
Maize stover	Outdoor	Foliar spray	United States	Table 69
Almond hulls	Outdoor	Foliar spray	United States	Table 70
Peanut hulls	Outdoor	Foliar spray	United States	Table 71

Table 29 Chlorothalonil residues in peaches following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Italy, Ravenna 1995 (Baby Gold 6)	SC 50	4	1.5	0.15	Whole fruit	< 0.01 (0.0075)	77	CTL/PRNPS 29b/E/95, 95-003-F-I Roland L., 1996 (CLTA10_090) [a]
	WG 75	4	1.5	0.15	Whole fruit	< 0.01 (0.008)	77	
Spain, Guadassuar 1995 (Maycrest)	SC 50	4	1.5	0.19	Whole fruit	4.2	13	CTL/PRNPS 29b/E/95, 95-003-F-E Roland L., 1996 (CLTA10_090) [a]
	WG 75	4	1.5	0.19	Whole fruit	3.4	13	
Portugal, Feteiras 1993 (Maracotoa)	SC 50	6	0.75 0.75 0.75 0.75 0.75 0.75	0.13 0.13 0.13 0.13 0.13 0.08	Whole fruit	0.81	21	CRP/94/1210, 92-001-F-P Roland L., 1994 (CLTA10_091) [a]
Portugal, Feteiras 1993 (Maracotoa)	SC 50	6	1.5	0.26 0.26 0.26 0.26 0.26 0.16	Whole fruit	6.4	21	CRP/94/1210, 92-001-F-P Roland L., 1994 (CLTA10_091) [a]
Portugal, Feteiras 1993 (Maracotoa)	WG 75	6	0.75	0.13 0.13 0.13 0.13 0.13 0.08	Whole fruit	3.2	21	CRP/94/1210, 92-001-F-P Roland L., 1994 (CLTA10_091) [a]
Portugal, Montargil 1993 (Springtime)	SC 50	5	0.75	0.16 0.16 0.16 0.16 0.1	Whole fruit	0.92	20	CRP/94/1211, 92-001-F-P Roland L., 1994 (CLTA10_092) [a]
Portugal, Montargil 1993 (Springtime)	SC 50	5	1.5	0.32 0.32 0.32 0.32 0.2	Whole fruit	4.7	20	CRP/94/1211, 92-001-F-P Roland L., 1994 (CLTA10_092) [a]
Portugal, Montargil 1993 (Springtime)	WG 75	5	0.75	0.16 0.16 0.16 0.16 0.1	Whole fruit	3.8	20	CRP/94/1211, 92-001-F-P Roland L., 1994 (CLTA10_092) [a]
Spain, Turis 1994 (Maria Serena)	SC 50	4	1.5	0.25 0.22 0.22 0.22	Fruit w/o stone	0.87	21	CRP/94/1277, 94-002-F-E Roland L., 1994 (CLTA10_093) [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
	WG 75	4	1.5	0.25 0.22 0.22 0.22	Fruit w/o stone	1.4	21	
Italy, Bologna 1994 (Maria Bianca)	SC 50	4	1.5	0.13	Fruit w/o stone	0.65	21	CRP/94/1320, 94-014-F-I Roland L., 1994 (CLTA10_094) [a]
	WG 75	4	1.5	0.13	Fruit w/o stone	0.59	21	
Italy, Saluzzo 1990 (Cress Haven)	SC 40	4	1.0	0.05	Whole fruit	0.98	21	CRP/91/585, SIPCAM-CL16-1990 Roland L., 1991 (CLTA10_095) [a]
Italy, Saluzzo 1990 (Cress Haven)	SC 40	4	2.0	0.1	Whole fruit	1.3	21	CRP/91/585, SIPCAM-CL16-1990 Roland L., 1991 (CLTA10_095) [a]

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 30 Chlorothalonil residues in plums following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Spain, Valencia 1996 (Friar)	SC 50	4	1.5	0.2 0.2 0.17 0.17	Whole fruit	0.3	20	CTL/PRNDO 03a/I/96, 96-011-F-E Roland L., 1997 (CLTA10_096) [a]
	WG 75	4	1.5	0.2 0.2 0.17 0.17	Whole fruit	0.29	20	
Italy, Bologna 1996 (Precoce di Giugno)	SC 50	4	1.5	0.15	Whole fruit	0.14	20	CTL/PRNDO 03a/I/96, 96-011-F-I Roland L., 1997 (CLTA10_096) [a]
	WG 75	4	1.5	0.15	Whole fruit	0.22	20	
Italy, Condifiume 1990 (Ozar Premier)	SC 40	4	1.0	0.06	Whole fruit	0.58	21	CRP/91/584, SIPCAM-CL24-1990 Roland L., 1991 (CLTA10_097) [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Italy, Condifiume 1990 (Ozar Premier)	SC 40	4	2.0	0.11	Whole fruit	1.9	21	CRP/91/584, SIPCAM-CL24-1990 Roland L., 1991 (CLTA10_097) [a]
Italy, Bologna 1995 (Angelo)	SC 50	4	1.5	0.15	Whole fruit	0.031	22	CTL/PRNDO 02b/E/95, 95-022-F-I Roland L., 1996 (CLTA10_098) [a]
	WG 75	4	1.5	0.15	Whole fruit	0.05	22	
Spain, Valencia 1995 (Red Beaut)	SC 50	4	1.5	0.11	Whole fruit	0.01	19	CTL/PRNDO 02b/E/95, 95-022-F-E Roland L., 1996 (CLTA10_098)
	WG 75	4	1.5	0.1	Whole fruit	0.03	19	
Italy, Forli 1997 (President)	SC 50	4	1.5	0.15	Whole fruit	0.02	19	CTL/PRNDO 04/I/97, 97-011-F-I Roland L., 1998 (CLTA10_099) [a]
	WG 75	4	1.5	0.15	Whole fruit	0.02	19	

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 31 Chlorothalonil residues in blueberries following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Orono (ME) 1988 (Wild variety)	SC 72	3	2.5	0.53	Fruit Chlorothalonil SDS-3701 R613636	 0.024 0.024 < 0.01 < 0.01 < 0.03 < 0.03	 68 68 68 68 68 68	HLA 6012-241C, MacGregor D., 1990 (CLTA10_115)
United States, Blairville (GE) 1987 (Tifblue)	SC 72	1	6.7		Fruit Chlorothalonil SDS-3701 R613636	 0.012 0.011 < 0.01 < 0.01 < 0.03 < 0.03	 101 101 101 101 101 101	HLA 6012-241C, MacGregor D., 1990 (CLTA10_115)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Blairville (GE) 1988 (Tifblue)	SC 72	3	2.5		Fruit Chlorothalonil SDS-3701 R613636	 0.017 0.017 < 0.01 < 0.01 < 0.03 < 0.03	 80 80 80 80 80 80	HLA 6012-241C, MacGregor D., 1990 (CLTA10_115)
United States, Poplarville (MS) 1988 (Tifblue)	SC 72	5	2.5	0.27	Fruit Chlorothalonil SDS-3701 R613636	 0.20 0.32 < 0.01 < 0.01 < 0.03 < 0.03	 42 42 42 42 42 42	HLA 6012-241C, MacGregor D., 1990 (CLTA10_115)
United States, Castle Hayne 1988 (Croaton)	SC 72	5	2.5	0.08	Fruit Chlorothalonil SDS-3701 R613636	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03	 49 49 49 49 49 49	HLA 6012-241C, MacGregor D., 1990 (CLTA10_115)
United States, Mays Landing (NJ) 1988 (Elliot)	SC 72	4	2.5	0.53	Fruit Chlorothalonil SDS-3701 R613636	 0.54 0.60 < 0.01 < 0.01 < 0.03 < 0.03	 75 75 75 75 75 75	HLA 6012-241C, MacGregor D., 1990 (CLTA10_115)
United States, Grand Junction (MI) 1988 (Jersey)	SC 72	2	2.5	1	Fruit Chlorothalonil SDS-3701 R613636	 0.093 0.084 < 0.01 < 0.01 < 0.03 < 0.03	 50 50 50 50 50 50	HLA 6012-241C, MacGregor D., 1990 (CLTA10_115)
United States, Grand Junction (MI) 1988 (Jersey)	SC 72	2	3.6	1.6	Fruit Chlorothalonil SDS-3701 R613636	 0.093 0.10 < 0.01 < 0.01 < 0.03 < 0.03	 50 50 50 50 50 50	HLA 6012-241C, MacGregor D., 1990 (CLTA10_115)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Meyersville (NJ) 1992 (Blue Crop)	SC 72	6	3.4	0.72	Fruit Chlorothalonil SDS-3701 R613636	 0.57 0.58 0.65 0.59 0.041 0.042 0.037 0.038 < 0.03 < 0.03 < 0.03 < 0.03	 49 49 49 49 49 49 49 49 49 49 49 49	HWI 6378-108, Ballantine L., 1993 (CLTA10_116) [a]
United States, Conklin (MI) 1990 (Blue Crop)	SC 72	6	3.4	0.24	Fruit Chlorothalonil SDS-3701 R613636	 0.55 0.53 0.51 0.53 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03 < 0.03 < 0.03	 54 54 54 54 54 54 54 54 54 54 54 54	HWI 6378-104, Ballantine L., 1991 (CLTA10_117) [a]

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 32 Chlorothalonil residues in cranberries following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Vesper (WI) 1988 (Searles)	SC 720	3	3.5	0.25	Fruit Chlorothalonil SDS-3701 R613636	 0.12 0.12 < 0.01 < 0.01 < 0.03 < 0.03	 83 83 83 83 83 83	HLA 6012-241G, MacGregor D., 1990 (CLTA10_118)
United States, Wisconsin Rapids (WI) 1988 (Searles)	SC 720	3	3.5	0.25	Fruit Chlorothalonil SDS-3701 R613636	 0.039 0.042 < 0.01 < 0.01 < 0.03 < 0.03	 91 91 91 91 91 91	HLA 6012-241G, MacGregor D., 1990 (CLTA10_118)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, East Wareham (MA) 1988 (Early Black)	SC 720	3	4.6	0.16	Fruit Chlorothalonil SDS-3701 R613636	 <u>0.79</u> 0.75 <u>< 0.01</u> < 0.01 < 0.03 < 0.03	 50 50 50 50 50 50	HLA 6012-241G, MacGregor D., 1990 (CLTA10_118)
United States, Long Beach (WA) 1985 (McFarlin)	SC 50	3	5.8	0.21	Fruit Chlorothalonil SDS-3701 R613636	 <u>3.7</u> 3.7 <u>0.060</u> 0.055 < 0.03 < 0.03	 60 60 60 60 60 60	HLA 6012-241G, MacGregor D., 1990 (CLTA10_118)
United States, Long Beach (WA) 1982 (McFarlin)	SC 50	2	2.3		Fruit Chlorothalonil SDS-3701	 0.36 0.40 0.12 0.09 < 0.01 < 0.01 < 0.01 < 0.01	 56 56 70 70 56 56 70 70	698-3CR-84-0070-001, Dillon K., 1985 (CLTA10_119) [a]
United States, Long Beach (WA) 1982 (McFarlin)	SC 50	2	4.7		Fruit Chlorothalonil SDS-3701	 2.9 2.9 0.68 0.70 < 0.01 < 0.01 < 0.01 < 0.01	 56 56 70 70 56 56 70 70	698-3CR-84-0070-001, Dillon K., 1985 (CLTA10_119) [a]
United States, Grayland (WA) 1983 (McFarlin)	SC 50	4	5.8		Fruit Chlorothalonil SDS-3701	 4.3 4.0 < 0.01 < 0.01	 54 54 54 54	698-3CR-84-0070-001, Dillon K., 1985 (CLTA10_119) [a]
United States, Chatsworth (NJ) 1984 (Early Black)	SC 50	3	5.8 (ground treat-ment)		Fruit Chlorothalonil SDS-3701	 1.2 1.4 < 0.01 < 0.01	 49 49 49 49	698-3CR-84-0070-001, Dillon K., 1985 (CLTA10_119) [a]
United States, Chatsworth (NJ) 1984 (Early Black)	SC 50	3	5.8 (air treat-ment)		Fruit Chlorothalonil SDS-3701	 0.75 0.58 < 0.01 < 0.01	 49 49 49 49	698-3CR-84-0070-001, Dillon K., 1985 (CLTA10_119) [a]

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 33 Chlorothalonil residues in currants following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Hereford 1996 (Ben Tiren)	SC 50	3	2.5	0.13	Fruit	1.8 1.9	28 28	CTL/RIBNI 03/6B/96, AK/3309/IB/1 Partingdon K., 1997 (CLTA10_112)
	WG 75	3	2.5	0.13	Fruit	1.3 1.6	28 28	
United Kingdom, Kent 1995 (Ben Alder)	SC 50	3	2.5	0.13	Fruit	0.9 0.99	27 27	CTL/RIBNI 03/6B/96, AK/3309/IB/2 Partingdon K., 1997 (CLTA10_112)
	WG 75	3	2.5	0.13	Fruit	0.74 0.92	27 27	
United Kingdom, Cheltenham 1993 (Baldwin)	SC 50	4	2.5	0.13	Fruit	5.8 10 5.9, 8.1 (7.0)	37 37 37	CTL/RIBNI 01/6B/93, AG/15121/1 Knight C., 1994 (CLTA10_113) [a]
United Kingdom, Tewkesbury 1993 (Ben Tirran)	SC 50	4	2.5	0.13	Fruit	5.4 5.6 5.5	28 28 28	CTL/RIBNI 01/6B/93, AG/15121/2 Knight C., 1994 (CLTA10_113) [a]
United Kingdom, Staffordshire 1995 (Baldwin)	SC 50	3	2.5	0.5	Fruit	3.4 3.5 3.1	28 28 28	CTL/RIBNI 02/6B/95, AK/2782/IB/1 Partingdon K., 1996 (CLTA10_114)
United Kingdom, Kent 1995 (Ben Alder)	SC 50	3	2.5	0.5	Fruit	3.7 2.8 5.0	26 26 26	CTL/RIBNI 02/6B/95, AK/2782/IB/2 Partingdon K., 1996 (CLTA10_114)

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 34 Chlorothalonil residues in grapes following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Hungary, Csopak Vitis Kft. 1992 (Unknown)	SC 50	3	1.5	0.15	Fruit	1.1 1.2 1.5 6.7 5.1 7.1 8.7 10.3 6.5 5.5 5.1 4.9 4.6 2.8 3.8 3.2 3.3 4.5 1.3 1.6 1.6 0.73 0.77 0.68 0.80 0.71 0.70 0.79	0 [a] 0 [a] 0 [a] 0 0 0 1 1 1 3 3 3 5 5 5 7 7 7 10 10 10 14 14 14 14 14 14 14	CTL/VITSS 28/H/92, Unknown, 1992 (CLTA10_107) [b]
Spain, Requena 1992 (Cencibel)	WG 75	6	0.5	0.07	Fruit	0.22, 0.26 (0.24)	14	CTL/VITVI 02/E/92, 92-018-F-E Roland L., 1993 (CLTA10_108) [b]
Spain, Requena 1992 (Cencibel)	WG 75	6	0.75	0.11	Fruit	0.41, 0.40 (0.40)	14	CTL/VITVI 02/E/92, 92-018-F-E Roland L., 1993 (CLTA10_108) [b]
Spain, Requena 1992 (Cencibel)	WG 75	6	1.0	0.14	Fruit	0.65, 0.56 (0.61)	14	CTL/VITVI 02/E/92, 92-018-F-E Roland L., 1993 (CLTA10_108) [b]
Spain, Requena 1992 (Cencibel)	WG 75	6	1.5	0.21	Fruit	0.99, 1.0 (1.0)	14	CTL/VITVI 02/E/92, 92-018-F-E Roland L., 1993 (CLTA10_108) [b]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (South), La Cheville 1992 (Gamay)	WP 72	10	1.0	0.3	Fruit chlorothalonil SDS-3701 Fruit (RAC) chlorothalonil SDS-3701 Wine, red chlorothalonil SDS-3701	 1.7 1.9 2.3 1.8, 1.9 (1.9) 0.04 0.15 0.09 0.06, 0.09, (0.08) 2.6 0.09 < 0.01 < 0.01	 21 21 21 21 21 21 21 21 21 21 21 21	CTL/VINE 21/F/92, 1714-92-284-01- 03B-01 Kennedy M., 1994 (CLTA10_243) [b]
France (South) Corcelles 1994 (Gamay)	WG 75	10	1.0	0.3	Fruit (RAC) chlorothalonil SDS-3701 Must chlorothalonil SDS-3701 Wine, red chlorothalonil SDS-3701	 0.67 < 0.01 0.028 < 0.01 < 0.01 < 0.01	 23 23 23 23 23 23	CTL/VITSS 30/F/93, B93504 Hubert M., 1994 (CLTA10_244) [b]
France (South) St. Etienne des Oullieres 1994 (Gamay)	WG 75	10	1.0	0.3	Fruit (RAC) chlorothalonil SDS-3701 Must chlorothalonil SDS-3701 Wine, red chlorothalonil SDS-3701	 0.69 < 0.01 0.46 < 0.01 < 0.01 < 0.01	 23 23 23 23 23 23	CTL/VITSS 30/F/93, B93505 Hubert M., 1994 (CLTA10_244) [b]
France (South) St. Etienne des Oullieres 1993 (Gamay)	WG 75	10	0.75	0.23	Fruit (RAC) Must Wine, red	0.92 0.66 < 0.01	23 23 23	CTL/Vine 20/F/93, B93506 Hubert M., 1994 (CLTA10_246) [b]
France (South) Eymet 1993 (Merlot)	WG 75	10	0.75	0.23	Fruit (RAC) Must Wine, red	2.7 2.3 < 0.01	21 21 21	CTL/Vine 20/F/93, G93029 Hubert M., 1994 (CLTA10_246) [b]
France (South) St. Etienne des Oulieres 1994 (Gamay)	WG 25	9	0.75	0.25	Fruit (RAC) Must Wine	1.2 0.37 < 0.01	21 21 21	CTL/VITSS 29/F/94, A94017 Communal P., 1994 (CLTA10_245) [b]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (South) Sigoules 1994 (Merlot)	WG 25	9	0.75	0.25	Fruit (RAC) Must Wine	1.2 1.1 < 0.01	21 21 21	CTL/VITSS 29/F/94, A94018 Communal P., 1994 (CLTA10_245) [b]
France (South) Calvisson 1994 (Tempranille)	WG 25	8	0.75	0.25	Fruit (RAC) Must Wine	1.1 0.4 < 0.01	20 20 20	CTL/VITSS 29/F/94, A94019 Communal P., 1994 (CLTA10_245) [b]
France (North), Ornes 2000 (Pinot Meunier)	SC 50	5	1.0	0.1	Fruit	1.1	21	RJ3172B, FR41-00-S760 Lister N., 2001 (CLTA10_109)
France (North), Athee Sur Cher 2000 (Sauvignon)	SC 50	5	1.0	0.1	Fruit	0.48	21	RJ3172B, FR41-00-S750 Lister N., 2001 (CLTA10_109)
France (North), Pierreclos 1999 (Gamay)	SC 50	5	1.0	0.13	Fruit	1.4, 1.5, 1.4, 1.4 (1.4) 1.8, 1.9, 1.9, 1.8 (1.9) 0.96 0.60 0.34	0 3 6 15 21	RJ3017B, FR32-99-S752 Lister N., 2000 (CLTA10_110)
France (North), Ormes 1999 (Pinot Meunier)	SC 50	5	1.0	0.1	Fruit	0.92	21	RJ3017B, FR41-99-S760 Lister N., 2000 (CLTA10_110)
France (North), Ecueil 1999 (Pinot Noir)	SC 50	5	1.0	0.1	Fruit	2.0 1.4 1.1 0.87 0.71	0 3 7 14 20	RJ3017B, FR43-99-S751 Lister N., 2000 (CLTA10_110)
France (North), Athee Sur Cher 1999 (Gamay)	SC 50	5	1.0	0.1	Fruit	0.99	21	RJ3017B, FR72-99-S757 Lister N., 2000 (CLTA10_110)
Germany, Sausenheim 2000 (Portugieser)	SC 50	5	1.0	0.13	Fruit	2.4 2.2 1.7 0.89, 1.2, 1.1, 1.2 (1.1) 1.3, 1.4, 1.4, 1.5 (1.4)	0 3 7 14 21	RJ3166B, DE17-00-S158 Lister N., 2001 (CLTA10_111)
Germany, Westhofen 2000 (Mueller-Thurgau)	SC 50	5	1.0	0.13	Fruit	2.0 2.3 1.4 1.5, 1.3, 1.1, 1.2 (1.3) 1.8, 1.5, 1.4, 1.5 (1.6)	0 3 7 14 21	RJ3166B, DE17-00-S258 Lister N., 2001 (CLTA10_111)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Ephrata (WA) 1993 (White Riesling)	WP 72	7	3.4	0.36	Chlorothalonil Fruit Raisins Raisin waste Wet pomace Dry pomace Fresh juice SDS-3701 Fruit (RAC) Raisins Raisin waste Wet pomace Dry pomace Fresh juice	 9.0, 12 (11) 8.4, 8.4 (8.4, RAC) 4.2, 4.3 (4.3) 19, 15 (17) 17, 14 (16) 12, 13 (13) 2.1, 2.3 (2.2) 0.02, 0.02 (0.02) 0.04, 0.03 (0.035, RAC) 0.02, 0.02 (0.02) 0.07, 0.06 (0.065) 0.03, 0.03 (0.03) 0.12, 0.12 (0.12) < 0.01, < 0.01 (< 0.01)	 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30	5919-94-0017-CR-001, King C., 1994 (CLTA10_248)

[a] before last treatment

[b] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 35 Chlorothalonil residues in strawberries grown outdoor following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Spain, El Rocio 1999 (Camarosa)	SC 50	4	1.5	0.17	Fruit	5.8 3.5 3.2 1.7 1.4	0 1 3 7 10	RJ3022B, ES50-99-S003 Lister N., 2000 (CLTA10_105)
	WG 75	4	1.5	0.17	Fruit	7.2 4.1 3.7 1.9 1.3	0 1 3 7 10	
Spain, Palos de la Frontera 1999 (Camarosa)	SC 50	4	1.5	0.17	Fruit	4.8 2.4 1.7 1.6 1.1	0 1 3 7 10	RJ3022B, ES50-99-S103 Lister N., 2000 (CLTA10_105)
	WG 75	4	1.5	0.17	Fruit	4.2 2.5 2.5 1.7 2.0	0 1 3 7 10	
Spain, Lepe 1999 (Camarosa)	SC 50	4	1.5	0.17	Fruit	2.8 2.1 2.0 1.7 1.2	0 1 3 7 10	RJ3022B, ES50-99-S203 Lister N., 2000 (CLTA10_105)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
	WG 75	4	1.5	0.17	Fruit	3.4 2.6 2.2 2.1 1.3	0 1 3 7 10	
Spain, Cartaya 1999 (Camarosa)	SC 50	4	1.5	0.17	Fruit	1.9 2.3 1.9 1.7 0.86	0 1 3 7 10	RJ3022B, ES50-99-S303 Lister N., 2000 (CLTA10_105)
	WG 75	4	1.5	0.17	Fruit	3.6 2.9 3.8 2.5 1.7	0 1 3 7 10	
Spain, Lloc Nou 2000 (Pajaro)	SC 50	4	1.5	0.15	Fruit	3.5 2.2	3 8	RJ3174B, ES40-00-S010 Gill J., 2001 (CLTA10_106)
Spain, Quatretonda 2000 (Pajaro)	SC 50	4	1.5	0.15	Fruit	3.8 2.4	3 8	RJ3174B, ES40-00-S110 Gill J., 2001 (CLTA10_106)
Spain, Palos de la Frontera 2000 (Camarosa)	SC 50	4	1.5	0.15	Fruit	2.8 1.9	3 6	RJ3174B, ES40-00-S210 Gill J., 2001 (CLTA10_106)
Spain, Almonte 2000 (Camarosa)	SC 50	4	1.5	0.15	Fruit	4.8 3.0	3 6	RJ3174B, ES40-00-S310 Gill J., 2001 (CLTA10_106)

Table 36 Chlorothalonil residues in protected strawberries following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Staplehurst 2000 (Elsanta)	SC 50	3	1.5	0.3	Fruit	2.9 2.3	3 7	RJ3181B, GB07-00-S064 Gill J., 2001 (CLTA10_100)
United Kingdom, Marden 2000 (Elsanta)	SC 50	3	1.5	0.3	Fruit	2.0 2.4	3 7	RJ3181B, GB07-00-S065 Gill J., 2001 (CLTA10_100)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France, Cormeray 2000 (Darselec)	SC 50	3	1.5	0.5	Fruit	1.1 1.0	3 7	RJ2129B, FR75-00-S754 Gill J., 2001 (CLTA10_101)
France, Soings en Sologne 2000 (Gariguette)	SC 50	3	1.5	0.5	Fruit	0.80 0.64	3 7	RJ2129B, FR75-00-S756 Gill J., 2001 (CLTA10_101)
United Kingdom, Staplehurst 1999 (Elsanta)	SC 50	3	1.5	0.25	Fruit Fruit (RAC) Calyxes Washed fruit Canned fruit Syrup Frozen fruit Jam	2.8 2.0 1.9 1.3 0.79 1.1 41 1.1 0.50 0.09 0.94 0.09	0 1 3 7 10 3 3 3 3 3 3 3	RJ3055B, GB07-99-S077 Gill J., 2000 (CLTA10_102)
France, St. Meslin du Bosc 1999 (Chapelaine)	SC 50	3	1.5	0.38	Fruit Fruit (RAC) Calyxes Washed fruit Canned fruit Syrup Fruit (RAC) Washed fruit Fruit for jamming Jam	1.0, 1.0, 1.0 (1.0) 2.0, 2.1, 1.9 (2.0) 1.3, 1.2, 1.4 (1.3) 1.6, 1.1, 1.5 (1.4) 0.75, 1.2, 1.1 (1.0) 0.64 23 0.58 0.19 0.04 0.96 0.34 0.41 0.06	0 1 3 7 10 3 3 3 3 3 3 3 3 3	RJ3046B, FR61-99-S760 Gill J., 2000 (CLTA10_103)
France, Cormeray 1999 (Elsanta)	SC 50	3	1.5	0.38	Fruit Fruit (RAC) Calyxes Washed fruit Canned fruit Syrup Fruit (RAC) Washed fruit Fruit for jamming Jam	1.6 1.2 0.91 0.68 0.57 0.61 15 0.30 0.27 0.10 0.54 0.59 0.42 0.01	0 1 3 8 10 3 3 3 3 3 3 3 3 3	RJ3046B, FR75-99-S751 Gill J., 2000 (CLTA10_103)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Staplehurst 1999 (Eros)	SC 50	3	1.5	0.25	Fruit	3.6 3.0 1.9 1.1 1.1	0 1 3 7 10	RJ3043B, GB07-99-S076 Gill J., 2000 (CLTA10_104)

Table 37 Chlorothalonil residues in bananas following foliar application by airplane

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Mexico, Chiapas 1985 (not specified)	WG 75	8	9 × 1.5 + 4 × 1.1 (aerial)		Whole fruit Chlorothalonil: bagged unbagged SDS-3701: bagged unbagged Pulp Chlorothalonil: bagged unbagged SDS-3701: bagged unbagged	 < 0.01(3) < 0.01(3) < 0.01(6) < 0.01(6) < 0.01(3) < 0.01(3) < 0.01(6) < 0.01(6)	 2 2 2 2 2 2 2 2	743-3CR-85-0022-001, Kenyon R., 1986 (CLTA10_120) [a]
Costa Rica, San Jose 1985 (not specified)	SC 50	10	1.8 (aerial)		Whole fruit Chlorothalonil: bagged unbagged SDS-3701: bagged unbagged Pulp Chlorothalonil: bagged unbagged SDS-3701: bagged unbagged	 0.03, < 0.01(5) 0.02, 0.03, 0.03, 0.10, 0.11, 0.12 < 0.01(6) < 0.01(6) < 0.01(6) < 0.01(6) < 0.01(6) < 0.01(6)	 6 6 6 6 6 6 6 6	743-3CR-85-0022-001, Kenyon R., 1986 (CLTA10_120) [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Colombia 1985 (not specified)	SC 50	11	1.5 (aerial)		Whole fruit Chlorothalonil: bagged unbagged SDS-3701: bagged unbagged Pulp Chlorothalonil: bagged unbagged SDS-3701: bagged unbagged	 < 0.01(6) < 0.01(6) < 0.01(6) < 0.01(6) < 0.01(6) < 0.01(6) < 0.01(6) < 0.01(6)	 3 3 3 3 3 3 3 3	743-3CR-85-0022-001, Kenyon R., 1986 (CLTA10_120) [a]
Guatemala, Puerto Barrios 1993 (Grand Name)	SC 54	20	1.7 (aerial)	7.4	Whole fruit (bagged) Chlorothalonil SDS-3701 Pulp Chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 < 0.01	 0 0 0 0 0 0	5529-92-0515-CR-002, 1-92-101 King C., 1994 (CLTA10_121)
Honduras, Coyoles 1993 (Enano Ecuatoriano)	SC 54	20	1.7 (aerial)	7.4	Whole fruit (bagged) Chlorothalonil SDS-3701 Pulp Chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 < 0.01	 0 0 0 0 0 0	5529-92-0515-CR-002, 1-92-102 King C., 1994 (CLTA10_121)
Costa Rica, Limon 1993 (Great Midget)	SC 54	20	1.7 (aerial)	7.4	Whole fruit (bagged) Chlorothalonil SDS-3701 Pulp Chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 < 0.01	 0 0 0 0 0 0	5529-92-0515-CR-002, 1-92-103 King C., 1994 (CLTA10_121)
Honduras, Yoro 1993 (Gran Nain)	SC 54	15	1.7 (aerial)	7.4	Whole fruit (bagged) Chlorothalonil SDS-3701 Pulp Chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 < 0.01	 0 0 0 0 0 0	5529-92-0515-CR-002, 1-92-104 King C., 1994 (CLTA10_121)
Panama, Divala-Chriqui 1993 (Granein)	SC 54	20	1.7 (aerial)	7.4	Whole fruit (bagged) Chlorothalonil SDS-3701 Pulp Chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 < 0.01	 0 0 0 0 0 0	5529-92-0515-CR-002, 1-92-105 King C., 1994 (CLTA10_121)

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 38 Chlorothalonil residues in mangoes following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Homestead (FL) 1987 (Tommy Atkins)	SC 50	7	1.5	0.16	Whole fruit Chlorothalonil SDS-3701 R613636	 0.66 0.35 0.058 0.055 0.02 0.02 0.02 0.01 0.14 0.07 < 0.01 < 0.01	 0 7 14 21 0 7 14 21 0 7 14 21	CHTL D3.2.5/184 2162, Biehn W., 1991 (CLTA10_122) [a]
United States, Homestead (FL) 1987 (Keitt)	SC 50	8	1.5	0.16	Whole fruit Chlorothalonil SDS-3701 R613636	 1.5 0.58 0.41 0.24 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02	 0 7 14 21 0 7 14 21 0 7 14 21	CHTL D3.2.5/184 2162, Biehn W., 1991 (CLTA10_122) [a]
United States, Homestead (FL) 1987 (Van Dyke)	SC 50	7	1.5	0.16	Whole fruit Chlorothalonil SDS-3701 R613636	 1.7 1.2 0.37 0.28 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05	 0 7 14 21 0 7 14 21 0 7 14 21	CHTL D3.2.5/184 2162, Biehn W., 1991 (CLTA10_122) [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Homestead (FL) 1988 (Tommy Atkins)	SC 50	19	1.4	0.06	Whole fruit Chlorothalonil SDS-3701 R613636 	 3.5 2.0 0.76 0.29 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05 < 0.05	 0 7 14 21 0 7 14 21 0 7 14 21	CHTL D3.2.5/184 2162, Biehn W., 1991 (CLTA10_122) [a]
United States, Homestead (FL) 1990 (Tommy Atkins)	SC 50	16	2.9	0.13	Whole fruit Chlorothalonil SDS-3701 R613636 	 0.88 0.45 0.80 0.27 < 0.02 < 0.02 < 0.02 < 0.02 < 0.05 < 0.05 < 0.05 < 0.05	 0 7 14 21 0 7 14 21 0 7 14 21	CHTL D3.2.5/184 2162, Biehn W., 1991 (CLTA10_122) [a]

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 39 Chlorothalonil residues in papaya following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Ivory Coast, Tiassalé 2004 (Golden)	EC 72	6	1.4	0.56	After 2nd treatment: Whole fruit After 4th treatment: Whole fruit After 6th treatment: Whole fruit 	 0.037 0.17 1.2 1.2 1.1 1.2	 3 7 3 7 3 7	CIV/CNRA/PA/2004, Anon., 2005 (CLTA10_259) & Jones A., 2004 (CLTA10_260)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Ivory Coast, Azaguié 2004 (Golden)	EC 72	6	1.4	0.28	After 2nd treatment: Whole fruit After 4th treatment: Whole fruit After 6th treatment: Whole fruit	 1.5 1.2 2.5 2.2 3.6 3.6	 3 7 3 7 3 7	CIV/CNRA/PA/2004, Anon., 2005 (CLTA10_259) & Jones A., 2004 (CLTA10_260)
Brazil, Itamaraju 2002 (Golden)	WG 83	6	1.7	0.2	Chlorothalonil Whole fruit [b] Peel Pulp SDS-3701 Whole fruit [b] Peel Pulp	 6.1 8.3 6.6 5.1 23 31 24 18 0.42 0.68 0.37 0.49 < 0.01 0.02 0.01 0.01 0.04 0.06 0.05 0.04 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 0[a] 0 3 7 0[a] 0 3 7 0[a] 0 3 7 0[a] 0 3 7 0[a] 0 3 7	02-6032, McGill C., 2004 (CLTA10_263)
Brazil, Pinheiros 2002 (Taiwan)	WG 83	6	2.1	0.25	Chlorothalonil Whole fruit SDS-3701 Whole fruit	 2.2 4.4 4.2 4.5 < 0.01 0.01 0.01 < 0.01	 0[a] 0 3 7 0[a] 0 3 7	02-6035, McGill C., 2004 (CLTA10_264)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Brazil, Aracruz 2002 (Golden)	WG 83	6	2.0 2.1 2.2 2.1 2.2 2.3	0.25	Chlorothalonil Whole fruit [b] Peel Pulp SDS-3701 Whole fruit [b] Peel Pulp 	 1.1 2.1 2.4 1.3 1.3, 1.1, 1.3, 1.2 (1.2) 3.4, 3.0, 3.2, 3.1 (3.2) 6.0, 4.5, 4.9, 5.0 (5.1) 2.6, 2.5, 2.4, 2.5 (2.4) 1.3, 0.88, 0.98, 0.93 (1.0) 1.9, 1.3, 1.5, 1.4 (1.5) 0.96, 0.58, 0.65, 0.65 (0.71) 0.94, 0.60, 0.51, 0.50 (0.64) < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 0[a] 0 3 7 0[a] 0 3 7 0[a] 0 3 7 0[a] 0 3 7 0[a] 0 3 7	02-6036, McGill C., 2004 (CTLA10_265)
Brazil, Linhares 2004 (Golden)	WG 83	6	2.1	0.25	Chlorothalonil Whole fruit SDS-3701 Whole fruit	 4.7 6.9 6.0 4.9 < 0.01 0.01 < 0.01 < 0.01	 0[a] 0 3 7 0[a] 0 3 7	02-6031, McGill C., 2004 (CTLA10_266)
Brazil, Monte Alto 2002 (Famosa)	SC 72	5		0.22	Whole Fruit	1.4 0.60 1.6 0.74 0.28	0 3 5 7 10	M01067, M01067-BAB Francisco E., 2003 (CTLA10_267)
Brazil, Monte Alto 2002 (Formosa)	SC 72	5		0.43	Whole Fruit	3.2 1.8 2.5 2.3 2.0	0 3 5 7 10	M01067, M01067-BAB Francisco E., 2003 (CTLA10_267)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Brazil, Bauru 2002 (Formosa)	SC 72	5		0.22	Whole Fruit	9.9 11 10 9.2 9.4	0 3 5 7 10	M01067, M01067-LZF Francisco E., 2003 (CTLA10_267)
Brazil, Bauru 2002 (Formosa)	SC 72	5		0.43	Whole Fruit	12 15 12 13 10	0 3 5 7 10	M01067, M01067-LZF Francisco E., 2003 (CTLA10_267)
Brazil, Piedade 2002 (Papaya)	SC 72	5		0.22	Whole Fruit	17 17 14 13 8.3	0 3 5 7 10	M01067, M01067-LZF2 Francisco E., 2003 (CTLA10_267)
Brazil, Piedade 2002 (Papaya)	SC 72	5		0.43	Whole Fruit	30 26 26 22 26	0 3 5 7 10	M01067, M01067-LZF2 Francisco E., 2003 (CTLA10_267)
Brazil, Monte Alto 2002 (Formosa)	WG 83	5		0.21	Whole Fruit	0.32 0.20 0.51 0.68 1.9	0 3 5 7 10	M01075, M01075-BAB Roncato C., 2003 (CTLA10_268)
Brazil, Monte Alto 2002 (Formosa)	WG 83	5		0.41	Whole Fruit	2.7 2.6 2.0 2.8 2.2	0 3 5 7 10	M01075, M01075-BAB Roncato C., 2003 (CTLA10_268)
Brazil, Bauru 2002 (Formosa)	WG 83	5		0.21	Whole Fruit	7.4 13 7.6 10 6.0	0 3 5 7 10	M01075, M01075-LZF Roncato C., 2003 (CTLA10_268)
Brazil, Bauru 2002 (Formosa)	WG 83	5		0.41	Whole Fruit	14 12 6.1 16 12	0 3 5 7 10	M01075, M01075-LZF Roncato C., 2003 (CTLA10_268)
Brazil, Arabá 2002 (Papaya)	WG 83	5		0.21	Whole Fruit	2.5 3.4 2.3 1.6 0.74	0 3 5 7 10	M01075, M01075-JJB Roncato C., 2003 (CTLA10_268)
Brazil, Arabá 2002 (Papaya)	WG 83	5		0.41	Whole Fruit	8.4 7.9 8.3 5.8 4.7	0 3 5 7 10	M01075, M01075-JJB Roncato C., 2003 (CTLA10_268)

[a] before last treatment

[b] calculated

Table 40 Chlorothalonil residues in bulb onions following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Kings Newton 1992 (Hysam)	SC 50	6	1.0	0.45	Dry onion	< 0.01 < 0.01 < 0.01	12 12 12	CTL/ALLCE 07/GB/92, AK/1796/IB/1 Kennedy E., 1993 (CLTA10_123) [a]
	SC 72	6	1.0	0.45	Dry onion	< 0.01 < 0.01 < 0.01	12 12 12	
	WG 75	6	1.0	0.45	Dry onion	< 0.01 < 0.01 < 0.01	12 12 12	
	WG 82	6	1.0	0.45	Dry onion	< 0.01 < 0.01 < 0.01	12 12 12	
United Kingdom, Kings Newton 1992 (Hysam)	SC 50	6	2.0	0.91	Dry onion	0.02 0.01 0.01	12 12 12	CTL/ALLCE 07/GB/92, AK/1796/IB/1 Kennedy E., 1993 (CLTA10_123) [a]
	SC 72	6	2.0	0.91	Dry onion	0.01 0.01 0.02	12 12 12	
	WG 75	6	2.0	0.91	Dry onion	0.02 0.02 0.03	12 12 12	
	WG 82	6	2.0	0.91	Dry onion	0.02 0.03 0.02	12 12 12	
United Kingdom, Prickwillow 1992 (Hysam)	SC 50	6	1.0	0.45	Dry onion	< 0.01	12	CTL/ALLCE 07/GB/92, AK/1796/IB/2 Kennedy E., 1993 (CLTA10_123) [a]
	SC 72	6	1.0	0.45	Dry onion	< 0.01	12	
	WG 75	6	1.0	0.45	Dry onion	< 0.01	12	
	WG 82	6	1.0	0.45	Dry onion	< 0.01	12	
United Kingdom, North Scarle 1992 (Hysam)	SC 50	6	1.0	0.45	Dry onion	< 0.01	12	CTL/ALLCE 07/GB/92, AK/1796/IB/3 Kennedy E., 1993 (CLTA10_123) [a]
	SC 72	6	1.0	0.45	Dry onion	< 0.01	12	
	WG 75	6	1.0	0.45	Dry onion	< 0.01	12	
	WG 82	6	1.0	0.45	Dry onion	< 0.01	12	

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Elford 1991 (Marquis)	SC 50	6	1.0	0.45	Dry onion	0.02 0.03 0.02 < 0.01	14	CTL/ALLCE 06/GB/91, AS/1624/IB/1 McKenzie J., 1992 (CLTA10_124) [a]
	SC 72	6	1.0	0.45	Dry onion	0.01 0.01 < 0.01 0.01	14	
	WG 75	6	1.0	0.45	Dry onion	0.05 0.01 < 0.01 0.01	14	
	WG 82	6	1.0	0.45	Dry onion	0.02 < 0.01 0.01 0.01	14	
United Kingdom, Elford 1991 (Marquis)	SC 50	6	2.0	0.91	Dry onion	< 0.01 0.03 0.03 0.02	14	CTL/ALLCE 06/GB/91, AS/1624/IB/1 McKenzie J., 1992 (CLTA10_124) [a]
	SC 72	6	2.0	0.91	Dry onion	0.01 0.02 0.02 0.02	14	
	WG 75	6	2.0	0.91	Dry onion	0.01 0.03 0.02 0.03	14	
	WG 82	6	2.0	0.91	Dry onion	0.03 0.01 0.03 0.01	14	
United Kingdom, Twyfrod 1991 (Rocky)	SC 50	6	1.0	0.45	Dry onion	< 0.01	14	CTL/ALLCE 06/GB/91, AS/1624/IB/2 McKenzie J., 1992 (CLTA10_124) [a]
	SC 72	6	1.0	0.45	Dry onion	0.01	14	
	WG 75	6	1.0	0.45	Dry onion	0.02	14	
	WG 82	6	1.0	0.45	Dry onion	0.01	14	
United Kingdom, Twyfrod 1991 (Rocky)	SC 50	6	2.0	0.45	Dry onion	0.06	14	CTL/ALLCE 06/GB/91, AS/1624/IB/2 McKenzie J., 1992 (CLTA10_124) [a]
	SC 72	6	2.0	0.45	Dry onion	0.02	14	
	WG 75	6	2.0	0.45	Dry onion	0.05	14	

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
	WG 82	6	2.0	0.45	Dry onion	0.04	14	
United Kingdom, Kelham 1991 (Hysam)	SC 50	6	1.0	0.45	Dry onion	0.02	14	CTL/ALLCE 06/GB/91, AS/1624/IB/3 McKenzie J., 1992 (CLTA10_124) [a]
	SC 72	6	1.0	0.45	Dry onion	0.05	14	
	WG 75	6	1.0	0.45	Dry onion	0.02	14	
	WG 82	6	1.0	0.45	Dry onion	0.02	14	
United Kingdom, Kelham 1991 (Hysam)	SC 50	6	2.0	0.45		Sample not analysed		CTL/ALLCE 06/GB/91, AS/1624/IB/3 McKenzie J., 1992 (CLTA10_124) [a]
	SC 72	6	2.0	0.45	Dry onion	0.05	14	
	WG 75	6	2.0	0.45	Dry onion	0.10	14	
	WG 82	6	2.0	0.45	Dry onion	0.06	14	

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 41 Chlorothalonil residues in spring onions following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Melbourne 2003 (Laser)	SC 50	2	1.0	0.2	Whole plant Chlorothalonil SDS-3701 	2.9 26 19 14 14 <u>7.5</u> 0.02 0.12 0.06 0.04 0.04 <u>0.05</u>	0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7306/SY, Oxspring S., 2004 (CLTA10_125)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Melbourne 2003 (Laser)	SC 50	2	1.5	0.3	Whole plant Chlorothalonil SDS-3701	 6.7 47 38 31 23 19 0.02 0.18 0.11 0.08 0.06 0.08	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7306/SY, Oxspring S., 2004 (CLTA10_125)
United Kingdom, Melbourne 2003 (Laser)	SC 50	4	1.5	0.3	Whole plant Chlorothalonil SDS-3701	 5.8 89 63 108 40 29 0.04 0.19 0.12 0.09 0.06 0.14	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7306/SY, Oxspring S., 2004 (CLTA10_125)
United Kingdom, Melbourne 2003 (Laser)	SC 50	3	1.3	0.26	Whole plant Chlorothalonil SDS-3701	 10 45 41 39 24 16 0.03 0.20 0.11 0.09 0.07 0.10	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7306/SY, Oxspring S., 2004 (CLTA10_125)
United Kingdom, Marston 2005 (Redmate)	SC 50	2	1.1	0.2	Whole plant Chlorothalonil SDS-3701	 <u>0.77</u> 0.15 <u>< 0.01</u> < 0.01	 14 21 14 21	05-0412, AF/8547/SY/1 Sole C., 2006 (CLTA10_126)
United Kingdom, Stareton 2005 (Laser)	SC 50	2	1.0	0.2	Whole plant Chlorothalonil SDS-3701	 <u>0.17</u> 0.02 <u>< 0.01</u> < 0.01	 14 21 14 21	05-0412, AF/8547/SY/2 Sole C., 2006 (CLTA10_126)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Hougham 2003 (Photon)	SC 50	2	1.0	0.2	Whole plant Chlorothalonil SDS-3701	 0.56 9.0 3.0 1.8 0.61 <u>0.90</u> < 0.01 0.03 0.02 0.01 < 0.01 <u>0.01</u>	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7307/SY, Oxspring S., 2004 (CLTA10_127)
United Kingdom, Hougham 2003 (Photon)	SC 50	2	1.5	0.3	Whole plant Chlorothalonil SDS-3701	 1.4 14 4.5 3.4 0.19 1.4 < 0.01 0.05 0.03 0.02 0.01 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7307/SY, Oxspring S., 2004 (CLTA10_127)
United Kingdom, Hougham 2003 (Photon)	SC 50	4	1.5	0.3	Whole plant Chlorothalonil SDS-3701	 2.0 15 7.3 6.3 0.08 1.8 0.01 0.06 0.03 0.04 < 0.01 0.03	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7307/SY, Oxspring S., 2004 (CLTA10_127)
United Kingdom, Hougham 2003 (Photon)	SC 50	3	1.3	0.26	Whole plant Chlorothalonil SDS-3701	 2.4 11 3.2 4.0 4.5 1.6 0.01 0.03 0.03 0.02 0.03 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7307/SY, Oxspring S., 2004 (CLTA10_127)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Italy, Sant'Anna Di Chioggia 2003 (Cipollarossa)	SC 50	2	1.0	0.2	Whole plant Chlorothalonil SDS-3701	 0.03 0.24 0.10 0.03 0.01 0.02 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7202/SY, Oxspring S., 2004 (CLTA10_128)
Italy, Sant'Anna Di Chioggia 2003 (Cipollarossa)	SC 50	2	1.5	0.3	Whole plant Chlorothalonil SDS-3701	 0.03 0.20 0.26 0.05 0.05 0.03 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7202/SY, Oxspring S., 2004 (CLTA10_128)
Italy, Sant'Anna Di Chioggia 2003 (Cipollarossa)	SC 50	4	1.5	0.3	Whole plant Chlorothalonil SDS-3701	 0.23 1.1 0.26 0.30 0.08 0.13 0.02 0.03 0.01 0.01 < 0.01 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7202/SY, Oxspring S., 2004 (CLTA10_128)

[a] before last treatment

Table 42 Chlorothalonil residues in leek following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Conningsby 1999 (Farinto)	SC 50	3	1.5	0.38	Bulb	1.2, 1.3, 1.4, 1.3 (1.3) 0.13 0.17 0.13 0.11, 0.07, 0.07, 0.08 (0.08)	0 3 7 10 14	RJ3019B, GB03-99-S074 Lister N., 2000 (CLTA10_129)
					Leaves	80 50 38 27 4.7, 4.4, 4.4, 4.2 (4.5)	0 3 7 10 14	
					Whole plant [b]	43 31 23 19 21	0 3 7 10 14	
United Kingdom, Collingham 1999 (Devina)	SC 50	3	1.5	0.38	Bulb	0.10 0.07 0.12 0.20 0.03	0 3 7 10 14	RJ3019B, GB03-99-S075 Lister N., 2000 (CLTA10_129)
					Leaves	19 19 20 8.9, 9.5, 9.6, 10 (9.5) 20, 20, 20, 21 (20)	0 3 7 10 14	
					Whole plant [b]	13 12 14 6.2 15	0 3 7 10 14	
France (North), Sains en Amienois 2000 (Fiesta)	SC 50	3	1.5	0.5	Bulb	0.53 0.34 0.47 0.44 0.34 0.55	0[a] 0 3 6 10 14	RJ3168B, FR22-00-S760 Richards S., 2001 (CLTA10_130)
					Leaves	15 50 24 35 17 11	0[a] 0 3 6 10 14	
					Whole plant [b]	13 46 20 26 12 8.2	0[a] 0 3 6 10 14	

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (North), Berthenay 2000 (Porilux)	SC 50	3	1.5	0.5	Bulb Leaves Whole plant [b] <u></u>	0.04 0.33 0.14 0.21 0.05 0.04 29 83 32 37 21 22 22 67 24 25 13 <u>11</u>	0[a] 0 3 7 11 14 0[a] 0 3 7 11 14 0[a] 0 3 7 11 14	RJ3168B, FR75-00-S753 Richards S., 2001 (CLTA10_130)
Italy, Foggia 1999 (Swiss Giant)	SC 50	3	1.5	0.3	Bulb Leaves Whole plant [b] <u></u>	0.62 0.46 0.33 0.24 0.30 33 15 11 6.8 3.6 22 11 8.5 <u>4.7</u> 2.7	0 3 7 10 14 0 3 7 10 14 0 3 7 10 14	RJ3018B, IT50-99-P364 Lister N., 2000 (CLTA10_131)
Italy, Cavazzana di Lussia 1999 (Armor)	SC 50	3	1.5	0.3	Bulb Leaves Whole plant [b] <u></u>	0.20 0.35 0.21 0.20 0.11 38 26 19 10 12 24 16 12 6.1 <u>7.0</u>	0 3 7 10 14 0 3 7 10 14 0 3 7 10 14	RJ3018B, IT20-99-P365 Lister N., 2000 (CLTA10_131)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Redhill 2000 (Porbella)	SC 50	3	1.5	0.38	Bulb Whole plant (RAC) Raw leeks Roots Wash water Washed cut leeks Boiling water Boiled leeks Steaming water Steamed leeks	0.12 18 0.59 2.0 0.03 0.22 < 0.01 < 0.01 < 0.01 < 0.01	14 14 14 14 14 14 14 14 14 14	RJ3187B, GB03-00-S062 Richards S., 2001 (CLTA10_254)
United Kingdom, Sleaford 2000 (Albana)	SC 50	3	1.5	0.38	Bulb Whole plant (RAC) Raw leeks Roots Wash water Washed cut leeks Boiling water Boiled leeks Steaming water Steamed leeks	0.85 22 0.20 1.6 0.02 0.06 < 0.01 < 0.01 < 0.01 < 0.01	14 14 14 14 14 14 14 14 14 14	RJ3187B, GB03-00-S063 Richards S., 2001 (CLTA10_254)

[a] before last treatment

[b] calculated from bulb and leaves

Table 43 Chlorothalonil residues in Brussels sprouts following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Switzerland, Les Barges 2002 (Content F1)	SC 50	2	1.5 1.3	0.25	Sprouts chlorothalonil SDS-3701 	 0.11 1.0 0.57 0.56 0.65 0.57 0.52 < 0.01 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 7 10 14 0[a] 0 3 7 7 10 14	02-6021, Sole C., 2003 (CLTA10_144)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Switzerland, Les Barges 2002 (Content F1)	SC 50	2	1.5	0.25	Sprouts chlorothalonil SDS-3701	 0.33 1.5 1.3 1.2 <u>1.6</u> 0.80 0.38 < 0.01 0.01 0.01 < 0.01 <u>0.01</u> < 0.01 < 0.01	 0[a] 0 3 7 7 10 14 0[a] 0 3 7 7 10 14	02-6022, Sole C., 2003 (CLTA10_145)
United Kingdom, Whittlesford 2002 (Maximus)	SC 50	2	1.5	0.5	Sprouts chlorothalonil SDS-3701	 0.10 0.30 0.22 <u>0.22</u> 0.10 0.14 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	A-7867A, Richards S., 2003 (CLTA10_146)
Germany, Ludwigshafen-Ruchhein 2001 (Maximus)	SC 50	2	1.5	0.25	Sprouts chlorothalonil SDS-3701	 1.0 1.3, 1.4, 1.5, 1.4 (1.4) 2.1 2.3 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 0[a] 0 3 7	gbs53701, Simon P., 2002 (CLTA10_147)
	WG 75	2	1.5	0.25	Sprouts chlorothalonil SDS-3701	 1.5 4.2, 3.9, 3.8, 3.9 (4.0) 2.4 <u>2.8</u> < 0.01 0.01 < 0.01 < <u>0.01</u>	 0[a] 0 3 7 0[a] 0 3 7	
United Kingdom, Ilmington 1999 (Top Line)	SC 50	2	1.5	0.38	Sprouts	1.6 0.81 <u>1.2</u>	0 3 7	RJ3009B, GB05-99-S070 Lister N., 2000 (CLTA10_148)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
	WG 75	2	1.5	0.38	Sprouts	2.3 1.3 0.87	0 3 7	
United Kingdom, Sandwich 1999 (Brave Heart)	SC 50	2	1.5	0.38	Sprouts	1.7 1.7 1.0	0 3 7	RJ3009B, GB07-99-S070 Lister N., 2000 (CLTA10_148)
	WG 75	2	1.5	0.38	Sprouts	2.2 1.2 1.5	0 3 7	
United Kingdom, Kirton Holme 2003 (Millenium)	SC 50	2	1.5	0.38	Sprouts chlorothalonil SDS-3701	 0.22 0.23 0.47 0.44 0.32 0.34 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7165/SY, Oxspring S., 2004 (CLTA10_149)
United Kingdom, Hemmington 2003 (Helemus)	SC 50	2	1.5 1.6	0.38	Sprouts chlorothalonil SDS-3701	 1.2 2.6 1.3 1.0 1.5 0.44 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7166/SY, Oxspring S., 2004 (CLTA10_150)
France (North), Dampierre en Burly 2003 (Warrior)	SC 50	2	1.5	0.38	Sprouts chlorothalonil SDS-3701	 0.27 2.7 1.2 1.3 1.5 1.4 < 0.01 0.01 < 0.01 < 0.01 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7167/SY, Oxspring S., 2004 (CLTA10_151)
United Kingdom, Tamworth 1992 (Pauline)	WG 75	2	1.5	0.3	Sprouts	0.37 0.45 0.32	8 8 8	CTL/BRSPR 11/GB/92, AK/1793/IB/1 Kennedy E., 1993 (CLTA10_152) [b]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
	WG 82	2	1.5	0.3	Sprouts	0.29 0.22 0.45	8 8 8	
United Kingdom, Tamworth 1992 (Pauline)	WG 75	2	3.0	0.6	Sprouts	1.1 0.93 0.69	8 8 8	CTL/BRSPR 11/GB/92, AK/1793/IB/1 Kennedy E., 1993 (CLTA10_152) [b]
	WG 82	2	3.0	0.6	Sprouts	0.80 0.75 0.75	8 8 8	
United Kingdom, Market Weighton 1992 (Cascade)	WG 75	2	1.5	0.3	Sprouts	0.18	8	CTL/BRSPR 11/GB/92, AK/1793/IB/2 Kennedy E., 1993 (CLTA10_152) [b]
	WG 82	2	1.5	0.3	Sprouts	0.09	8	
United Kingdom, Evesham 1992 (Richard)	WG 75	2	1.5	0.3	Sprouts	0.53	8	CTL/BRSPR 11/GB/92, AK/1793/IB/3 Kennedy E., 1993 (CLTA10_152) [b]
	WG 82	2	1.5	0.3	Sprouts	0.35	8	
United Kingdom, Eyeworth 1990 (Amphortass)	SC 50	2	1.5	0.3	Sprouts	0.28 0.19 0.19 0.35 0.37 0.18 0.26 0.19 0.23 0.28 0.21 0.27 0.15 0.11 0.14 0.24 0.15 0.18	0 0 0 3 3 3 5 5 5 7 7 7 12 12 12 13 13 13	CTL/BRSPR 08/GB/90, McKenzie J., 1991 (CLTA10_153) [b]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
	SC 50	2	1.5	0.3	Sprouts	0.19 0.28 0.18 0.14 0.14 0.21 0.19 0.33 0.28 0.23 0.24 0.17 0.15 0.17 0.12 0.24 0.16 0.09	0 0 0 3 3 3 5 5 5 7 7 7 12 12 12 13 13 13	Remark: under addition of AGRAL
	SC 72	2	1.5	0.3	Sprouts	0.16 0.12 0.13	13 13 13	
	SC 72	2	1.5	0.3	Sprouts	0.20 0.18 0.08	13 13 13	Remark: under addition of wetter
United Kingdom, Eyeworth 1990 (Amphortass)	SC 50	2	3.0	0.6	Sprouts	0.15	13	CTL/BRSPR 08/GB/90, McKenzie J., 1991 (CLTA10_153) [b]
	SC 50	2	3.0	0.6	Sprouts	0.22	13	Remark: under addition of wetter
	SC 72	2	3.0	0.6	Sprouts	0.36	13	
	SC 72	2	3.0	0.6	Sprouts	0.61	13	Remark: under addition of wetter
United Kingdom, Fritville 1990 (Rampart)	SC 50	2	1.5	0.3	Sprouts	0.45	7	CTL/BRSPR 08/GB/90, McKenzie J., 1991 (CLTA10_153) [b]
	SC 50	2	1.5	0.3	Sprouts	0.53	7	Remark: under addition of wetter
	SC 72	2	1.5	0.3	Sprouts	0.92	7	
	SC 72	2	1.5	0.3	Sprouts	0.31	7	Remark: under addition of wetter
United Kingdom, Fritville 1990 (Rampart)	SC 50	2	3.0	0.6	Sprouts	1.3	7	CTL/BRSPR 08/GB/90, McKenzie J., 1991 (CLTA10_153) [b]
	SC 50	2	3.0	0.6	Sprouts	0.68	7	Remark: under addition of wetter
	SC 72	2	3.0	0.6	Sprouts	1.2	7	

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
	SC 72	2	3.0	0.6	Sprouts	1.2	7	Remark: under addition of wetter
United Kingdom, Fishtoft 1990 (Zoras)	SC 50	2	1.5	0.3	Sprouts	0.15	7	CTL/BRSPR 08/GB/90, McKenzie J., 1991 (CLTA10_153) [b]
	SC 50	2	1.5	0.3	Sprouts	0.13	7	Remark: under addition of wetter
	SC 72	2	1.5	0.3	Sprouts	0.47	7	
	SC 72	2	1.5	0.3	Sprouts	0.29	7	Remark: under addition of wetter
United Kingdom, Fishtoft 1990 (Zoras)	SC 50	2	3.0	0.6	Sprouts	0.23	7	CTL/BRSPR 08/GB/90, McKenzie J., 1991 (CLTA10_153) [b]
	SC 50	2	3.0	0.6	Sprouts	0.76	7	Remark: under addition of wetter
	SC 72	2	3.0	0.6	Sprouts	0.49	7	
	SC 72	2	3.0	0.6	Sprouts	0.33	7	Remark: under addition of wetter
France (South), Lafrancaise 2003 (Oliver)	SC 50	2	1.5	0.38	Sprouts chlorothalonil SDS-3701	 0.75 1.2 1.1 0.81 0.72 <u>0.95</u> 0.01 0.01 < 0.01 0.01 0.01 <u>0.02</u>	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7168/SY, Oxspring S., 2004 (CLTA10_154)
Spain, Rincon De Soto 2003 (Oliver)	SC 50	2	1.5	0.38	Sprouts chlorothalonil SDS-3701	 0.37 1.9 1.6 <u>1.3</u> 1.1 0.68 0.02 0.01 0.01 < <u>0.01</u> < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7169/SY, Oxspring S., 2004 (CLTA10_155)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Spain, Rincon de Soto 2002 (Oliver)	SC 50	2	1.5	0.3	Sprouts chlorothalonil SDS-3701	 0.18 0.69 0.96 0.73 0.56 0.56 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	02-6067, Sole C., 2003 (CLTA10_156)
Spain, Amposta 2002 (Oliver)	SC 50	2	1.5	0.3	Sprouts chlorothalonil SDS-3701	 0.13 0.47 0.64 0.70 0.50 0.81 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	02-6066, Sole C., 2003 (CLTA10_157)

[a] before last treatment

[b] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 44 Chlorothalonil residues in head cabbage following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Switzerland, Chessel 2005 (Castello F1)	SC 50	2	7.6	1.2	Chlorothalonil Heads Heads (RAC) Washed cabbage Cores and leaves Cooked cabbage SDS-3701 Heads Heads (RAC) Washed cabbage Cores and leaves Cooked cabbage 	 26 34 7.5, 8.3, 8.1 (8.0) 11, 12, 14 (12) 66, 58, 60 (61) 26, 26, 26 (26) 65 < 0.01 < 0.01 0.08 < 0.01 0.02, 0.02 (0.02) 0.02 0.01 0.03 0.01 0.03 < 0.01 < 0.01 < 0.01 < 0.01	 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	05-6038, CH-FR-05-0330 Gardinal P., 2007 (CLTA10_253)

Table 45 Chlorothalonil residues in cauliflower following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Jealott's Hill 1999 (Fremont)	SC 50	2	1.5	0.5	Curds	2.9, 2.9, 2.9 (2.9) 1.5 0.84	0 3 7	RJ2998B, GB01-99-S071 Lister N., 2000 (CLTA10_132)
United Kingdom, Spalding 1999 (Beauty)	SC 50	2	1.5	0.5	Curds	0.11	7	RJ2998B, GB02-99-S071 Lister N., 2000 (CLTA10_132)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Holbeach 2003 (Fremont)	SC 50	2	1.0	0.2	Curds chlorothalonil SDS-3701	 < 0.01 7.2 1.7 0.01 0.02 0.06 < 0.01 0.02 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7170/SY, Oxspring S., 2004 (CLTA10_133)
United Kingdom, Holbeach 2003 (Fremont)	SC 50	2	1.5	0.3	Curds chlorothalonil SDS-3701	 0.02 0.09 0.07 0.09 0.01 0.03 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7170/SY, Oxspring S., 2004 (CLTA10_133)
United Kingdom, Kirton Holme 2003 (Bodius)	SC 50	2	1.0	0.2	Curds chlorothalonil SDS-3701	 0.02 0.09 0.07 0.09 0.01 0.03 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7171/SY, Oxspring S., 2004 (CLTA10_134)
United Kingdom, Kirton Holme 2003 (Bodius)	SC 50	2	1.5	0.3	Curds chlorothalonil SDS-3701	 0.01 0.15 0.07 0.07 0.01 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7171/SY, Oxspring S., 2004 (CLTA10_134)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (North), Gometz le Chatel 2003 (Fremont)	SC 50	2	1.0	0.2	Curds chlorothalonil SDS-3701	 0.01 2.6 2.3 0.65 0.34 0.19 < 0.01 0.02 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7172/SY, Oxspring S., 2004 (CLTA10_135)
France (North), Gometz le Chatel 2003 (Fremont)	SC 50	2	1.5	0.3	Curds chlorothalonil SDS-3701	 < 0.01 0.93 0.18 0.10 <u>0.20</u> 0.10 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7172/SY, Oxspring S., 2004 (CLTA10_135)
Switzerland, Evionnaz 2005 (Fremont)	SC 50	2	1.5	0.25	Curds chlorothalonil SDS-3701	 1.3 0.88 0.43 <u>0.50</u> 0.32 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0 3 7 10 14 0 3 7 10 14	05-0531, CH-FR-05-0468 Sole C., 2006 (CLTA10_136)
Switzerland, Evionnaz 2005 (Fremont)	SC 50	2	1.0	0.25	Curds chlorothalonil SDS-3701	 1.2 0.99 0.26 0.15 0.17 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0 3 7 10 14 0 3 7 10 14	05-0531, CH-FR-05-0468 Sole C., 2006 (CLTA10_136)
United Kingdom, Elford 1992 (Balmoral)	SC 50	2	1.5	0.15	Curds	0.38 0.16 0.24	7 7 7	CTL/BRSOB 03/GB/92, Smith J., 1993 (CLTA10_138) [b]
	SC 72	2	1.5	0.15	Curds	0.11 0.12 < 0.02	7 7 7	

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
	WG 75	2	1.5	0.15	Curds	0.18 1.3 2.3	7 7 7	
	WG 82	2	1.5	0.15	Curds	0.03 0.58 0.13	7 7 7	
United Kingdom, Elford 1992 (Balmoral)	SC 50	2	3.0	0.3	Curds	< 0.02 0.097 0.058	7 7 7	CTL/BRSOB 03/GB/92, Smith J., 1993 (CLTA10_138) [b]
	SC 72	2	3.0	0.3	Curds	0.71 1.1 0.82	7 7 7	
	WG 75	2	3.0	0.3	Curds	0.16 0.55 0.62	7 7 7	
	WG 82	2	3.0	0.3	Curds	2.1 0.21 1.4	7 7 7	
United Kingdom, Badsley 1992 (Barrier Reef)	SC 50	2	1.5	0.15	Curds	0.73	8	CTL/BRSOB 03/GB/92, Smith J., 1993 (CLTA10_138) [b]
	SC 72	2	1.5	0.15	Curds	0.80	8	
	WG 75	2	1.5	0.15	Curds	0.67	8	
	WG 82	2	1.5	0.15	Curds	0.74	8	
United Kingdom, Bicker 1992 (White Rock)	SC 50	2	1.5	0.15	Curds	1.5	7	CTL/BRSOB 03/GB/92, Smith J., 1993 (CLTA10_138) [b]
	SC 72	2	1.5	0.15	Curds	1.0	7	
	WG 75	2	1.5	0.15	Curds	2.1	7	
	WG 82	2	1.5	0.15	Curds	1.3	7	
United Kingdom, Ebrington 1991 (Elby)	SC 50	2	1.5	0.15	Curds	0.28	6	CTL/BRSOB 02/GB/91, RES/12/91 McKenzie J., 1992 (CLTA10_139) [b]
	SC 72	2	1.5	0.15	Curds	0.28	6	
	WG 75	2	1.5	0.15	Curds	0.45	6	
	WG 82	2	1.5	0.15	Curds	0.42	6	
United Kingdom, Chipping Campden 1991 (Lateman)	SC 50	2	1.5	0.15	Curds	0.19	6	CTL/BRSOB 02/GB/91, RES/12/91 McKenzie J., 1992 (CLTA10_139) [b]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
	SC 72	2	1.5	0.15	Curds	0.25	6	
	WG 75	2	1.5	0.15	Curds	0.32	6	
	WG 82	2	1.5	0.15	Curds	0.47	6	
United Kingdom, Chipping Campden 1991 (Batsman)	SC 50	2	1.5	0.15	Curds	0.02 0.02 0.01 0.02	42 42 42 42	CTL/BRSOB 02/GB/91, RES/12/91 McKenzie J., 1992 (CLTA10_139) [b]
	SC 72	2	1.5	0.15	Curds	0.01 0.02 0.01 0.01	42 42 42 42	
	WG 75	2	1.5	0.15	Curds	0.02 0.01 0.02 0.01	42 42 42 42	
	WG 82	2	1.5	0.15	Curds	0.02 0.01 0.01 0.01	42 42 42 42	
United Kingdom, Chipping Campden 1991 (Batsman)	SC 50	2	3.0	0.3	Curds	0.02 0.02 0.02 0.02	42 42 42 42	CTL/BRSOB 02/GB/91, RES/12/91 McKenzie J., 1992 (CLTA10_139) [b]
	SC 72	2	3.0	0.3	Curds	0.02 0.02 0.01 0.01	42 42 42 42	
	WG 75	2	3.0	0.3	Curds	0.03 0.02 0.03 0.03	42 42 42 42	
	WG 82	2	3.0	0.3	Curds	0.03 0.01 0.02 0.01	42 42 42 42	
Italy, Bologna 2003 (Kartie)	SC 50	2	1.5	0.3	Curds chlorothalonil SDS-3701	 < 0.01 0.16 0.11 0.02 <u>0.19</u> 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 8 10 14 0[a] 0 3 8 10 14	AF/7173/SY, Oxspring S., 2004 (CLTA10_140)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Italy, Bologna 2003 (Kartie)	SC 50	2	1.0	0.2	Curds chlorothalonil SDS-3701 	 < 0.01 0.06 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 15 0[a] 0 3 7 10 15	AF/7173/SY, Oxspring S., 2004 (CLTA10_140)
France (South), St. Caprais 2003 (Forest)	SC 50	2	1.5	0.3	Curds chlorothalonil SDS-3701 	 < 0.01 0.06 0.05 <u>0.09</u> 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < <u>0.01</u> < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7174/SY, Oxspring S., 2004 (CLTA10_141)
France (South), St. Caprais 2003 (Forest)	SC 50	2	1.0	0.2	Curds chlorothalonil SDS-3701 	 < 0.01 0.02 0.01 0.02 0.01 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7174/SY, Oxspring S., 2004 (CLTA10_141)
France (South), Rieux 2002 (Fremont)	SC 50	2	1.5	0.3	Curds chlorothalonil SDS-3701 	 0.02 1.6 0.54 <u>0.39</u> 0.07 0.03 < 0.01 < 0.01 < 0.01 < <u>0.01</u> < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	02-6072, Richards S., 2003 (CLTA10_142)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (South), Rieux 2002 (Fremont)	SC 50	2	1.0	0.2	Curds chlorothalonil SDS-3701 	 < 0.01 0.68 0.16 0.28 0.11 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	02-6072, Richards S., 2003 (CLTA10_142)
France (South), St. Caprais 2005 (Sirente)	SC 50	2	1.5	0.35	Curds chlorothalonil SDS-3701 	 < 0.01 0.28 0.07 0.04 0.10 0.52 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	05-0524, AF/8544/SY/1 Sole C., 2006 (CLTA10_143)
France (South), St. Caprais 2005 (Sirente)	SC 50	2	1.0	0.25	Curds chlorothalonil SDS-3701 	 < 0.01 0.01 0.05 < 0.01 0.02 0.09 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	05-0524, AF/8544/SY/1 Sole C., 2006 (CLTA10_143)

[a] before last treatment

[b] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 46 Chlorothalonil residues in courgettes following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Bracknell 2000 (Storr's Green F1)	SC 50	4	1.5	0.3	Fruit Fruit Tops/Roots Raw/cut courgettes (RAC) Boiled courgettes Steamed courgettes Fried courgettes	0.48 1.1 2.0 0.61 < 0.01 < 0.01 0.05	3	RJ3133B, GB01-00-S066 McGill C., 2002 (CLTA10_250)
United Kingdom, North Woodbridge 2000 (Ambassador)	SC 50	4	1.5	0.3	Fruit Fruit Tops/Roots Raw/cut courgettes (RAC) Boiled courgettes Steamed courgettes Fried courgettes	0.67 1.4 2.2 0.7 < 0.01 < 0.01 0.06	3	RJ3133B, GB02-00-S067 McGill C., 2002 (CLTA10_250)
United Kingdom, Stapelhurst 2000 (All Green)	SC 50	4	1.5	0.3	Fruit Fruit Tops/Roots Raw/cut courgettes (RAC) Boiled courgettes Steamed courgettes Fried courgettes	1.0 1.5 2.0 0.75 0.01 < 0.01 0.09	3	RJ3133B, GB07-00-S068 McGill C., 2002 (CLTA10_250)

Table 47 Chlorothalonil residues in cucumbers grown outdoor following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Italy, Casale di Scodosia 1997 (Grini F1)	SC 54	4	2.1 2.1 2.0 2.0	0.25	Fruit	0.43 1.7 0.07 0.05 < 0.02	0[a] 0 6 13 20	117/97, 2107/97 Kuehne R., 1998 (CLTA10_159)
Italy, Urbana 1997 (Potomac)	SC 54	4	2.1 2.0 2.0 2.0	0.25	Fruit	2.7 15.2 0.24 0.02 < 0.02	0[a] 0 6 13 20	117/97, 2109/97 Kuehne R., 1998 (CLTA10_159)
Italy, Masi 1997 (Potomac)	SC 54	4	2.0	0.25	Fruit	0.91 2.1 0.07 0.04 0.03	0[a] 0 6 13 20	117/97, 2111/97 Kuehne R., 1998 (CLTA10_159)
Italy, Casale di Scodosia 1997 (Potomac)	SC 54SC 50	4	2.1 2.0 2.0 2.0	0.25	Fruit	5.7 3.5 0.12 0.04 < 0.01	0[a] 0 6 13 20	117/97, 2113/97 Kuehne R., 1998 (CLTA10_159)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, unknown (FL) 1985 (Poinsett 76)	SC 50	3	1.8 (air treatment)	3.6	Fruit	0.06 0.08 0.08 0.09 0.06 <u>0.25</u> 0.11 0.07 0.04 0.05	1 1 1 1 1 1 1 1 1 1	1137-85-0010-CR-002, Marks A., 1987 (CLTA10_161)
United States, unknown (FL) 1985 (Floracuke)	SC 50	4	1.8	0.2	Fruit	0.25 0.12 0.43 0.54 0.41 0.44 0.46 <u>0.79</u> 0.19 0.37	0 0 0 0 0 0 0 0 0 0	1137-85-0010-CR-002, Marks A., 1987 (CLTA10_161)
United States, unknown (TX) 1985 (Dasher II)	SC 50	4	1.8 (air treatment)	3.6	Fruit	0.09 0.05 0.02 0.02 0.04 0.08 0.05 0.04 <u>0.14</u> 0.11	1 1 1 1 1 1 1 1 1 1	1137-85-0010-CR-002, Marks A., 1987 (CLTA10_161)
United States, unknown (TX) 1985 (Poinsett 76)	SC 50	3	1.8 (air treatment)	3.6	Fruit	0.05 0.03 0.09 0.06 0.07 0.13 <u>0.41</u> 0.05 0.33 0.09	1 1 1 1 1 1 1 1 1 1	1137-85-0010-CR-002, Marks A., 1987 (CLTA10_161)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Elmore (OH) 1985 (not specified)	SC 50	2	2.7		Chlorothalonil Fruit (RAC) Washed fruit Pickle slices Cold canned pickles Hot canned pickles SDS-3701 Fruit (RAC) Washed fruit Pickle slices Cold canned pickles Hot canned pickles R611965 Fruit (RAC) Washed fruit Pickle slices Cold canned pickles Hot canned pickles	 1.0, 1.2, 1.4, 1.6 (<u>1.3</u>) 0.69, 0.73 (0.71) 0.38, 0.38 (0.38) 0.13, 0.07, 0.14 (0.11) 0.02, 0.02, 0.02 (0.02) 0.01, < 0.01, 0.01, 0.01 (0.01) < 0.01, < 0.01 (< 0.01) < 0.01, < 0.01 (< 0.01) < 0.01(3) (< 0.01) < 0.01(3) (< 0.01) < 0.01(4) (< 0.01) < 0.01, < 0.01 (< 0.01) < 0.01, < 0.01 (< 0.01) < 0.01(3) (< 0.01) < 0.01(3) (< 0.01)	 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1351-86-0059-CR-001, King C., 1987 (CLTA10_252)

[a] before last treatment

Table 48 Chlorothalonil residues in protected cucumbers following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Germany, Schifferstadt 1999 (Indira)	SC 50	4	1.6 2.1 2.6 2.5	0.2	Fruit	0.77 <u>0.36</u>	0 3	RJ3083B, RS-9916-E1 White B., 2000 (CLTA10_158)
Germany, 1999 (Cumlaude)	SC 50	4	3.0 3.4 3.4 3.4	0.2	Fruit	4.2 2.8 2.2	0 1 3	RJ3083B, RS-9916-G1 White B., 2000 (CLTA10_158)
France, St. Genouph 1997 (Aramon)	SC 54	4	2.0 2.1 2.2 2.1	0.4	Fruit	2.0 2.7 2.1 0.39 0.08	0[a] 0 7 14 21	117/97, 2099/97 Kuehne R., 1998 (CLTA10_159)
France, St. Genouph 1997 (Avalon)	SC 54	4	1.9 2.1 2.0 2.0	0.4	Fruit	0.75 1.3 0.48 0.25 0.06	0[a] 0 7 14 21	117/97, 2101/97 Kuehne R., 1998 (CLTA10_159)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France, Berthenay 1997 (Aramon)	SC 54	4	2.0	0.4	Fruit	0.47 1.3 0.32 0.05 < 0.01	0[a] 0 7 14 21	117/97, 2103/97 Kuehne R., 1998 (CLTA10_159)
France, St. Cyr en Val 1999 (Cardita)	SC 54	4	1.9	0.29	Fruit	0.81 1.2 0.20 0.10 0.11 0.01	0 4 7 14 14 22	2138/98, Kuehne R., 1999 (CLTA10_160)

[a] before last treatment

Table 49 Chlorothalonil residues in melons grown outdoor following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Spain, Beniganin 1992 (Galia)	WG 75	4	1.3	0.13	Whole fruit	0.51 0.43 0.05	0 7 14	CTL/MELON 14/E/92, 92-002-F-E Roland L., 1993 (CLTA10_162) [c]
Spain, Beniganin 1992 (Galia)	WG 75	4	2.5	0.25	Whole fruit	0.17 0.02 0.44	0 7 14	CTL/MELON 14/E/92, 92-002-F-E Roland L., 1993 (CLTA10_162) [c]
France (South), Buzet-sur-Baise 1995 (Buffalo)	SC 50	3	1.5	0.38	Whole fruit	0.10, 0.09 (0.10)	3	OF96130, TRIAL TP97, Pointurier R., 1998 (CLTA10_164) [c]
France (South), Pierrelatte 1996 (Sezanne)	SC 50	3	1.5	0.38	Whole fruit	0.038, 0.039 (0.039)	3	OF96130, TRIAL BY11 Pointurier R., 1998 (CLTA10_165) [c]
France (South), Venejan 1996 (Awerel)	SC 50	3	1.5	0.38	Whole fruit	0.014 0.018	3 3	OF96130, TRIAL BY10 Pointurier R., 1998 (CLTA10_166) [c]
France (South), Ondes 1989 (Alpha)	SC 50	3	1.5	0.15	Whole fruit Peel Pulp	0.018 0.03 0.072 0.067 < 0.01 < 0.01	3 7 3 7 3 7	CTL/MELON 04/F/89, Malet J., 1989 (CLTA10_168) [c]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Spain, El Ejido 1996 (Yuppie)	SC 50	4	1.5	0.3 0.3 0.2 0.2	Whole fruit	0.20, 0.21 (0.21) 0.28, 0.29 (0.29) 0.33, 0.28 (0.31)	0 3 7	CTL/CUNSS 26a/E/96, 95-007-F-E Roland L., 1996 (CLTA10_169) [c]
	WG 75	4	1.5	0.3 0.3 0.2 0.2	Whole fruit	0.44, 0.50 (0.47) 0.29, 0.29 (0.29) 0.32, 0.33 (0.32)	0 3 7	
Spain, El Ejido 1996 (Yuppie)	SC 50	4	1.5	0.3 0.3 0.2 0.2	Whole fruit	0.14, 0.13 (0.13)	3	CTL/CUNSS 26a/E/96, 95-036-F-E Roland L., 1996 (CLTA10_169) [c]
	WG 75	4	1.5	0.3 0.3 0.2 0.2	Whole fruit	0.18, 0.19 (0.19)	3	
Spain, Cadiz 1996 (Galia)	SC 50	4	1.5	0.3 0.3 0.2 0.2	Whole fruit	0.36, 0.40 (0.38) 0.19, 0.22 (0.21) 0.92, 0.82 (0.87)	0 3 7	CTL/CUNSS 26a/E/96, 95-007-F-E Roland L., 1996 (CLTA10_169) [c]
	WG 75	4	1.5	0.3 0.3 0.2 0.2	Whole fruit	0.36, 0.35 (0.36) 0.42, 0.39 (0.41) 0.12, 0.12 (0.12)	0 3 7	
Spain, Cadiz 1996 (Galia)	SC 50	4	1.5	0.3 0.3 0.2 0.2	Whole fruit	0.38, 0.39 (0.39)	3	CTL/CUNSS 26a/E/96, 95-036-F-E Roland L., 1996 (CLTA10_169) [c]
	WG 75	4	1.5	0.3 0.3 0.2 0.2	Whole fruit	0.34, 0.37 (0.36)	3	
France (South), Mirabel 1996 (Manta)	SC 50	3	1.5	0.38	Whole fruit	0.11, 0.13 (0.12)	3	OF96130, TRIAL LD67 Pointurier R., 1998 (CLTA10_171) [c]
Italy, Bosco Mesola 1999 (Baggio)	SC 50	4	1.5	0.3	Whole fruit [b] Peel Pulp	0.70 0.50 <u>0.31</u> 2.1 1.5 0.93 0.02 0.01 < 0.<u>01</u>	0 1 3 0 1 3 0 1 3	RJ2918B, IT20-99-P367 Lister N., 2000 (CLTA10_173)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Italy, Borgo Sabotino 1999 (Proteo)	SC 50	4	1.5	0.3	Whole fruit [b] Peel Pulp	0.84 0.64 <u>1.0</u> 2.5 1.9 2.8 0.03 0.02 <u>0.04</u>	0 1 3 0 1 3 0 1 3	RJ2918B, IT40-99-P378 Lister N., 2000 (CLTA10_173)
Italy, Foggia 1999 (Proteo)	SC 50	4	1.5	0.3	Whole fruit [b] Peel Pulp	0.88 0.54 <u>0.60</u> 2.8 1.8 2.1 0.01 < 0.01 < 0<u>.01</u>	0 1 3 0 1 3 0 1 3	RJ2918B, IT50-99-P368 Lister N., 2000 (CLTA10_173)
France (South), Mauguio 1996 (Galoubet)	SC 50	3	1.5	0.38	Whole fruit	0.16, 0.19 (0.18)	3	OF96130, TRIAL AC27 Pointurier R., 1998 (CLTA10_175) [c]
France (South), Marsillargues 1996 (Alpha)	SC 50	3	1.5	0.38	Whole fruit	0.047, 0.038 (0.043)	3	OF96130, TRIAL AC28 Pointurier R., 1998 (CLTA10_175) [c]
Spain, Moron de la Frontera 1993 (Rochet)	SC 50	3	1.0	0.17 0.1 0.1	Whole fruit	0.15, 0.13 (0.14) 0.13, 0.12 (0.13) 0.05, 0.05 (0.05) 0.01, 0.01 (0.01)	0 3 7 14	CTL/MELON 20/E/93, Roland L., 1994 (CLTA10_177) [c]
Spain, Moron de la Frontera 1993 (Rochet)	SC 50	3	1.5	0.28 0.15 0.15	Whole fruit	0.30, 0.29 (0.30) 0.31, 0.30 (0.31) 0.07, 0.07 (0.07) 0.22, 0.19 (0.21)	0 3 7 14	CTL/MELON 20/E/93, Roland L., 1994 (CLTA10_177) [c]
Spain, La Rinconada 1999 (Ribatejo)	SC 50	4	1.5	0.17	Whole fruit [b] Peel Pulp	<u>0.57</u> 1.5 0.17, 0.22 (<u>0.20</u>)	3 3 3	RJ2971B, ES51-99-S019 Lister N., 2000 (CLTA10_178)
	WG 75	4	1.5	0.17	Whole fruit [b] Peel Pulp	0.53 2.5 0.13, 0.13 (0.13)	3 3 3	
Spain, Lucena del Puerto 1999 (Cantasapo)	SC 50	4	1.5	0.17	Whole fruit [b] Peel Pulp	0.59 2.1 0.18, 0.24 (<u>0.21</u>)	3 3 3	RJ2971B, ES51-99-S119 Lister N., 2000 (CLTA10_178)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
	WG 75	4	1.5	0.17	Whole fruit [b]	0.60	3	
					Peel	2.1	3	
					Pulp	0.18, 0.22 (0.20)	3	

[a] before last treatment

[b] calculated

[c] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 50 Chlorothalonil residues in protected melons following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Italy, Borgo Sabotini 1999 (Hombre)	SC 50	4	1.5	0.3	Whole fruit [b]	0.52	3	RJ2924B, IT40-99-P369 Lister N., 2000 (CLTA10_163)
					Peel	1.7	3	
					Pulp	< 0.01	3	
Italy, Settepolesini 1999 (Harper)	SC 50	4	1.5	0.3	Whole fruit [b]	0.12 0.13	3 9	RJ2924B, IT20-99-P370 Lister N., 2000 (CLTA10_163)
					Peel	0.32 0.32	3 9	
					Pulp	< 0.01 < 0.01	3 9	
Spain, Vistabella 1999 (Cantaloup)	SC 50	4	1.5		Whole fruit [b]	0.27 0.18 0.27	0 1 3	RJ2920B, ES80-99-S014 Lister N., 2000 (CLTA10_167)
					Peel	0.74 0.47 0.80	0 1 3	
					Pulp	0.03 0.05 0.03	0 1 3	
Spain, Vistabella 1999 (Cantaloup)	SC 50	4	1.5		Whole fruit [b]	0.67 0.51 0.58	0 1 3	RJ2920B, ES80-99-S114 Lister N., 2000 (CLTA10_167)
					Peel	2.5 1.9 2.3	0 1 3	
					Pulp	0.10 0.08 0.04	0 1 3	

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (South), Ondes 1989 (Girola)	SC 50	3	1.5	0.15	Whole fruit Peel Pulp	0.047 0.047 0.23 0.23 0.014 < 0.01	3 7 3 7 3 7	CTL/MELON 04/F/89, Malet J., 1989 (CLTA10_168) [c]
Italy, Catania 1992 (Charentais)	WG 75	3	1.5	0.15	Whole fruit	0.45, 0.40 (0.43) 0.54, 0.53 (0.54)	0 14	CRP/93/1013, 92-009-F-I Roland L., 1993 (CLTA10_170) [c]
Italy, Catania 1992 (Charentais)	WG 75	3	1.0	0.1	Whole fruit	0.55, 0.48 (0.53) 0.23, 0.27 (0.25)	0 14	CRP/93/1013, 92-009-F-I Roland L., 1993 (CLTA10_170) [c]
France, Candillargues 1997 (Luna Star)	SC 50	3	1.5	0.38	Whole fruit	0.21 0.48 <u>0.21</u> 0.07 0.09 0.07	0[a] 0 3 7 13 20	2351/97, Kuehne R., 1998 (CLTA10_172)
France, Mauguio 1997 (Luna Star)	SC 50	3	1.5	0.38	Whole fruit	0.05 0.47 0.27 <u>0.31</u> 0.12 0.03	0[a] 0 3 7 14 21	2352/97, Kuehne R., 1998 (CLTA10_174)

[a] before last treatment

[b] calculated

[c] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 51 Chlorothalonil residues in winter squash following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Columbus (OH) 1988 (Butternut)	WP 72	11	2.5		Chlorothalonil Fruit (RAC) Squash pulp Milled squash Cooked squash Squash waste Baby food SDS-3701 Fruit (RAC) Squash pulp Milled squash Cooked squash Squash waste Baby food R613636 Fruit (RAC) Squash pulp Milled squash Cooked squash Squash waste Baby food	 3.4, 3.1 (3.2) < 0.01, < 0.01 (< 0.01) < 0.01, < 0.01 (< 0.01) < 0.01, < 0.01 (< 0.01) 0.13, 0.18 (0.15) < 0.01, < 0.01 (< 0.01) 0.02, 0.02 (0.02) < 0.01, < 0.01 (< 0.01) < 0.01, < 0.01 (< 0.01) < 0.01, < 0.01 (< 0.01) < 0.01, < 0.01 (< 0.01) < 0.01, < 0.01 (< 0.01) 0.06, 0.05 (0.06) 0.03, 0.04 (0.04) < 0.03, < 0.03 (< 0.03) < 0.03, < 0.03 (< 0.03) 0.05, < 0.03 (0.04) < 0.03, < 0.03 (< 0.03)	 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3185-89-0287-CR-001, SARS-88-OH-42 King C., 1990 (CLTA10_251) [a]

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 52 Chlorothalonil residues in okra following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Ivory Coast, Dabou 2004 (Indiana)	EC 72	2	1.0		Fruit	0.06 0.04	2 7	CI/AIPR/2004/03, Anon., 2005 (CLTA10_261) & Whetton M.., 2004 (CLTA10_262) (dry season) [a]
Ivory Coast, Abengourou 2004 (Indiana)	EC 72	2	1.0		Fruit	1.0 0.17	2 7	CI/AIPR/2004/03, Anon., 2005 (CLTA10_261) & Whetton M.., 2004 (CLTA10_262) (dry season) [a]
Ivory Coast, Dabou 2004 (Indiana)	EC 72	2	1.0		Fruit	0.15 < 0.01	2 7	CI/AIPR/2004/03, Anon., 2005 (CLTA10_261) & Whetton M.., 2004 (CLTA10_262) (rainy season) [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Ivory Coast, Abengourou 2004 (Indiana)	EC 72	2	1.0		Fruit	0.82 0.06	2 7	CI/AIPR/2004/03, Anon., 2005 (CLTA10_261) & Whetton M.., 2004 (CLTA10_262) (rainy season) [a]
Ivory Coast, Dabou 2004 (Indiana)	EC 72	2	1.0		Fruit	0.03 < 0.01 < 0.01	7 14 21	CI/AIPR/2004/03, Anon., 2005 (CLTA10_261) & Whetton M.., 2004 (CLTA10_262) (rainy season) [a]
Ivory Coast, Abengourou 2004 (Indiana)	EC 72	2	1.0		Fruit	0.03 < 0.01 < 0.01	7 14 21	CI/AIPR/2004/03, Anon., 2005 (CLTA10_261) & Whetton M.., 2004 (CLTA10_262) (rainy season) [a]
Ivory Coast, Dabou 2004 (Indiana)	EC 72	2	1.0 (treatm. Before thinning)		Fruit	< 0.01	Not spec.	CI/AIPR/2004/03, Anon., 2005 (CLTA10_261) & Whetton M.., 2004 (CLTA10_262) (rainy season) [a]

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 53 Chlorothalonil residues in peppers following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Brazil, Engenheiro Coelho (SP) (Magali R)	SC 50	3	2.0	0.2	Fruit	3.7 3.1 2.4 1.6 1.1	0 1 3 5 7	M08007, Lopez N., 2006 (CLTA10_182)
Brazil, Tapira (SP) (Magali R)	SC 50	3	2.0	0.2	Fruit	4.3 4.7 3.2 4.4 1.7	0 1 3 5 7	M08007, Lopez N., 2006 (CLTA10_182)
Brazil, Hidrolandia (GO) (Magali)	SC 50	3	2.0	0.2	Fruit	2.3 3.1 1.8 1.5 1.5	0 1 3 5 7	M08007, Lopez N., 2006 (CLTA10_182)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Brazil, Palmeira (PR) (Magali)	SC 50	3	2.0	0.2	Fruit	7.1 4.4 5.6 4.4 4.4	0 1 3 5 7	M08007, Lopez N., 2006 (CLTA10_182)

Table 54 Chlorothalonil residues in tomatoes following different types of foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Painesville (OH) 1979 (Jet Star)	SC 50	8	2.5	0.27	Fruit	0.25 0.42 0.17 0.32 0.23 0.25 0.19, 0.07 (0.13) 0.25, 0.07 (0.16)	0 0 0 7 7 7 14 14	125-3CR-84-0008-001, Prince P., 1984 (CLTA10_179) broadcast spray [a]
	SC 50	8	2.5	0.27	Fruit	0.86 0.95 1.9 0.45 0.70 0.54 0.96, 0.69 (0.83) 0.80, 0.63 (0.72)	0 0 0 7 7 7 14 14	direct concentrated spray
	SC 50	8	2.5	0.27	Fruit	0.41 0.36 0.23 0.09 0.14 0.25, 0.23 (0.24) 0.27, 0.17 (0.22)	0 0 7 7 7 14 14	direct spray for complete coverage
United States, Donna (TX) 1979 (Floradade)	SC 50	6	5.0	1.4	Fruit	1.6, 0.88, 1.3 (1.3) 1.7, 3.3, 2.2 (2.4) 0.14, 0.34, 0.12 (0.20) 0.47, 0.77, 0.56 (0.60) 0.70, 0.56, 1.1 (0.79) 1.3, 0.89, 0.40 (0.86) 0.09, 0.09, 0.05 (0.08) 0.15, 0.09, 0.15 (0.13) 0.21, 0.03, 0.15 (0.13)	0 0 0 7 7 14 14 14	125-3CR-84-0008-001, Prince P., 1984 (CLTA10_179) direct wrap-around boom spraying [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Donna (TX) 1979 (Floradade)	SC 50	6	2.5	1.4	Fruit	0.13, 0.93, 1.5 (0.85) 0.78, 2.8, 0.61 (1.4) 0.10, 0.17, 1.2 (0.49) 0.11, 0.08, 0.06 (0.08) 0.30, 0.39, 0.21 (0.30) 0.22, 0.55, 0.21 (0.33) < 0.01, < 0.01, 0.04 (0.02) 0.17, 0.21, < 0.01 (0.13) < 0.01, < 0.01, 0.03 (0.02)	0 0 0 7 7 7 14 14 14	125-3CR-84-0008-001, Prince P., 1984 (CLTA10_179) broadcast straight boom spraying [a]
United States, Clermont (FL) 1979 (Floradade)	SC 50	10	1.8	0.19	Fruit	0.61 0.56 0.59	0 0 0	125-3CR-84-0008-001, Prince P., 1984 (CLTA10_179) constant spray with 3 nozzles [a]
	SC 50	10	1.8	0.19	Fruit	0.69 0.54 1.4	0 0 0	constant spray with 6 nozzles
	SC 50	10	1.8	0.19	Fruit	0.25 0.27 0.50	0 0 0	boom spray
United States, Clermont (FL) 1979 (Floradade)	SC 50	10	2.5	0.27	Fruit	0.70 0.98	0 0	125-3CR-84-0008-001, Prince P., 1984 (CLTA10_179) constant spray with 3 nozzles [a]
	SC 50	10	2.5	0.27	Fruit	1.9 2.1 2.2	0 0 0	constant spray with 6 nozzles
	SC 50	10	2.5	0.27	Fruit	0.91 1.3 0.28	0 0 0	boom spray
United States, Painter (VA) 1979 (Campbell 327)	SC 50	5	2.5	0.54	Fruit	7.7, 8.1, 3.4 (6.4) 4.9, 3.5, 4.2 (4.2) 3.6, 6.1, 2.2 (4.0) 5.6, 7.0, 2.0 (4.9) 3.4, 3.3, 2.3 (3.0) 1.0, 1.6, 1.7 (1.4) 0.95, 1.6, 1.2 (1.3) 0.76, 0.67, 1.6 (1.0) 0.42, 1.3, 1.7 (1.1)	0 0 0 7 7 7 14 14 14	125-3CR-84-0008-001, Prince P., 1984 (CLTA10_179) direct concentrated spray [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
	SC 50	5	2.5	0.54	Fruit	2.8, 3.7, 0.97 (2.5) 1.6, 1.9, 2.3 (1.9) 6.0, 1.7, 2.7 (3.5) 1.4, 0.94, 1.6 (1.3) 0.75, 0.49, 0.57 (0.60) 0.78, 0.77 (0.78) 0.17, 0.32, 0.12 (0.21) 1.2, 0.70, 0.46 (0.79) 0.14, 0.28, 0.24 (0.22)	0 0 0 7 7 7 14 14 14	broadcast spray
United States, Painesville (OH) 1979 (Campbell 1327)	SC 50	8	2.5	0.27	Fruit	0.53 0.78 0.57 0.84 0.49 0.85 1.1 0.74 0.53 0.80 0.66 0.41 0.71 0.64 0.82 0.52 1.1 0.53 0.66 0.12 0.34 0.68 0.62 1.2 0.42 1.0	0 0 0 0 0 0 0 0 0 7 7 7 7 7 7 7 7 14 14 14 14 14 14 14 14 14	334-3CR-80-0051-001, Ballee D., 1980 (CLTA10_180) Test formulation batch 8590225 [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
	SC 50	8	2.5	0.27	Fruit	1.1 2.7 0.86 1.0 1.3 0.94 0.06 0.06 0.57 0.91 0.99 0.98 1.1 0.68 0.74 0.43 0.65 0.44 0.32 0.53 0.59 0.42 0.44 0.42 0.34 0.32 0.22	0 0 0 0 0 0 0 0 0 7 7 7 7 7 7 7 7 14 14 14 14 14 14 14 14 14	334-3CR-80-0051-001, Ballee D., 1980 (CLTA10_180) Test formulation batch 2190325 [a]
	WG 75	8	2.5	0.27	Fruit	0.63 0.58 0.69 0.57 0.60 0.76 0.91 0.73 0.84 0.33 0.26 0.21 0.44 0.37 0.48 0.41 0.60 0.23 0.22 0.21 0.33 0.32 0.41 0.37 0.52 0.57 0.41	0 0 0 0 0 0 0 0 0 7 7 7 7 7 7 7 7 7 14 14 14 14 14 14 14 14 14	

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Lake Worth (FL) 1979 (not specified)	SC 50	11	2.5		Fruit	1.2 0.24 0.50 0.60 0.36 0.35 0.91 0.67 0.74 0.12 0.06 0.25 0.07 0.20 0.13 0.39 0.04 0.04 0.05 0.02 0.03 0.04 0.03 0.02 0.05 0.03 0.02	0 0 0 0 0 0 0 0 0 7 7 7 7 7 7 7 7 7 14 14 14 14 14 14 14 14 14	334-3CR-80-0051-001, Ballee D., 1980 (CLTA10_180) Test formulation batch 8590225 [a]
	SC 50	11	2.5		Fruit	0.65 0.51 0.67 0.54 0.51 0.21 0.46 0.14 0.10 0.05 0.15 0.13 0.22 0.07 0.25 0.04 0.09 < 0.01 < 0.01 < 0.01 0.04 0.02 0.18 0.06 0.04 0.02 0.02	0 0 0 0 0 0 0 0 0 7 7 7 7 7 7 7 7 7 14 14 14 14 14 14 14 14 14	Test formulation batch 2190325

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
	WG 75	11	2.5		Fruit	0.47 1.4 0.50 0.76 1.5 2.7 1.4 0.90 0.76 0.04 0.13 0.15 0.17 0.13 0.17 0.12 0.34 0.23 0.02 0.05 0.03 0.11 0.14 0.14	0 0 0 0 0 0 0 0 0 7 7 7 7 7 7 7 7 7 14 14 14 14 14 14	
United States, Lafayette (IN) 1979 (Knox)	SC 50	6	2.5	0.36	Fruit	3.2 4.8 3.7 2.9 3.1 3.2 5.3 3.1 2.6 1.8 1.2 3.0 2.1 1.6 2.4 3.3 1.7 1.6 0.39 2.5 0.88 2.2 0.94 0.54 1.7	0 0 0 0 0 0 0 0 0 7 7 7 7 7 7 7 14 14 14 14 14 14 14 14 14	334-3CR-80-0051-001, Ballee D., 1980 (CLTA10_180) Test formulation batch 8590225 [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
	WG 75	6	2.5	0.36	Fruit	< 0.01 < 0.01 < 0.01 1.2 < 0.01 0.8 3.8 2.8 3.5 0.61 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 1.2 1.5 0.78 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 0.43 < 0.01 0.40	0 0 0 0 0 0 0 0 0 7 7 7 7 7 7 7 7 14 14 14 14 14 14 14 14 14	
United States, Painter (VA) 1979 (not specified)	SC 50	5	2.5		Fruit	2.8 3.7 0.97 1.6 1.9 2.3 6.0 1.7 2.7 1.4 0.94 1.6 0.75 0.49 0.57 0.78 0.77 0.17 0.32 0.13 1.2 0.70 0.46 0.14 0.28 0.24	0 0 0 0 0 0 0 0 0 7 7 7 7 7 7 7 7 14 14 14 14 14 14 14 14 14	334-3CR-80-0051-001, Ballee D., 1980 (CLTA10_180) [a]
United States, Clermont (FL) 1979 (not specified)	SC 50	10	2.5		Fruit	0.91 1.3 0.28	0 0 0	334-3CR-80-0051-001, Ballee D., 1980 (CLTA10_180) [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Painesville (OH) 1979 (Jet Star)	SC 50	8	1.8	0.19	Fruit chlorothalonil SDS-3701	 0.37 0.47 0.91 0.94 0.40 0.47 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 0 0 7 7 14 14 0 0 7 7 14 14	459-3CR-83-0034-001, Kenyon R., 1984 (CLTA10_181) [a]
United States, Painesville (OH) 1979 (Jet Star)	SC 50	8	2.5	0.27	Fruit chlorothalonil SDS-3701	 0.98 0.76 0.91 1.2 0.74 1.3 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 0 0 7 7 14 14 0 0 7 7 14 14	459-3CR-83-0034-001, Kenyon R., 1984 (CLTA10_181) [a]
United States, Painesville (OH) 1979 (Jet Star)	SC 50	5	4.1	0.44	Fruit chlorothalonil SDS-3701	 2.1 2.4 0.87 1.1 1.5 1.6 0.76 0.78 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 0 0 7 7 8 8 14 14 0 0 7 7 8 8 14 14	459-3CR-83-0034-001, Kenyon R., 1984 (CLTA10_181) [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Painesville (OH) 1979 (Jet Star)	SC 50	5	8.2	0.88	Fruit chlorothalonil SDS-3701	 2.3 1.8 1.6 2.0 1.2 1.8 0.24 0.39 0.23 0.30 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 0 0 8 8 8 8 14 14 21 21 0 0 8 8 8 8 14 14 21 21	459-3CR-83-0034-001, Kenyon R., 1984 (CLTA10_181) [a]
United States, Painter (VA) 1980 (Campbell 1327)	SC 50	2	8.2	1.7	Fruit chlorothalonil SDS-3701	 2.8 2.2 < 0.03 < 0.03	 0 0 0 0	459-3CR-83-0034-001, Kenyon R., 1984 (CLTA10_181) direct spray treatment [a]
	SC 50	2	8.2	1.7	Fruit chlorothalonil SDS-3701	 3.3 2.5 < 0.03 < 0.03	 0 0 0 0	broadcast spraying
United States, Rock Springs (PA) 1980 (Merit)	SC 50	11	2.5	0.32	Fruit chlorothalonil SDS-3701	 1.8 1.4 0.05 0.06	 0 0 0 0	459-3CR-83-0034-001, Kenyon R., 1984 (CLTA10_181) [a]
United States, Rock Springs (PA) 1980 (Merit)	SC 50	6	4.7	0.61	Fruit chlorothalonil SDS-3701	 3.1 2.9 0.06 0.04	 0 0 0 0	459-3CR-83-0034-001, Kenyon R., 1984 (CLTA10_181) Note 1
United States, Rock Springs (PA) 1980 (Merit)	SC 50	6	5.6	0.72	Fruit chlorothalonil SDS-3701	 4.0 3.5 0.06 0.04	 0 0 0 0	459-3CR-83-0034-001, Kenyon R., 1984 (CLTA10_181) [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, New Brunswick (NJ) 1980 (Campbell 28)	SC 50	4	2.3	0.2	Fruit chlorothalonil SDS-3701	 1.0 0.87 < 0.03 < 0.03	 0 0 0 0	459-3CR-83-0034-001, Kenyon R., 1984 (CLTA10_181) [a]
United States, New Brunswick (NJ) 1980 (Campbell 28)	SC 50	4	5.4	0.46	Fruit chlorothalonil SDS-3701	 2.3 2.6 < 0.03 < 0.03	 11 11 11 11	459-3CR-83-0034-001, Kenyon R., 1984 (CLTA10_181) [a]
United States, New Brunswick (NJ) 1980 (Campbell 28)	SC 50	4	6.4	0.55	Fruit chlorothalonil SDS-3701	 2.3 2.6 < 0.03 < 0.03	 11 11 11 11	459-3CR-83-0034-001, Kenyon R., 1984 (CLTA10_181) [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (South),	SC 50	3	7.5	0.94	<u>Chlorothalonil</u>			05-6039,
Bias					Fruits	6.7	3	AF/8548/SY/1
								Anderson L.,
2005					Fruits (RAC)	9.6, 9.6 (9.6)	3	2005
(Leader)					Crushed Tomatoes	2.5	3	(CLTA10_249)
					Wet pomace	3.5	3	
						3.1	3	
					Dry pomace	0.09	3	
						12	3	
						13	3	
						10	3	
					Raw juice	12	3	
					Pasteurised juice	2.9	3	
						1.1	3	
						1.0	3	
					Reduce tomatoes	0.87	3	
					Sieved tomatoes	1.2	3	
					Puree	0.05	3	
						< 0.01	3	
						< 0.01	3	
						< 0.01	3	
						< 0.01	3	
					Peeled tomatoes	< 0.01	3	
					Tomato peel	0.24	3	
					Canned tomatoes	28	3	
						< 0.01	3	
						< 0.01	3	
						< 0.01	3	
					<u>SDS-3701</u>	< 0.01	3	
					Fruits			
						0.01	3	
					Fruits (RAC)			
					Crushed Tomatoes	0.02, 0.01 (0.02)	3	
					Wet pomace	< 0.01	3	
						< 0.01	3	
					Dry pomace	0.03	3	
						0.38	3	
						0.25	3	
						0.31	3	
					Raw juice	0.28	3	
					Pasteurised juice	0.36	3	
						0.01	3	
						0.02	3	
						0.02	3	
						0.02	3	
						0.03	3	
					Reduce tomatoes	0.24	3	
					Sieved tomatoes			
					Puree	0.15	3	
						0.15	3	
						0.13	3	
					Peeled tomatoes	0.12	3	
					Tomato peel	0.11	3	
					Canned tomatoes	< 0.01	3	
						0.03	3	
						0.02	3	
						0.04	3	
						0.04	3	
						0.05	3	

[a] extracted at ambient temperature, without addition of sulphuric acid before homogenisation or not collected according to the Codex sampling procedure

Table 55 Chlorothalonil residues in sweet corn following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Hillsboro (OR) 1995 (Golden Jubilee)	WP 72	8	1.3	0.7 0.7 0.7 0.7 0.35 0.35 0.35 0.35	Ears chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 < 0.01	 14 14 14 14	6513-95-0270-CR-001, Dillon K., 1996 (CLTA10_066) [a]
United States, Germansville (PA) 1995 (not specified)	WP 72	8	1.3	0.35	Ears chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 < 0.01	 14 14 14 14	6513-95-0270-CR-001, Dillon K., 1996 (CLTA10_066) [a]
United States, Arkansaw (WI) 1995 (not specified)	WP 72	8	1.3	0.7	Ears chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 0.01	 14 14 14 14	6513-95-0270-CR-001, Dillon K., 1996 (CLTA10_066) [a]

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 56 Chlorothalonil residues in carrots following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Woodbridge 1999 (Nairobi)	SC 50	4	1.5	0.38	Root	0.04 0.03 0.02 0.02 0.02	0 3 7 10 13	RJ2976B, GB06-99-S072 Gill J., 2000 (CLTA10_183)
United Kingdom, Norfolk 1999 (Gladiator)	SC 50	4	1.5	0.38	Root	0.03 0.05 0.03 0.03 0.01	0 3 7 10 13	RJ2976B, GB06-99-S073 Gill J., 2000 (CLTA10_183)
Germany, Luebeck 1999 (Merida)	SC 50	4	1.5	0.25	Root	0.03 0.02 0.03 0.01 0.01	0 3 7 10 14	RJ2963B, RS-9915-A1 Gill J., 2000 (CLTA10_184)
Germany, Morxdorf 1999 (Nevis)	SC 50	4	1.5	0.25	Root	0.01 0.01 0.01 0.02 0.02	0 3 7 10 14	RJ2963B, RS-9915-K1 Gill J., 2000 (CLTA10_184)
United Kingdom, Crank 1995 (Nerac)	SC 50	4	1.5	0.75	Root	0.32 0.24 0.23	14 14 14	CTL/DAUCS 06/6B/95, AK/2780/IB/1 Partington K., 1996 (CLTA10_185)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Soham 1995 (Nairobi)	SC 50	4	1.5	0.75	Root	0.75 0.41 0.35	14 14 14	CTL/DAUCS 06/6B/95, AK/2780/IB/2 Partington K., 1996 (CLTA10_185)
United Kingdom, Crank 1995 (Nerac)	WG 75	4	1.5	0.75	Root	0.20 0.25 0.33	14 14 14	CTL/DAUCS 07/6B/95, AK/2781/IB/1 Partington K., 1996 (CLTA10_186)
United Kingdom, Soham 1995 (Nairobi)	WG 75	4	1.5	0.75	Root	1.1 0.64 0.93	14 14 14	CTL/DAUCS 07/6B/95, AK/2781/IB/2 Partington K., 1996 (CLTA10_186)
France (North), Loos en Gohelle 1997 (Kamaran)	SC 72	4	1.4		Root Root after removal of top 1 cm	0.09, 0.08 (0.09) 0.04, 0.04 (0.04)	14 14	CTL/DAUCS 09/F/97, BKA/699/97/RES1 Roland L., 1998 (CLTA10_187) [a]
France (North), Frelinghem 1997 (Nerobi)	SC 72	4	1.4		Root Root after removal of top 1 cm	0.20, 0.24 (0.22) 0.06, 0.06 (0.06)	14 14	CTL/DAUCS 09/F/97, BKA/699/97/RES2 Roland L., 1998 (CLTA10_187) [a]
France (South), Liposthey 1997 (Bolero)	SC 72	4	1.4		Root Root after removal of top 1 cm	0.07, 0.08 (0.08) 0.01, 0.01 (0.01)	14 14	CTL/DAUCS 09/F/97, BKA/699/97/RES3 Roland L., 1998 (CLTA10_187) [a]
France (South), Meauzac 1997 (Bolero)	SC 72	4	1.4		Root Root after removal of top 1 cm	0.18, 0.19 (0.19) 0.03, 0.03 (0.03)	14 14	CTL/DAUCS 09/F/97, BKA/699/97/RES4 Roland L., 1998 (CLTA10_187) [a]
France (South), St. Jory 1999 (Presto F1)	SC 50	4	1.5	0.5	Root	0.02 0.01 < 0.01 < 0.01	4 7 11 14	RJ3036B, FR15-99-S753 Gill J., 2000 (CLTA10_188
France (South), Loriol du Comtat 1999 (Nevis)	SC 50	4	1.5	0.5	Root	0.11 0.05 0.06 0.06 0.05	0 3 7 10 13	RJ3036B, FR52-99-S783 Gill J., 2000 (CLTA10_188
France (South), Audenge 1999 (Bolero)	SC 50	4	1.5	0.5	Root	0.01 0.04 0.03 0.01 0.02	0 3 7 10 14	RJ3036B, FR92-99-S760 Gill J., 2000 (CLTA10_188
Spain, L'Alcudia 1999 (Macarena)	SC 50	4	1.5	0.3	Root	0.06 0.08 0.10 0.12 0.06	0 3 7 9 14	RJ3057B, ES40-99-S011 Gill J., 2000 (CLTA10_189)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Spain, Rotova 1999 (Forto)	SC 50	4	1.5	0.3	Root Raw carrots Trimmings Peelings Peeled carrots Cooked carrots Raw carrots Trimmings Peeled carrots Canned carrots Raw carrots Trimmings Peeled carrots Pressed solids Raw juice Canned juice	0.01 < 0.01 0.03 < 0.01 < 0.01 < 0.01 < 0.01 0.01 < 0.01 < 0.01 0.02 0.03 < 0.01 < 0.01 < 0.01 < 0.01	14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14	RJ3057B, ES40-99-S211 Gill J., 2000 (CLTA10_189)
Spain, Rotova 1999 (Antares)	SC 50	4	1.5	0.3	Root Raw carrots Trimmings Peelings Peeled carrots Cooked carrots Raw carrots Trimmings Peeled carrots Canned carrots Raw carrots Trimmings Peeled carrots Pressed solids Raw juice Canned juice	0.02 0.03 0.25 0.01 < 0.01 < 0.01 0.04 0.13 < 0.01 < 0.01 0.02 0.13 < 0.01 < 0.01 < 0.01 < 0.01	12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12	RJ3057B, ES40-99-S311 Gill J., 2000 (CLTA10_189)

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 57 Chlorothalonil residues in potatoes following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Germany, Dissau 2000 (Palma)	SC 50	8	1.5	0.3	Tuber	< 0.01, < 0.01, < 0.01, 0.01 (0.01) < 0.01 < 0.01 < 0.01 < 0.01	0 3 7 10 14	RJ3137B, DE11-00-S159 McGill C., 2001 (CLTA10_190)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Germany, Radepohl 2000 (Saturna)	SC 50	8	1.5	0.3	Tuber	< 0.01 0.01, 0.01, < 0.01, < 0.01 (0.01) < 0.01 < 0.01 < 0.01	0 3 6 11 15	RJ3137B, DE12-00-S159 McGill C., 2001 (CLTA10_190)
Germany, Warendorf 2000 (Simone)	SC 50	8	1.5	0.3	Tuber	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01	0 3 7 10 14	RJ3137B, DE15-00-S159 McGill C., 2001 (CLTA10_190)
Germany, Grosstreben 2000 (Agria)	SC 50	8	1.5	0.3	Tuber	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01	0 3 7 10 15	RJ3137B, DE16-00-S159 McGill C., 2001 (CLTA10_190)
United Kingdom, Eriswell 1999 (King Edward)	SC 50	8	1.5	0.5	Tuber	0.01, 0.01, 0.01, 0.01 (0.01)	7	RJ3052B, GB06-99-S083 McGill C., 2000 (CLTA10_191)
United Kingdom, Littleport 1999 (Maris Piper)	SC 50	8	1.5	0.5	Tuber	< 0.01	7	RJ3052B, GB06-99-S084 McGill C., 2000 (CLTA10_191)
Germany, Pohnsdorf 1999 (Jaqueline)	SC 50	8	1.5	0.3	Tuber	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01	0 3 7 10 14	RJ3034B, RS-9918-A1 McGill C., 2000 (CLTA10_192)
Germany, Linda 1999 (Tomensa)	SC 50	8	1.5	0.3	Tuber	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01	0 3 7 10 14	RJ3034B, RS-9918-K1 McGill C., 2000 (CLTA10_192)
Spain, Utera 2000 (Monalisa)	SC 50	8	1.5	0.33	Tuber	< 0.01	6	RJ3190B, ES51-00-S027 Richards S., 2001 (CLTA10_193)
Spain, Huelva 2000 (Punta)	SC 50	8	1.5	0.33	Tuber	< 0.01	7	RJ3190B, ES51-00-S127 Richards S., 2001 (CLTA10_193)
France (South), Ondes 1999 (Mistral)	SC 50	8	1.5	0.5	Tuber	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01	0 3 7 10 14	RJ3051B, FR12-99-S758 McGill C., 2000 (CLTA10_194)
France (South), Manziat 1999 (Charlotte)	SC 50	8	1.5	0.5	Tuber	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01	0 3 7 10 14	RJ3051B, FR33-99-S753 McGill C., 2000 (CLTA10_194)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Spain, Tamarite de Litera 2000 (Kennebec)	SC 50	8	1.5	0.30	Tuber	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01	0 3 7 10 14	RJ3144B, ES60-00-S012 Gill J., 2001 (CLTA10_195)
Spain, Ranillas 2000 (Red Pontiac)	SC 50	8	1.5	0.25	Tuber	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01	0 3 7 10 14	RJ3144B, ES30-00-S112 Gill J., 2001 (CLTA10_195)

Table 58 Chlorothalonil residues in asparagus following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Germany, Iffezheim 2002 (Boonlim)	SC 50	1	2.5	0.21	Spears chlorothalonil SDS-3701	< 0.01, < 0.01, < 0.01, < 0.01, < 0.01 (< 0.01) < 0.01	268 268	gas63601, Simon P., 2003 (CLTA10_196
Germany, Worms 2002 (Geinlim)	SC 50	1	2.5	0.21	Spears chlorothalonil SDS-3701	< 0.01, < 0.01, < 0.01, < 0.01 (< 0.01) < 0.01	245 245	gas53601, Simon P., 2003 (CLTA10_197)
Greece, Abelonas Larisas 2001 (Dariana)	SC 50	3	2.5	0.25	Spears chlorothalonil SDS-3701	< 0.01 < 0.01	223 223	RJ3332B, GR-01-P101 Gill J., 2003 (CLTA10_198)
Greece, Vriotopos Larisas 2001 (Dariana)	SC 50	3	2.5	0.25	Spears chlorothalonil SDS-3701	< 0.01 < 0.01	224 224	RJ3332B, GR-01-P102 Gill J., 2003 (CLTA10_198)
United States, Roberts Island (CA) 1990 (157)	SC 72	3	3.4 (aerial appli-cation)	1.0	Spears chlorothalonil SDS-3701 R613636	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03 < 0.03 < 0.03	195 195 195 195 195 195 195 195 195 195 195 195	HWI 6378-100, Ballantine L., 1992 (CLTA10_063) [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Roberts Island (CA) 1990 (157)	SC 72	3	3.4	3.5	Spears chlorothalonil SDS-3701 R613636 	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03 < 0.03 < 0.03	 189 189 189 189 189 189 189 189 189 189 189 189	HWI 6378-100, Ballantine L., 1992 (CLTA10_063) [a]
United States, Moses Lake (WA) 1986 (WS-1)	SC 72	6	1.7 (aerial appli-cation)	1.8	Spears chlorothalonil SDS-3701 R613636 	 0.018 0.013 0.017 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03 < 0.03 < 0.03	 192 192 192 192 192 192 192 192 192 192 192 192	HWI 6378-100, Ballantine L., 1992 (CLTA10_063) [a]
United States, Moses Lake (WA) 1986 (WS-1)	SC 72	3	3.4 (aerial appli-cation)	3.5	Spears chlorothalonil SDS-3701 R613636 	 0.033 0.012 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03 < 0.03 < 0.03	 192 192 192 192 192 192 192 192 192 192 192 192	HWI 6378-100, Ballantine L., 1992 (CLTA10_063) [a]
United States, Conklin (MI) 1986 (New Jersey Giant)	SC 72	6	1.7		Spears chlorothalonil SDS-3701 R613636 	 < 0.01 < 0.01 < 0.01 0.012 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03 < 0.03 < 0.03	 231 231 231 231 231 231 231 231 231 231 231 231	HWI 6378-100, Ballantine L., 1992 (CLTA10_063) [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Conklin (MI) 1986 (New Jersey Giant)	SC 72	3	3.4		Spears chlorothalonil SDS-3701 R613636	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03 < 0.03 < 0.03	 231 231 231 231 231 231 231 231 231 231 231 231	HWI 6378-100, Ballantine L., 1992 (CLTA10_063) [a]
United States, East Lansing (MI) 1985 (Viking)	SC 50	5	2.3		Spears chlorothalonil SDS-3701 R613636	 < 0.01 < 0.01 < 0.01 < 0.01 0.036 0.045	 262 262 262 262 262 262	HLA 6012-2411, Ruhlnad J., 1991 (CLTA10_199) [a]
United States, East Lansing (MI) 1986 (Viking)	SC 72	5	2.3		Spears chlorothalonil SDS-3701 R613636	 < 0.01 < 0.01 < 0.01 < 0.01 0.032 < 0.03	 233 233 233 233 233 233	HLA 6012-2411, Ruhlnad J., 1991 (CLTA10_199) [a]
United States, East Lansing (MI) 1986 (Viking)	SC 72	5	3.4		Spears chlorothalonil SDS-3701 R613636	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03	 233 233 233 233 233 233	HLA 6012-2411, Ruhlnad J., 1991 (CLTA10_199) [a]
United States, Bixby (OK) 1983 (UC-157 F2))	SC 50	8	1.8		Spears chlorothalonil SDS-3701 R613636	 < 0.01 < 0.01 < 0.01 < 0.01 0.045 0.039	 215 215 215 215 215 215	HLA 6012-2411, Ruhlnad J., 1991 (CLTA10_199) [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Bixby (OK) 1983 (UC-157 F2))	SC 50	8	3.5		Spears chlorothalonil SDS-3701 R613636	 < 0.01 < 0.01 < 0.01 < 0.01 0.039 0.050	 215 215 215 215 215 215	HLA 6012-2411, Ruhlnad J., 1991 (CLTA10_199) [a]
United States, Bixby (OK) 1987 (UC-157 F2))	SC 72	3	1.8		Spears chlorothalonil SDS-3701 R613636	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03	 248 248 248 248 248 248	HLA 6012-2411, Ruhlnad J., 1991 (CLTA10_199) [a]
United States, Bixby (OK) 1988 (UC-157 F2)	SC 72	4	1.8		Spears chlorothalonil SDS-3701 R613636	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03 < 0.03 < 0.03	 193 193 235 235 193 193 235 235 193 193 235 235	HLA 6012-2411, Ruhlnad J., 1991 (CLTA10_199) [a]
United States, Bixby (OK) 1988 (Mary Washington)	SC 72	4	1.8		Spears chlorothalonil SDS-3701 R613636	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03 < 0.03 < 0.03	 193 193 235 235 193 193 235 235 193 193 235 235	HLA 6012-2411, Ruhlnad J., 1991 (CLTA10_199) [a]
United States, Stockton (CA) 1987 (not specified)	SC 72	6	2.5		Spears chlorothalonil SDS-3701 R613636	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03	 97 97 97 97 97 97	HLA 6012-2411, Ruhlnad J., 1991 (CLTA10_199) [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Stockton (CA) 1987 (not specified)	SC 72	3	3.4		Spears chlorothalonil SDS-3701 R613636	< 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03	107 107 107 107 107 107	HLA 6012-2411, Ruhlnad J., 1991 (CLTA10_199) [a]
United States, Sunnyside (WA) 1987 (not specified)	SC 72	3	1.3		Spears chlorothalonil SDS-3701 R613636	< 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03	223 223 223 223 223 223	HLA 6012-2411, Ruhlnad J., 1991 (CLTA10_199) [a]
United States, Sunnyside (WA) 1987 (not specified)	SC 72	3	2.5		Spears chlorothalonil SDS-3701 R613636	< 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03	223 223 223 223 223 223	HLA 6012-2411, Ruhlnad J., 1991 (CLTA10_199) [a]

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table59 Chlorothalonil residues in celery following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Santa Maria (CA) 1980 (5270-R)	WP 75	7	3.4 (sprin-kler irri-gation)		Sticks	1.3 1.3 1.2 1.3 1.0 1.1	7 7 7 7 7 7	336-3CR-81-0083-001, Ballee L., 1981 (CLTA10_070)
United States, Santa Maria (CA) 1980 (5270-R)	SC 50	7	2.5 (sprin-kler irri-gation)		Sticks	0.03 0.03 <u>0.06</u> 0.03 0.02 0.06	7 7 7 7 7 7	336-3CR-81-0083-001, Ballee L., 1981 (CLTA10_070)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Bath (MI) 1980 (Camero)	SC 50	8	2.5	2.8	Sticks	6.4 7.4 4.1 4.4 2.5 2.2 3.2 3.3 1.5 1.4 2.5 2.4	0 0 0 0 0 0 7 7 7 7 7 7	336-3CR-81-0083-001, Ballee L., 1981 (CLTA10_070)
United States, Santa Maria (CA) 1980 (5270-R)	WP 75	7	3.4 (sprinkler irrigation)		Sticks	3.2 3.3 1.1 1.1 2.2 2.1	7 7 7 7 7 7	334-3CR-81-0084-001, Ballee L., 1981 (CLTA10_071)
United States, Santa Maria (CA) 1980 (5270-R)	SC 50	7	2.5 (sprinkler irrigation)		Sticks	2.0 1.5 1.6 1.6 0.87 1.0	7 7 7 7 7 7	334-3CR-81-0084-001, Ballee L., 1981 (CLTA10_071)
United States, Sodus (NY) 1983 (Florida 683)	SC 50	10	2.5	0.51	Sticks chlorothalonil SDS-3701	 6.4 6.9 7.1 7.5 0.02 0.01 0.01 0.02	 7 7 7 7 7 7 7 7	645-3EF-83-0083-001, Nelson T., 1984 (CLTA10_072)

Table 60 Chlorothalonil residues in green beans following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Halsham 1997 (Lystra)	SC 50	2	1.5	0.6	Fresh seeds	0.01 0.02, 0.02 (0.02)	10 10	CTL/VICFJ 02/GB/97, AS/3718/IB/1 Partington K., 1998 (CLTA10_137)
United Kingdom, Halsham 1997 (Lystra)	WG 75	2	1.5	0.6	Fresh seeds	0.01 0.01	10 10	CTL/VICFJ 02/GB/97, AS/3718/IB/1 Partington K., 1998 (CLTA10_137)
United Kingdom, Aldington 1997 (Dreadnough)	SC 50	2	1.5	0.6	Fresh seeds	< 0.01 < 0.01, < 0.01 (< 0.01)	10 10	CTL/VICFJ 02/GB/97, AS/3718/IB/2 Partington K., 1998 (CLTA10_137)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Aldington 1997 (Dreadnough)	WG 75	2	1.5	0.6	Fresh seeds	< 0.01 < 0.01	10 10	CTL/VICFJ 02/GB/97, AS/3718/IB/2 Partington K., 1998 (CLTA10_137)
France (North), Vivy 2005 (Angers)	SC 50	2	7.4	1.5	Chlorothalonil Beans with pods Beans with pods (RAC) Tips Blanched beans Canned beans Cooked beans SDS-3701 Beans with pods Beans with pods (RAC) Tips Blanched beans Canned beans Cooked beans	 6.1 7.9, 6.1 (7.0) 8.6 14 0.15 < 0.01 < 0.01 < 0.01 < 0.01 0.02 0.03 0.02 < 0.01 0.03 0.04, 0.03 (0.04) 0.07 0.06 0.02 0.02 0.03 0.02 0.03 0.02 0.02 0.02 0.02	 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	05-6037, AF/10078/SY/1 Gardinal P., 2007 (CLTA10_255)

Table 61 Chlorothalonil residues in beans (pulses) following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Radford Semele 2002 (Victor)	SC 50	2	1.5	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701	 0.02 0.04 0.33 0.01, 0.01, 0.01 (0.01) 0.03 0.02 0.02 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 6.5 66 63 60 30 41 16 0.97 1.3 1.3 0.91 0.99 0.47	 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14	02-6061, Sole C., 2003 (CLTA10_200)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (North), Montcresson 2002 (Melodie)	SC 50	2	1.5	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701 	 < 0.01 < 0.01 < 0.01 0.01 0.02 0.01 0.35 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 14 2.2, 0.56, 0 59 (1.2) 69 46 34 18 15 0.12 0.05, 0.02, 0.02 (0.03) 0.65 0.69 0.57 0.58 0.59	 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14	02-6062, Sole C., 2003 (CLTA10_201)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Breedon on the Hill 2003 (Quatro)	SC 50	2	1.5	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701 	 0.18 0.98 1.7 1.5 4.9 0.21 0.44 0.01 < 0.01 0.02 0.02 < 0.01 < 0.01 < 0.01 8.9 48 47 30 24 27 38 0.23 0.46 0.59 0.38 0.36 0.33 0.37	 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14	AF/7177/SY, Oxspring S., 2004 (CLTA10_202)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Hathern 2003 (Clipper)	SC 50	2	1.5	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701	 0.35 3.0 4.8 1.2 1.1 2.4 0.01 0.01 0.14 0.01 0.02 0.02 12 63 74 35 28 25 22 0.34 0.45 1.3 0.53 0.46 0.54 0.45	 0[a] 0 3 10 14 14 0[a] 0 3 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14	AF/7178/SY, Oxspring S., 2004 (CLTA10_203

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Whaley 2003 (Disc)	SC 50	2	1.5	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701 	 1.5 0.47 2.2 1.4 1.7 1.8 2.0 0.01 < 0.01 0.03 0.02 0.03 0.07 0.05 38 7.7 22 34 40 32 32 0.12 0.03 0.17 0.35 0.39 0.44 0.43	 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14	AF/7179/SY, Oxspring S., 2004 (CLTA10_204)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United Kingdom, Ockbrook 2003 (Victor)	SC 50	2	1.5	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701	 1.1 2.1 3.3 6.2 0.13 0.85 1.1 < 0.01 0.01 0.03 0.07 < 0.01 < 0.01 0.01 25 74 128 52 67 65 80 0.17 0.23 0.52 0.21 0.38 0.43 0.09	 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14	AF/7180/SY, Oxspring S., 2004 (CLTA10_205)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (North), Treves 2003 (Gloria)	SC 50	2	1.5	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701	 0.02 0.07 0.02 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 13 87 11 4.8 2.7 1.6 0.57 1.1 0.36 0.44 0.40 0.30	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7181/SY, Oxspring S., 2004 (CLTA10_206)
France (North), Boce 2003 (Castel)	SC 50	2	1.5	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701	 < 0.01 0.10 0.24 0.02 0.01 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 7.2 67 22 11 11 4.8 0.48 0.91 0.60 0.63 0.76 0.59	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7182/SY, Oxspring S., 2004 (CLTA10_207)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (North), Ascheres Le Marche 2003 (Gloria)	SC 50	2	1.5	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701 	 0.02 0.26 0.26 0.15 0.07 0.06 0.34 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 0.01 4.9 44 58 24 17 6.3 9.7 0.04 0.32 0.23 0.18 0.18 0.24 0.33	 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14	AF/7183/SY, Oxspring S., 2004 (CLTA10_208)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Spain, Altobar dela Encomienda 2002 (Palmena)	SC 50	2	1.5	0.5	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701	 0.05 0.09 0.06 0.05 0.06 <u>0.05</u> < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.<u>01</u> 52 70 83 61 57 67 0.04 0.89 0.71 0.49 0.57 0.58	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	02-6044, Sole C., 2003 (CLTA10_209)
France (South), Grisolles 2002 (Linex)	SC 50	2	1.5	0.5	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701	 < 0.01 0.03 0.05 0.02 0.01 0.01 <u>0.11</u> < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.<u>01</u> 17 86 89 88 44 20 17 0.20 0.98 0.76 0.80 0.60 0.33 0.27	 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14	02-6040, Sole C., 2003 (CLTA10_210)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (South), Borcq Sur Airvault 2003 (Gloria)	SC 50	2	1.6	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701	 < 0.01 0.21 0.09 0.06 0.04 <u>0.05</u> < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 <u>0.02</u> 2.5 91 43 25 12 3.6 0.26 0.98 0.64 1.2 0.95 1.0	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7184/SY, Oxspring S., 2004 (CLTA10_211)
France (South), Blaslay 2003 (Divine)	SC 50	2	1.5 2.1	0.38 0.52	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701	 0.08 0.29 0.05 0.04 0.02 0.02 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 19 171 51 24 16 18 0.28 1.5 0.45 0.63 0.54 0.58	 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14	AF/7185/SY, Oxspring S., 2004 (CLTA10_212)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (South), Lafrancaise 2003 (Castel)	SC 50	2	1.5	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701 	 0.31 1.9 1.2 0.13 0.50 0.38 <u>0.68</u> 0.02 0.06 0.05 0.01 0.05 0.03 <u>0.04</u> 34 103 63 58 69 33 16 0.60 0.82 0.86 1.3 1.4 1.3 0.48	 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14	AF/7186/SY, Oxspring S., 2004 (CLTA10_213)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (South), Realville 2003 (Castel)	SC 50	2	1.5	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701 	 0.12 0.32 0.08 0.10 0.16 0.09 <u>0.32</u> < 0.01 < 0.01 < 0.01 0.01 0.02 0.02 <u>0.02</u> 13 60 53 20 17 12 46 0.30 0.69 0.80 0.59 0.85 0.53 0.50	 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14	AF/7187/SY, Oxspring S., 2004 (CLTA10_214)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (South), Mazaret 2003 (Irena)	SC 50	2	1.5	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701 Haulm chlorothalonil SDS-3701	 0.50 0.97 0.28 0.39 0.09 <u>0.19</u> 0.14 < 0.01, 0.02 (0.02) 0.02 < 0.01 0.02 0.01 <u>0.02</u> < 0.01 29 87 48, 47 (48) 31 21, 19 (20) 8.7, 8.6, 8.5, 8.7 (8.6) 0.41 0.65 0.29 0.60 0.51 0.37 8.3, 8.7, 10, 9.8 (9.2) 0.26	 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 14 14	AF/7188/SY, Oxspring S., 2004 (CLTA10_215)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
France (South), Lizac 2003 (Castel)	SC 50	2	1.5	0.38	Dry seeds chlorothalonil	 0.52 3.9 1.1 0.31 0.33 <u>0.52</u> 0.23	 0[a] 0 3 7 10 14 14	AF/7189/SY, Oxspring S., 2004 (CLTA10_216)
					SDS-3701	0.02 0.10 .003 0.02 0.02 <u>0.04</u> 0.01	0[a] 0 3 7 10 14 14	
					Plant chlorothalonil	 23, 22 (23) 116 67, 66 (67) 50, 47 (49) 26, 21 (24) 21, 21 (21)	 0[a] 0 3 7 10 14	
					SDS-3701	0.26 0.88 0.73 1.1 1.0 1.8	0[a] 0 3 7 10 14	
					Haulm chlorothalonil SDS-3701	 7.9, 8.0, 11, 10 (9.3) 0.33	 14 14	

[a] before last treatment

Table 62 Chlorothalonil residues in chickpeas following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Italy,	SC 50	3	1.5	0.38	Dry seeds			02-6047,
Idice					chlorothalonil	1.3	0[a]	Richards S., 2003
						3.2	0	(CLTA10_217)
2002						0.34	3	
(Cicerone)						0.37	7	
						0.23	10	
						0.03	14	
						0.03	14	
						0.10	14	
						0.10	14	
					SDS-3701	0.01	0[a]	
						0.01	0	
						< 0.01	3	
						< 0.01	7	
						< 0.01	10	
						< 0.01	14	
						< 0.01	14	
						< 0.01	14	
						< 0.01	14	
					Plant			
					chlorothalonil	18	0[a]	
						63	0	
						29	3	
						9.8	7	
						27	10	
						8.6	14	
						11	14	
						5.2	14	
						11	14	
					SDS-3701	0.23	0[a]	
						0.36	0	
						0.49	3	
						0.36	7	
						0.83	10	
						0.53	14	
						0.62	14	
						0.41	14	
						0.51	14	

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Spain, Villalba 2002 (Blanci Lechoso)	SC 50	3	1.5	0.38	Dry seeds chlorothalonil	 0.04 0.14 0.26 0.17 0.05 0.06 0.05 0.28 0.28	 0[a] 0 3 7 10 14 14 14 14	02-6048, Richards S., 2002 (CLTA10_218)
					SDS-3701	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	0[a] 0 3 7 10 14 14 14 14	
					Plant chlorothalonil	 69 145 127 89 72 82 95 58 59	 0[a] 0 3 7 10 14 14 14 14	
					SDS-3701	0.16 0.45 0.34 0.32 0.35 0.44 0.50 0.39 0.35	0[a] 0 3 7 10 14 14 14 14	

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Spain, Bollullos Del Condado 2003 (Blanco Lechoso)	SC 50	3	1.5	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701 Haulm chlorothalonil SDS-3701	 0.08 0.27 0.15 0.19 0.13 0.08 <u>0.62</u> < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 <u>0.02</u> 72, 65 (68) 189, 777 (183) 126, 121 (124) 77, 69 (73) 67, 56 (62) 40, 35 (38) 0.57 0.84 0.99 0.85 0.80 0.65 12, 8.7 (10) 0.22	 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 0[a] 0 3 7 10 14 14 14	AF/7175/SY, Oxspring S., 2004 (CLTA10_219)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Spain, Villalba 2003 (Blanco Lechoso)	SC 50	3	1.5	0.38	Dry seeds chlorothalonil SDS-3701 Plant chlorothalonil SDS-3701 Haulm chlorothalonil SDS-3701	 0.18 0.53 0.24 0.49 0.47 0.34 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 37 168, 152 (160) 140, 124 (132) 53, 47 (50) 35, 25 (30) 32, 26 (29) 0.32 0.66 0.65 0.56 0.40 0.38 48, 48 (48) 0.69	 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 0[a] 0 3 7 10 14 14 14	AF/7176/SY, Oxspring S., 2004 (CLTA10_220)
Spain, Algodonales 1996 (Sirio)	SC 50	3	1.5	0.2	Dry seeds	0.29, 0.28 (0.29)	14	CTL/CIEAR 03/E/96, 96-032-F-E Roland L., 1997 (CLTA10_221) [b] REMARK: sample size 0.3 kg
	WG 75	3	1.5	0.2	Dry seeds	0.21, 0.21 (0.21)	14	
Spain, Montilla 1996 (Blanco Lechoso)	SC 50	3	1.5	0.2	Dry seeds	0.11, 0.11 (0.11)	15	CTL/CIEAR 03/E/96, 96-032-F-E Roland L., 1997 (CLTA10_221) [b] REMARK: sample size 0.3 kg
	WG 75	3	1.5	0.2	Dry seeds	0.10, 0.10 (0.10)	15	

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
Spain, Espejo 1996 (Pedro Sillano)	SC 50	3	1.5	0.2	Dry seeds	0.11, 0.10 (0.10)	15	CTL/CIEAR 03/E/96, 96-032-F-E Roland L., 1997 (CLTA10_221) [b] REMARK: sample size 0.3 kg
	WG 75	3	1.5	0.2	Dry seeds	0.10, 0.11 (0.11)	15	
Spain, Paterna del Campo 1995 (Blanco Lechoso)	SC 50	3	1.5	0.3	Dry seeds	0.10, 0.10 (0.10)	14	CTL/CIEAR 02/E/95, 95-020-F-E Roland L., 1996 (CLTA10_222) [b]
	WG 75	3	1.5	0.3	Dry seeds	0.29, 0.32 (0.31)	14	
Spain, Carretera la Carlota 1995 (Blanco Lechoso)	SC 50	3	1.5	0.3	Dry seeds	0.31, 0.36 (0.33)	14	CTL/CIEAR 02/E/95, 95-020-F-E Roland L., 1996 (CLTA10_222) [b]
	WG 75	3	1.5	0.3	Dry seeds	0.39, 0.39 (0.39)	14	
Spain, Montilla 1994 (Blanco)	SC 50	3	1.5	0.3	Dry seeds Seeds with pods	0.17, 0.16 (0.17) 11, 12 (12)	14 14	CTL/CIEAR 01/E/94, 94-001-F-E Roland L., 1995 (CLTA10_223) [b]
	WG 75	3	1.5	0.3	Dry seeds Seeds with pods	0.03, 0.03 (0.03) 11, 10 (11)	14 14	
Spain, Benalup 1994 (Blanco)	SC 50	3	1.5	0.3	Dry seeds Seeds with pods	0.02, 0.03 (0.03) 25, 22 (24)	14 14	CTL/CIEAR 01/E/94, 94-001-F-E Roland L., 1995 (CLTA10_223) [b]
	WG 75	3	1.5	0.3	Dry seeds Seeds with pods	0.42, 0.46 (0.44) 27, 24 (26)	14 14	

[a] before last treatment

[b] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 63 Chlorothalonil residues in soya beans following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Lexington (KY) 1979 (Williams)	SC 50	2	1.2		Seeds, dry	< 0.01 < 0.01 < 0.01 < 0.01 0.013 < 0.01	57 57 57 57 57 57	334-3CR-79-0113-001, Ballee D., 1980 (CLTA10_225)
United States, Gorin (MO) 1979 (Williams)	SC 50	2	1.2		Seeds, dry	< 0.01 0.011 0.014 0.014 0.011 0.017	45 45 45 45 45 45	334-3CR-79-0113-001, Ballee D., 1980 (CLTA10_225)
United States, Clarence (MO) 1979 (Williams)	SC 50	2	1.2		Seeds, dry	0.01 < 0.01 < 0.01 < 0.01 0.013 < 0.01	47 47 47 47 47 47	334-3CR-79-0113-001, Ballee D., 1980 (CLTA10_225)
United States, Painesville (OH) 1979 (Beeson)	SC 50	2	2.0		Seeds, dry	0.019 0.019 < 0.01 0.01 0.013 0.016	54 54 54 54 54 54	334-3CR-79-0113-001, Ballee D., 1980 (CLTA10_225) Formulation batch 8590225
United States, Painesville (OH) 1979 (Beeson)	SC 50	2	2.0		Seeds, dry	0.011 0.011 0.018 0.018 0.015 0.015	54 54 54 54 54 54	334-3CR-79-0113-001, Ballee D., 1980 (CLTA10_225) Formulation batch 2190325
United States, Lake Worth (FL) 1979 (not specified)	SC 50	2	2.0		Seeds, dry	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	43 43 43 43 43 43	334-3CR-79-0113-001, Ballee D., 1980 (CLTA10_225) Formulation batch 8590225
United States, Lake Worth (FL) 1979 (not specified)	SC 50	2	2.5		Seeds, dry	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	43 43 43 43 43 43	334-3CR-79-0113-001, Ballee D., 1980 (CLTA10_225) Formulation batch 2190325
United States, Lake Worth (FL) 1979 (not specified)	WP 75	2	2.5		Seeds, dry	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	43 43 43 43 43 43	334-3CR-79-0113-001, Ballee D., 1980 (CLTA10_225)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Beaumont (TX) 1979 (Davis)	SC 50	2	2.0		Seeds, dry	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	40 40 40 40 40 40	334-3CR-79-0113-001, Ballee D., 1980 (CLTA10_225) Formulation batch 2190325
United States, Washington (LA) 1986 (Forrest)	SC 72	3	1.7		Chlorothalonil Seeds (before drying) Seeds (after drying) Kernels Soya bean hulls Soya bean meal Crude oil Refined oil Soapstock Trash SDS-3701 Seeds (before drying) Seeds (after drying) Kernels Soya bean hulls Soya bean meal Crude oil Refined oil Soapstock Trash	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 0.02 0.03 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 1.2 1.2 0.02 0.02 < 0.01 < 0.01 < 0.01 0.02 0.01 0.02 0.02 0.03 < 0.01 < 0.01 < 0.01 < 0.01 0.02 0.02 0.25 0.25	 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68 68	1350-86-0058-CR-001, Kenyon R., 1987 (CLTA10_226)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Washington (LA) 1986 (Forrest)	SC 72	4	1.7		Chlorothalonil Seeds (before drying) Seeds (after drying) Kernels Soya bean hulls Soya bean meal Crude oil Refined oil Soapstock Trash SDS-3701 Seeds (before drying) Seeds (after drying) Kernels Soya bean hulls Soya bean meal Crude oil Refined oil Soapstock Trash	 0.02 0.02 0.02 0.02 < 0.01 0.01 0.07 0.07 < 0.01 < 0.01 0.03 0.02 < 0.01 < 0.01 < 0.01 < 0.01 0.49 0.39 0.03 0.03 < 0.01 < 0.01 0.01 < 0.01 0.03 0.03 0.02 0.02 < 0.01 < 0.01 < 0.01 < 0.01 0.04 0.05 0.22 0.20	 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13 13	1350-86-0058-CR-001, Kenyon R., 1987 (CLTA10_226)

Table 64 Chlorothalonil residues in maize seed following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Urbana (IL) 1982 (373)	SC 50	3	1.2		Maize seeds chlorothalonil SDS-3701	 0.02 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 61 61 61 61 61 61 61 61	638-3CR-83-0054-001, Kenyon R., 1983 (CLTA10_065)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Urbana (IL) 1982 (373)	SC 50	3	2.4		Maize seeds chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 61 61 61 61 61 61 61 61	638-3CR-83-0054-001, Kenyon R., 1983 (CLTA10_065)
United States, Lafayette (IN) 1982 (373)	SC 50	3	1.2		Maize seeds chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 35 35 35 35 35 35 35 35	638-3CR-83-0054-001, Kenyon R., 1983 (CLTA10_065)
United States, Lafayette (IN) 1982 (373)	SC 50	3	2.4		Maize seeds chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 35 35 35 35 35 35 35 35	638-3CR-83-0054-001, Kenyon R., 1983 (CLTA10_065)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States Crown Point (IN) 1993 (Pioneer 3475)	WP 72	7	1.2	0.63	Chlorothalonil Maize seeds grain dust grits Meal Flour Starch Presscake (dry milled) Presscake (wet milled) Crude oil (dry milled) Crude oil (wet milled) Refined oil (dry milled) Refined oil (wet milled) SDS-3701 Maize seeds grain dust grits Meal Flour Starch Presscake (dry milled) Presscake (wet milled) Crude oil (dry milled) Crude oil (wet milled) Refined oil (dry milled) Refined oil (wet milled)	 < 0.01 < 0.01 0.07 0.05 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45	5528-93-0090-CD-001, Fitzgerald T., 1993 (CLTA10_064) [a]

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 65 Chlorothalonil residues in almonds following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Ripon (CA) 1994 (Mission)	SC 50	6	3.5	0.37	Nutmeat chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 < 0.01	 148 148 148 148	5908-94-0239-CR-001, King C., 1995 (CLTA10_067) [a]
United States, Ripon (CA) 1994 (Mission)	SC 50	6	3.5	1.9	Nutmeat chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 < 0.01	 148 148 148 148	5908-94-0239-CR-001, King C., 1995 (CLTA10_067) [a]
United States, Madera (CA) 1994 (Butte Padre)	SC 50	5	3.5	0.37	Nutmeat chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 < 0.01	 156 156 156 156	5908-94-0239-CR-001, King C., 1995 (CLTA10_067) [a]
United States, Fresno (CA) 1994 (Non Pareil)	SC 50	5	3.5	0.37	Nutmeat chlorothalonil SDS-3701	 0.04 0.04 0.02 0.02 < 0.01 < 0.01	 163 163 163 163 163 163	5908-94-0239-CR-001, King C., 1995 (CLTA10_067) [a]
United States, Fresno (CA) 1994 (Non Pareil)	SC 50	5	3.5	1.9	Nutmeat chlorothalonil SDS-3701	 < 0.01 < 0.01 0.01 < 0.01 < 0.01 < 0.01	 163 163 163 163 163 163	5908-94-0239-CR-001, King C., 1995 (CLTA10_067) [a]
United States, Hughson (CA) 1994 (Price)	SC 50	6	3.5	0.4	Nutmeat chlorothalonil SDS-3701	 0.01 0.01 < 0.01 < 0.01	 170 170 170 170	5908-94-0239-CR-001, King C., 1995 (CLTA10_067) [a]
United States, Wheatland (CA) 1981 (Non Pareil)	SC 50	2	2.6		Nutmeat chlorothalonil SDS-3701	 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 197 197 197 197 197 197 197 197 197 197 197 197 197 197 197 197	488-3CR-82-0031-001, Stallard D., 1982 (CLTA10_068)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Wheatland (CA) 1981 (Non Pareil)	SC 50	2	3.5		Nutmeat chlorothalonil SDS-3701	 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 197 197 197 197 197 197 197 197 197 197 197 197 197 197 197 197	488-3CR-82-0031-001, Stallard D., 1982 (CLTA10_068)
United States, Wheatland (CA) 1981 (Non Pareil)	SC 50	2	2.6		Nutmeat chlorothalonil SDS-3701	 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 197 197 197 197 197 197 197 197 197 197 197 197 197 197 197 197	488-3CR-82-0031-001, Stallard D., 1982 (CLTA10_068) Remark: in combination with benlate
United States, Wheatland (CA) 1981 (Non Pareil)	SC 50	2	3.5		Nutmeat chlorothalonil SDS-3701	 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 197 197 197 197 197 197 197 197 197 197 197 197 197 197 197 197	488-3CR-82-0031-001, Stallard D., 1982 (CLTA10_068) Remark: in combination with benlate

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Parlier (CA) 1981 (Drake)	SC 50	2	4.7		Nutmeat chlorothalonil SDS-3701	 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 208 208 208 208 208 208 208 208 208 208 208	488-3CR-82-0031-001, Stallard D., 1982 (CLTA10_068)
United States, Parlier (CA) 1981 (Drake)	SC 50	2	9.4		Nutmeat chlorothalonil SDS-3701	 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 208 208 208 208 208 208 208 208 208 208 208	488-3CR-82-0031-001, Stallard D., 1982 (CLTA10_068)

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 66 Chlorothalonil residues in pistachios following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Tuscon (AZ) 1994 (Kerman)	WP 72	5	5.0		Nutmeat chlorothalonil SDS-3701	 < 0.01 < 0.01 < 0.01 < 0.01	 14 14 14 14	5196.92-AZ01 Anonymus, 1995 (CLTA10_224)
United States, Chico (CA) 1994 (Kerman)	WP 72	5	5.0		Nutmeat chlorothalonil SDS-3701	 0.14 0.081 < 0.01 < 0.01	 14 14 14 14	5196.92-CA68, Anonymus, 1995 (CLTA10_224)
United States, Madera (CA) 1994 (Kerman)	WP 72	5	5.0		Nutmeat chlorothalonil SDS-3701	 0.091 0.073 < 0.01 < 0.01	 14 14 14 14	5196.92-CA69, Anonymus, 1995 (CLTA10_224)

Table 67 Chlorothalonil residues in peanuts following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Lake Worth (FL) 1979 (Florunner)	SC 50	7	1.2		Nutmeat	< 0.01 < 0.01 < 0.01	0 7 14	334-3CR-81-0020-001, Kenyon R., 1985 (CLTA10_227) Formulation batch 8590225
	SC 50	7	1.2		Nutmeat	< 0.01 < 0.01 0.02	0 7 14	Formulation batch 2190325
	WP 75	7	1.3		Nutmeat	< 0.01 < 0.01 < 0.01	0 7 14	Formulation batch 2190325
United States, Yoakum (TX) 1979 (Tamnut 74)	SC 50	7	1.2		Nutmeat	< 0.01 0.03 0.01	1 8 11	334-3CR-81-0020-001, Kenyon R., 1985 (CLTA10_227)
United States, Tifton (GO) 1986 (not specified)	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	 0.02 0.03 < 0.01 < 0.01 < 0.03 < 0.03	 22 22 22 22 22 22	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Suffolk (VI) 1986 (not specified)	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	 < 0.01 < 0.01 < 0.01 < 0.01 0.03 < 0.03	 27 27 27 27 27 27	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Quincy (FL) 1986 (not specified)	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	 < 0.01 < 0.01 < 0.01 < 0.01 0.03 0.03	 12 12 12 12 12 12	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Headland (AL) 1986 (Florunner)	WP 72	8	1.3		Nutmeat chlorothalonil SDS-3701 R611965	 < 0.01 < 0.01 < 0.01 < 0.01 0.05 0.05	 17 17 17 17 17 17	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Yoakum (TX) 1986 (Tamnut 74)	SC 50	6	1.2		Nutmeat chlorothalonil SDS-3701 R611965	 0.01 0.01 < 0.01 < 0.01 < 0.03 < 0.03	 22 22 22 22 22 22	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Rocky Mount (NC) 1986 ()	SC 50	5	1.2		Nutmeat chlorothalonil SDS-3701 R611965	 < 0.01 < 0.01 0.02 0.02 0.03 0.04	 35 35 35 35 35 35	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Yoakum (TX) 1986 (Tamnut 74)	SC 50	6	1.2		Nutmeat chlorothalonil SDS-3701 R611965	 < 0.01 < 0.01 < 0.01 < 0.01 0.04 0.04	 13 13 13 13 13 13	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Yoakum (TX) 1986 (Tamnut 74)	SC 50	6	0.9		Nutmeat chlorothalonil SDS-3701 R611965	 < 0.01 < 0.01 < 0.01 < 0.01 0.05 0.05	 22 22 22 22 22 22	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Stephenville (TX) 1986 ()	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	 < 0.01 < 0.01 < 0.01 < 0.01 0.05 0.05	 17 17 17 17 17 17	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Stillwater (OK) 1986 ()	WP 72	6	1.3		Nutmeat chlorothalonil SDS-3701 R611965	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03	 43 43 43 43 43 43	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Blacksville (SC) 1986 ()	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	 < 0.01 < 0.01 0.03 0.03 0.03 0.03	 32 32 32 32 32 32	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Eakly (OK) 1991 (Okrun)	WP 72	8	1.3		Nutmeat chlorothalonil SDS-3701 R611965	 0.05 0.05 < 0.01 < 0.01 < 0.03 < 0.03	 14 14 14 14 14 14	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Eakly (OK) 1991 (Okrun)	WP 72	8	1.3		Nutmeat chlorothalonil SDS-3701 R611965	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03	 21 21 21 21 21 21	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Pinehurst (GO) 1991 (Florunner)	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	< 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03	14 14 14 14 14 14	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Pinehurst (GO) 1991 (Florunner)	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	< 0.01 < 0.01 < 0.01 < 0.01 0.05 0.03 < 0.03 0.03	21 21 21 21 21 21 21 21	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Meigs (GO) 1991 (Florunner)	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	< 0.01 < 0.01 < 0.01 < 0.01 < 0.03 0.03	14 14 14 14 14 14	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Meigs (GO) 1991 (Florunner)	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	< 0.01 < 0.01 < 0.01 < 0.01 < 0.03 0.03	21 21 21 21 21 21	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Malone (FL) 1991 (Florunner)	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	< 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03	14 14 14 14 14 14	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Malone (FL) 1991 (Florunner)	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	< 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03	21 21 21 21 21 21	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Lucama (NC) 1991 (Florigiant)	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	< 0.01 < 0.01 < 0.01 < 0.01 0.03 0.06	15 15 15 15 15 15	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Lucama (NC) 1991 (Florigiant)	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	< 0.01 < 0.01 < 0.01 < 0.01 0.04 0.04	22 22 22 22 22 22	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Grangerburg (AL) 1991 (Florunner)	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	 < 0.01 < 0.01 < 0.01 < 0.01 < 0.03 < 0.03	 14 14 14 14 14 14	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Grangerburg (AL) 1991 (Florunner)	WP 72	7	1.3		Nutmeat chlorothalonil SDS-3701 R611965	 < 0.01 < 0.01 < 0.01 < 0.01 0.09 0.16 0.10 0.12	 21 21 21 21 21 21 21 21	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)

Table 68 Chlorothalonil residues in sweet corn forage following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Hillsboro (OR) 1995 (Golden Jubilee)	WP 72	8	1.3		Forage chlorothalonil SDS-3701	 28 28 0.05 0.05	 14 14 14 14	6513-95-0270-CR-001, Dillon K., 1996 (CLTA10_066) [a]
United States, Germansville (PA) 1995 (not specified)	WP 72	8	1.3		Forage chlorothalonil SDS-3701	 61 56 0.07 0.07	 14 14 14 14	6513-95-0270-CR-001, Dillon K., 1996 (CLTA10_066) [a]
United States, Arkansaw (WI) 1995 (not specified)	WP 72	8	1.3		Forage chlorothalonil SDS-3701	 7.6 8.7 0.06 0.07	 14 14 14 14	6513-95-0270-CR-001, Dillon K., 1996 (CLTA10_066) [a]

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 69 Chlorothalonil residues in maize stover following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Urbana (IL) 1982 (373)	SC 50	3	1.2		Maize seeds chlorothalonil SDS-3701	 7.9 5.4 5.3 4.8 0.013 0.011 0.011 0.011	 61 61 61 61 61 61 61 61	638-3CR-83-0054-001, Kenyon R., 1983 (CLTA10_065)
United States, Urbana (IL) 1982 (373)	SC 50	3	2.4		Maize seeds chlorothalonil SDS-3701	 1.9 1.4 4.2 1.2 < 0.01 < 0.01 < 0.01 < 0.01	 61 61 61 61 61 61 61 61	638-3CR-83-0054-001, Kenyon R., 1983 (CLTA10_065)
United States, Lafayette (IN) 1982 (373)	SC 50	3	1.2		Maize seeds chlorothalonil SDS-3701	 3.5 6.4 < 0.01 < 0.01	 35 35 35 35	638-3CR-83-0054-001, Kenyon R., 1983 (CLTA10_065)
United States, Lafayette (IN) 1982 (373)	SC 50	3	2.4		Maize seeds chlorothalonil SDS-3701	 6.5 7.0 0.014 0.015	 35 35 35 35	638-3CR-83-0054-001, Kenyon R., 1983 (CLTA10_065)

Table 70 Chlorothalonil residues in almond hulls following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Ripon (CA) 1994 (Mission)	SC 50	6	3.5	0.37	Hulls chlorothalonil SDS-3701	 0.44 0.63 < 0.01 < 0.01	 148 148 148 148	5908-94-0239-CR-001, King C., 1995 (CLTA10_067) [a]
United States, Ripon (CA) 1994 (Mission)	SC 50	6	3.5	1.9	Hulls chlorothalonil SDS-3701	 1.1 1.0 < 0.01 < 0.01	 148 148 148 148	5908-94-0239-CR-001, King C., 1995 (CLTA10_067) [a]
United States, Madera (CA) 1994 (Butte Padre)	SC 50	5	3.5	0.37	Hulls chlorothalonil SDS-3701	 0.02 0.03 < 0.01 < 0.01	 156 156 156 156	5908-94-0239-CR-001, King C., 1995 (CLTA10_067) [a]

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Fresno (CA) 1994 (Non Pareil)	SC 50	5	3.5	0.37	Hulls chlorothalonil SDS-3701	 0.09 0.04 < 0.01 < 0.01	 163 163 163 163	5908-94-0239-CR-001, King C., 1995 (CLTA10_067) [a]
United States, Fresno (CA) 1994 (Non Pareil)	SC 50	5	3.5	1.9	Hulls chlorothalonil SDS-3701	 0.03 0.02 < 0.01 < 0.01	 163 163 163 163	5908-94-0239-CR-001, King C., 1995 (CLTA10_067) [a]
United States, Hughson (CA) 1994 (Price)	SC 50	6	3.5	0.4	Hulls chlorothalonil SDS-3701	 0.88 0.91 < 0.01 < 0.01	 170 170 170 170	5908-94-0239-CR-001, King C., 1995 (CLTA10_067) [a]
United States, Wheatland (CA) 1981 (Non Pareil)	SC 50	2	2.6		Hulls chlorothalonil SDS-3701	 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 197 197 197 197 197 197 197 197 197 197 197 197 197 197 197 197	488-3CR-82-0031-001, Stallard D., 1982 (CLTA10_068)
United States, Wheatland (CA) 1981 (Non Pareil)	SC 50	2	3.5		Hulls chlorothalonil SDS-3701	 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 197 197 197 197 197 197 197 197 197 197 197 197 197 197 197 197	488-3CR-82-0031-001, Stallard D., 1982 (CLTA10_068)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Wheatland (CA) 1981 (Non Pareil)	SC 50	2	2.6		Hulls chlorothalonil SDS-3701	 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 197 197 197 197 197 197 197 197 197 197 197 197 197 197 197	488-3CR-82-0031-001, Stallard D., 1982 (CLTA10_068) Remark: in combination with benlate
United States, Wheatland (CA) 1981 (Non Pareil)	SC 50	2	3.5		Hulls chlorothalonil SDS-3701	 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 197 197 197 197 197 197 197 197 197 197 197 197 197 197 197	488-3CR-82-0031-001, Stallard D., 1982 (CLTA10_068) Remark: in combination with benlate
United States, Parlier (CA) 1981 (Drake)	SC 50	2	4.7		Hulls chlorothalonil SDS-3701	 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 208 208 208 208 208 208 208 208 208 208 208 208 208	488-3CR-82-0031-001, Stallard D., 1982 (CLTA10_068)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Parlier (CA) 1981 (Drake)	SC 50	2	9.4		Hulls chlorothalonil SDS-3701	 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03 < 0.03	 208 208 208 208 208 208 208 208 208 208 208	488-3CR-82-0031-001, Stallard D., 1982 (CLTA10_068)

[a] extracted at ambient temperature or without addition of sulphuric acid before homogenisation

Table 71 Chlorothalonil residues in peanut hulls following foliar application

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Lake Worth (FL) 1979 (Florunner)	SC 50	7	1.2		Hulls	0.02 < 0.01 0.02	0 7 14	334-3CR-81-0020-001, Kenyon R., 1985 (CLTA10_227) Formulation batch 8590225
United States, Lake Worth (FL) 1979 (Florunner)	SC 50	7	1.2		Hulls	0.01 0.04 0.05	0 7 14	334-3CR-81-0020-001, Kenyon R., 1985 (CLTA10_227) Formulation batch 2190325
United States, Lake Worth (FL) 1979 (Florunner)	WP 75	7	1.3		Hulls	< 0.01 < 0.01 0.02	0 7 14	334-3CR-81-0020-001, Kenyon R., 1985 (CLTA10_227) Formulation batch 2190325
United States, Yoakum (TX) 1979 (Tamnut 74)	SC 50	7	1.2		Hulls	0.02 < 0.01 0.02	1 8 11	334-3CR-81-0020-001, Kenyon R., 1985 (CLTA10_227)
United States, Tifton (GO) 1986 (not specified)	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.20 0.15 0.12 0.13 0.03 < 0.03	 22 22 22 22 22 22	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Suffolk (VI) 1986 (not specified)	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.10 0.11 < 0.01 < 0.01 < 0.03 < 0.03	 27 27 27 27 27 27	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Quincy (FL) 1986 (not specified)	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.02 0.02 < 0.01 < 0.01 0.03 0.04	 12 12 12 12 12 12	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Headland (AL) 1986 (Florunner)	WP 72	8	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.08 0.08 0.10 0.10 0.04 0.04	 17 17 17 17 17 17	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Yoakum (TX) 1986 (Tamnut 74)	SC 50	6	1.2		Hulls chlorothalonil SDS-3701 R611965	 0.05 0.06 0.07 0.08 0.05 0.05	 22 22 22 22 22 22	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Rocky Mount (NC) 1986 ()	SC 50	5	1.2		Hulls chlorothalonil SDS-3701 R611965	 0.09 0.09 0.03 0.03 < 0.03 < 0.03	 35 35 35 35 35 35	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Yoakum (TX) 1986 (Tamnut 74)	SC 50	6	1.2		Hulls chlorothalonil SDS-3701 R611965	 0.04 0.04 0.09 0.09 < 0.03 < 0.03	 13 13 13 13 13 13	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Yoakum (TX) 1986 (Tamnut 74)	SC 50	6	0.9		Hulls chlorothalonil SDS-3701 R611965	 0.07 0.07 0.07 0.10 0.03 0.03	 22 22 22 22 22 22	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Stephenville (TX) 1986 ()	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.08 0.07 0.57 0.56 0.35 0.35 < 0.03 < 0.03	 17 17 17 17 17 17 17 17	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Stillwater (OK) 1986 ()	WP 72	6	1.3		Hulls chlorothalonil SDS-3701 R611965	 < 0.01 < 0.01 0.02 0.02 0.04 0.04	 43 43 43 43 43 43	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Blacksville (SC) 1986 ()	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.03 0.03 < 0.01 < 0.01 < 0.03 < 0.03	 32 32 32 32 32 32	1424-86-0094-CR-001, King C., 1988 (CLTA10_228)
United States, Eakly (OK) 1991 (Okrun)	WP 72	8	1.3		Hulls chlorothalonil SDS-3701 R611965	 1.0 1.2 0.64 0.78 < 0.03 < 0.03	 14 14 14 14 14 14	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Eakly (OK) 1991 (Okrun)	WP 72	8	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.32 0.30 0.38 0.33 < 0.03 < 0.03	 21 21 21 21 21 21	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Pinehurst (GO) 1991 (Florunner)	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.77 0.81 0.16 0.18 0.03 0.04	 14 14 14 14 14 14	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Pinehurst (GO) 1991 (Florunner)	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.41 0.31 0.16 0.11 0.03 0.03	 21 21 21 21 21 21	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)

Location, Year (variety)	Form, % ai	Application data			Residues data			Reference (Report, Trial No., Author)
		No.	kg ai/ha	kg ai/hL	Sample	Residues [mg/kg]	PHI [days]	
United States, Meigs (GO) 1991 (Florunner)	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.12 0.13 0.14 0.13 0.03 0.03	 14 14 14 14 14 14	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Meigs (GO) 1991 (Florunner)	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.19 0.20 0.19 0.21 0.06 0.07	 21 21 21 21 21 21	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Malone (FL) 1991 (Florunner)	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.74 0.71 1.7 1.2 0.16 0.09	 14 14 14 14 14 14	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Malone (FL) 1991 (Florunner)	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.21 0.26 0.11 0.08 0.11 0.08	 21 21 21 21 21 21	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Lucama (NC) 1991 (Florigiant)	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.41 0.41 0.09 0.10 0.10 0.08	 15 15 15 15 15 15	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Lucama (NC) 1991 (Florigiant)	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.70 0.89 0.06 0.07 0.07 0.06	 22 22 22 22 22 22	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Grangerburg (AL) 1991 (Florunner)	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.54 0.53 0.14 0.12 0.05 0.04	 14 14 14 14 14 14	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)
United States, Grangerburg (AL) 1991 (Florunner)	WP 72	7	1.3		Hulls chlorothalonil SDS-3701 R611965	 0.48 0.36 0.62 0.67 0.13 0.15	 21 21 21 21 21 21	5064-92-0123-CR-001, King C., 1993 (CLTA10_069)

FATE OF RESIDUES IN STORAGE AND PROCESSING

In processing

The Meeting received information on the fate of incurred residues of chlorothalonil during the processing of grapes, strawberries, tomatoes, courgettes, cucumbers, winter squash, head cabbage, leek and French beans. Also information was provided on hydrolysis studies of chlorothalonil to assist with identification of the nature of the residue during processing.

Processing factors have been calculated for chlorothalonil and SDS-3701 residues and are presented in Table 74.

Hydrolysis of chlorothalonil was investigated by Grout S., which is described in the Physical/Chemical properties section of this document. ^{14}C-phenyl-labelled chlorothalonil was stable at pH 4, 5 and 6 at temperatures below 100°C (> 70% of the initial amount remaining). At 120°C at pH 6, which were selected as representative conditions for sterilisation, less than 30% of the parent substance was recovered. Most of the radioactivity was identified as SDS-3701 (47.5-58.7% of the TRR) and R613636 (15.2-23.1% of the TRR).

The hydrolysis study indicates a possible transformation of chlorothalonil residues into the SDS-3701 during processing. For a better utilization of chlorothalonil residues found in supervised field trials in the dietary risk assessment of SDS-3701, an additional processing factor for risk assessment purposes was derived (chlorothalonil → SDS-3701).

Grape processing

For the investigation of the processing behaviour of chlorothalonil residues in grape products several supervised field trials were carried out by Kennedy E., (1994, CLTA10_243), Hubert M. (1994, CLTA10_244 & 1995, CLTA10_246) and Communal P. (1995, CLTA10_245). In addition, processing information from transfer studies are available from Kenyon R. (1983, CLTA10_247).

In the first study by Kennedy E., grapes in Southern France were treated 10 times with chlorothalonil at a rate of 1 kg ai/ha. Samples of raw grapes were collected 21 days after the final application and processed into red wine following common practice. In the RAC residues of chlorothalonil of 2.6 mg/kg were detected. After processing no chlorothalonil residues above the LOQ for chlorothalonil or SDS-3701 (0.01 mg/kg each) were found in red wine.

Several studies on grape processing were conducted by Hubert in Southern France. Grapes were processed into must and red wine following the common processing practice for wine making. While the concentration of residue from grapes to must decreased only moderately (0.67–2.7 mg/kg in grapes, 0.03–2.3 mg/kg in must), no chlorothalonil residues above the LOQ of 0.01 mg/kg could be found in red wine.

A set of three studies on grapes in Southern France was conducted by Communal P. in 1994. Again red wine grape was processed into must and red wine following common practices for wine making. A moderate decrease in residue levels for chlorothalonil was observed for the processing into must (1.1–1.2 mg/kg in grapes, 0.37–1.1 mg/kg in must). In red wine no chlorothalonil residues above the LOQ of 0.01 mg/kg were detected.

In a processing transfer study by Kenyon R. grapes from Chile treated 7 times at a rate of 0.75 kg ai/ha each were processed into juice, raisins and pomace. All matrices were analysed for chlorothalonil and its metabolite SDS-3701. In grapes RAC initial residues were at a level of 10.2 mg/kg. The residue level for chlorothalonil decreased in all processed commodities except grape stems. A scheme of the process is presented in Figure 4. Residues found in the individual processed products are presented in Table 72.

Table 72 Residues in grapes and its processed products

Commodity	Chlorothalonil residue in mg/kg	SDS-3701 residue in mg/kg
Grapes (RAC)	9.3, 8.3, 9.8, 13.5 (Mean: 10.2)	0.03, 0.03, 0.04, 0.04 (Mean: 0.04)
Wash water	0.29, 0.30 (Mean: 0.29)	0.009, 0.002 (Mean: 0.006)
Washed grapes	2.1, 1.6 (Mean: 1.9)	0.02, 0.02 (Mean: 0.02)
Grape stems	45, 56 (Mean: 50)	0.56, 0.58 (Mean: 0.57)
Wet pomace	6.8, 5.5 (Mean: 6.2)	0.06, 0.06 (Mean: 0.06)
Dry pomace (oven dried)	3.9, 2.9 (Mean: 3.4)	0.13, 0.08 (Mean: 0.11)
Juice, raw	0.22, 0.21 (Mean: 0.22)	< 0.01, < 0.01 (Mean: < 0.01)
Juice, canned	0.14, 0.14 (Mean: 0.14)	< 0.01, < 0.01 (Mean: < 0.01)
Raisins, air dried	0.08, 0.10 (Mean: 0.09)	0.04, 0.03 (Mean: 0.04)
Raisins, UV light dried	0.06, 0.06 (Mean: 0.06)	0.02, 0.03 (Mean: 0.03)

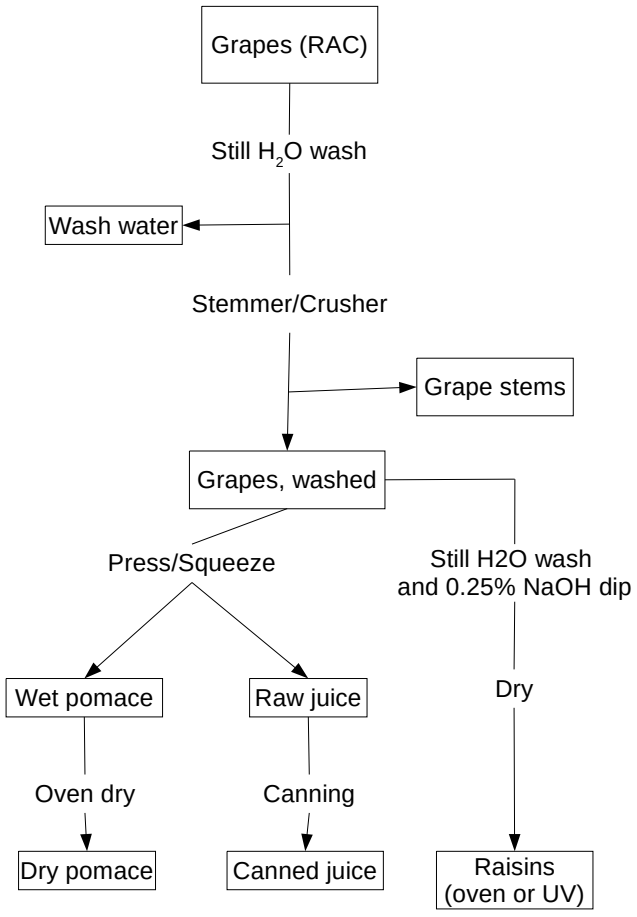


Figure 4 Processing scheme for grape products

In a second transfer study by King C. (1994, CLTA10_248) based on supervised field trial on grapes in the USA the crop was treated with seven application at a rate of 3.4 kg ai/ha each (see Table 34). Samples were collected after 30 days and processed into raisins, wet and dry pomace and juice. In raisins and juice a decline in the residue level could be observed for parent chlorothalonil (RAC 8.4 mg/kg, raisins 4.3 mg/kg, juice 2.2 mg/kg) while residues of SDS-3701 remained more or less stable (RAC 0.035 mg/kg, raisins 0.065 mg/kg, juice < 0.01 mg/kg). Pomace (wet and dry) as well as raisin waste gave higher residues for chlorothalonil in comparison to the RAC (wet pomace 16 mg/kg, dry pomace 13 mg/kg, raisin waste 17 mg/kg).

Strawberry processing

The influence of processing on residues in strawberries was investigated by Gill J. (2000, CLTA10_102 and CLTA10_103). Strawberries grown in foil tunnels were treated with application rates of 3 × 1.5 kg ai/ha and processed into canned fruits, syrup and jam. Residue levels of parent chlorothalonil decreased after all processing steps. The metabolite SDS-3701 was not investigated in these studies. An overview of the corresponding residue values is presented in Table 36.

Leek processing

In two supervised field trials on leek conducted in United Kingdom by Richards S. (2001, CLTA10_254) the plants were treated three times with application rates of 1.5 kg ai/ha each (see Table 42). Samples of whole plants were collected seven days after the final treatment and processed into boiled or steamed leek. All samples were analysed for parent chlorothalonil.

Cabbage processing

The influence of cooking was investigated on residues in cabbage in a study conducted by Gardinal P. (2006, CLTA10_253). In one supervised field trial conducted in Switzerland (see Table 44) cabbage was treated two times with application rates of 7.6 kg ai/ha each. Samples were collected after 7 days and processed into cooked cabbage and various waste commodities. For the process of cooking three follow-up studies were conducted. All samples were analysed for chlorothalonil, SDS-3701 and R613636, although the later was not detected in any sample.

Courgette processing

In a study by McGill C. (2002, CLTA10_250) involving three supervised field trials in UK the residue behaviour of chlorothalonil during processing of courgettes was investigated. The plants were treated 4 times with 1.5 kg ai/ha each. Samples intended for processing were collected after 1 day and processed into boiled, steamed or fried courgettes. The metabolite SDS-3701 was not investigated in these studies. An overview of the corresponding supervised field trials and the individual residue values are presented in Table 46.

Cucumber processing

The processing of cucumbers into pickles was investigated in one study conducted in the United States by King C. (1987, CLTA10_252). The plants were treated with 2 application at 2.7 kg ai/ha each. Cucumbers collected 12 hours after treatment were processed into brined pickle slices, hot canned pickles or cold canned pickles. A summary of the supervised field trial including residue values is presented in Table 47. All samples were analysed for chlorothalonil, SDS-3701 and R611965, although the later was not detected in any sample and is therefore not considered for the estimation of processing factors.

Winter squash processing

In a study conducted by King C. (1990, CLTA10_251) winter squash obtained from one supervised field trial in the United States was processed into peeled squash, baby foods and several by-products. The plants were treated with eleven application of 2.5 kg ai/ha and samples immediately after the final

treatment. A summary of the supervised field trial including residue values is presented in Table 51. All samples were analysed for chlorothalonil, SDS-3701 and R611965.

Tomato processing

In a study by Gardinal P. (2006, CLTA10_258) outdoor tomatoes grown in Southern France were treated with chlorothalonil with application rates of 7.5 kg chlorothalonil/ha. Samples were harvested 3 days after the last application and used for the production of tomato juice, tomato puree and canned tomatoes (see Figure 5). Samples of various processed commodities were analysed for chlorothalonil, SDS-3701 and R613636. A full mass balance study was conducted to determine the accountability of the chlorothalonil residue, and three follow-up studies were conducted to determine residue transfer into the processed commodities. An overview of all chlorothalonil and SDS-3701 residues found is presented in Table 73. For R613636 residues in RAC were not analysed and in processed products only blanched tomatoes gave a residue above the LOQ of 0.01 mg/kg (0.07 mg/kg in blanched tomatoes).

Table 73 Residues in tomatoes and its processed products

Commodity	Chlorothalonil residue in mg/kg	SDS-3701 residue in mg/kg
Tomato (RAC)	9.6	0.02
Crushed tomato	2.5, 3.5	< 0.01, < 0.01
Wet pomace	0.09, 3.1	0.03, 0.38
Dry pomace	10, 12, 12, 13	0.25, 0.28, 0.31, 0.36
Raw juice	2.9	0.01
Bottled juice	0.87, 1.0, 1.1, 1.2	0.02, 0.02, 0.02, 0.03
Reduced tomato	0.05	0.24
Sieved tomato	< 0.01	0.15
Puree, pre-sterilisation	< 0.01	0.14
Puree, post-sterilisation	< 0.01, < 0.01, < 0.01, < 0.01	0.11, 0.12, 0.13, 0.15
Blanched tomatoes	1.0	0.03
Peeled tomatoes	0.24	< 0.01
Peel	28	0.03
Canned tomatoes	< 0.01, < 0.01, < 0.01, < 0.01	0.02, 0.04, 0.04, 0.05

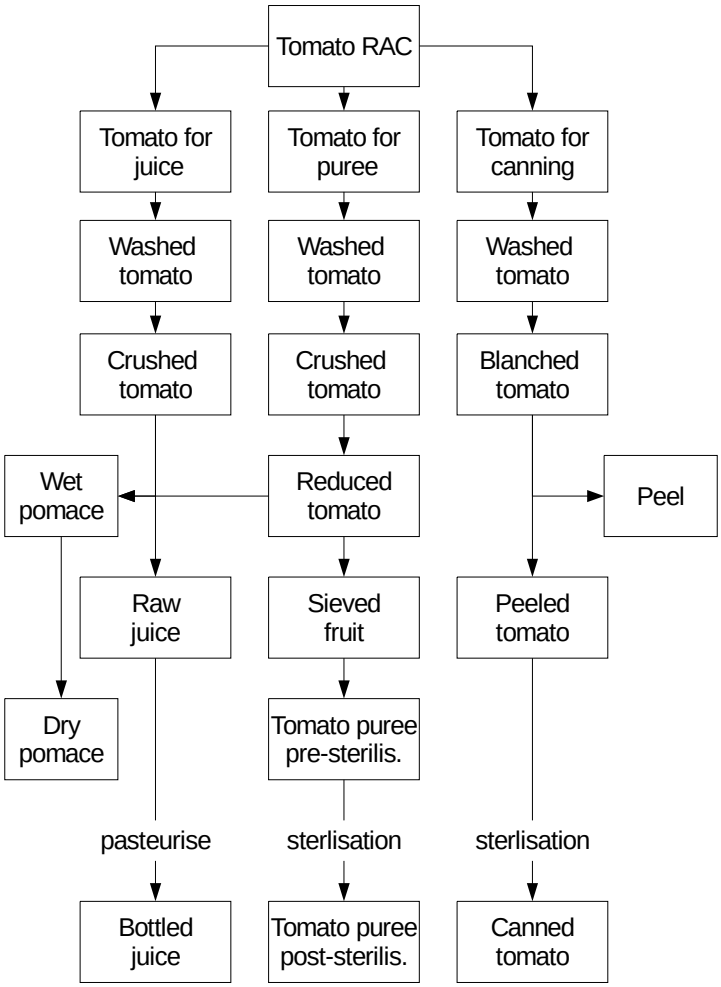


Figure 5 Processing scheme for tomato products

French bean processing

For the investigation of the residue behaviours of chlorothalonil during French bean processing a transfer study was conducted by Gardinal P. (2007, CLTA10_255) in Northern France. The plants were treated twice at application rates of 7.4 kg ai/ha each (see Table 60). Samples of fresh beans with pods were collected after 7 days and processed into blanched, canned and cooked beans. For the process of cooking and canning three follow-up studies were conducted. All samples were analysed for chlorothalonil, SDS-3701 and R613636, although the later was not detected in any sample.

Table 74 Summary of processing factors for chlorothalonil in plant commodities

Raw agricultural commodity (RAC)	Processed commodity	Calculated processing factors	Median or best estimate
Chlorothalonil (chlorothalonil → chlorothalonil)			
Grapes	Must	Chlorothalonil: 0.31, 0.36, 0.42, 0.67, 0.72, 0.85,	Chlorothalonil: 0.67

Raw agricultural commodity (RAC)	Processed commodity	Calculated processing factors	Median or best estimate
		0.92	
	Wine, red	Chlorothalonil: < 0.01(6), < 0.02, < 0.02	Chlorothalonil: < 0.01
	Raisins	Chlorothalonil: 0.01, 0.51	Chlorothalonil: 0.26
	Juice, unpasteurized	Chlorothalonil: 0.02, 0.26	Chlorothalonil: 0.14
	Juice, pasteurized	Chlorothalonil: 0.01	Chlorothalonil: 0.01
	Pomace, wet	Chlorothalonil: 0.61, 1.9	Chlorothalonil: 1.3
	Pomace, dry	Chlorothalonil: 0.33, 1.5	Chlorothalonil: 0.78
Strawberries	Canned fruit	Chlorothalonil: 0.3, 0.44, 0.45	Chlorothalonil: 0.44
	Syrup	Chlorothalonil: 0.06, 0.08, 0.16	Chlorothalonil: 0.08
	Jam	Chlorothalonil: 0.02, 0.06, 0.08	Chlorothalonil: 0.06
Leek	Boiled leeks	Chlorothalonil: < 0.001, < 0.001	Chlorothalonil: < 0.001
	Steamed leeks	Chlorothalonil: < 0.001, < 0.001	Chlorothalonil: < 0.001
Head cabbage	Cooked cabbage	Chlorothalonil: < 0.001, < 0.001, 0.002, < 0.001	Chlorothalonil: 0.002
	Cores and leaves	Chlorothalonil: 1.9	Chlorothalonil: 1.9
Courgettes	Boiled courgettes	Chlorothalonil: < 0.01, 0.01, < 0.02,	Chlorothalonil: 0.01
	Steamed courgettes	Chlorothalonil: < 0.01, < 0.01, < 0.02,	Chlorothalonil: < 0.01
	Fried courgettes	Chlorothalonil: 0.08, 0.09, 0.12	Chlorothalonil: 0.09
Cucumbers	Brined pickle slices	Chlorothalonil: 0.29	Chlorothalonil: 0.29
	Cold canned pickles	Chlorothalonil: 0.09	Chlorothalonil: 0.09
	Hot canned pickles	Chlorothalonil: 0.02	Chlorothalonil: 0.02
Winter squash	Squash pulp	Chlorothalonil: < 0.01	Chlorothalonil: < 0.01
	Cooked squash	Chlorothalonil: < 0.01	Chlorothalonil: < 0.01
	Squash waste	Chlorothalonil: 0.05	Chlorothalonil: 0.05
	Baby food	Chlorothalonil: < 0.01	Chlorothalonil: < 0.01
Tomato	Crushed tomato	Chlorothalonil: 0.26, 0.36	Chlorothalonil: 0.31
	Wet pomace	Chlorothalonil: 0.01, 0.32	Chlorothalonil: 0.32
	Dry pomace	Chlorothalonil: 1.0, 1.3, 1.3, 1.4	Chlorothalonil: 1.3
	Raw juice	Chlorothalonil: 0.30	Chlorothalonil: 0.3
	Bottled juice	Chlorothalonil: 0.09, 0.1, 0.11, 0.13	Chlorothalonil: 0.11 SDS-3701: 1.1
	Reduced tomato	Chlorothalonil: 0.005	Chlorothalonil: 0.005
	Sieved tomato	Chlorothalonil: < 0.01	Chlorothalonil: < 0.01
	Puree, pre-sterilisation	Chlorothalonil: < 0.01	Chlorothalonil: < 0.01
	Puree, post-sterilisation	Chlorothalonil: < 0.01, < 0.01, < 0.01, < 0.01	Chlorothalonil: < 0.01

Raw agricultural commodity (RAC)	Processed commodity	Calculated processing factors	Median or best estimate
	Blanched tomato	Chlorothalonil: 0.1	Chlorothalonil: 0.1
	Peeled tomato	Chlorothalonil: 0.03	Chlorothalonil: 0.03
	Peel	Chlorothalonil: 2.9	Chlorothalonil: 2.9
	Canned tomato	Chlorothalonil: < 0.01, < 0.01, < 0.01, < 0.01	Chlorothalonil: < 0.01
French beans	Blanched beans	Chlorothalonil: 0.02	Chlorothalonil: 0.02
	Canned beans	Chlorothalonil: < 0.001, < 0.001, < 0.001, < 0.001	Chlorothalonil: < 0.001
	Cooked beans	Chlorothalonil: 0.003, 0.004, 0.003, < 0.001	Chlorothalonil: 0.003
	Tips	Chlorothalonil: 1.2, 2	Chlorothalonil: 1.6
SDS-3701 (SDS-3701 → SDS-3701)			
Grapes	Must	SDS-3701: < 1, < 1	SDS-3701: < 1
	Wine, red	SDS-3701: < 0.11, < 1, < 1	SDS-3701: < 0.11
	Raisins	SDS-3701: 0.57, 1	SDS-3701: 0.79
	Juice, unpasteurized	SDS-3701: < 0.25, < 0.29	SDS-3701: < 0.27
	Juice, pasteurized	SDS-3701: < 0.25	SDS-3701: < 0.25
	Pomace, wet	SDS-3701: 0.86, 1.5	SDS-3701: 1.2
	Pomace, dry	SDS-3701: 2.8, 3.4	SDS-3701: 3.1
Head cabbage	Cooked cabbage	SDS-3701: < 0.5, < 0.5, < 0.5, < 0.5	SDS-3701: < 0.5
	Cores and leaves	SDS-3701: 1.5	SDS-3701: 1.5
Cucumbers	Brined pickle slices	SDS-3701: < 1	SDS-3701: < 1
	Cold canned pickles	SDS-3701: < 1	SDS-3701: < 1
	Hot canned pickles	SDS-3701: < 1	SDS-3701: < 1
Winter squash	Squash pulp	SDS-3701: < 0.5	SDS-3701: < 0.5
	Cooked squash	SDS-3701: < 0.5	SDS-3701: < 0.5
	Squash waste	SDS-3701: < 0.5	SDS-3701: < 0.5
	Baby food	SDS-3701: < 0.5	SDS-3701: < 0.5
Tomato	Crushed tomato	SDS-3701: < 0.5, < 0.5	SDS-3701: < 0.5
	Wet pomace	SDS-3701: 1.5, 19	SDS-3701: 19
	Dry pomace	SDS-3701: 13, 14, 16, 18	SDS-3701: 15
	Raw juice	SDS-3701: 0.5	SDS-3701: 0.5
	Bottled juice	SDS-3701: 1, 1, 1, 1.5	SDS-3701: 1.1
	Reduced tomato	SDS-3701: 12	SDS-3701: 12
	Sieved tomato	SDS-3701: 8	SDS-3701: 8
	Puree, pre-sterilisation	SDS-3701: 7	SDS-3701: 7
	Puree, post-sterilisation	SDS-3701: 5.5, 6, 6.5, 7.5	SDS-3701: 6.5
	Blanched tomato	SDS-3701: 1.5	CSDS-3701:1.5
	Peeled tomato	SDS-3701: < 0.5	SDS-3701: < 0.5
	Peel	SDS-3701: 1.5	SDS-3701: 1.5
	Canned tomato	SDS-3701: 1, 2, 2, 2.5	SDS-3701: 2

Raw agricultural commodity (RAC)	Processed commodity	Calculated processing factors	Median or best estimate
French beans	Blanched beans	SDS-3701: 0.5	SDS-3701: 0.5
	Canned beans	SDS-3701: 0.5, 0.75, 0.5, 0.5	SDS-3701: 0.5
	Cooked beans	SDS-3701: 0.5, 0.5, 0.5, 0.5	SDS-3701: 0.5
	Tips	SDS-3701: 1.5, 1.8	SDS-3701: 1.7
R613636 (R613636 → R613636)			
Winter squash	Squash pulp	R613636: 0.66	R613636: 0.66
	Cooked squash	R613636: < 0.5	R613636: < 0.5
	Squash waste	R613636: 0.66	R613636: 0.66
	Baby food	R613636: < 0.5	R613636: < 0.5

Table 75 Summary of processing factors for chlorothalonil into SDS-3701 (chlorothalonil → SDS-3701) in plant commodities

Raw agricultural commodity (RAC)	Processed commodity	Calculated processing factors chlorothalonil → SDS-3701	Median or best estimate
Grapes	Wine, red	< 0.004, < 0.02, < 0.26	< 0.02
	Raisins	0.002, 0.004	0.003
	Juice, unpasteurized	< 0.001, < 0.001	< 0.001
	Juice, pasteurized	< 0.001	< 0.001
	Pomace, wet	0.004, 0.006	0.005
	Pomace, dry	0.01, 0.014	0.012
Head cabbage	Cooked cabbage	< 0.001(4)	< 0.001
	Cores and leaves	0.001	0.001
Cucumbers	Pickle slices	< 0.001	< 0.001
	Cold canned pickles	< 0.001	< 0.001
	Hot canned pickles	< 0.001	< 0.001
Winter squash	Squash pulp	< 0.003	< 0.003
	Cooked squash	< 0.003	< 0.003
	Squash waste	< 0.003	< 0.003
	Baby food	< 0.003	< 0.003
Tomato	Crushed tomato	< 0.001, < 0.001	< 0.001
	Wet pomace	0.003, 0.04	0.022
	Dry pomace	0.03(3), 0.04	0.03
	Raw juice	0.001	0.001
	Bottled juice	0.002(4)	0.002
	Reduced tomato	0.02	0.02
	Sieved tomato	0.02	0.02
	Puree, pre-sterilisation	0.01	0.01
	Puree, post-sterilisation	0.01(3), 0.02	0.01
	Blanched tomato	0.003	0.003
	Peeled tomato	< 0.001	< 0.001
	Peel	0.003	0.003

Raw agricultural commodity (RAC)	Processed commodity	Calculated processing factors chlorothalonil → SDS-3701	Median or best estimate
	Canned tomato	0.002, 0.004, 0.004, 0.005	0.004
French beans	Blanched beans	0.003	0.003
	Canned beans	0.003(4)	0.003
	Cooked beans	0.003(4)	0.003
	Tips	0.01, 0.01	0.01

RESIDUES IN ANIMAL COMMODITIES

Farm animal feeding studies

Farm animal feeding studies are available for lactating cows. In this study by Wiedmann J. (1995, CLTA10_256) lactating cows (4 per dose group) were administered daily doses of chlorothalonil and SDS-3701 via gelatine capsule (body weight between 500 to 550 kg per animal). The dose levels of the animals were 1.5 ppm chlorothalonil/0.1 ppm SDS-3701 (0.5×), 3 ppm chlorothalonil/0.2 ppm SDS-3701 (1×), 9 ppm chlorothalonil/0.6 ppm SDS-3701 (3×) and 30 ppm chlorothalonil/2.0 ppm SDS-3701 (10×) over 28 consecutive days. Four additional cows received a placebo treatment.

Milk samples were collected twice daily and a daily composite sample made from each cow. On four occasions extra composite samples of milk were made and separated into skimmed milk and cream fractions. Within 24 hours of the final dose all animals were sacrificed and samples of round muscle, loin muscle, liver, kidney, perirenal fat and omental fat were taken. All samples were analysed for SDS-3701 only, since metabolism studies indicate this compound to be the only residue present in animal commodities. The amounts of milk per day varied between the animals from 15 to 30 kg, with an average of 20-25 kg per day and animal.

Table 76 Residues of SDS-3701 in milk of lactating cows

Days	0.5× (1.5 ppm chlorothalonil. 0.1 ppm SDS-3701)	1× (3 ppm chlorothalonil. 0.2 ppm SDS-3701)	3× (9 ppm chlorothalonil. 0.6 ppm SDS-3701)	10× (30 ppm chlorothalonil. 2 ppm SDS-3701)
	mg/kg	mg/kg	mg/kg	mg/kg
1	< 0.01/ < 0.01/ < 0.01/ < 0.01 Mean: < 0.01	< 0.01/ < 0.01/ < 0.01/ < 0.01 Mean: < 0.01	< 0.01/ < 0.01/ < 0.01/ 0.01 Mean: 0.01	0.01/ 0.02/ 0.01/ 0.02 Mean: 0.02
2	< 0.01/ < 0.01/ < 0.01/ < 0.01 Mean: < 0.01	0.01/ 0.01/ < 0.01/ 0.01 Mean: 0.01	0.03/ 0.03/ 0.03/ 0.07 Mean: 0.04	0.10/ 0.09/ 0.07/ 0.12 Mean: 0.10
3	0.01/ 0.02/ 0.01/ 0.02 Mean: 0.02	0.03/ 0.02/ 0.01/ 0.03 Mean: 0.02	0.07/ 0.05/ 0.07/ 0.11 Mean: 0.08	0.16/ 0.14/ 0.14/ 0.19 Mean: 0.16
4	0.01/ 0.01/ 0.01/ 0.01 Mean: 0.01	0.04/ 0.03/ 0.02/ 0.02 Mean:0.03	0.11/ 0.07/ 0.10/ 0.14 Mean: 0.11	0.24/ 0.21/ 0.21/ 0.27 Mean: 0.24
5	0.01/ 0.02/ 0.01/ 0.02 Mean: 0.02	0.04/ 0.03/ 0.02/ 0.03 Mean: 0.03	0.10/ 0.07/ 0.11/ 0.16 Mean: 0.11	0.24/ 0.22/ 0.20/ 0.28 Mean: 0.24
6	0.02/ 0.02/ 0.01/ 0.02 Mean: 0.02	0.03/ 0.03/ 0.01/ 0.02 Mean: 0.02	0.13/ 0.09/ 0.14/ 0.20 Mean: 0.14	0.33/ 0.27/ 0.30/ 0.37 Mean: 0.32
7	0.02/ 0.02/ 0.01/ 0.02 Mean: 0.02	0.05/ 0.03/ 0.02/ 0.04 Mean: 0.04	0.15/ 0.11/ 0.15/ 0.27 Mean: 0.17	0.25/ 0.30/ 0.33/ 0.44 Mean: 0.33
8	0.02/ 0.03/ 0.02/ 0.03 Mean: 0.03	0.06/ 0.05/ 0.03/ 0.04 Mean: 0.05	0.15/ 0.12/ 0.18/ 0.19 Mean: 0.16	0.35/ 0.39/ 0.39/ 0.45 Mean: 0.40
9	0.02/ 0.03/ 0.03/ 0.02	0.05/ 0.05/ 0.03/ 0.04	0.16/ 0.11/ 0.16/ 0.22	0.36/ 0.36/ 0.37/ 0.48

Days	0.5× (1.5 ppm chlorothalonil. 0.1 ppm SDS-3701)	1× (3 ppm chlorothalonil. 0.2 ppm SDS-3701)	3× (9 ppm chlorothalonil. 0.6 ppm SDS-3701)	10× (30 ppm chlorothalonil. 2 ppm SDS-3701)
	mg/kg	mg/kg	mg/kg	mg/kg
	Mean: 0.03	Mean: 0.04	Mean: 0.16	Mean: 0.40
10	0.03/ 0.03/ 0.02/ 0.03 Mean: 0.03	0.06/ 0.05/ 0.04/ 0.05 Mean: 0.05	0.16/ 0.11/ 0.15/ 0.22 Mean: 0.16	0.39/ 0.40/ 0.40/ 0.58 Mean: 0.44
11	0.03/ 0.04/ 0.02/ 0.03 Mean: 0.03	0.06/ 0.06/ 0.04/ 0.05 Mean: 0.05	0.15/ 0.12/ 0.15/ 0.22 Mean: 0.16	0.38/ 0.38/ 0.41/ 0.50 Mean: 0.42
12	0.02/ 0.03/ 0.02/ 0.02 Mean: 0.02	0.05/ 0.04/ 0.02/ 0.04 Mean: 0.04	0.20/ 0.13/ 0.18/ 0.25 Mean: 0.19	0.38/ 0.41/ 0.37/ 0.55 Mean: 0.43
13	0.03/ 0.03/ 0.02/ 0.03 Mean: 0.03	0.06/ 0.04/ 0.03/ 0.05 Mean: 0.05	0.19/ 0.14/ 0.19/ 0.28 Mean: 0.20	0.38/ 0.45/ 0.44/ 0.59 Mean: 0.47
14	0.03/ 0.03/ 0.02/ 0.02 Mean: 0.03	0.08/ 0.05/ 0.03/ 0.06 Mean: 0.06	0.18/ 0.14/ 0.21/ 0.28 Mean: 0.19	0.48/ 0.46/ 0.44/ 0.51 Mean: 0.47
15	0.02/ 0.03/ 0.02/ 0.02 Mean: 0.02	0.08/ 0.05/ 0.03/ 0.06 Mean: 0.06	0.21/ 0.16/ 0.23/ 0.29 Mean: 0.22	0.40/ 0.42/ 0.40/ 0.61 Mean: 0.46
16	0.03/ 0.03/ 0.02/ 0.03 Mean: 0.03	0.06/ 0.05/ 0.04/ 0.05 Mean: 0.05	0.18/ 0.14/ 0.21/ 0.24 Mean: 0.19	0.47/ 0.50/ 0.44/ 0.63 Mean: 0.51
17	0.03/ 0.03/ 0.02/ 0.03 Mean: 0.03	0.07/ 0.05/ 0.04/ 0.05 Mean: 0.05	0.21/ 0.15/ 0.21/ 0.31 Mean: 0.22	0.47/ 0.43/ 0.41/ 0.54 Mean: 0.46
18	0.03/ 0.03/ 0.02/ 0.03 Mean: 0.03	0.07/ 0.06/ 0.04/ 0.07 Mean: 0.06	0.23/ 0.16/ 0.22/ 0.29 Mean: 0.20	0.46/ 0.41/ 0.37/ 0.52 Mean: 0.57
19	0.03/ 0.04/ 0.03/ 0.03 Mean: 0.03	0.07/ 0.06/ 0.03/ 0.06 Mean: 0.06	0.23/ 0.16/ 0.21/ 0.27 Mean: 0.22	0.51/ 0.48/ 0.43/ 0.54 Mean: 0.49
20	0.03/ 0.04/ 0.03/ 0.03 Mean: 0.03	0.07/ 0.06/ 0.04/ 0.06 Mean: 0.06	0.22/ 0.15/ 0.20/ 0.29 Mean: 0.22	0.50/ 0.45/ 0.43/ 0.51 Mean: 0.47
21	0.03/ 0.03/ 0.04/ 0.03 Mean: 0.03	0.06/ 0.05/ 0.03/ 0.05 Mean: 0.05	0.16/ 0.12/ 0.16/ 0.20 Mean: 0.16	0.46/ 0.48/ 0.41/ 0.50 Mean: 0.46
22	0.03/ 0.04/ 0.03/ 0.03 Mean: 0.03	0.07/ 0.05/ 0.04/ 0.05 Mean: 0.05	0.15/ 0.13/ 0.15/ 0.25 Mean: 0.17	0.53/ 0.50/ 0.54/ 0.55 Mean: 0.53
23	0.03/ 0.04/ 0.03/ 0.03 Mean: 0.03	0.08/ 0.06/ 0.05/ 0.06 Mean: 0.06	0.19/ 0.14/ 0.20/ 0.26 Mean: 0.20	0.47/ 0.46/ 0.44/ 0.51 Mean: 0.47
24	0.03/ 0.04/ 0.04/ 0.03 Mean: 0.04	0.08/ 0.07/ 0.04/ 0.07 Mean: 0.07	0.17/ 0.15/ 0.15/ 0.26 Mean: 0.18	0.51/ 0.52/ 0.43/ 0.60 Mean: 0.52
25	0.03/ 0.04/ 0.03/ 0.03 Mean: 0.03	0.08/ 0.07/ 0.04/ 0.06 Mean: 0.06	0.18/ 0.17/ 0.17/ 0.26 Mean: 0.20	0.59/ 0.49/ 0.47/ 0.65 Mean: 0.55
26	0.03/ 0.04/ 0.04/ 0.03 Mean: 0.04	0.10/ 0.07/ 0.04/ 0.06 Mean: 0.07	0.19/ 0.16/ 0.19/ 0.24 Mean: 0.20	0.50/ 0.47/ 0.48/ 0.59 Mean: 0.51
27	0.03/ 0.04/ 0.04/ 0.03 Mean: 0.04	0.10/ 0.06/ 0.04/ 0.06 Mean: 0.07	0.21/ 0.19/ 0.19/ 0.30 Mean: 0.22	0.51/ 0.44/ 0.39/ 0.58 Mean: 0.48
28	0.02/ 0.03/ 0.04/ 0.02 Mean: 0.03	0.10/ 0.06/ 0.04/ 0.06 Mean: 0.07	0.20/ 0.15/ 0.20/ 0.30 Mean: 0.21	0.48/ 0.47/ 0.45/ 0.56 Mean: 0.49

In addition to the residues found in whole milk the distribution between milk fat and skim milk was investigated once per week (see Table 77):

Table 77 Distribution of SDS-3701 residues in milk fat and skim milk

Day	0.5× (1.5 ppm chlorothalonil. 0.1 ppm SDS-3701)		1× (3 ppm chlorothalonil. 0.2 ppm SDS-3701)		3× (9 ppm chlorothalonil. 0.6 ppm SDS-3701)		10× (30 ppm chlorothalonil. 2 ppm SDS-3701)	
	Milk fat (mg/kg SDS-3701)	Skim milk (mg/kg SDS-3701)	Milk fat (mg/kg SDS-3701)	Skim milk (mg/kg SDS-3701)	Milk fat (mg/kg SDS-3701)	Skim milk (mg/kg SDS-3701)	Milk fat (mg/kg SDS-3701)	Skim milk (mg/kg SDS-3701)
9	0.03/ 0.04/ 0.03/ 0.03	0.02/ 0.03/ 0.02/ 0.03	0.06/ 0.05/ 0.04/ 0.05	0.05/ 0.05/ 0.03/ 0.04	0.15/ 0.12/ 0.17/ 0.20	0.17/ 0.13/ 0.16/ 0.22	0.30/ 0.37/ 0.36/ 0.40	-/ 0.34/ 0.33/ 0.46
15	0.03/ 0.05/ 0.03/ 0.03	0.03/ 0.04/ 0.02/ 0.03	0.09/ 0.06/ 0.04/ 0.07	0.08/ 0.05/ 0.03/ 0.06	0.21/ 0.15/ 0.22/ 0.26	0.18/ 0.15/ 0.18/ 0.24	0.39/ 0.41/ 0.40/ 0.50	0.38/ 0.39/ 0.39/ 0.51
21	0.03/ 0.06/ 0.03/ 0.03	0.02/ 0.03/ 0.02/ 0.02	0.06/ 0.05/ 0.05/ 0.06	0.05/ 0.04/ 0.03/ 0.04	0.20/ 0.14/ 0.18/ 0.25	0.20/ 0.12/ 0.14/ 0.22	0.46/ 0.50/ 0.48/ 0.51	0.42/ 0.40/ 0.39/ 0.43
27	0.03/ 0.04/ 0.04/ 0.03	0.03/ 0.03/ 0.03/ 0.03	0.08/ 0.06/ 0.04/ 0.06	0.08/ 0.06/ 0.03/ 0.05	0.17/ 0.16/ 0.18/ 0.24	0.19/ 0.19/ 0.19/ 0.28	0.47/ 0.43/ 0.40/ 0.58	0.52/ 0.45/ 0.37/ 0.59
Total mean	0.035	0.027	0.058	0.048	0.19	0.19	0.44	0.42

In tissues residues of SDS-3701 after 28 days were:

Table 78 Residues of SDS-3701 in cow tissues (mg/kg)

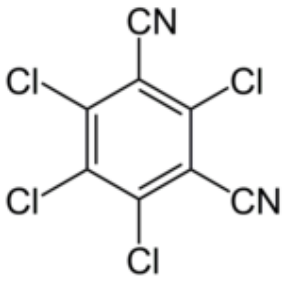
Dose level/ Animal	Loin muscle	Round muscle	Omental fat	Perirenal fat	Kidney	Liver
0.5× / 5	< 0.01	< 0.01	0.02	0.01	0.13	0.02
0.5× / 6	< 0.01	< 0.01	0.03	0.02	0.14	0.02
0.5× / 7	< 0.01	< 0.01	0.02	0.01	0.14	0.03
0.5× / 8	< 0.01	< 0.01	0.03	0.02	0.13	0.02
0.5× MEAN	< 0.01	< 0.01	0.03	0.02	0.14	0.02
1× / 9	0.01	0.02	0.01	0.05	0.13	0.04
1× / 10	0.02	0.01	0.07	0.05	0.28	0.02
1× / 11	0.01	0.01	0.05	0.03	0.18	0.02
1× / 12	0.01	0.01	0.03	0.02	0.22	0.02
1× MEAN	0.01	0.01	0.04	0.04	0.20	0.03
3× / 13	0.05	0.04	0.02	0.06	0.55	0.13
3× / 14	0.07	0.09	0.06	0.07	0.49	0.18
3× / 15	0.04	0.05	0.01	0.03	0.52	0.18
3× / 16	0.04	0.04	0.05	0.08	0.39	0.13
3× MEAN	0.05	0.06	0.04	0.06	0.49	0.16
10× / 17	0.10	0.11	0.09	0.85	0.95	0.39
10× / 18	0.24	0.14	0.25	0.47	1.2	0.55
10× / 19	0.15	0.15	0.36	0.53	0.76	0.37
10× / 20	0.11	0.15	0.14	0.81	0.89	0.47
10× MEAN	0.15	0.14	0.21	0.67	0.95	0.45

APPRAISAL

Chlorothalonil is a non-systemic fungicide first evaluated by JMPR in 1974 and a number of times subsequently. It was recently reviewed for toxicology by the 2009 JMPR within the periodic review programme of the CCPR. For the parent substance an ADI of 0–0.02 mg/kg bw and an ARfD of 0.6 mg/kg bw were established. In addition to the parent substance an ADI of 0–0.008 mg/kg bw and an ARfD of 0.03 mg/kg bw were established for the metabolite SDS-3701. In the 2010 JMPR chlorothalonil was scheduled for periodic review for residues. The 2010 JMPR evaluated newly submitted studies on the metabolite R611965 at the request of the 2009 JMPR to address the toxicological relevance of this soil degradation product.

CCPR, at its Forty-first Session in 2009, noted that one manufacturer would submit residue data to JMPR for the consideration by the 2010 JMPR. Additional information on the uses in okra and papaya were submitted by the COLEACP (Comité de Liaison Europe-Afrique-Carïbes-Pacifique). Information on GAP was also provided by Australia, the Ivory Coast, Japan and the Netherlands.

This evaluation is based on the latest FAO specifications for chlorothalonil, limiting the amount of the impurity hexachlorobenzene (HCB) to a maximum of 0.04 g/kg. There may be implications for HCB in animal commodities, if chlorothalonil were to contain higher levels of this impurity.



The following abbreviations are used for the metabolites discussed below:

chlorothalonil	tetrachloroisophthalonitrile
SDS-3701	2,5,6-trichloro-4-hydroxyisophthalonitrile
R611965	3-carbamyl-2,4,5-trichlorobenzoic acid
R417888	2-carbamyl-3,5,6-trichloro-4-cyanobenzenesulfonic acid
R611966	2,4,5-trichloro-3-cyano benzamide

Animal metabolism

The Meeting received animal metabolism studies with [^{14}C]chlorothalonil and [^{14}C]SDS-3701 in rats, lactating goats and laying hens. In all studies carbon atoms in the ring structure were substituted with ^{14}C. In general the metabolism of chlorothalonil is very limited giving only SDS-3701 as the detectable residue beside the unchanged parent.

In the 2009 Evaluation for toxicology it was reported that "in rats given a single oral dose of chlorothalonil at 1.5–50 mg/kg bw, absorption was about 31%, with 17–21% being excreted in the bile and about 8–12% being excreted in the urine. In rats, the highest tissue concentrations were found in the kidney, probably due to binding to kidney proteins. Chlorothalonil is metabolized via initial glutathione conjugation and subsequent enzymatic processing of the di-and triglutathion substituents via the mercapturic acid and cysteine conjugate β-lyase pathways yielding N-acetyl cysteine, cysteinyl-glycine and S-methyl-derivates."

For lactating goats five animals were dosed with parent [^{14}C]-chlorothalonil at rates of 3 or 30 ppm in the diet over a period of 8 consecutive days. TRR found in muscle and fat were at a comparable level of 0.004 mg/kg for the low dose animals and 0.03–0.038 mg/kg for the high dose animals. In milk TRR levels up to 0.015 mg/kg and 0.19 mg/kg were found for the two dose groups. Highest TRR levels were found in liver and kidney and concentrations equivalent to 0.085 and 0.24 mg/kg, respectively, for the low dose animals and 0.73 to 2.3 mg/kg, respectively, for the high dose animals. The only metabolite identified was SDS-3701 found at 30–58% in milk, 3–6% in liver and 2–3% in kidney of the TRR. Muscle and fat were not further identified. Although no other specific metabolites could be identified, complex mixtures of components were found in the samples with a molecular weight of 46000–54000 Da.

In a comparable study animals were dosed with 0.2 or 2 ppm SDS-3701 for 9 consecutive days. TRR levels found in the various tissues and milk for the low and high does animals were: muscle 0.02/0.13 mg/kg, fat 0.02/0.08 mg/kg, liver 0.07/0.77 mg/kg, kidney 0.26/1.35 mg/kg and milk 0.15/1.0 mg/kg. For all matrices > 90% of the radioactivity could be released and was identified as unchanged SDS-3701.

For laying hens the animals were dosed with [^{14}C]-chlorothalonil at rates of 2, 6 or 20 ppm over 21 consecutive days. In the eggs collected over the length of the study a plateau of the TRR was observed after 13–17 days at a level of 0.035–0.047 mg/kg for the 20 ppm dose group. In all tissues, except liver, TRR levels were below the LOQ of the LSC method (0.01 mg/kg). In liver TRR levels of 0.098 and 0.05 mg/kg were found for the 6 and 20 ppm dose group, respectively. Further analysis on the composition of radioactivity was not conducted.

A comparable study was conducted using [^{14}C]-SDS-3701 at dose rates of 0.1, 0.3 and 1.0 ppm over 21 consecutive days. In egg white, pectoral muscle, adductor muscle and fat, no TRRs above the LOQ of 0.01 mg/kg were found in any dose group. TRR in cardial muscle were < 0.01 mg/kg for the 0.1 ppm group, 0.55 mg/kg for the 0.3 ppm dose group and 0.15 mg/kg for the 1.0 ppm dose group. TRR in skin gave a single high result for the 1.0 ppm dose group of 37 mg/kg, but no detectable residues for the 0.1 and 0.3 ppm group were found. Egg yolk and liver gave detectable TRRs for all dose groups (0.1, 0.3 and 1.0 ppm) at levels of 0.044, 0.12 and 0.42 mg/kg for egg yolk and 0.056, 0.27 and 0.78 mg/kg for liver, respectively. Further identification of the radioactivity was conducted for egg yolk, revealing that > 80% of the TRR consisted of unchanged SDS-3701.

Plant metabolism

The Meeting received plant metabolism studies with [^{14}C]-chlorothalonil in lettuce, tomatoes, carrots, celery and snap beans. Parent substance labelled in the phenyl-ring was used in all of these studies.

Generally in all matrices, unchanged chlorothalonil was identified as the major residue. The only metabolite identified was SDS-3701, which was present in amounts of < 10% of the TRR in edible parts and up to 12% of the TRR in non-edible parts of the plants. The remaining radioactivity consisted of numerous polar metabolites at individual levels too low for further investigation. Translocation within the plants was very limited.

In a study on lettuce the plants were treated four times at dose rates equivalent to 1.75 kg ai/ha. Lettuce samples were taken after 1, 3, 7, 10, 14 and 21 days. The mean TRRs were 118 mg/kg at PHI 1 day, increasing to 170 mg/kg at PHI 3 days and 158 mg/kg after 21 days. Identification of the radioactivity revealed at least 87% (88–155 mg/kg) of unchanged chlorothalonil in the extract. The only other metabolite identified was SDS-3701, found in amounts of 2% of the TRR (1.5–3.1 mg/kg). Polar water-soluble residue, which did not partition into diethyl ether, accounted for between 4.7 and 7.0% TRR (approximately 5–11 mg/kg).

For tomatoes the metabolism of chlorothalonil was investigated following three applications at rates of 2.3 kg ai/ha each made to plants in growth chambers. Samples of fruit and vines were collected after 1, 7 and 14 days. TRR levels in the fruit declined from 2.6 mg/kg after 1 day to 0.6 mg/kg after 14 days. In vines TRRs stayed relatively stable at levels between 12.7–20.6 mg/kg.

Extraction of fruit showed that 56–75% of the total residue was present in the dichloromethane rinse. The major identified component of the total organosoluble fraction was parent chlorothalonil, which accounted for 56–76% and 41–73% of the total residue in fruit and vines respectively. The metabolite SDS-3701 was identified as a minor component of the organosoluble fractions but represented < 4% of the residue in fruit and a maximum of 8% of the residue in vines.

In a study on carrots, treated three times at rates of 1.6 kg ai/ha each, samples of roots and foliage were collected 1, 7, 14 and 21 days after the final treatment. TRR levels in roots were relatively stable ranging from 0.012 to 0.12 mg/kg. In foliage TRR was measured at 9.7–40.2 mg/kg. In roots collected after 21 days, about 45% of the TRR (0.023 mg/kg) was identified as chlorothalonil. SDS-3701 was found at amounts of 3.9% of the TRR (0.002 mg/kg). In the foliage a large part of the radioactivity remained unextracted (39.1–45.9%). Chlorothalonil levels decreased from 13.7% of the TRR (1.85 mg/kg) down to 4% (0.1 mg/kg). In parallel SDS-3701 residues increased from 3.4% of the TRR (0.49 mg/kg) to 12.1% (0.3 mg/kg) at day 21.

The metabolism of chlorothalonil in celery was investigated using 12 applications of 2.5 kg ai/ha at intervals of 6–8 days. Samples of stalks and foliage were collected 7 and 21 days after the final treatment. Total radioactive residues found in stalks were 0.7 to 4.6 mg/kg. In the foliage much higher TRR levels of 52–263 mg/kg were detected. The only substance identified was unchanged chlorothalonil at levels of 10–55% of the TRR in the stalks and 42–80% of the TRR in foliage. Unextracted residues were in the range of 21-35% of the TRR for stalks and 8–24% of the TRR for foliage. Further treatment using hydrolytic enzymes and hydrochloric acid released about 30% of the unextracted residues, but further identification was not possible due to a complex mixture of components.

For snap beans, grown outdoor, the metabolism of chlorothalonil was investigated following four, weekly applications, at rates of 2.5 kg ai/ha each. Samples of beans and foliage were collected after 7 and 28 days. The TRRs in the foliage (154 mg/kg at PHI 7 days; 90 mg/kg at PHI 28 days) were higher than those in the edible beans (mean of 1.0 mg/kg at PHI 7 days; 1.8 mg/kg at PHI 28 days). Analysis of the organosoluble fractions by HPLC showed that chlorothalonil was the only significant component in both the bean and foliage samples. Further analyses indicated the probable presence of SDS-3701 and R611965, however levels were too low for definitive identification or quantification (LOQ 0.02 mg/kg and 0.03 mg/kg for SDS-3701 and R611965 respectively).

Environmental fate in soil

The Meeting received information on photolysis on soil, aerobic soil metabolism and residues in rotational crop (confined and field studies).

The photolysis of chlorothalonil and its metabolite SDS-3701 was investigated in two soil types using artificial irradiation. Both substances were stable with more than 97% of the applied radioactivity still being extractable.

Aerobic soil metabolism was investigated in four soils using [^{14}C]-chlorothalonil. The parent compound was found to be degraded quickly with estimated half-life times of less than 1.9 days. Several metabolites could be identified. Primary degradation products were SDS-3701 (6.3–25.3% of the dose), R417888 (5.8–14.1% of the applied dose) and R611965 (2.0–13.2% of the applied dose). Mineralisation after 120 days was relatively low at 6.3–23.8% of the applied dose.

In a confined rotational crop study radio labelled chlorothalonil was applied to soil at a rate equivalent to approx. 12 kg ai/ha. Follow crops (lettuce, carrots and wheat) were planted after 30 or 88 days and grown to the point of commercial harvest. After 30 days TRR levels in lettuce (3.3 mg/kg), carrots (1.0 mg/kg for roots, 2.2 mg/kg for tops) and wheat grain (3.3 mg/kg) were of the same magnitude, while in wheat straw higher TRRs of 51.9 mg/kg were found. After the 88 day plant back interval (PBI) TRRs in lettuce (1.0 mg/kg) and carrot (0.9 mg/kg for roots, 3.2 mg/kg for tops) remained more or less unchanged while in wheat higher radioactive residue levels were found in comparison to the 30 day PBI (21.6 mg/kg in grain, 63.8 mg/kg in straw).

Identification of the radioactivity revealed no unchanged parent substance in the radioactive residue. In the organosoluble fraction 37.3–63.1% of the TRR consisted of R611965, while up to 2.5% of the TRR were identified as SDS-3701. In the aqueous fraction the amounts were up to 16.9% of the TRR being R611965 and up to 11.9% SDS-3701.

Field crop rotation studies using chlorothalonil were conducted in the USA. At three location soil was treated with eight application of 2.5 kg ai/ha each. Follow crops (spinach, snapbeans, carrots and wheat) were planted 14 to 450 days after the final application. All samples collected at the point of commercial harvest were analysed for residues of SDS-3701 and R611965.

Residues of SDS-3701 were found at relatively low levels, ranging from < 0.01 mg/kg in legume vegetables and cereals grains up to 0.19 mg/kg in leafy vegetables. In root and tuber vegetables (tubers and tops) as well as in straw of cereal grains SDS-3701 residues were between 0.03 mg/kg and 0.08 mg/kg.

A second set of studies investigated the residues of chlorothalonil, SDS-3701 and R611965 following treatments of primary crops according to US GAP at 12 locations. Application rates involved 3–12 treatments at rates of 1.2–2.5 kg ai/ha each. As follow crops a large spectrum of crop groups (root and tuber vegetables, bulb vegetables, fruiting vegetables, legume vegetables, leafy and brassica vegetables, pulses, oilseeds and cereals) were selected.

In the follow crops residues of chlorothalonil and SDS-3701 were not found above the LOQs in most cases. Single results at or slightly above the LOQ of 0.01–0.02 mg/kg were found occasionally. For peanut vines one result of 0.22 mg/kg chlorothalonil was found. At another location pea fodder and bean hay contained chlorothalonil at levels of 0.06 mg/kg and 0.09 mg/kg, respectively and SDS-3701 of 0.07 mg/kg and < 0.02 mg/kg, respectively.

Residues of R611965 above the LOQ of 0.03 mg/kg were detected more frequently. While in most trials R611965 residue levels were below 0.3 mg/kg single high results were found for turnip tops (0.59 mg/kg), oat straw (2.95 mg/kg), spinach (0.8 mg/kg), winter squash (1.05 mg/kg) and potatoes (0.64 mg/kg).

A field dissipation study conducted at locations in Canada and the USA confirmed the results from the aerobic soil metabolism. After 3 to 10 subsequent applications of chlorothalonil, residues in soil declined to less than 50% of the initial residue within the first 30 days, reaching the LOQ of 0.01 mg/kg after approximately 120 days. Residues of SDS-3701 were detectable for the whole study period of up to 540 days, but its levels in soil were relatively low mostly around 0.02–0.05 mg/kg. In the study conducted in the USA higher residues of SDS-3701 were found in the first 30 days after the final treatment, ranging from 0.05 mg/kg up to 0.23 mg/kg.

The Meeting concluded that parent chlorothalonil degrades quickly within the first 100 days after treatment. No significant transfer into follow crops was observed. SDS-3701 was present for a period of more than one year, but at levels between the LOQ and 0.1 mg/kg in soil as well as in follow crops. Following treatment with chlorothalonil higher residues of the soil metabolite R611965 were found, being the major residue in soil as well as in rotational crops.

Methods of analysis

The Meeting received information on analytical methods for the determination of chlorothalonil, SDS-3701 and R613636 in plant matrices and SDS-3701 in bovine tissues, milk and eggs.

Methods for plant matrices involve extraction and homogenisation with acetone:5M sulphuric acid solution (95:5 v/v). After centrifugation and further clean-up (e.g., by SPE extraction) the extracts are analysed either by gas- or liquid-chromatography in combination with electron-capture- or mass-selective detection (MS or MS/MS for R613636 only: m/z 282.91 to 239.75 and 282.91 to 42.1). Using MS-techniques LOQs of 0.01 mg/kg were achieved for all plant matrices. A specific method submitted for the determination of celery using GC-ECD was validated at 0.03 mg/kg. The Meeting concluded that a LOQ of 0.01 mg/kg for chlorothalonil, SDS-3701 and R613636 achievable with the analytical methods available. Analytical recovery data were satisfactory in plant commodities.

Residue methods were tested by independent laboratories unfamiliar with the analysis and were found to have satisfactory recoveries and no background interferences.

The Meeting noted that in some matrices (e.g., lettuce, celery and cabbage) careful treatment during the homogenisation may be required for parent chlorothalonil to avoid a loss of extractable residues during the sample preparation due to enzymatic degradation. A study was submitted showing the stability of chlorothalonil residues in fortified samples prior to homogenisation following addition of sulphuric acid (0.1M) at 10% v/w. The 1997 JMPR reported that homogenisation of frozen samples under addition of dry ice or inactivation of the cell structure by microwaving before the sample preparation also improves the extraction rate.

In animal matrices one method for analysis of SDS-3701 was reported also using extraction and homogenisation with acetone:5M sulphuric acid (95:5 v/v) from muscle, liver and kidney, with acetonitrile:5M sulphuric acid (95: 5 v/v) from fat, with acetonitrile from milk and with acetonitrile:water (3:1 v/v) from eggs. SDS-3701 residues are analysed by high performance liquid chromatography with triple quadrupole mass spectrometric detection (LC-MS/MS, m/z 244.9 to 181.9). The LOQ achieved in the validations was 0.01 mg/kg for all matrices.

Although no data on analytical multi-residue method for plant commodities were submitted to Meeting it is noted that chlorothalonil parent substance is validated within existing QuEChERS-Multimethods.

Stability of residues in stored analytical samples

Information was received on the freezer storage stability of chlorothalonil in plant commodities and SDS-3701 in animal commodities.

In plant commodities two types of data were used. The first data set consisted of incurred residues in different samples from one treated field trial plot, which were analysed up to 7 years after harvest. The variation within the results indicated a sampling uncertainty much higher than possible from degradation during freezer storage. Therefore it was consluded that this information could not be used for further investigation on the freezer storage stability of chlorothalonil.

In fortified samples stored up to 12 months no significant degradation (> 70% remaining) was observed in peach, strawberries, orange, potato, carrot, onion, cabbage, leek, lentil tomato, melon, sugarbeet and barley forage. In peas and barley straw less than 70% of the initial concentration of chlorothalonil was found after 6 months or more.

For animal commodities the freezer storage stability of SDS-3701 was investigated in fortified bovine tissues and milk for up to 12 months. In muscle, fat and milk recoveries were stable (> 70%) for the whole test period. In liver samples analytical recoveries were 63% after 9 months and 67% after 12 months, indicating a possible degradation of the residue when stored longer than 6 months.

Definition of the residue

In animals chlorothalonil is quickly metabolised with SDS-3701 being the only metabolite in all matrices. Separation between skim milk and cream in livestock feeding studies gave comparable residue levels in both compartments. The same result can be found in muscle and fat, giving slightly higher residues in fat at the lowest dose group but comparable residue levels in these tissues at higher dosing.

The Meeting concluded that the residue definition (risk assessment and enforcement) for chlorothalonil in animal matrices is SDS-3701 only. The residue in not considered fat-soluble.

The residue following use of chlorothalonil in crops is predominantly unchanged chlorothalonil. In all metabolism studies the unchanged parent compound was the major residue, mainly located on the surface of the plants. The only other metabolite identified was SDS-3701 in amounts of less than 3% of the TRRs.

In soil, the degradation of chlorothalonil happens relatively quickly with an estimated half-life of less than 2 days. Significant metabolites identified in soil metabolism and in rotational crops were SDS-3701 and R611965. The residue in follow crops mainly consists of R611965 (up to 50% of the TRR), while SDS-3701 remained at levels between 0.01 and 0.05 mg/kg. Unchanged parent substance was found at or below the LOQ in most cases.

The Meeting concluded that parent chlorothalonil is a representative marker in all plant commodities and decided to set the residue definition for enforcement purposes in plant commodities to be parent chlorothalonil only.

For dietary intake purposes the metabolite SDS-3701 was identified to be of higher acute and chronic toxicity than the parent substance (maximum ADI value of 0.008 mg/kg bw, ARfD of 0.03 mg/kg bw), but follows a different toxicological endpoint. Although found at low levels following direct treatment, in follow crops or after processing, the low toxicological reference values require an independent additional dietary intake assessment. Therefore the Meeting decided to consider SDS-3701 separately in the residue definition for the estimation of the dietary intake.

The soil metabolite R611965 was identified to be the major residue in follow crops found in a broad variety of commodities. The 2010 Meeting of the JMPR concluded that R611965 is considerably less toxic (e.g., NOAEL = 200 mg/kg bw per day; 2-year-rat study) than the parent compound chlorothalonil (e.g., NOAEL 1.8 mg/kg bw per day; 2-year-rat study). R611965 is not acutely toxic by the oral route. The Meeting decided that the contribution of R611965 to the overall dietary intake of plant and animal commodities arising from residues in follow crops is insignificant in comparison to chlorothalonil and that its inclusion in the residue definition for risk assessment purposes was not required.

Definition of the residue (for compliance with MRL) for plant commodities: *chlorothalonil*

Definitions of the residue (for estimation of dietary intake) for plant commodities:

- *chlorothalonil*
- *SDS-3701 (2,5,6-trichloro-4-hydroxyisophthalonitrile), all considered separately*

Definition of the residue (for compliance with MRL and for estimation of dietary intake) for animal commodities: *SDS-3701 (2,5,6-trichloro-4-hydroxyisophthalonitrile)*

The residue is not fat-soluble.

Results of supervised trials on crops

The Meeting received supervised residue trials data for chlorothalonil on peaches, plums, blueberries, cranberries, currants, grapes, strawberries, bananas, mangoes, papaya, bulb onions, spring onions, leek, cauliflower, Brussels sprouts, head cabbage, courgettes, cucumbers, melons, winter squash, okra, peppers, tomatoes, sweet corn, carrots, potatoes, asparagus, celery, green beans, pulses, soya beans, maize, almonds, pistachios and peanuts.

In trials where duplicate field samples from replicated or unreplicated plots were taken at each sampling time and analysed separately, the higher residue was taken as the best estimate of the residue from the plot. Supervised field trials conducted with different formulations on identical varieties, locations and dates were not considered as independent. The highest result according to the corresponding GAP was selected in these cases.

Labels (or translation of labels) were available from Australia, Brazil, Costa Rica, Cyrpus, Ireland, Ivory Coast, Japan, Moldavia, Slovenia, Spain, the Netherlands, the United Kingdom and the United States of America describing the registered uses of chlorothalonil.

The NAFTA calculator was used as a tool in the estimation of the maximum residue level from the selected residue data set obtained from trials conducted according to GAP. As a first step, the Meeting reviewed all relevant factors related to each data set in arriving at a best estimate of the maximum residue level using expert judgement. Then, the NAFTA calculator was employed. If the

statistical calculation spreadsheet suggested a different value from that recommended by the JMPR, a brief explanation of the deviation was supplied. Some common factors that may lead to rejection of the statistical estimate include when the number of data points in a data set is < 15 or when there are a large number of values < LOQ.

The Meeting noted that in several commodities (e.g., lettuce, celery, cabbage) careful treatment for chlorothalonil during sample preparation may be required to ensure a deactivation of enzymes at or before the homogenisation process, otherwise possibly resulting in a reduced rate of extraction. It was concluded that trials not following this procedure can not be considered valid for a recommendation by the JMPR, but the results may be taken into account as additional information for the evaluation.

In this section the assessment of residues resulting from uses of chlorothalonil on plants for the purpose of estimating maximum residue levels, STMR and HR values are reported. The estimation of STMR and HR values for SDS-3701 in crops being subject to crop rotation is described in the section for residues in follow crops.

Stone fruits

The use of chlorothalonil on peaches, nectarines and plums is registered in Cyprus with up to 4 applications at rates of 1.5 kg ai/ha (0.15 kg ai/hL) with a PHI of 15 days.

Three supervised field trials conducted in Southern Europe according to this GAP was submitted, but these trials did not involve appropriate treatment of the samples during homogenisation so as to avoid a loss of extractable residues.

The Meeting decided that the data submitted for the use of chlorothalonil on stone fruits was not sufficient for the estimation of maximum residue levels and HR or STMR values.

The Meeting withdraws its previous recommendation for chlorothalonil in cherries of 0.5 mg/kg and in peaches of 0.2 mg/kg.

Blueberries

Chlorothalonil is registered on blueberries in the USA with application rates of 3.4 kg ai/ha with a PHI of 42 days. Supervised field trials conducted in the USA according to this GAP were submitted.

The corresponding chlorothalonil residues in fruits were (n = 2): 0.1 and 0.32 mg/kg. Residues of SDS-3701 were: < 0.01 and < 0.01 mg/kg.

Additional information from supervised field trials conducted according to GAP, but not using homogenisation that involves enzyme deactivation, are available, giving residues of 0.55 and 0.65 mg/kg. Residues of SDS-3701 were: < 0.01 and 0.042 mg/kg.

The Meeting concluded that the available information on chlorothalonil in blueberries was not sufficient for a recommendation.

Cranberries

The use of chlorothalonil on cranberries is registered in the USA with application rates of 5.5 kg ai/ha with a PHI of 50 days and a maximum annual rate of 17 kg ai/ha. Supervised field trials conducted in the USA according to this GAP were submitted.

The corresponding chlorothalonil residues in fruits were: 0.79 and 3.7 mg/kg. Residues of SDS-3701 were: < 0.01 and 0.06 mg/kg.

Additional information from supervised field trials conducted according to GAP, but not using homogenisation that involves enzyme deactivation, are available, giving residues of 0.75, 1.4, 2.9 and 4.3 mg/kg. Residues of SDS-3701 were: < 0.01(4) mg/kg.

The Meeting concluded that the overall information on chlorothalonil in cranberries are not sufficient for a recommendation and withdraws its previous recommendation for chlorothalonil in cranberries of 5 mg/kg,

Currants and gooseberries

For currants chlorothalonil is registered in the United Kingdom with up to 4 application of 2.5 kg ai/ha each with a PHI of 28 days. Supervised field trials conducted in the United Kingdom according to this GAP were submitted.

The corresponding chlorothalonil residues in fruits were: 0.99, 1.9, 3.5 and 5.0 mg/kg. Residues of SDS-3701 were not analysed.

Additional information from supervised field trials conducted according to GAP, but not using homogenisation that involves enzyme deactivation, are available, giving residues of 5.6 and 10 mg/kg. Residues of SDS-3701 were not analysed.

The Meeting recognized that additional information from two supervised residue trials in currants homogenised without measures to inhibit enzymic activity are available, resulting in higher residues than the field trial data considered as valid. Since the valid dataset available is sufficient for a recommendation of a maximum residue level for currants on its own, the Meeting decided to take the additional informative data into account for its recommendation also, including the probability of higher residues in its estimate.

The Meeting recommends a maximum residue level for chlorothalonil in currants (black, red, white) of 20 mg/kg and concluded to extrapolate the data from currants to gooseberries also. To accommodate for the uncertainty involved with the additional data, the Meeting decided to base the dietary risk assessment (chronic and acute) on the maximum residue level also.

The value derived from use of the NAFTA Calculator was 12.5 mg/kg. The Meeting considered a value of 20 mg/kg as more appropriate in view of the additional information based on currant samples with possible extraction loss.

The Meeting withdraws its previous recommendations for chlorothalonil currants (black, red, white) of 5 mg/kg.

Strawberry

Chlorothalonil is registered on strawberries grown indoor or outdoor in Cyprus and Slovenia with application rates of 1.5 kg ai/ha with a PHI of 7 days. Supervised field trials conducted in Southern Europe according to these GAPs were submitted.

For strawberries grown in the field (outdoor) the corresponding chlorothalonil residues were (n = 8): 1.9, 1.9, 2.0, 2.1, 2.2, 2.4, 2.5 and 3.0 mg/kg.

Residues of SDS-3701 were not analysed.

On protected strawberries the corresponding chlorothalonil residues in fruits were (n = 8): 0.64, 0.68, 1.0, 1.1, 1.3, 1.4, 2.3 and 2.4 mg/kg.

Residues of SDS-3701 were not analysed.

Based on the use of chlorothalonil in field the Meeting estimated a maximum residue level, an STMR and an HR value for strawberries of 5, 2.05 and 3 mg/kg, respectively.

The value derived from use of the NAFTA Calculator was 3.2 mg/kg. The Meeting considered a higher value of 5 mg/kg for its recommendation taking into account that the small variation within the data probably results in an underestimation of the MRL by statistical methods.

Grapes

In Moldavia the use of chlorothalonil on grapes is registered with four applications of 1 kg ai/ha and a PHI of 21 days. Corresponding supervised field trials conducted in Europe were submitted.

Residues of chlorothalonil in grapes were (n = 8): 0.34, 0.48, 0.71, 0.92, 0.99, 1.1, 1.4 and 1.6 mg/kg.

Residues of SDS-3701in grapes were not analysed.

The Meeting decided to recommend a maximum residue level for grapes of 3 mg/kg, and estimated an STMR and an HR value of 0.955 mg/kg and 1.6 mg/kg, respectively, for chlorothalonil, based on the use of chlorothalonil on grapes in Moldavia.

The value derived from use of the NAFTA Calculator was 2.9 mg/kg, providing good correlation with the Meetings recommendation.

The Meeting withdraws its previous recommendation for chlorothalonil in grapes of 0.5 mg/kg.

For SDS-3701 in grapes supervised field trials data from Europe are available which were conducted according to GAP reported for Moldavia. Residues were < 0.01, < 0.01 and 0.15 mg/kg. Although these trails were not considered valid for the evaluation of chlorothalonil residue due to a possible loss of residue during the extraction, enzymic degradation is not reported for SDS-3701. The Meeting therefore decided that the data may be used for the estimation of an STMR of 0.01 mg/kg and an HR of 0.15 mg/kg for SDS-3701 in grapes.

Bananas

For bananas chlorothalonil is registered in Brazil with application rates of 1 kg ai/ha with a PHI of 0 days. Supervised field trials conducted in the Middle America involved treatment of bagged bananas at application rates of at least 1.7 kg ai/ha.

The Meeting concluded that the data on bananas are not corresponding to the GAP and therefore a recommendation on a maximum residue levels is not possible.

The Meeting withdraws its previous recommendation of a maximum residue level of 0.01* mg/kg (including a footnote: “Based on trials with bagged bananas”).

Mangoes

The use of chlorothalonil on mangoes is registered in the USA with application rates of 2.9 kg ai/ha with a PHI of 21 days. One supervised field trial conducted in the USA according to this GAP was submitted, but no appropriate treatment of the samples during homogenisation to avoid a loss of extractable residues was applied.

The Meeting decided that the data submitted for the use of chlorothalonil on mangoes are not sufficient for the estimation of maximum residue levels, HR or STMR values.

Papaya

For papaya chlorothalonil is registered in the Ivory Coast with 6 applications of 1.4 kg ai/ha with a PHI of 3 days. Supervised field trials conducted in the Ivory Coast according to this GAP were submitted.

The corresponding chlorothalonil residues in fruits were (n = 2): 1.2 and 3.6 mg/kg.

In Brazil chlorothalonil is registered for the use on papaya with up to 7 treatments at spray concentrations of 0.21 kg ai/hL each with a PHI of 7 days. Supervised field trials conducted in Brazil according to this GAP were submitted.

The corresponding chlorothalonil residues in whole fruits were (n = 10): 0.74, 1.3, 1.6, 1.9, 4.5, 4.9, 5.1, 9.4, 10 and 13 mg/kg. In the pulp residues were (n = 2): 0.49 and 0.64 mg/kg. The ratio of the residue levels between whole fruit and pulp in two trials was 0.49 and 0.09.

Residues of SDS-3701 in whole papaya fruits were (n = 4): < 0.01(3) and 0.01 mg/kg. In the pulp residues were (n = 2): < 0.01 and < 0.01 mg/kg.

Based on the data for whole fruits treated according to Brazilian GAP the Meeting estimated a maximum residue level of 20 mg/kg for chlorothalonil in papayas. The NAFTA procedure suggested a maximum residue level of 30 mg/kg, based on the UCL 95 Median. For the estimation the Meeting also considered additional information on the decline of residues starting from day 0, which indicate a stable level of overall residues in papaya fruits independent of the PHI with residues all below the estimated maximum residue level by the Meeting of 20 mg/kg.

Since supervised field trial data are very limited on chlorothalonil residues in papaya pulp, the Meeting decided to apply the higher ratio of 0.49 for residue concentrations between whole fruit and pulp to the median and highest residue found for the whole fruit. Under consideration of metabolism data suggesting that the application of chlorothalonil results in surface residues, the ratio of 0.49 is considered as an overestimation of the likely residue in papaya pulp. Based on this approach the Meeting estimated an STMR value of 2.3 mg/kg (0.49 × 4.7 mg/kg) and an HR value of 6.4 mg/kg (0.49 × 13 mg/kg) for chlorothalonil in papaya pulp.

Based on the data following direct treatment of papayas the Meeting estimated an STMR and an HR value of 0.01 mg/kg for SDS-3701.

Bulb onions

For bulb onions chlorothalonil is registered in the United Kingdom with 2 application of 1 kg ai/ha each with a PHI of 14 days. Supervised field trials conducted according to this GAP were submitted, but these trials did not involve appropriate treatment of the samples during homogenisation to avoid a loss of extractable residues.

The Meeting concluded that the data submitted for the use of chlorothalonil on bulb onions are not sufficient for a recommendation and withdraws its previous recommendation for chlorthalonil of 0.5 mg/kg.

Leek

For leek chlorothalonil is registered in the Netherlands with 5 application of 1.5 kg ai/ha each with a PHI of 14 days. Supervised field trials from Northern France and the United Kingdom, conducted according to GAP were submitted.

The corresponding chlorothalonil residues in whole plants (bulb and leaves) were (n = 6): 8.2, 11, 15, 18, 21 and 22 mg/kg.

Residues of SDS-3701 were not analysed.

An additional GAPs for the use of chlorothalonil on leek was reported from Spain involving up to 4 applications with 1.5 kg ai/ha each and a PHI of 10 days. Supervised field trials conducted in Italy according to this GAP were submitted.

The corresponding chlorothalonil residues in whole plants (bulb and leaves) were (n = 2): 4.7 and 7 mg/kg.

Residues of SDS-3701 were not analysed.

Based on the dataset for the use of chlorothalonil on leek in Northern Europe the Meeting considered a value of 40 mg/kg appropriate as a maximum residue level for leek. The value derived from the NAFTA calculator agreed with the estimate of 40 mg/kg made by the present Meeting (after rounding (NAFTA = 37 mg/kg)).

The Meeting estimated a maximum residue level, and STMR and an HR value of 40 mg/kg, 17.5 mg/kg and 22 mg/kg, respectively.

Spring onions

The use of chlorothalonil on spring onions is registered in United Kingdom with 2 application of 1 kg ai/ha each with a PHI of 14 days. Supervised field trials conducted in United Kingdom according to this GAP were submitted.

The corresponding chlorothalonil residues in spring onions were (n = 4): 0.17, 0.77, 0.9 and 7.5 mg/kg.

Residues of SDS-3701 were (n = 4): < 0.01, < 0.01, 0.01 and 0.05 mg/kg.

Additional supervised field trials on spring onions conducted in Italy were submitted, but no corresponding GAP was reported for chlorothalonil.

For spring onions the value derived from the NAFTA calculator was 8.75 mg/kg, based on the UCL95 Median. The Meeting estimated a maximum residue level, and STMR and an HR value of 10 mg/kg, 0.835 mg/kg and 7.5 mg/kg for spring onions, respectively, and decided to extrapolate this recommendation to Chinese onions and Welsh onions also.

Brussels sprouts

The use of chlorothalonil on Brussels sprouts is registered in the United Kingdom with 2 applications at rates of 1.5 kg ai/ha each with a PHI of 7 days. Supervised field trials conducted with several formulations in Northern Europe according to this GAP were submitted.

The corresponding chlorothalonil residues were: 0.22, 0.44, 0.65, 1.2, 1.5(3), 1.6 and 2.8 mg/kg.

Residues of SDS-3701 were (n = 7): < 0.01(5), 0.01 and 0.01 mg/kg.

Additional information from supervised field trials conducted according to GAP, but not using homogenisation that involves enzyme deactivation, are available, giving residues of 0.18, 0.28, 0.45, 0.47, 0.53, 0.92 and 1.1 mg/kg. Residues of SDS-3701 were not analysed.

For Cyprus chlorothalonil is registered for Brussels sprouts with 4 applications of 1.5 kg ai/ha each with a PHI of 7 days. Supervised field trials conducted in the Southern Europe according to this GAP were submitted.

The corresponding chlorothalonil residues in Brussels sprouts were (n = 4): 0.73, 0.81, 0.95 and 1.3 mg/kg.

Residues of SDS-3701 were (n = 4): < 0.01(3) and 0.02 mg/kg.

Based on the dataset for the use of chlorothalonil on Brussels sprouts in United Kingdom the Meeting considered a value of 6 mg/kg appropriate as a maximum residue. The value derived from the NAFTA calculator was 6.3 mg/kg.

The Meeting estimated a maximum residue level, and STMR and an HR value of 6 mg/kg, 1.5 mg/kg and 2.8 mg/kg, respectively.

The Meeting withdraws its previous recommendation for chlorothalonil in Brussels sprouts of 5 mg/kg.

Cabbages, Head

No trials matching GAP for chlorothalonil residues in head cabbage were submitted to the Meeting.

The Meeting withdraws its previous recommendation for chlorothalonil in head cabbage of 1 mg/kg.

Flowerhead brassica

For cauliflower chlorothalonil is registered in the United Kingdom with 2 application of 1.5 kg ai/ha each with a PHI of 7 days. Supervised field trials conducted in the United Kingdom according to this GAP were submitted.

The corresponding chlorothalonil residues in cauliflowers were: 0.07, 0.09, 0.11, 0.2, 0.5 and 0.84 mg/kg.

Residues of SDS-3701 were (n = 4): < 0.01(4) mg/kg.

Additional information from supervised field trials conducted according to GAP, but not using homogenisation that involves enzyme deactivation, are available, giving residues of 0.45, 0.47, 0.8, 2.1 and 2.3 mg/kg. Residues of SDS-3701 were not analysed.

In Cyprus the use of chlorothalonil on cauliflower is registered with up to 4 application with 1.5 kg ai/ha each with a PHI of 7 days. Supervised field trials conducted in the Southern Europe according to this GAP were submitted.

The corresponding chlorothalonil residues in cauliflowers were (n = 4): 0.09, 0.19, 0.39 and 0.52 mg/kg.

Residues of SDS-3701 were (n = 4): < 0.01(4) mg/kg.

The Meeting recognized that additional information from supervised residue trials in cauliflowers homogenised without measures to inhibit enzymic activity are available, resulting in higher residues than the field trial data considered as valid. Since the valid dataset available is sufficient for a recommendation of a maximum residue level for cauliflower on its own, the Meeting decided to take the additional informative data into account for its recommendation also, including the probability of higher residues in its estimate.

The Meeting recommends a maximum residue level for chlorothalonil in flowerhead brassica of 5 mg/kg. To accommodate for the uncertainty involved with the additional data, the Meeting decided to base the dietary risk assessment (chronic and acute) on the maximum residue level also.

The Meeting withdraws its previous recommendation for chlorothalonil in cauliflower of 1 mg/kg.

Cucumber, gherkins and summer squash

The use of chlorothalonil on cucumbers (outdoor) is registered in Spain with 3 application of 2.25 kg ai/ha each with a PHI of 3 days. Supervised field trials conducted in Italy did not match the PHI registered.

In the USA the use of chlorothalonil on cucumbers (outdoor) is registered with application rates of 2.5 kg ai/ha with a PHI of 0 days. Supervised field trials conducted in the USA according to this GAP were submitted.

The corresponding chlorothalonil residues in cucumbers were (n = 5): 0.14, 0.25, 0.41, 0.79 and 1.3 mg/kg.

For chlorothalonil on protected cucumbers a registered use from the Netherlands was reported involving 3 application with 2.25 kg ai/ha with a PHI of 3 days. One supervised field trials conducted in Germany according to this GAP was submitted.

The corresponding chlorothalonil residue in cucumbers was: 0.36 mg/kg.

Based on the dataset for cucumbers from the US the Meeting estimated a maximum residue level, an STMR and an HR for chlorothalonil in cucumbers of 3 mg/kg, 0.41 mg/kg and 1.3 mg/kg, respectively. The result from the NAFTA-calculator was 3.4 mg/kg, providing good compliance with the Meetings estimation. The Meeting also decided to extrapolate its recommendations for cucumbers to gerkins and summer squash.

The Meeting withdraws its previous recommendation for chlorothalonil in cucumbers and summer squash of 5 mg/kg.

Melons, except Watermelon

The use of chlorothalonil on melons (outdoor) is registered in Cyprus with 4 application of 1.5 kg ai/ha each with a PHI of 3 days. Supervised field trials conducted in Southern Europe according to this GAP were submitted.

The corresponding chlorothalonil residues in melons (whole fruits) were: 0.31, 0.57, 0.6, 0.6 and 1.0 mg/kg.

Residues of chlorothalonil in melon pulp were (n = 5): < 0.01, < 0.01, 0.04, 0.2 and 0.21 mg/kg.

Additional information from supervised field trials conducted according to GAP, but not using homogenisation that involves enzyme deactivation, are available, giving residues of 0.018, 0.03, 0.039, 0.043, 0.1, 0.12, 0.18, 0.19, 0.31, 0.32, 0.39 and 0.87 mg/kg in the whole fruit. Residues of SDS-3701 were not analysed.

For chlorothalonil on protected melon a registered use from Cyprus with 4 application of 1.5 kg ai/ha each and a PHI of 3 days was reported. Supervised field trials conducted in Southern Europe according to this GAP were submitted.

The corresponding chlorothalonil residues in melons (whole fruits) were: 0.13, 0.21, 0.27, 0.31, 0.52 and 0.58 mg/kg.

Residues of chlorothalonil in melon pulp were (n = 5): < 0.01, < 0.01, 0.04 and 0.05 mg/kg.

Based on the data for field melon from Southern Europe the Meeting confirms the maximum residue level of 2 mg/kg for melons, except watermelons and estimated an STMR and an HR value 0.04 mg/kg and 0.21 mg/kg in the pulp, respectively.

The MRL derived from use of the NAFTA Calculator was 1.5 mg/kg. Due to the low number of results the Meeting concluded that the results of the NAFTA-calculator are not reliable and should not be used for a recommendation.

Winter squash

For chlorothalonil on winter squash a registered use from the USA involving applications with 2.5 kg ai/ha and a PHI of 0 days was reported. One supervised field trial conducted according to this GAP was submitted, but it did not involve appropriate treatment of the samples during homogenisation to avoid a loss of extractable residues.

The Meeting concluded that the data submitted for the use of chlorothalonil on winter squash is not sufficient for a recommendation and withdraws its previous recommendation for chlorthalonil of 5 mg/kg.

Okra

For okra chlorothalonil is registered in the Ivory Coast with 2 application of 1.0 kg ai/ha each with a PHI of 2 days. Supervised field trials conducted in the Ivory Coast according to this GAP were submitted, but did not involve appropriate treatment of the samples during homogenisation to avoid a loss of extractable residues. The corresponding chlorothalonil residues in okras were (n = 4): 0.06, 0.15, 0.82 and 1.0 mg/kg.

The Meeting concluded that the data submitted for the use of chlorothalonil on okra is not sufficient for a recommendation.

Peppers

For peppers supervised field trials involving chlorothalonil from Brazil were submitted matching the GAP of 0.2 kg ai/hL with a PHI of 7 days.

Corresponding residues in bell peppers were (n = 4): 1.1, 1.5, 1.7 and 4.4 mg/kg.

The Meeting decided that the data submitted are not sufficient for a recommendation on maximum residue levels or for the estimation of STMR and HR values for chlorothalonil in peppers.

The Meeting withdraws it previous recommendation for peppers, sweet of 7 mg/kg and peppers, chili (dry) of 70 mg/kg.

Tomatoes

For tomatoes chlorothalonil is registered in the United States with applications of 2.4 kg ai/ha each with a PHI of 0 days. Supervised field trials conducted in the US according to this GAP were submitted, but they either did not involve appropriate treatment of the samples during homogenisation to avoid a loss of extractable residues or were not collected according to the recommended FAO sampling procedure. The corresponding chlorothalonil residues in tomato fruits were: 0.94, 1.0, 1.3, 1.3, 1.4, 1.4, 1.8, 1.9, 2.2, 2.7, 2.7, 5.3, 6.0 and 6.4 mg/kg, the corresponding SDS-3701 residues in tomato fruits were: < 0.03, < 0.03, 0.06 mg/kg.

The Meeting concluded that the data submitted for the use of chlorothalonil on tomatoes is not sufficient for a recommendation and withdraws its previous recommendation for chlorthalonil of 5 mg/kg.

Sweet corn

The use of chlorothalonil on sweet corn is registered in the United States with applications of 1.7 kg ai/ha each with a PHI of 14 days. Supervised field trials conducted in the US according to this GAP were submitted, but did not involve appropriate treatment of the samples during homogenisation to avoid a loss of extractable residues. The corresponding chlorothalonil residues in ears were: < 0.01(3) mg/kg, the corresponding SDS-3701 residues in ears were: < 0.01, < 0.01 and 0.01 mg/kg.

The Meeting concluded that the data submitted for sweet corn is not sufficient for a recommendation and withdraws its previous recommendation for chlorothalonil in sweet corn of 0.01* mg/kg.

Beans, shelled (legume vegetables)

For the use of chlorothalonil on legume vegetables supervised field trials in the United Kingdom on green beans without pods were submitted, but no corresponding GAP was reported.

The Meeting withdraws its previous recommendation for chlorothalonil in common beans (pods and/or immature seeds) of 5 mg/kg.

Pulses

For beans (pulses) chlorothalonil is registered in Spain with 2 application of 1.5 kg ai/ha each with a PHI of 15 days. Supervised field trials conducted in Southern Europe according to this GAP were submitted.

The corresponding chlorothalonil residues in dry seeds were (n = 7): 0.05, 0.05, 0.11, 0.19, 0.32, 0.52 and 0.68 mg/kg.

The corresponding SDS-3701 residues in dry seeds were (n = 7): < 0.01, < 0.01, 0.02(3), 0.04 and 0.04 mg/kg.

For chick peas (pulses) chlorothalonil is registered in Spain with 2 application of 1.5 kg ai/ha each with a PHI of 15 days. Supervised field trials were conducted in Southern Europe according to this GAP.

The corresponding chlorothalonil residues in dry seeds were: 0.1, 0.28, 0.34 and 0.62 mg/kg.

The corresponding SDS-3701 residues in dry seeds were (n = 4): < 0.01(3), 0.02 mg/kg.

Additional information from supervised field trials conducted according to GAP, but not using homogenisation that involves enzyme deactivation, are available, giving residues of 0.11, 0.11, 0.17, 0.29, 0.31, 0.39 and 0.44 mg/kg. Residues of SDS-3701 were not analysed.

The use of chlorothalonil on soya beans (pulses) is registered in the United States with applications of 1.9 kg ai/ha each with a PHI of 42 days. Supervised field trials conducted in the US according to this GAP were submitted.

The corresponding chlorothalonil residues in dry seeds were: < 0.01(3) and 0.019 mg/kg.

The Meeting decided to make a recommendation for the whole group of pulses based on the data on beans treated according to the submitted GAP from Spain and estimated a maximum residue level and an STMR value for pulses of 1 and 0.19 mg/kg, respectively.

The value derived from use of the NAFTA Calculator was 1.4 mg/kg, providing good compliance with the value estimated by the Meeting.

The Meeting withdraws its previous recommendation for chlorothalonil in beans (dry) of 0.2 mg/kg.

Root and tuber vegetables

For carrots chlorothalonil is registered in Spain with 3 application of 1.5 kg ai/ha each with a PHI of 15 days. Supervised field trials conducted in Southern Europe according to this GAP were submitted.

The corresponding chlorothalonil residues in carrots were (n = 6): < 0.01, 0.01, 0.02, 0.02, 0.05 and 0.06 mg/kg.

Additional information from supervised field trials conducted according to GAP, but not using homogenisation that involves enzyme deactivation, are available, giving residues of 0.08 and 0.19 mg/kg. Residues of SDS-3701 were not analysed.

The use of chlorothalonil on potatoes is registered in the United Kingdom with 5 applications of 1.5 kg ai/ha each with a PHI of 7 days. Supervised field trials conducted in Northern Europe according to this GAP were submitted.

The corresponding chlorothalonil residues in potato tubers were: < 0.01(7) and 0.01 mg/kg.

In Cyprus chlorothalonil is registered on potatoes with 3 applications of 1.5 kg ai/ha each with a PHI of 10 days. Supervised field trials conducted in Southern Europe according to this GAP were submitted.

The corresponding chlorothalonil residues in potato tubers were: < 0.01(4) mg/kg.

The Meeting recognized that additional information from supervised residue trials in carrots homogenised without measures to inhibit enzymic activity are available, resulting in higher residues than the field trial data considered as valid. Since the valid dataset available is sufficient for a recommendation of a maximum residue level for root and tuber vegetables on its own, the Meeting decided to take the additional informative data into account for its recommendation also, including the probability of higher residues in its estimate.

The Meeting recommends a maximum residue level for chlorothalonil in root and tuber vegetables of 0.3 mg/kg. To accommodate for the uncertainty involved with the additional data, the Meeting decided to base the dietary risk assessment (chronic and acute) on the maximum residue level also.

The Meeting withdraws its previous recommendations for chlorothalonil in carrots of 1 mg/kg and in potatoes of 0.2 mg/kg.

Asparagus

For asparagus chlorothalonil is registered in the United States with application of 3.4 kg ai/ha each with a PHI of 190 days. Supervised field trials conducted in the US according to this GAP were submitted, but did not involve appropriate treatment of the samples during homogenisation to avoid a loss of extractable residues. The corresponding chlorothalonil residues in asparagus spears were (n = 6): < 0.01(5), 0.033 mg/kg, the corresponding SDS-3701 residues were (n = 6): < 0.01(6) mg/kg.

The Meeting concluded that the data submitted for asparagus is not sufficient for a recommendation for chlorothalonil.

Celery

The use of chlorothalonil on celery is registered in the United States with applications of 2.5 kg ai/ha each with a PHI of 7 days. Supervised field trials conducted in the US according to this GAP were submitted.

The corresponding chlorothalonil residues in celery stalks were: 0.06, 2.0, 3.3 and 7.5 mg/kg.

The corresponding SDS-3701 residues in celery stalks were: 0.02 mg/kg.

The Meeting estimated a maximum residue level, an STMR and an HR value for celery of 20, 2.65 and 7.5 mg/kg, respectively.

The value derived from use of the NAFTA Calculator was 28 mg/kg. Under consideration of additional trial data conducted at higher application rates the Meeting concluded that the value derived by the calculator was probably an overestimation of the maximum residue level due to a small dataset matching GAP.

The Meeting withdraws its previous recommendations for chlorothalonil in celery of 10 mg/kg and in celery leaves of 3 mg/kg.

Barley

No information on chlorothalonil residues in barley were submitted to the Meeting.

The Meeting withdraws its previous recommendation for chlorothalonil in barley of 0.1 mg/kg.

Maize

The use of chlorothalonil on maize is registered in the United States with applications of 1.7 kg ai/ha each with a PHI of 14 days. No supervised field trials matching this GAP were submitted.

Wheat

No information on chlorothalonil residues in wheat were submitted to the Meeting.

The Meeting withdraws its previous recommendation for chlorothalonil in wheat of 0.1 mg/kg.

Almonds

The use of chlorothalonil on almonds is registered in the United States with applications of 3.4 kg ai/ha each with a PHI of 150 days. Supervised field trials conducted in the US according to this GAP were submitted.

The corresponding chlorothalonil residues in nutmeat were: < 0.03 and < 0.03mg/kg.

The corresponding SDS-3701 residues in nutmeat were: < 0.03 and < 0.03 mg/kg.

Additional information from supervised field trials conducted according to GAP, but not using homogenisation that involves enzyme deactivation, are available, giving residues of < 0.01(3), 0.01 and 0.01 mg/kg. Residues of SDS-3701 were < 0.01(6).

The Meeting concluded that the data submitted for almonds is not sufficient for a recommendation for chlorothalonil.

Pistachio nut

The use of chlorothalonil on pistachios is registered in the United States with applications of 2.5 kg ai/ha each with a PHI of 14 days. Supervised field trials were conducted in the US with application rates of 5 kg ai/ha and a PHI of 14 days.

The Meeting concluded that the data on pistachios are not corresponding to the GAP reported and therefore recommendations on a maximum residue levels are not possible.

Peanuts

The use of chlorothalonil on peanuts is registered in the United States with applications of 1.3 kg ai/ha each with a PHI of 14 days. Supervised field trials conducted in the US according to this GAP were submitted.

The corresponding chlorothalonil residues in nutmeat were (n = 12): < 0.01(9), 0.01, 0.02, 0.05 mg/kg.

The corresponding SDS-3701 residues in nutmeat were (n = 10): < 0.01(10) mg/kg.

The corresponding R611965 residues in nutmeat, taken up from the soil within the vegetation period, were (n = 10): < 0.03(4), 0.03, 0.03, 0.04, 0.05, 0.05, 0.06 mg/kg.

The Meeting estimated a maximum residue level and an STMR value for peanuts of 0.1 and 0.01 mg/kg, respectively.

Due to the high percentage of residue values below the LOQ the Meeting concluded that the NAFTA procedure is no applicable for the estimation of maximum residue levels in peanuts.

The Meeting withdraws its previous recommendation for chlorothalonil in peanuts of 0.05 mg/kg.

Sweet corn forage

Supervised field trials on sweet corn forage conducted in the United States were submitted, but the US GAP states that sweet corn may not be utilized as forage or silage.

Barley, straw and fodder

No information on chlorothalonil residues in barley were submitted to the Meeting.

The Meeting withdraws its previous recommendation for chlorothalonil in barley, straw and fodder, dry of 20 mg/kg.

Maize stover

Supervised field trials on maize stover conducted in the United States were submitted, but the US GAP states that sweet corn may not be utilized as forage or silage.

Wheat, straw and fodder

No information on chlorothalonil residues in wheat were submitted to the Meeting.

The Meeting withdraws its previous recommendation for chlorothalonil in wheat, straw and fodder, dry of 20 mg/kg.

Almond hulls

The use of chlorothalonil on almond is registered in the United States with applications of 3.4 kg ai/ha each with a PHI of 150 days. Supervised field trials conducted in the US according to this GAP were submitted.

The corresponding chlorothalonil residues in almond hulls were: < 0.03, < 0.03 mg/kg.

The corresponding SDS-3701 residues in almond hulls were: < 0.03 and < 0.03 mg/kg.

Additional information from supervised field trials conducted according to GAP, but not using homogenisation that involves enzyme deactivation, are available, giving residues of 0.03, 0.03, 0.09, 0.63, 0.91 and 1.1 mg/kg. Residues of SDS-3701 were < 0.01(6).

The Meeting concluded that the data submitted for almond hulls is not sufficient for a recommendation for chlorothalonil.

Residues following treatment with chlorothalonil in follow crops

Although residues of chlorothalonil are quickly degraded in soil, the toxicological relevant metabolite SDS-3701 may be taken up by succeeding crops. Information on the DT50 value is not available, but in field dissipation studies residues were found up to 540 days after treatment. It is likely that soil residues would require several years to reach plateau levels and residues in succeeding crops could be higher than those observed in the rotational crop following a single season of applications.

For the estimation of residues in follow crops all residues in field rotational crop studies were compared to the highest annual application rate of 20 kg ai/ha reported for celery from the United States. In the following table residues found in the different commodities were directly scaled based on the individual ratio of active substance applied in the respective trial to a theoretical annual rate of 20 kg ai/ha.

Since residues of parent chlorothalonil were very low giving results at or below the LOQ of the analytical method used, the Meeting concluded that no significant transfer of chlorothalonil into follow crops has to be expected. For dietary intake purposes only residues of SDS-3701 are considered.

The estimation of STMR and HR values was based on the data from follow crops or direct treatment resulting in the highest residue level in the respective crop group. For all permanent crops no significant transfer of SDS-3701 into commodities is expected.

Summary of SDS-3701 residues found in field rotational crop studies scaled to the highest annual rate of 20 kg ai/ha.

Group	No. of trials	Highest results per trial (mg/kg)	Mean in mg/kg	Median in mg/kg	Highest residue in mg/kg
SDS-3701					
Bulb vegetables	3	< 0.01(3)	< 0.01	< 0.01	< 0.01
Brassica vegetables	5	< 0.01, < 0.01, < 0.02(3)	< 0.02	< 0.02	< 0.02
Fruiting vegetables	6	< 0.01(5), < 0.02	< 0.01	< 0.01	< 0.02
Leafy vegetables	9	< 0.01(4), < 0.02, 0.04, 0.04, 0.05, 0.19	0.076	0.02	0.19
Legume vegetables	4	< 0.01(3), < 0.02	< 0.01	< 0.01	< 0.02
Pulses	5	< 0.01, < 0.01, < 0.02(3)	< 0.02	< 0.02	< 0.02
Root and tuber vegetables	12	< 0.01(3), < 0.02(5), 0.02, 0.03(3)	0.02	0.02	0.03
Stem vegetables	1	< 0.02	< 0.02	< 0.02	< 0.02
Cereal grains	15	< 0.01(7), < 0.02(6), < 0.05, < 0.05	< 0.02	< 0.02	< 0.05
Oilseeds	5	< 0.01, < 0.02(3), < 0.05	0.02	0.02	0.05
Legumes hay and fodder	2	< 0.02, 0.14	0.08	0.08	0.14
Forage of cereal grains	2	< 0.02, 0.04	0.03	0.03	0.04
Straw and fodder of cereal grains	10	< 0.02, 0.02, < 0.03(4), < 0.04, 0.04, 0.04, 0.08	0.036	0.03	0.08
Root leaves and tops	8	< 0.01, 0.01, < 0.02, < 0.02, 0.02, 0.03, 0.04, 0.04	0.024	0.02	0.04

For dietary intake purposes of SDS-3701 in the group of berries and other small fruits, except grapes, residue data on blue- and cranberries are available giving residues of < 0.01(3) and

0.06 mg/kg. Crops within this group are normally not subject to crop rotation. Under consideration of plant metabolism data indicating an overall very low level of SDS-3701 in all plants following direct treatment, the Meeting concluded that the data on blue- and cranberries are also representative for other berries and small fruits, except grapes, and estimated an STMR value of 0.01 mg/kg and an HR value of 0.06 mg/kg for SDS-3701.

Residues in bulb vegetables grown as a rotational crop were < 0.01(3) mg/kg for SDS-3701. For spring onion supervised field trial data are available with SDS-3701 residues of < 0.01, < 0.01, 0.01 and 0.04 mg/kg.

Under consideration of higher residue data from supervised field trials the Meeting estimated an STMR and an HR value of 0.01 mg/kg and 0.04 mg/kg for SDS-3701 in bulb vegetables, respectively.

For brassica vegetables residues of SDS-3701 found in field rotational crop studies were < 0.01, < 0.01 and < 0.02(3) mg/kg. Additional supervised field trial data are available for Brussels sprouts (< 0.01(9), 0.01 and 0.02 mg/kg) and cauliflower (< 0.01(8) mg/kg). Under consideration of all data available the Meeting estimated an STMR and an HR value for SDS-3701 in brassica vegetables of 0.01 mg/kg and 0.02 mg/kg, respectively.

Residues in SDS-3701 in fruiting vegetables grown as a rotational crop were found in field crop rotation studies at levels of < 0.01(5) and < 0.02 mg/kg. In supervised field trials residues of SDS-3701 were investigated in winter squash (0.02 mg/kg) and tomatoes (< 0.03, < 0.03 and 0.06 mg/kg). Under consideration of all residue data available (< 0.01(5), < 0.02, 0.02, < 0.03, < 0.03 and 0.06 mg/kg) the Meeting estimated an STMR and an HR value of 0.015 mg/kg and 0.06 mg/kg, respectively, for fruiting vegetables (cucurbits and other than cucurbits).

In leafy vegetables SDS-3701 residues found in field rotational crops studies were < 0.01(4), < 0.02, 0.04, 0.04, 0.05 and 0.19 mg/kg. No information on SDS-3701 residues from supervised field trials was available. The Meeting estimated an STMR and an HR value of 0.02 mg/kg and 0.19 mg/kg, respectively, for SDS-3701 residues in leafy vegetables.

The Meeting decided to extrapolate the estimations for SDS-3701 from leafy vegetables to herbs.

For legume vegetables residues of SDS-3701 found in field rotational crop studies were < 0.01(3), < 0.02 mg/kg. No information on SDS-3701 residues from supervised field trials was available. The Meeting estimated an STMR and an HR value of 0.01 mg/kg and 0.02 mg/kg, respectively, for SDS-3701 residues in legume vegetables.

Residues in SDS-3701 in pulses grown as a rotational crop were found in field crop rotation studies at levels of < 0.01, < 0.01 and < 0.02(3) mg/kg. In supervised field trials residues of SDS-3701 were investigated in beans (< 0.01, < 0.01, 0.02(3), 0.04 and 0.04 mg/kg) and chick peas (< 0.01(3), 0.02 mg/kg). Under consideration of all residue data available (< 0.01(7), < 0.02(3), 0.02(4), 0.04 and 0.04 mg/kg) the Meeting estimated an STMR value of 0.02 mg/kg.

In root and tuber vegetables SDS-3701 residues found in field rotational crops studies were < 0.01(3), < 0.02(5), 0.02 and 0.03(3) mg/kg. No information on SDS-3701 residues from supervised field trials was available. The Meeting estimated an STMR and a HR value of 0.02 mg/kg and 0.03 mg/kg, respectively, for SDS-3701 residues in root and tuber vegetables.

Residues in SDS-3701 in stalk and stem vegetables grown as rotational crops were found in field crop rotation studies at levels of < 0.02 mg/kg. In supervised field trials residues of SDS-3701 were investigated in asparagus (< 0.01(6) mg/kg) and celery (0.02 mg/kg). Under consideration of all available residue data (< 0.01(6), < 0.02 and 0.02 mg/kg) the Meeting estimated an STMR value and a HR value of 0.01 mg/kg and 0.02 mg/kg, respectively.

For cereal grains residues of SDS-3701 found in field rotational crop studies were < 0.01(7), < 0.02(6), < 0.05, < 0.05 mg/kg. No information on SDS-3701 residues from supervised field trials

was available. The Meeting estimated an STMR value of 0.02 mg/kg for SDS-3701 residues in cereal grains.

In oilseeds SDS-3701 residues found in field rotational crops studies were < 0.01, < 0.02(3), and < 0.05 mg/kg. No information on SDS-3701 residues from supervised field trials was available. The Meeting estimated an STMR value of 0.02 mg/kg for SDS-3701 residues in oilseeds.

Residues in SDS-3701 in legume hay and fodder grown as a rotational crop were found in field crop rotation studies at levels of < 0.02 and 0.04 mg/kg. No information on SDS-3701 residues from supervised field trials was available. The Meeting estimated an STMR and a highest residue value of 0.03 mg/kg and 0.04 mg/kg, respectively, for SDS-3701 residues in legume hay and fodder.

For forage of cereal grains residues of SDS-3701 found in field rotational crop studies were < 0.02 and 0.04 mg/kg. No information on SDS-3701 residues from supervised field trials was available. The Meeting estimated an STMR value of 0.03 mg/kg and a highest residue value of 0.04 mg/kg for SDS-3701 residues in forage of cereal grains.

For straw and fodder of cereal grains residues of SDS-3701 found in field rotational crop studies were < 0.02, 0.02, < 0.03(4), < 0.04, 0.04, 0.04, 0.08 mg/kg. No information on SDS-3701 residues from supervised field trials was available. The Meeting estimated an STMR value of 0.03 mg/kg and a highest residue of 0.08 mg/kg for SDS-3701 residues in straw and fodder of cereal grains.

In tops and leaves of root crops SDS-3701 residues found in field rotational crops studies were < 0.01, 0.01, < 0.02, < 0.02, 0.02, 0.03, 0.04 and 0.04 mg/kg. No information on SDS-3701 residues from supervised field trials was available. The Meeting estimated an STMR and a highest residue value of 0.02 mg/kg and 0.04 mg/kg, respectively, for SDS-3701 residues in tops and leaves of root crops.

Fate of residues during processing

The Meeting received information on the fate of incurred residues of chlorothalonil during the processing of grapes, strawberries, tomatoes, courgettes, cucumbers, winter squash, head cabbage, leek and French beans. Also information was provided on hydrolysis studies of chlorothalonil to assist with identification of the nature of the residue during processing.

The degradation of chlorothalonil was investigated under conditions representative of pasteurisation (pH 4, 90 °C for 20 minutes), baking, brewing and boiling (pH 5, 100 °C for 60 minutes) and sterilisation (pH 6, 120 °C for 20 minutes). Additional experiments were also performed at pH 4 at 120 °C and pH 6 at 90 °C for 20 minutes to investigate which of pH or temperature was the key variable in hydrolytic degradation of chlorothalonil.

At pH 4 chlorothalonil residues were relatively stable with > 90% remaining at 90 °C and 73% remaining at 120 °C.

For pH 5 at 100 °C a moderate degradation was observed in all samples leaving approx. 80% of the initial chlorothalonil. The major degradation product was identified as SDS-3701 at 19% of the initial residue.

For pH6 at 120 °C chlorothalonil is quickly degraded. Under addition of a sodium acetate buffer less than 4% of the chlorothalonil remained. Main degradation products were SDS-3701 (48%) and an artefact (28%, identified as 4-amino-2,5,6-trichloroisophthalonitrile). In sterile water without buffer approx. 26% of the chlorothalonil remained. SDS-3701 constituted 59% of the residue while no formation of the artefact was found.

In contrast to the results obtained from sterile buffer solutions processing studies involving background matrices gave much lower levels of SDS-3701 after the processing. The Meeting decided that besides the normal processing factors for chlorothalonil yield factors for the conversion of parent substance into SDS-3701 should be taken into account for the estimation of the dietary intake. Depending on the outcome the higher STMR-P or HR-P of SDS-3701 → SDS-3701 or chlorothalonil → SDS-3701 is used for the overall estimation of STMR-P and HR-P for SDS-3701 in the processed

product. The resulting processing factors relevant for dietary intake of the estimation of maximum residue levels are summarised below:

Processing factors for chlorothalonil

Raw agricultural commodity (RAC)	Processed commodity	Calculated processing factors	Median or best estimate	STMR (mg/kg)	STMR-P (mg/kg)	HR (mg/kg)	HR-P (mg/kg)
Grapes	Wine, red	Chlorothalonil: < 0.01(6), < 0.02, < 0.02	Chlorothalonil: < 0.01	0955	0.0096		
	Raisins	Chlorothalonil: 0.01, 0.51	Chlorothalonil: 0.26	0.955	0.248	1.6	0.416
	Juice, unpasteurized	Chlorothalonil: 0.02, 0.26	Chlorothalonil: 0.14	0.955	0.134		
	Pomace, wet	Chlorothalonil: 0.61, 1.9	Chlorothalonil: 1.3	0.955	1.24	1.6	2.08
	Pomace, dry	Chlorothalonil: 0.33, 1.5	Chlorothalonil: 0.78	0.955	0.745	1.6	1.25

Yield factors for SDS-3701 → SDS-3701

Raw agricultural commodity (RAC)	Processed commodity	Calculated processing factors	Median or best estimate	STMR (mg/kg)	STMR-P (mg/kg)	HR (mg/kg)	HR-P (mg/kg)
Grapes	Wine, red	SDS-3701: < 0.11, < 1, < 1	SDS-3701: < 0.11	0.01	0.009		
	Raisins	SDS-3701: 0.57, 1	SDS-3701: 0.79	0.01	0.0079	0.15	0.1185
	Juice, unpasteurized	SDS-3701: < 0.25, < 0.29	SDS-3701: < 0.27	0.01	0.0027		
	Pomace, wet	SDS-3701: 0.86, 1.5	SDS-3701: 1.2	0.01	0.012	0.15	0.18
	Pomace, dry	SDS-3701: 2.8, 3.4	SDS-3701: 3.1	0.01	0.031	0.15	0.465

Yield factors of chlorothalonil → SDS-3701 during processing

Raw agricultural commodity (RAC)	Processed commodity	Calculated processing factors chlorothalonil → SDS-3701	Median or best estimate	STMR chlorothalonil (mg/kg)	STMR-P SDS-3701 (mg/kg)
Grapes	Wine, red	< 0.004, < 0.02, < 0.26	< 0.02	0.955	0.0191
	Raisins	0.002, 0.004	0.003	0.955	0.00287
	Juice, unpasteurized	< 0.001, < 0.001	< 0.001	0.955	0.00096
	Pomace, wet	0.004, 0.006	0.005	0.955	0.00478
	Pomace, dry	0.01, 0.014	0.012	0.955	0.0115

Chlorothalonil

For processed grapes the Meeting estimated STMR-P values for chlorothalonil of 0.0096 mg/kg in wine, 0.134 mg/kg in juice and 1.24 mg/kg and 0.745 mg/kg in wet and dry grape pomace, respectively (chlorothalonil → chlorothalonil).

For raisins an STMR-P of 0.248mg/kg and an HR-P of 0.416 mg/kg were estimated (chlorothalonil → chlorothalonil). Since the processing of grapes into raisins is covered by the recommendation for a maximum residue level for the raw commodity, a separate recommendation for dried grapes is not necessary.

SDS-3701

For the effect of processing the Meeting selected the higher STMR-P or HR-P value for each commodity following either SDS-3701 → SDS-3701 or chlorothalonil → SDS-3701.

For processed grapes the Meeting estimated STMR-P values for SDS-3701 of 0.019 mg/kg in wine (chlorothalonil → SDS-3701), 0.0079 mg/kg for raisins (SDS-3701→ SDS-3701), 0.0027 mg/kg in juice (SDS-3701→ SDS-3701) and 0.012 mg/kg and 0.031 mg/kg in wet and dry grape pomace (SDS-3701→ SDS-3701), respectively.

For raisins the Meeting estimated a HR-P of 0.12 mg/kg for SDS-3701 (SDS3701 → SDS-3701).

Residues in animal commodities

Livestock dietary burden

The Meeting received a lactating dairy cow feeding study which provided information on likely SDS-3701 residues resulting in animal commodities and milk from chlorothalonil residues in the animal diet.

In this study lactating cows (4 per dose group) were administered daily doses of chlorothalonil and SDS-3701 via gelatine capsule. The dose levels of the animals were 1.5 ppm chlorothalonil/0.1 ppm SDS-3701 (0.5×), 3 ppm chlorothalonil/0.2 ppm SDS-3701 (1×), 9 ppm chlorothalonil/0.6 ppm SDS-3701 (3×) and 30 ppm chlorothalonil/2.0 ppm SDS-3701 (10×) over 28 consecutive days. Milk was collected over whole study period.. Samples of fat, muscle, kidney and liver were taken for analysis.

In milk SDS-3701 residues reached a plateau after approximately 7–10 days of dosing. Plateau levels found for the different dose groups were 0.03 mg/kg (0.5×), 0.07 mg/kg (1×), 0.21 mg/kg (3×) and 0.49 mg/kg (10×). Separation of skim milk and cream revealed comparable residue levels in the two fractions.

In tissues highest residues of SDS-3701 were found in kidney and liver. Residues in kidney were always higher than liver with 0.14 mg/kg (0.5×), 0.2 mg/kg (1×), 0.49 mg/kg (3×) and 0.95 mg/kg (10×) in comparison to 0.02 mg/kg (0.5×), 0.03 mg/kg (1×), 0.16 mg/kg (3×) and 0.45 mg/kg (10×). Residues in fat were at a comparable level to residues in liver, giving 0.02 mg/kg (0.5×), 0.04 mg/kg (1×), 0.06 mg/kg (3×) and 0.67 mg/kg (10×) in perirenal fat. In muscle SDS-3701 was found at low levels only: < 0.01 mg/kg (0.5×), 0.01 mg/kg (1×), 0.05 mg/kg (3×) and 0.15 mg/kg (10×).

For poultry matrices no feeding studies are available. In radio-labelled metabolism studies using [^{14}C]-chlorothalonil no TRR above the LOQ of 0.01 mg/kg were found in any dose group (2, 6 and 20 ppm) for muscle and fat. Eggs contained TRR levels between 0.035–0.047 mg/kg for the 20 ppm group. In liver TRR levels were < 0.01 mg/kg for the 2 ppm group, 0.098 mg/kg for the 6 ppm group and 0.05 mg/kg for the 20 ppm group.

Poultry metabolism studies using ^{14}C-SDS-3701 were conducted at dose levels of 0.1, 0.3 and 1 ppm. For the 0.1 ppm dose group, which corresponds to the highest estimated dietary burden for poultry of 0.094 ppm (poultry layer–EU), no TRR above the LOQ of 0.01 mg/kg was found for egg whites, muscle, fat and skin. In liver TRR were 0.056 mg/kg while in egg yolk a TRR of 0.044 mg/kg was found. At higher dose rates residues in eggs yolk and liver correlated to the dose increasement. In cardial muscle single high residue of 0.55 mg/kg for the 0.3 ppm group and 0.154 mg/kg for the 1.0 ppm group were found. In the pectoral and adductor muscles no residues above the LOQ were found for any dose group.

For both studies the hens were sacrificed after 6 hours after the final dosing.

Estimated maximum and mean dietary burdens of livestock

Dietary burden calculations based on chlorothalonil and SDS-3701 for beef cattle, dairy cattle, broilers and laying poultry are presented in Annex 6. The calculations were made according to the livestock diets from US/CAN, EU, Australia and Japan in the OECD Table (Annex 6 of the 2006 JMPR Report).

In the following table the estimated livestock dietary burden is presented for chlorothalonil and SDS-3701 simultaneously, since both substances were administered in combined doses to the test animals.

	Livestock dietary burden, chlorothalonil and SDS-3701, ppm of dry matter diet (chlorothalonil / SDS-3701)							
	US/CAN		EU		Australia		Japan	
	max.	mean	max.	mean	max.	mean	max.	mean
Beef cattle	0.46 / 0.112	0.46 / 0.09	1.24 / 0.25	1.24 / 0.17	2.06 / 0.31[a]	2.06 / 0.27 [b]	0.03 / 0.04	0.03 / 0.03
Dairy cattle	0.27 / 0.15	0.27 / 0.12	0.79 / 0.22	0.79 / 0.15	2.0 / 0.3	2.0 / 0.28	0.02 / 0.09	0.02 / 0.05
Poultry - broiler	0.04 / 0.02	0.04 / 0.02	0.42 / 0.069[c]	0.42 / 0.05[d]	0.15 / 0.02	0.15 / 0.02	0 / 0.02	0 / 0.01
Poultry - layer	0.04 / 0.02	0.04 / 0.02	0.38 / 0.09[e]	0.38 / 0.07[d,f]	0.15 / 0.02	0.15 / 0.02	0 / 0.01	0 / 0.01

[a] Highest maximum beef or dairy cattle burden suitable for MRL estimates for mammalian meat and milk

[b] Highest mean beef or dairy cattle burden suitable for STMR estimates for mammalian meat and milk

[c] Highest maximum poultry burden suitable for MRL estimated for poultry meat

[d] Highest mean poultry burden suitable for STMR estimates in poultry meat

[e] Highest maximum poultry burden suitable for MRL estimated for eggs

[f] Highest mean poultry burden suitable for STMR estimates in eggs

Animal commodities, MRL estimation

In the table below, dietary burdens for chlorothalonil and SDS-3701 are shown in round brackets (), feeding levels and residue concentrations from the feeding studies are shown in square brackets [] and estimated concentrations related to the dietary burden are shown without brackets. Since the corresponding dairy cattle feeding study chlorothalonil and SDS-3701 were administered simultaneously, both levels are listed for comparison. In view of SDS-3701 being the only residue of concern in livestock animals after administration of both chlorothalonil and SDS-3701, the combined dose was considered relevant for the estimation of residues in tissues and milk.

Dietary burden (ppm) Feeding level [ppm]	Milk	Muscle	Liver	Kidney	Fat
MRL	mean	highest	highest	highest	highest
MRL beef or dairy cattle (2.06 / 0.31) [1.5 chlorothalonil + 0.1 SDS-3701, 3 chlorothalonil + 0.2 SDS-3701]	0.05 [0.04, 0.07]	0.013 [< 0.01, 0.02]	0.033 [0.03, 0.04]	0.18 [0.14, 0.28]	0.05 [0.03, 0.07]
STMR	mean	mean	mean	mean	mean
STMR beef or dairy cattle (2.06 / 0.27) [1.5 chlorothalonil + 0.1 SDS-3701, 3 chlorothalonil + 0.2 SDS-3701]	0.05 [0.04, 0.07]	0.01 [< 0.01, 0.01]	0.03 [0.03, 0.03]	0.16 [0.14, 0.2]	0.025 [0.02, 0.04]

In lactating cows residues above the LOQ of the analytical method of 0.01 mg/kg are expected for all commodities. The Meeting estimated maximum residue levels for mammalian meat of 0.02 mg/kg, for mammalian fat of 0.07 mg/kg, for milk of 0.07 and for edible offal (mammalian), based on kidney, of 0.2 mg/kg.

The Meeting estimated an STMR value for SDS-3701 in whole milk of 0.05 mg/kg.

For mammalian meat an STMR and an HR value of 0.01 mg/kg and 0.013 mg/kg were estimated by the Meeting. In mammalian fat the STMR and HR values were estimated at levels of 0.025 mg/kg and 0.05 mg/kg, respectively. For edible offal (mammalian) the Meeting estimated STMR and HR values of 0.16 mg/kg and 0.18 mg/kg, respectively, based on kidney.

For poultry a maximum dietary burden of 0.42 ppm was calculated for chlorothalonil. In absence of appropriate feeding studies the Meeting considered the available metabolism study with [^{14}C]-chlorothalonil dosed to laying hens for the estimation of SDS-3701 residues in poultry. In the lowest dose group of 2 ppm no detectable residues above the LOQ of 0.01 mg/kg were found in tissues or eggs, indicating an insignificant contribution to the overall residues of SDS-3701 in poultry matrices and eggs.

For the transfer of SDS-3701 into poultry matrices or eggs also no data from unlabelled feeding studies are available. Therefore the Meeting decided to estimating residues in poultry tissues and eggs based on the metabolism study on poultry, dose with [^{14}C]-SDS-3701 for a period of 21 days.

In this study for all matrices except egg yolk only TRR levels were reported. Under consideration of the results for egg yolk, revealing > 80% of the TRR being unchanged SDS-3701, the Meeting decided to directly use the TRR levels for the estimation of residues in poultry tissues and eggs.

Dietary burden (ppm) Feeding level [ppm]	Eggs [a]	Muscle	Liver	Fat
MRL				
	mean	highest	highest	highest
MRL boiler or layer poultry (0.09 SDS-3701) [0.1 SDS-3701]	0.04 [0.044]	< 0.01 [< 0.01]	0.05 [0.056]	< 0.01 [< 0.01]
STMR				
	mean	mean	mean	mean
STMR boiler or layer poultry (0.07) [0.1 SDS-3701]	0.031 [0.044]	< 0.01 [< 0.01]	0.039 [0.056]	< 0.01 [< 0.01]

[a] In the metabolism study pooled whites and yolk were analysed, without reporting of separate weights. The Meeting concluded to based it estimations for whole eggs on the critical values reported for yolk only

Under consideration of the results of the 0.1 ppm dose group the Meeting estimated maximum residue levels for SDS-3701 in poultry muscle, skin and fat of 0.01 mg/kg, 0.05 mg/kg for eggs and 0.07 mg/kg for poultry, edible offal of, based on liver.

For the estimation of the dietary intake the Meeting estimated STMR and HR values of 0.031 and 0.04 mg/kg for eggs, 0.039 and 0.05 mg/kg for poultry, edible offal of and 0.01 and 0.01 mg/kg for poultry muscle, skin and for fat.

RECOMMENDATIONS

On the basis of the data from supervised trials the Meeting concluded that the residue levels listed below are suitable for establishing maximum residue limits and for IEDI and IESTI assessment.

Definition of the residue (for compliance with MRL) for plant commodities*: chlorothalonil*

Definitions of the residue (for estimation of dietary intake) for plant commodities*:*

chlorothalonil

SDS-3701 (2,5,6-trichloro-4-hydroxyisophthalonitrile), all considered separately

Definition of the residue (for compliance with MRL and for estimation of dietary intake) for animal commodities*: SDS-3701 (2,5,6-trichloro-4-hydroxyisophthalonitrile)*

The residue is not fat-soluble.

Commodity		Maximum residue level recommendation, mg/kg		STMR or STMR-P, mg/kg	HR, mg/kg
CCN	Name	New	Previous		
FI 0327	Banana	W	0.01* [a]		
GC 0640	Barley	W	0.1		
AS 0640	Barley, straw and fodder, dry	W	20		
VD 0071	Beans, dry	W	0.2		
FB 0018	Berries and other small fruit, except grapes			SDS-3701: 0.01	SDS-3701: 0.06
VB 0040	Brassica vegetables			SDS-3701: 0.01	SDS-3701: 0.02
VB 0400	Broccoli	W	5		
VB 0402	Brussels sprouts	6	5	Chlorothalonil: 1.5	Chlorothalonil: 2.8
VA 0035	Bulb vegetables			SDS-3701: 0.01	SDS-3701: 0.04
VB 0041	Cabbages, head	W	1		
VR 0577	Carrots	W	1		
VB 0404	Cauliflower	W	1		
VX 0624	Celery	20	10	Chlorothalonil: 2.65	Chlorothalonil: 7.5
HH 0624	Celery leaves	W	3		
GC 0080	Cereal grains			SDS-3701: 0.02	
FS 0013	Cherries	W	0.5		
VP 0526	Common beans (pods an/or immature seeds)	W	5		
FB 0265	Cranberry	W	5		
VC 0424	Cucumbers	3	5	Chlorothalonil: 0.41	Chlorothalonil: 1.3
FB 0021	Currants, Black, Red and White	20	5	Chlorothalonil: 20 [b]	Chlorothalonil: 20 [b]
DF 0269	Dried grapes (raisins)			Chlorothalonil: 0.248 SDS-3701: 0.0079	Chlorothalonil: 0.416 SDS-3701: 0.12
MO 0105	Edible offal (mammalian)	0.2		SDS-3701: 0.16	SDS-3701: 0.18
PE 0112	Eggs		0.05	SDS-3701: 0.031	SDS-3701: 0.04
VB 0042	Flowerhead brassica	5		Chlorothalonil: 5 [b]	Chlorothalonil: 5 [b]
-	Forage of cereal grains			SDS-3701: 0.03	SDS-3701: 0.04
VC 0045	Fruiting vegetables, cucurbits			SDS-3701: 0.015	SDS-3701: 0.06
VO 0050	Fruiting vegetables, other than cucurbits			SDS-3701: 0.015	SDS-3701: 0.06
VC 0425	Gherkins	3		Chlorothalonil: 0.41	Chlorothalonil: 1.3
FB 0268	Gooseberries	20		Chlorothalonil: 20 [b]	Chlorothalonil: 20 [b]
FB 0269	Grapes	3	0.5	Chlorothalonil: 0.955	Chlorothalonil: 1.6

Commodity		Maximum residue level recommendation, mg/kg		STMR or STMR-P, mg/kg	HR, mg/kg
				SDS-3701: 0.01	SDS-3701: 0.15
JF 0269	Grape juice			Chlorothalonil: 0.134 SDS-3701: 0.0027	
AB 0269	Grape, pomace dry			Chlorothalonil: 0.745 SDS-3701: 0.031	
	Grape, pomace wet			Chlorothalonil: 1.24 SDS-3701: 0.012	
HH 0720	Herbs			SDS-3701: 0.02	SDS-3701: 0.19
VL 0053	Leafy vegetables			SDS-3701: 0.02	SDS-3701: 0.19
VA 0384	Leek	40		Chlorothalonil: 17.5	Chlorothalonil: 22
AL 0157	Legume animal feeds			SDS-3701: 0.03	SDS-3701: 0.03
VP 0060	Legume vegetables			SDS-3701: 0.01	SDS-3701: 0.02
MF 0100	Mammalian fats (except milk fat)		0.07	SDS-3701: 0.025	SDS-3701: 0.05
MM 0095	Meat (from mammals other than marine mammals)		0.02	SDS-3701: 0.01	SDS-3701: 0.012
VC 0046	Melons, except watermelons	2	2	Chlorothalonil: 0.04	Chlorothalonil: 0.21
ML 0106	Milks		0.07	SDS-3701: 0.05	
SO 0088	Oilseeds			SDS-3701: 0.02	
VA 0385	Onion, bulb	W	0.5		
VA 0386	Onions, Chinese	10		Chlorothalonil: 0.835	Chlorothalonil: 7.5
VA 0387	Onions, Welsh	10		Chlorothalonil: 0.835	Chlorothalonil: 7.5
FI 0350	Papaya	20		Chlorothalonil: 2.3	Chlorothalonil: 6.4
FS 0247	Peaches	W	0.2		
SO 0697	Peanut	0.1	0.05	Chlorothalonil: 0.01	
HS 0444	Peppers Chili, dried	W	70		
VO 0445	Pepper, sweet	W	7		
VR 0589	Potatoes	W	0.2		
PF 0111	Poultry fats	0.01		SDS-3701: 0.01	SDS-3701: 0.01
PM 0110	Poultry meat	0.01		SDS-3701: 0.01	SDS-3701: 0.01
PO 0113	Poultry skin	0.01		SDS-3701: 0.01	SDS-3701: 0.01
PO 0111	Poultry, edible offal of	0.07		SDS-3701: 0.039	SDS-3701: 0.05
VD 0070	Pulses	1		Chlorothalonil: 0.19 SDS-3701: 0.02	
VR 0075	Root and tuber vegetables	0.3		Chlorothalonil: 0.3 [b] SDS-3701: 0.02	Chlorothalonil: 0.3 [c] SDS-3701: 0.03
	Root and tuber vegetables, tops and leaves			SDS-3701: 0.02	SDS-3701: 0.04
VA 0387	Spring onions	10		Chlorothalonil: 0.835	Chlorothalonil: 7.5
VC 0431	Squash, Summer	3	5	Chlorothalonil: 0.41	Chlorothalonil: 1.3
VS 0078	Stalk and stem vegetables			SDS-3701: 0.01	SDS-3701: 0.02
AS 0081	Straw and fodder (dry) of cereal grains			SDS-3701: 0.03	SDS-3701: 0.08
FB 0275	Strawberry	5		Chlorothalonil: 2.05	Chlorothalonil: 3
VO 0447	Sweet Corn (corn-on-the-cob)	W	0.01*		
VO 0448	Tomato	W	10		

Commodity		Maximum residue level recommendation, mg/kg		STMR or STMR-P, mg/kg	HR, mg/kg
GC 0654	Wheat	W	0.1		
AS 0654	Wheat, straw and fodder, dry	W	20		
	Wine			Chlorothalonil: 0.0096 SDS-3701: 0.019	
VC 0433	Winter squash	W	5		

[a] based on bagged bananas

[b] based on the maximum residue level

DIETARY RISK ASSESSMENT

Long-term intake

The evaluation of chlorothalonil and SDS-3701 resulted in recommendations for MRLs and STMR values for raw and processed commodities. Where data on consumption were available for the listed food commodities, dietary intakes were calculated for the 13 GEMS/Food Consumption Cluster Diets. The results are shown in Annex 3.

The IEDIs for chlorothalonil in the thirteen Cluster Diets, based on the estimated STMRs were 9-40% of the maximum ADI (0.02 mg/kg bw). The Meeting concluded that the long-term intake of residues of chlorothalonil from uses that have been considered by the JMPR is unlikely to present a public health concern.

The IEDIs for SDS-3701 in the thirteen Cluster Diets, based on the estimated STMRs were 5-10% of the maximum ADI (0.008 mg/kg bw). The Meeting concluded that the long-term intake of residues of SDS-3701 from uses that have been considered by the JMPR is unlikely to present a public health concern.

Short-term intake

The IESTI for chlorothalonil calculated on the basis of the recommendations made by the JMPR represented 0-100% of the ARfD (0.6 mg/kg bw) for children and 0–20% for the general population.

The Meeting points out that the IESTI of 100% of the ARfD for children results from to the conservative assumption of residues in currants at the maximum residue level.

The IESTI for SDS-3701 calculated on the basis of the recommendations made by the JMPR represented 0–50% of the ARfD (0.03 mg/kg bw) for children and 0–20% for the general population.

The Meeting concluded that the short-term intake of residues of chlorothalonil or SDS-3701 resulting from uses that have been considered by the JMPR are unlikely to present a public health concern.

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Author	Year	Title, Institute, Report reference	Code
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Tummon O.	2005	Chlorothalonil: Validation of an Analytical Method for the Determination of Residues of a Chlorothalonil Metabolite R182281 in Soil, Syngenta Crop Protection AG, Basel, Switzerland, Syngenta - Jealott's Hill International, Bracknell, Berkshire, United Kingdom, RJ3629B 05-S501, GLP, not published, Syngenta File No R44686/3757	CLTA10_080
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Robinson N	2006	Residue Analytical Method for the Determination of Chlorothalonil in Water, Syngenta Crop Protection AG, Basel, Switzerland, Syngenta - Jealott's Hill International, Bracknell, Berkshire, United Kingdom, RAM 333/02, GLP, not published, Syngenta File No R44686/3903	CLTA10_086
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Roland L, Marien L	1994	Residues of Chlorothalonil on Peaches - CRP/94/1210, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/PEACH 21/P/93, GLP, not published, Syngenta File No R44686/2067	CLTA10_091
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Roland L	1998	Determination of Chlorothalonil Residues in Plums, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/PRNDO 04/I/97, GLP, not published, Syngenta File No R44686/2057	CLTA10_099
Gill JP, Roberts S	2001	Chlorothalonil: Residue Levels in Protected Strawberries from Trials conducted in the UK during 2000, Syngenta Crop Protection AG, Basel, Switzerland, , RJ3181B, GLP, not published, Syngenta File No R44686/3167	CLTA10_100
Gill JP, Barnaud C, Burke SR	2001	Residue Levels in Strawberries from Trials Conducted in France during 2000, Syngenta Crop Protection AG, Basel, Switzerland, , RJ3129B, GLP, not published, Syngenta File No R44686/1849	CLTA10_101
Gill JP, Roberts S, Burke SR	2000	Chlorothalonil: Residue Levels in Strawberries and Processed Strawberry Products from a Trial carried out in Polythene Tunnels in the UK during 1999., Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ3055B, GLP, not published, Syngenta File No R44686/0173	CLTA10_102
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Lister N, Picard JM	2000	Chlorothalonil: Residue Levels in Vine from Trials carried out in Northern France during 1999., Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ3017B,	CLTA10_110

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Partingdon K	1997	Study to determine the Magnitude of Residue of Chlorothalonil in Blackcurrant whole fruit following 3 sequential Field Applications of ACSE 3488 or ACSE 3623, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/RIBNI 03/GB/96, GLP, not published, Syngenta File No R44686/1972	CLTA10_112
Knight C	1994	Residues of Chlorothalonil in Blackcurrants, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/RIBNI 01/GB/93, GLP, not published, Syngenta File No R44686/2105	CLTA10_113
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Dillon KA	1985	Residues of tetrachloroisophthalonitrile (chlorothalonil SDS-2787), 4-hydroxy-trichloro-isophthalonitrile (SDS-3701) , HCB and PBCN on cranberries -1982, 1983, 1984, Syngenta Crop Protection AG, Basel, Switzerland, , 698-3CR-84-0070-001, GLP, not published, Syngenta File No R44686/2229	CLTA10_119
Kenyon RG	1986	Residues of Tetrachloroisophthalonitrile (Chlorothalonil, SDS-2787), 4-Hydroxy-2,5,6-Trichloroisophthalonitrile (SDS-3701), HCB & PCBN on Bananas - 1984-85, Syngenta Crop Protection AG, Basel, Switzerland, , 743-3CR-85-0022-001, GLP, not published, Syngenta File No R44686/2078	CLTA10_120
King C	1994	Determination of Residues of Tetrachloroisophthalonitrile (Chlorothalonil, Syngenta Crop Protection AG, Basel, Switzerland, , 5529-92-0515-CR-002, GLP, not published, Syngenta File No R44686/1678	CLTA10_121
Biehn WL	1991	Chlorothalonil: Magnitude of Residue on Mango, Syngenta Crop Protection AG, Basel, Switzerland, , CHTL D3.2.5/184 2162, GLP, not published, Syngenta File No R44686/3200	CLTA10_122
Kennedy EM	1993	The Determination of Concentrations of Chlorothalonil in Onions, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/ALLCE 07/GB/92, GLP, not published, Syngenta File No R44686/2123	CLTA10_123
McKenzie J	1992	Chlorothalonil Residue Test Report - The Determination of Concentrations of Chlorothalonil in Onions, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/ALLCE 06/GB/91, GLP, not published, Syngenta File No R44686/1530	CLTA10_124
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) and Metalaxyl-M (CGA329351) + Chlorothalonil (R44686) in or on Spring Onions in The UK, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7306/SY, GLP, not published, Syngenta File No R44686/3648	CLTA10_125
Sole C.	2006	Chlorothalonil (R44686): Residue study on spring onions in the United Kingdom, Syngenta Crop Protection AG, Basel, Switzerland, ADME - Bioanalyses, Vergeze, France, 05-0412, GLP, not published, Syngenta File No R44686/3983	CLTA10_126
Oxspring S.	2004	Residue study with Chlorothalonil (R44686) and Metalaxyl-M CGA329351) in or on Spring Onions in the UK, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7307/SY, GLP, not published, Syngenta File No R44686/3622	CLTA10_127
Oxspring S.	2004	Residue study with Chlorothalonil (R44686) in or on Spring Onions in Italy, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7202/SY, GLP, not published, Syngenta File No R44686/3630	CLTA10_128
Lister N, Frost M,	2000	Chlorothalonil: Residue Levels In Leeks from Trials carried out in the UK during 1999., Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ3019B, GLP, not	CLTA10_129

Author	Year	Title, Institute, Report reference	Code
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Richards S., Picard J.M.	2001	Chlorothalonil : Residue Levels in Leeks from Trials conducted in Northern France during 2000, Syngenta Crop Protection AG, Basel, Switzerland, Syngenta - Jealott's Hill International, Bracknell, Berkshire, United Kingdom, RJ3186B, GLP, not published, Syngenta File No R44686/3273	CLTA10_130
Lister N, Volpi E	2000	Chlorothalonil: Residue Levels in Leeks from Trials Carried out in Italy During 1999., Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ3018B, GLP, not published, Syngenta File No R44686/0118	CLTA10_131
Lister N, Palmer H, Stenning R	2000	Chlorothalonil: Residue Levels in Cauliflowers from Trials carried out in the UK during 1999., Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ2998B, GLP, not published, Syngenta File No R44686/0130	CLTA10_132
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) and Metalaxyl-M (CGA329351) in or on Cauliflower in the UK, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7170/SY, GLP, not published, Syngenta File No R44686/3674	CLTA10_133
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) and Metalaxyl-M (CGA329351) in or on Outdoor Cauliflower in the UK, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7171/SY, GLP, not published, Syngenta File No R44686/3675	CLTA10_134
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) and Metalaxyl-M (CGA329351) in or on Cauliflower in France (North), Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7172/SY, GLP, not published, Syngenta File No R44686/3676	CLTA10_135
Sole C.	2006	Chlorothalonil (R44686) - Residue study on cauliflower in Switzerland, Syngenta Crop Protection AG, Basel, Switzerland, ADME - Bioanalyses, Vergeze, France, 05-0531, GLP, not published, Syngenta File No R44686/4049	CLTA10_136
Partington K.	1998	Study to Determine the Magnitude of Residue of Chlorothalonil in Broad Beans Following 2 Sequential Field Applications of Bravo 500 (ASCE 3488) or ISK 375 (ASCE 3623), Syngenta Crop Protection AG, Basel, Switzerland, , CTL/VICFJ 02/GB/97, GLP, not published, Syngenta File No R44686/1758	CLTA10_137
Smith JSC	1993	Residues of Chlorothalonil in Cauliflowers, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/BRSOB 03/GB/92, GLP, not published, Syngenta File No R44686/1587	CLTA10_138
McKenzie J	1992	The Determination of Concentrations of Chlorothalonil in Cauliflower, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/BRSOB 02/GB/92, GLP, not published, Syngenta File No R44686/1609	CLTA10_139
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) and Metalaxyl-M (CGA329351) in or on Cauliflower in Italy, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7173/SY, GLP, not published, Syngenta File No R44686/3677	CLTA10_140
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) and Metalaxyl-M (CGA329351) in or on Cauliflower in France (South), Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7174/SY, GLP, not published, Syngenta File No R44686/3678	CLTA10_141
Richards S	2003	Residue Study with Chlorothalonil (R44686) and Metalaxyl (CGA 329351) + Chlorothalonil (R44686) in or on Cauliflower in Southern France, Syngenta Crop Protection AG, Basel, Switzerland, Syngenta - Jealott's Hill International, Bracknell, Berkshire, United Kingdom, 02-6072, GLP, not published, Syngenta File No R44686/3378	CLTA10_142
Sole C.	2006	Chlorothalonil (R44686) - Residue study on cauliflower in Southern France, Syngenta Crop Protection AG, Basel, Switzerland, ADME - Bioanalyses, Vergeze, France, 05-0524, GLP, not published, Syngenta File No R44686/4048	CLTA10_143
Sole C.	2003	Residue Study with Chlorothalonil (R44686) in or on Brussels Sprouts in Switzerland, Syngenta Crop Protection AG, Basel, Switzerland, ADME - Bioanalyses, Vergeze, France, 02-6021, GLP, not published, Syngenta File No R44686/3368	CLTA10_144
Sole C.	2003	Residue Study with Chlorothalonil (R44686) in or on Brussels Sprouts in Switzerland, Syngenta Crop Protection AG, Basel, Switzerland, ADME - Bioanalyses, Vergeze, France, 02-6022, GLP, not published, Syngenta File No R44686/3381	CLTA10_145
Richards S.	2003	Residue Study with Chlorothalonil (R44686) in or on Brussels Sprouts in the UK, Syngenta Crop Protection AG, Basel, Switzerland, Syngenta - Jealott's Hill International, Bracknell, Berkshire, United Kingdom, 02-6039, GLP, not published, Syngenta File No R44686/3349	CLTA10_146
Simon P.	200	Determination of Residues of Chlorothalonil in Brussels Sprouts in Germany,	CLTA10_147

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Lister N, Codd M, Roberts S, McGill C	2000	Chlorothalonil : Residue Levels in Brussels Sprouts from Trials Carried out in the UK during 1999., Syngenta Crop Protection AG, Basel, Switzerland, , RJ3009B, GLP, not published, Syngenta File No R44686/0645	CLTA10_148
Oxspring S.	2004	Residue study with Chlorothalonil (R44686) in or on Brussels Sprouts in the UK, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7165/SY, GLP, not published, Syngenta File No R44686/3640	CLTA10_149
Oxspring S.	2004	Residue study with Chlorothalonil (R44686) in or on Brussels Sprouts in the UK, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7166/SY, GLP, not published, Syngenta File No R44686/3642	CLTA10_150
Oxspring S.	2004	Residue study with Chlorothalonil (R44686) in or on Brussels Sprouts in France (North), Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7167/SY, GLP, not published, Syngenta File No R44686/3643	CLTA10_151
Kennedy EM	1993	The Determination of Concentrations of Chlorothalonil in Brussels Sprouts, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/BRSPR 11/GB/92, GLP, not published, Syngenta File No R44686/1606	CLTA10_152
McKenzie J	1991	The Determination of Concentrations of Chlorothalonil in Brussels Sprouts, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/BRSPR 08/GB/90, GLP, not published, Syngenta File No R44686/1605	CLTA10_153
Oxspring S.	2004	Residue study with Chlorothalonil (R44686) in or on Brussels Sprouts in France (South), Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7168/SY, GLP, not published, Syngenta File No R44686/3645	CLTA10_154
Oxspring S.	2004	Residue study with Chlorothalonil (R44686) in or on Brussels Sprouts in Spain, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7169/SY, GLP, not published, Syngenta File No R44686/3644	CLTA10_155
Sole C.	2003	Residue Study with Chlorothalonil (R44686) in or on Brussels Sprouts in Spain, Syngenta Crop Protection AG, Basel, Switzerland, ADME - Bioanalyses, Vergeze, France, 02-6067, GLP, not published, Syngenta File No R44686/3383	CLTA10_156
Sole C.	2003	Residue Study with Chlorothalonil (R44686) in or on Brussels Sprouts in Spain, Syngenta Crop Protection AG, Basel, Switzerland, ADME - Bioanalyses, Vergeze, France, 02-6066, GLP, not published, Syngenta File No R44686/3382	CLTA10_157
White B, Chamier O	2000	Chlorothalonil: Residue Levels in Indoor Cucumbers from a Study carried out in Germany during 1999., Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ3083B, GLP, not published, Syngenta File No R44686/0164	CLTA10_158
Kuhne R.O.	1998	CGA 329351 + ASF 41 (Chlorothalonil)/CGA 329351 + Mancozeb, SC 537.5/WP68, A-9652 B/A-9407 A, Cucumber, France (North) and Italy, Novartis Crop Protection AG, Basel, Switzerland, Novartis Crop Protection AG, Basel, Switzerland, 117/97, GLP, not published, Syngenta File No CGA329351/0918	CLTA10_159
Kuhne R.O	2000	Residue Study with Metalaxyl-M (CGA 329351) and Chlorothalonil (ASF 41) in or on Cucumbers in France, Novartis Crop Protection AG, Basel, Switzerland, Novartis Crop Protection AG, Basel, Switzerland, 2138/98, GLP, not published, Syngenta File No CGA329351/1326	CLTA10_160
Marks AF	1987	Determination of Residues of Tetrachloroisophthalonitrile (Chlorothalonil, Syngenta Crop Protection AG, Basel, Switzerland, , 1137-85-0010-CR-002, Not GLP, not published, Syngenta File No R44686/0314	CLTA10_161
Roland L	1993	Residues of Chlorothalonil on Melons CRP/93/1138, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/MELON 14/E/92, GLP, not published, Syngenta File No R44686/1806	CLTA10_162
Lister N, Volpi E	2000	Chlorothalonil: Residue Levels in Melons Grown in Polytunnels from Trials Carried out in Italy During 1999, Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ2924B, GLP, not published, Syngenta File No R44686/0154	CLTA10_163
Pointurier R.	1998	CGA 329351 + Chlorothalonil, SC 537.5, A-9652 A, Melons, France (South), Novartis Crop Protection AG, Basel, Switzerland, Novartis Agro S.A., Aigues-Vives, France, OF96130/TP97, GLP, not published, Syngenta File No CGA329351/0770	CLTA10_164
Pointurier R.	1998	CGA 329351 + Chlorothalonil, SC 537.5, A-9652 A, Melons, France (South), Novartis Crop Protection AG, Basel, Switzerland, Novartis Agro S.A., Aigues-Vives, France, OF96130/BY11, GLP, not published, Syngenta File No CGA329351/0768	CLTA10_165

Author	Year	Title, Institute, Report reference	Code
Pointurier R.	1998	CGA 329351 + Chlorothalonil, SC 537.5, A-9652 A, Melons, France (South), Novartis Crop Protection AG, Basel, Switzerland, Novartis Agro S.A., Aigues-Vives, France, OF96130/BY10, GLP, not published, Syngenta File No CGA329351/0767	CLTA10_166
Lister N, Gallardo E	2000	Chlorothalonil: Residue Levels in Melons Grown under Glass from Trials carried out in Spain during 1999., Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ2920B, GLP, not published, Syngenta File No R44686/0152	CLTA10_167
Malet JC	1989	Experimentation du Daconil 500 Flow sur le Mildiou des Cucurbitacees, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/MELON 04/F/89, GLP, not published, Syngenta File No R44686/1905	CLTA10_168
Roland L	1997	Evolution of Residues of Chlorothalonil in Melons, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/CUMSS 26A/E/96, GLP, not published, Syngenta File No R44686/1771	CLTA10_169
Roland L	1993	Chlorothalonil Residues on Melons CRP/93/1013, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/MELON 11/I/92, GLP, not published, Syngenta File No R44686/1815	CLTA10_170
Pointurier R.	1998	CGA 329351 + Chlorothalonil, SC 537.5, A-9652 A, Melons, France (South), Novartis Crop Protection AG, Basel, Switzerland, Novartis Agro S.A., Aigues-Vives, France, OF96130/LD67, GLP, not published, Syngenta File No CGA329351/0769	CLTA10_171
Kuhne R.O.	1998	CGA 329351 + ASF 41 (Chlorothalonil), SC 537.5, A-9652 B, Melon, France, Novartis Crop Protection AG, Basel, Switzerland, Novartis Crop Protection AG, Basel, Switzerland, 2351/97, GLP, not published, Syngenta File No CGA329351/0863	CLTA10_172
Lister N, Volpi E	2000	Chlorothalonil: Residue Levels in Outdoor Melons from Trials carried out in Italy during 1999., Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ2918B, GLP, not published, Syngenta File No R44686/0150	CLTA10_173
Kuhne R.O.	1998	CGA 329351 + ASF 41 (Chlorothalonil), SC 537.5, A-9652 B, Melon, France, Novartis Crop Protection AG, Basel, Switzerland, Novartis Crop Protection AG, Basel, Switzerland, 2352/97, GLP, not published, Syngenta File No CGA329351/0864	CLTA10_174
Pointurier R.	1998	CGA 329351 + Chlorothalonil, SC 537.5, A-9652 A, Melons, France (South), Novartis Crop Protection AG, Basel, Switzerland, Novartis Agro S.A., Aigues-Vives, France, OF96130/AC27, GLP, not published, Syngenta File No CGA329351/0765	CLTA10_175
Pointurier R.	1998	CGA 329351 + Chlorothalonil, SC 537.5, A-9652 A, Melons, France (South), Novartis Crop Protection AG, Basel, Switzerland, Novartis Agro S.A., Aigues-Vives, France, OF96130/AC28, GLP, not published, Syngenta File No CGA329351/0766	CLTA10_176
Roland L	1994	Residues of Chlorothalonil on Melons, Syngenta Crop Protection AG, Basel, Switzerland, , CRP/94/1222, GLP, not published, Syngenta File No R44686/1833	CLTA10_177
Lister N, Gallardo E	2000	Chlorothalonil: Residue Levels in Outdoor Melons from Trials Carried out in Spain during 1999., Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ2971B, GLP, not published, Syngenta File No R44686/0156	CLTA10_178
Prince PM	1984	Residues of 2, Syngenta Crop Protection AG, Basel, Switzerland, , 125-3CR-84-0008-001, GLP, not published, Syngenta File No R44686/2080	CLTA10_179
Ballee DL, Szalkowski MB, Stallard DE	1980	Residues of 2, Syngenta Crop Protection AG, Basel, Switzerland, , 334-3CR-80-0051-001, GLP, not published, Syngenta File No R44686/1938	CLTA10_180
Kenyon RG	1984	Residues of Tetrachloroisophthalonitrile (Chlorothalonil, Syngenta Crop Protection AG, Basel, Switzerland, , 459-3CR-83-0034-001, GLP, not published, Syngenta File No R44686/2081	CLTA10_181
Lopez N.	2009	Bravonil 500 - Residues of Chlorothalonil in chilli - Brazil, 2007-08, Syngenta, Syngenta Proteção de Cultivos Ltd.a, São Paulo, Brazil, M08007, GLP, not published, Syngenta File No A7867H_10011	CLTA10_182
Gill JP, Sanderson G, Burke S	2000	Chlorothalonil: Residue Levels in Carrots from Trials carried out in the UK during 1999., Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ2976B, GLP, not published, Syngenta File No R44686/0120	CLTA10_183
Gill JP, Griel T, Aver E	2000	Chlorothalonil: Residue Levels in Carrots from a Study Carried out in Germany During 1999., Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ2963B, GLP, not published, Syngenta File No R44686/0107	CLTA10_184
Partington K	1996	Study to Determine the Magnitude of Residue of Chlorothalonil in Carrot Roots Following 4 Sequential Field Applications of Bravo 500, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/DAUCS 06/GB/95, GLP, not published, Syngenta File No R44686/1559	CLTA10_185

Author	Year	Title, Institute, Report reference	Code
Partington K	1996	Study to Determine the Magnitude of Residue of Chlorothalonil in Carrot Roots Following 4 Sequential Field Applications of ASCE 3623, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/DAUCS 07/GB/95, GLP, not published, Syngenta File No R44686/1533	CLTA10_186
Roland L	1999	Determination of Chlorothalonil Residues in Carrots, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/DAUCS09/F/97, GLP, not published, Syngenta File No R44686/1599	CLTA10_187
Gill JP, Sutra G	2000	Chorothalonil: Residue Levels in Carrots from Trials carried out in France during 1999., Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ3036B, GLP, not published, Syngenta File No R44686/0116	CLTA10_188
Gill JP, Gallardo E	2000	Chlorothalonil: Residue Levels in Carrots and Processed Carrot Products from Trials carried out in Spain during 1999., Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ3057B, GLP, not published, Syngenta File No R44686/0123	CLTA10_189
McGill C, Griehl T	2001	Residue Levels in Potatoes from a Study conducted in Germany during 2000, Syngenta Crop Protection AG, Basel, Switzerland, Syngenta - Jealott's Hill International, Bracknell, Berkshire, United Kingdom, RJ3137B, GLP, not published, Syngenta File No R44686/2526	CLTA10_190
McGill C, O Doherty D, Sanderson G	2000	Chlorothalonil: Residue Levels in Potatoes from Trials carried out in the UK during 1999, Zeneca Agrochemicals, Jealott's Hill, United Kingdom, Zeneca Agrochemicals, Jealott's Hill, United Kingdom, RJ3052B, GLP, not published, Syngenta File No R44686/2185	CLTA10_191
McGill C, Griehl T	2000	Chlorothalonil: Residue Levels in Potatoes from a Study carried out in Germany during 1999, Zeneca Agrochemicals, Jealott's Hill, United Kingdom, Zeneca Agrochemicals, Jealott's Hill, United Kingdom, RJ3034B, GLP, not published, Syngenta File No R44686/2184	CLTA10_192
Richards S., Iniesta L.	2001	Chlorothalonil - Residue Levels in Potatoes from Trials conducted in Spain during 2000, Syngenta Crop Protection AG, Basel, Switzerland, Syngenta - Jealott's Hill International, Bracknell, Berkshire, United Kingdom, RJ3190B, GLP, not published, Syngenta File No R44686/3224	CLTA10_193
McGill C, Barnaud C	2000	Chlorothalonil: Residue Levels in Potatoes from Trials carried out in France during 1999., Zeneca Agrochemicals, Jealott's Hill, United Kingdom, , RJ3051B, GLP, not published, Syngenta File No R44686/0126	CLTA10_194
Gill J.P., Iniesta L.	2001	Chlorothalonil : Residue Levels in Potatoes from Trials conducted in Spain during 2000, Syngenta Crop Protection AG, Basel, Switzerland, Syngenta - Jealott's Hill International, Bracknell, Berkshire, United Kingdom, RJ3144B, GLP, not published, Syngenta File No R44686/3274	CLTA10_195
Simon P.	2003	Determination of Residues of Chlorothalonil in Asparagus in Germany (2001/2002), Syngenta Crop Protection AG, Basel, Switzerland, Syngenta Agro GmbH, Maintal, Germany, gas63601, GLP, not published, Syngenta File No R44686/3340	CLTA10_196
Simon P.	2003	Determination of Residues of Chlorothalonil in Asparagus in Germany (2001/2002), Syngenta Crop Protection AG, Basel, Switzerland, Syngenta Agro GmbH, Maintal, Germany, gas53601, GLP, not published, Syngenta File No R44686/3341	CLTA10_197
Gill J.P., Vaiopoulos V.	2003	Chlorothalonil: Residue Levels in Asparagus from Trials conducted in Greece during 2001, Syngenta Crop Protection AG, Basel, Switzerland, Syngenta - Jealott's Hill International, Bracknell, Berkshire, United Kingdom, RJ3332B, GLP, not published, Syngenta File No R44686/3325	CLTA10_198
Ruhland JH	1991	Determination of Residues of Chlorothalonil (SDS-2787), Syngenta Crop Protection AG, Basel, Switzerland, , HLA 6012-2411, GLP, not published, Syngenta File No R44686/1547	CLTA10_199
Sole C.	2003	Residue Study with Chlorothalonil (R44686) in or on Pulses (Beans) in the UK, Syngenta - Jealott's Hill, Bracknell, United Kingdom, ADME - Bioanalyses, Vergeze, France, 02-6061, GLP, not published, Syngenta File No R44686/3416	CLTA10_200
Sole C.	2003	Residue Study with Chlorothalonil (R44686) in or on Pulses (Beans) in Northern France, Syngenta - Jealott's Hill, Bracknell, United Kingdom, ADME - Bioanalyses, Vergeze, France, 02-6062, GLP, not published, Syngenta File No R44686/3415	CLTA10_201
Oxspring S.	2004	Residue study with Chlorothalonil (R44686) in or on Pulses (Beans) in the UK, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7177/SY, GLP, not published, Syngenta File No R44686/3619	CLTA10_202
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) in or on Pulses (Beans) in the UK, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7178/SY, GLP, not published, Syngenta File No R44686/3679	CLTA10_203

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Oxspring S.	2004	Residue study with Chlorothalonil (R44686) in or on Pulses (Beans) in the UK, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7179/SY, GLP, not published, Syngenta File No R44686/3620	CLTA10_204
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) in or on Pulses (Beans) in the UK, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7180/SY, GLP, not published, Syngenta File No R44686/3680	CLTA10_205
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) in or on Pulses (Beans) in Northern France, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7181/SY, GLP, not published, Syngenta File No R44686/3681	CLTA10_206
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) in or on Pulses (Beans) in Northern France, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7182/SY, GLP, not published, Syngenta File No R44686/3682	CLTA10_207
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) in or on Pulses (Beans) in Northern France, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7183/SY, GLP, not published, Syngenta File No R44686/3683	CLTA10_208
Sole C.	2003	Residue Study with Chlorothalonil (R44686) in or on Pulses (Beans) in Spain, Syngenta - Jealott's Hill, Bracknell, United Kingdom, ADME - Bioanalyses, Vergeze, France, 02-6044, GLP, not published, Syngenta File No R44686/3419	CLTA10_209
Sole C.	2003	Residue Study with Chlorothalonil (R44686) in or on Pulses (Beans) in Southern France, Syngenta - Jealott's Hill, Bracknell, United Kingdom, ADME - Bioanalyses, Vergeze, France, 02-6040, GLP, not published, Syngenta File No R44686/3417	CLTA10_210
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) in or on Pulses (Beans) in Southern France, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7184/SY, GLP, not published, Syngenta File No R44686/3684	CLTA10_211
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) in or on Pulses (Beans) in Southern France, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7185/SY, GLP, not published, Syngenta File No R44686/3685	CLTA10_212
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) in or on Pulses (Beans) in Southern France, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7186/SY, GLP, not published, Syngenta File No R44686/3686	CLTA10_213
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) in or on Pulses (Beans) in Southern France, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7187/SY, GLP, not published, Syngenta File No R44686/3687	CLTA10_214
Oxspring S.	2004	Residue study with Chlorothalonil (R44686) in or on Pulses (Beans) in France (South), Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7188/SY, GLP, not published, Syngenta File No R44686/3618	CLTA10_215
Oxspring S.	2004	Residue study with Chlorothalonil (R44686) in or on Pulses (Beans) in France (South), Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7189/SY, GLP, not published, Syngenta File No R44686/3617	CLTA10_216
Richards S.	2003	Residue Study with Chlorothalonil (R44686) in or on Chickpeas in Italy, Syngenta Crop Protection AG, Basel, Switzerland, Syngenta - Jealott's Hill International, Bracknell, Berkshire, United Kingdom, 02-6047, GLP, not published, Syngenta File No R44686/3356	CLTA10_217
Richards S.	2003	Residue Study with Chlorothalonil (R44686) in or on Chickpeas in Spain, Syngenta Crop Protection AG, Basel, Switzerland, Syngenta - Jealott's Hill International, Bracknell, Berkshire, United Kingdom, 02-6048, GLP, not published, Syngenta File No R44686/3355	CLTA10_218
Oxspring S.	2004	Residue study with Chlorothalonil (R44686) in or on Outdoor Chickpeas in Spain, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7175/SY, GLP, not published, Syngenta File No R44686/3621	CLTA10_219
Oxspring S.	2004	Residue Study with Chlorothalonil (R44686) in or on Outdoor Chickpeas in Spain, Syngenta Crop Protection AG, Basel, Switzerland, Agrisearch UK Ltd., Melbourne, Derbyshire, United Kingdom, AF/7176/SY, GLP, not published, Syngenta File No R44686/3647	CLTA10_220

Author	Year	Title, Institute, Report reference	Code
Roland L	1997	Determination of Residues of Chlorothalonil in Chick Peas, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/CIEAR 03/E/96, GLP, not published, Syngenta File No R44686/1840	CLTA10_221
Roland L	1997	Evolution of Residues of Chlorothalonil in Chick Peas, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/CIEAR 02/E/95, GLP, not published, Syngenta File No R44686/1711	CLTA10_222
Roland L	1995	Residues of Chlorothalonil on Chickpeas, Syngenta Crop Protection AG, Basel, Switzerland, , CTL/CIEAR 01/E/94, GLP, not published, Syngenta File No R44686/1710	CLTA10_223
Anonymus	1994	IR-4 Residue Data Report for Chlorothalonil/Pistachio, University of California, Davis, Syngenta, Syngenta Crop Protection, Inc., Greensboro, USA, 5947-92-0533-FS-001-000, 1992-0533-FS, GLP, not published, Syngenta File No R044686_10816	CLTA10_224
Ballee DL, Szalkowski MB, Stallard DE	1980	Residues of 2, Syngenta Crop Protection AG, Basel, Switzerland, , 334-3CR-79-0113-001, GLP, not published, Syngenta File No R44686/1699	CLTA10_225
Kenyon RG, Ballee DL	1987	Residues of Tetrachloroisophthalonitrile (Chlorothalonil, Syngenta Crop Protection AG, Basel, Switzerland, , 1350-86-0058-CR-001, GLP, not published, Syngenta File No R44686/3186	CLTA10_226
Kenyon RG	1985	Residues of Tetrachloroisophthalonitrile (Chlorothalonil, SDS-2787), Hexachlorobenzene (HCB) & Pentachlorobenzonitrile (PCBN) on Peanut Nutmeats & Peanut Hulls, Syngenta Crop Protection AG, Basel, Switzerland, , 334-3CR-81-0020-001, GLP, not published, Syngenta File No R44686/2480	CLTA10_227
King C, Ballee DL	1988	Residues of Tetrachloroisophthalonitrile (Chlorothalonil, SDS-2787), SDS-3701, SDS-46851, HCB & PCBN on Peanut Nutmeats & Hulls - 1986, Syngenta Crop Protection AG, Basel, Switzerland, , 1424-86-0094-CR-001, GLP, not published, Syngenta File No R44686/2487	CLTA10_228
King C	1995	Determination of the Residues of Tetrachloroisophthalonitrile (Chlorothalonil, SDS-2787), SDS-3701, SDS-46851, HCB and PCBN in Cherries from a Stability Study (Field Incurred)–1988–Six Year Final Report. Study conducted by Ricerca, Inc. Syngenta Unpublished Report No. 3064-88-0068-CR-003. Study Dates: June 1988–August 1994. (Syngenta File No. R44686/1354)	CLTA10_229
Rose C	1995	Residues of Tetrachloroisophthalonitrile (Chlorothalonil, SDS-2787), SDS-3701, SDS-46851, HCB and PCBN in Potatoes from a Stability Study (Field Incurred)–1988–Six Year Final Report. Study conducted by Ricerca, Inc. Syngenta Unpublished Report No. 3064-88-095-CR-003. Study Dates: June 1988–August 1994. (Syngenta File No. R44686/2173)	CLTA10_230
Rose CA	1995	Residues of Tetrachloroisophthalonitrile (Chlorothalonil, SDS-2787), SDS-3701, SDS-46851, HCB and PCBN in Carrot from a Stability Study (Field Incurred)–1988–Six Year Final Report. Study conducted by Ricerca, Inc. Syngenta Unpublished Report No. 3064-88-096-CR-003. Study Dates: June 1988–August 1994. (Syngenta File No. R44686/1466)	CLTA10_231
King C	1995	Residues of Tetrachloroisophthalonitrile (Chlorothalonil, SDS-2787), SDS-3701, SDS-46851, HCB and PCBN in Celery from a Stability Study (Field Incurred)–1988–Six Year Final Report. Study conducted by Ricerca, Inc. Syngenta Unpublished Report No. 3064-88-0136-CR-003. Study Dates: June 1988–August 1994. (Syngenta File No. R44686/1378)	CLTA10_232
Kenyon RG	1995	Residues of Tetrachloroisophthalonitrile (Chlorothalonil, SDS-2787), SDS-3701, SDS-46851, HCB and PCBN in Wheat Grain from a Stability Study (Field Incurred)–1988–Six Year Final Report. Study conducted by Ricerca, Inc. Syngenta Unpublished Report No. 3064-88-0070-CR-003. Study Dates: June 1988–August 1994. (Syngenta File No. R44686/2174)	CLTA10_233
King C, Wiedmann JL	1996	Residues of Tetrachloroisophthalonitrile (Chlorothalonil, SDS-2787), SDS-3701, SDS-46851, HCB and PCBN in Almond Hulls and Nutmeats from a Stability Study (Field Incurred)–1988–Six Year Final Report. Study conducted by Ricerca, Inc. Syngenta Unpublished Report No. 3064-88-0158-CR-003. Study Dates: June 1988–August 1994. (Syngenta File No. R44686/1352)	CLTA10_234
Wiedmann JL, King C	1996	Residues of Tetrachloroisophthalonitrile (Chlorothalonil, SDS-2787), SDS-3701, SDS-46851, HCB and PCBN in Cucumbers from a Stability Study (Field Incurred)–1988–Six Year Final Report. Study conducted by Ricerca, Inc. Syngenta Unpublished Report No. 3064-88-093-CR-003. Study Dates: June 1988–August 1994. (Syngenta File No. R44686/1429)	CLTA10_235
Hayes PC, Kenyon RG	1996	Residues of Tetrachloroisophthalonitrile (Chlorothalonil, SDS-2787), SDS-3701, SDS-46851, HCB and PCBN in Tomatoes from a Stability Study (Field Incurred)–1988–Six Year Final Report. Study conducted by Ricerca, Inc. Syngenta Unpublished Report No. 3064-88-083-CR-003. Study Dates: June 1988–August	CLTA10_236

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		1994. (Syngenta File No. R44686/1351)	
King C	1995	Determination of Residues of Tetrachloroisophthalonitrile (Chlorothalonil, SDS-2787), SDS-3701, SDS-46851, HCB and PCBN in Peanuts from a Stability Study (Field Incurred)–1988–Six Year Final Report. Study conducted by Ricerca, Inc. Syngenta Unpublished Report No. 3064-88-0160-CR-003. Study Dates: June 1988–August 1994. (Syngenta File No. R44686/2502)	CLTA10_237
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