

TEBUFENOZIDE

EXPLANATION

Tebufenozide is a fat-soluble insecticide used to control Lepidoptera pests in fruits, vegetables and other crops. It was first reviewed by the 1996 JMPR when an ADI was allocated and MRLs were recommended. Kiwifruit was one of the crops for which residue data were provided, but a maximum residue level was not estimated because the data from trials in accordance with GAP were considered insufficient.

At the 29th (1997) Session of the CCPR the delegation of New Zealand requested a re-evaluation of tebufenozide residues in kiwifruit on the basis of revised GAP in New Zealand.

USE PATTERN

Current New Zealand GAP indicates that tebufenozide is applied to kiwifruit to control leafrollers by high-volume spraying to run off. The first application is pre-bloom, the second at petal fall, and these may be followed by two further applications at intervals of 14 days. The details are shown in Table 1.

Table 1. Registered uses of tebufenozide on kiwifruit in New Zealand.

Formulation	Application			PHI, days
	No.	kg ai/ha	kg ai/hl	
70 WP	2-4	<0.12	0.006	90

RESIDUES RESULTING FROM SUPERVISED TRIALS

Kiwifruit. In a number of residue trials in New Zealand in 1990-95 (Tillman, 1995) single vine plots, with 5 replicates per treatment in a randomized block design, were sprayed using a motorized hand-lance plot-sprayer to the point of run-off. Each vine received approximately 6 litres of spray per application, which was reported as equivalent to 2000 l/ha.

Trials were conducted in 1990-93 to determine the efficacious use rates and effects of timing of applications, and to assess the residues in the crop at various pre-harvest intervals. Whole fruit samples were analysed by HPLC with UV detection, with HPLC-MS for confirmation. All the results were corrected for recoveries which ranged from 88.8 to 96.6%.

The trials in 1994-95 were with three alternative use patterns: (a) four applications, at pre-bloom, 75-95% petal fall, first cover (21-day interval) and second cover (21-day interval); (b) four applications as in (a) followed by three further applications at 21-day intervals; (c) two applications, at pre-bloom and 75-95% petal fall. Whole kiwifruit were analysed by HPLC with a limit of detection of 0.01 mg/kg, with HPLC-MS confirmation (Deakyne *et al.*, 1995).

Only a few of the trials were in accordance with current New Zealand GAP. The residues in these ranged from 0.05 to 0.22 mg/kg.

Two trials were conducted in the USA in 1995 (Deakyne, 1996). Four applications of the 70WP

formulation were made at either 0.15 or 0.30 kg ai/ha, giving a total treatment of 0.60 or 1.20 kg ai/ha. The air-blast applications were at intervals of 6 to 14 days to plots of 0.50-0.54 ha. Single samples were taken 90 days after the last application. Whole fruit was analysed by the method of Deakyné *et al.* (1995). The residues were all below 0.5 mg/kg, even from the double rate.

The results of the New Zealand and US trials are shown in Table 2.

Table 2. Residues of tebufenozide in kiwifruit. Underlined residues are from treatments according to GAP.

Country, Location, Year	Form.	Application			PHI, days	Residue, mg/kg	Reference
		No.	kg ai/ha	kg ai/hl			
New Zealand	SC	4	a	0.006	10	0.77	Tillman, 1995
1990-1991					21	0.86	
					52	0.21	
					115	<u>0.22</u>	
New Zealand	SC	4	a	0.012	10	1.69	Tillman, 1995
1990-1991					21	1.55	
					52	0.55	
					115	0.34	
New Zealand	SC	8	0.092-0.10	0.004	4	0.69	Tillman, 1995
1992					7	0.57	
					14	0.65	
					21	0.44	
					28	0.22	
					42	0.41	
New Zealand	SC	8	0.138-0.15	0.006	4	0.85	Tillman, 1995
1992					7	0.82	
					14	0.94	
					21	0.92	
					28	0.63	
					42	0.65	
New Zealand	SC	8	0.277-0.30	0.012	4	2.5	Tillman, 1995
1992					7	2.6	
					14	2.28	
					21	1.77	
					28	1.5	
					42	1.3	
New Zealand	WP	3	b	0.004	21	0.1	Tillman, 1995
1992					42	0.06	
					72	0.01	
					98	0.02	
					127	0.01	
					147	0.03	
New Zealand	WP	3	b	0.006	21	0.18	Tillman, 1995
1992					42	0.16	
					72	0.06	
					98	0.05	
					127	<u>0.08</u>	
					147	0.08	
New Zealand	WP	3	b	0.012	21	0.37	Tillman, 1995
1992					42	0.25	
					72	0.1	
					98	0.02	
					127	0.11	
					147	0.07	
New Zealand	WDG	10	0.084-0.108	0.006	7	0.75	Tillman, 1995
1993					14	0.6	

Country, Location, Year	Form.	Application			PHI, days	Residue, mg/kg	Reference
		No.	kg ai/ha	kg ai/hl			
					21	0.62	
					28	0.58	
					35	0.44	
					42	0.48	
New Zealand 1993	WDG	10	0.168-0.216	0.012	7	1.5	Tillman, 1995
					14	1.4	
					21	2.1	
					28	1.2	
					35	1.3	
					42	1.5	
New Zealand 1994-1995	WP	4	c	0.003	1	0.28	Tillman, 1995
					7	0.39	
					14	0.19	
					28	0.16	
					107	0.03	
New Zealand 1994-1995	WP	4	c	0.006	1	0.65	Tillman, 1995
					7	0.82	
					14	0.4	
					28	0.32	
					107	0.08	
New Zealand 1994-1995	WP	4	c	0.012	1	1.1	Tillman, 1995
					7	1.5	
					14	1.1	
					28	1.1	
					107	0.18	
New Zealand 1995	WP	7	c	0.006	1	0.39	Tillman, 1995
					7	0.42	
					14	0.33	
					28	0.29	
New Zealand 1995	WP	7	c	0.012	31	0.62	Tillman, 1995
New Zealand 1994	WP	2	c	0.006	154	0.05	Tillman, 1995
New Zealand 1994/95	WP	4	c	0.003	0	0.46	Tillman, 1995
					7	0.3	
					14	0.26	
					28	0.19	
					122	0.06	
New Zealand 1994-1995	WP	4	c	0.006	0	0.94	Tillman, 1995
					7	0.63	
					14	0.93	
					28	0.72	
					122	0.19	
New Zealand 1994-1995	WP	4	c	0.012	0	1.7	Tillman, 1995
					7	1.6	
					14	1.1	
					28	0.47	
					122	0.4	
New Zealand 1995	WP	7	c	0.006	0	0.92	Tillman, 1995
					8	0.82	
					14	0.84	
					28	0.58	
New Zealand 1995	WP	7	c	0.012	28	1.3	Tillman, 1995
New Zealand 1994	WP	2	c	0.006	163	0.04	Tillman, 1995

Country, Location, Year	Form.	Application			PHI, days	Residue, mg/kg	Reference
		No.	kg ai/ha	kg ai/hl			
USA, CA. 1995	WP	4	0.150	0.010-0.011	90	0.15	Deakayne, 1996
	WP	4	0.300	0.020-0.022	90	0.49	
USA, CA. 1995	WP	4	0.150	0.010-0.011	90	0.09	Deakayne, 1996
	WP	4	0.300	0.019-0.021	90	0.19	

- a Each vine received approximately 5-7 litres of spray solution at each application, applied to the point of runoff.
- b Each vine received approximately 5 litres of spray solution at each application.
- c Each vine received approximately 6 litres of spray solution at each application.

RESIDUES IN FOOD IN COMMERCE OR AT CONSUMPTION

No information was provided.

NATIONAL MAXIMUM RESIDUE LIMITS

The national MRL for kiwifruit in New Zealand was reported to be 0.5 mg/kg.

APPRAISAL

Tebufenozide was first evaluated by the 1996 JMPR, which recommended MRLs for grapes, pome fruits, husked rice and walnuts. Trials on kiwifruit could not be related to GAP in New Zealand and no maximum residue level could be estimated.

The New Zealand Government and the manufacturer requested the JMPR to re-evaluate the residue data on kiwifruit in the light of revised New Zealand GAP, in which the PHI has been increased from 21 to 90 days.

The residues in the trials reported in 1996 which reflect the revised New Zealand GAP (median underlined) were 0.05, 0.08, 0.19 and 0.22 mg/kg.

In two trials in the USA with 4 applications at 0.15 kg ai/ha and a 90-day PHI, the residues were 0.09 and 0.15 mg/kg. Although these results cannot be related to the reported GAP, they can be considered as supplementary supporting information.

The Meeting concluded that although the data were limited they were just sufficient to estimate a maximum residue level of 0.5 mg/kg and an STMR of 0.14 mg/kg for kiwifruit.

RECOMMENDATIONS

On the basis of data from supervised trials the Meeting concluded that the residue level listed below is suitable for establishing a maximum residue limit and the supervised trials median residue is suitable for use in dietary intake estimations.

Definition of the residue for compliance with MRLs and for the estimation of dietary intake:
tebufenozide

Tebufenozide is fat-soluble

Commodity		MRL, mg/kg		PHI, days	STMR,mg/kg
CCN	Name	New	Previous		
FI 0341	Kiwifruit	0.5	-	90	0.14

REFERENCES

Deakyne, R.O., 1996. Magnitude of the Residue for RH-5992 in Kiwifruit (1995 US). Rohm and Haas Report No. 34-95-206. Unpublished.

Deakyne, R.O., Chen, Y. and Burnett, T. 1995e. Revised RH-5992 Apple residue Analytical Method with HPLC-MS Confirmation. Rohm and Haas No.34-95-56. Unpublished.

Tillman, A.M., 1995. RH-5992 (Tebufenozide): Summary of the magnitude of the Residue in Kiwifruit from Trials Performed in New Zealand -1992-1995. Rohm and Haas Report No. 34-95-183. Unpublished.