CYPERMETHRIN (118)

The first draft was prepared by Mr. D. J. Hamilton Department of Primary Industries and Fisheries Brisbane, Australia

EXPLANATION

Cypermethrin was subject to a periodic review for residues in 2008. Information about GAP for cypermethrin use as a grain protectant was provided at a late stage of the meeting and it was not possible to evaluate that use in 2008.

Further information has now been provided on the registration of cypermethrin for post-harvest use on cereals.

USE PATTERN

A cypermethrin UL formulation containing 20 g/L cypermethrin and 57 g/L piperonyl butoxide is registered in France for post-harvest use on cereal grains as a grain protectant. The application rate is equivalent to 1.7 g cypermethrin per tonne of grain.

The authorisation is for 'céréales à paille'. In France, this is understood as barley, oats, rye and wheat.

RESIDUES RESULTING FROM SUPERVISED TRIALS ON CROPS

Data on the residues arising from post-harvest uses of cypermethrin on wheat were summarised in the JMPR Residue Evaluations of 2008 (JMPR 2008, Table 36, page 829).

FATE OF RESIDUES IN STORAGE AND PROCESSING

In processing

Information on the fate of cypermethrin residues during the processing of wheat was recorded in the JMPR Residue Evaluations of 2008 (JMPR 2008) in the monographs on cypermethrin, alpha-cypermethrin and zeta-cypermethrin.

Table 46, page 839. Cypermethrin residues in wheat and processed commodities.

Table 71, page 1038-1039. Alpha-cypermethrin residues in barley and processed commodities.

Table 64, page 1159. Zeta-cypermethrin residues in wheat and processed commodities.

Pigeon (2007, 21048/4) treated 20 kg wheat grain with a cypermethrin UL formulation at 1.7 g ai/t and milled the wheat 1 and 7 days after treatment. No details are available on the milling process. Residue data for grain, bran and flour are summarised in Table 46 of the 2008 cypermethrin residue evaluation (JMPR 2008, page 839).

The 2008 JMPR received information on the fate of alpha-cypermethrin residues during the processing of barley for beer. In this case, the residues resulted from a pre-harvest use, rather than a post-harvest use. The data are summarised in Table 71 of the alpha-cypermethrin evaluation in 2008 (JMPR 2008, page 1038–1039).

The 2008 JMPR received information on the fate of zeta-cypermethrin residues during the milling of wheat. In this case, the residues resulted from a pre-harvest use, rather than a post-harvest

use. The data are summarised in Table 64 of the zeta-cypermethrin evaluation in 2008 (JMPR 2008, page 1159).

In this zeta-cypermethrin wheat milling study (Nagel, 2000, P-3453), the harvested wheat was dried at 43–57 °C until the moisture content was in the range of 10–13%. Grain dust (aspirated grain) was generated by cycling the dried wheat from a bin, through drag conveyors and a bucket conveyor and back into the bin for 120 minutes. As the sample moved, grain dust was aspirated from the system. All the material to pass through a 2360 micron sieve was classified as grain dust.

For flour milling, wheat was first cleaned of large and small foreign particles. Then moisture was adjusted to 17.5% for milling with a break mill producing bran, middlings and flour. Further milling with other rollers and screens produced shorts and flour. For production of germ, a sample of cleaned wheat was moisture adjusted to 16 % and then milled to produce germ and bran. Germ and bran were separated in a suitable sifter.

Information is available in the open literature on the fate of residues during the milling of wheat after post-harvest treatment with cypermethrin.

Table 1 Cypermethrin residues in wheat and processed commodities resulting from supervised post-harvest treatment trials with cypermethrin in Australia

WHEAT	Application			Conditions	Interval	Commodity	Residue, mg/kg	Ref
country, year (variety)	Form	g ai/t	no.		months after treatment		cypermethrin	
Australia, 1982	EC	4.2	1	510 tonnes, silo moisture 11.6 % temp 23-32 ºC	0 1.5 3 4.5 6 9 9	grain grain grain grain grain grain grain bran white flour wholemeal flour	3.0 3.1 2.5 2.4 2.2 2.2 2.1 10.0 0.30 2.1	Bengston *et al*., 1987

Table 2 Summary of processing factors for cypermethrin, alpha-cypermethrin and zeta-cypermethrin residues. The factors are calculated from the data recorded in the above table

Raw agricultural commodity (RAC)	Processed commodity	Calculated processing factors.	Median or best estimate
Cypermethrin, post-harvest			
Wheat	bran	2.4, 2.6	2.5
Wheat	flour	0.27, 0.43	0.35
Cypermethrin, post-harvest – open literature			
Wheat	bran	4.8	
Wheat	flour	0.14	
Alpha-cypermethrin, pre-harvest			
Barley	beer	<0.03, <0.04, <0.04, <0.09, <0.17, <0.5	<0.03
Zeta-cypermethrin, pre-harvest			
Wheat	bran	1.4	1.4
Wheat	flour	<0.56	<0.56
Wheat	germ	<0.56	<0.56

REFERENCES

Code	Author	Year	Title, Institute & Report reference
21048 (2/2)	Pigeon O	2007	Determination of residues of cypermethrin and piperonyl butoxide in wheat grain after post-harvest treatment with Cypermethrin ULV, CRA-W Pesticides Department, Gembloux, Belgium, report n° 21048 (2/2), GLP, unpublished.
P-3453	Nagel WD	2000	Magnitude of the residue of zeta-cypermethrin in/on wheat grain and its processed products following treatment with Fury® 1.5 EC Insecticide. FMC Corporation. Report P-3453. Unpublished.
Bengston M, Desmarchelier JM, Hayward B, Henning R, Moulden JH, Noble RM, Smith G, Snelson JT, Sticka R, Thomas D, Wallbank BE and Webley DJ		1985	Cypermethrin and fenvalerate residues in stored wheat and milled fractions. *J Agric Food Chem, 33:618-622.*
JMPR		2008	Pesticide residues in food 2008. JMPR Evaluations Part 1 – Residues. *FAO Plant Production and Protection Paper*, 194.