

## FENVALERATE (119)

## EXPLANATION

Fenvalerate has been reviewed by the JMPR in 1979, 1981, 1982 and 1984-1988, at which times numerous maximum residue levels were estimated or revised. The 1988 JMPR proposed an increase in the MRL for Brussels sprouts from 2 mg/kg to 5 mg/kg on the basis of new data and CAP information. The need for a 3-day PHI was questioned at the 1989 CCPR and it was noted that the proposal was probably based on proposed CAP in the USA (ALINORM 89/24A, para 155). The proposal was held at Step 7B with a request to delegations to provide updated information on GAP. The request was repeated at the 1990 CCPR (ALINORM 91/24, para 161). This evaluation considers the questions raised in the light of residue data and CAP information now provided.

## USE PATTERN

The Meeting received confirmation that the use of fenvalerate on Brussels sprouts is not currently CAP in the USA, although such a proposed use is still pending, including a proposed 3-day PHI. The most recent information on national CAP for the use of fenvalerate on Brussels sprouts recorded in the JMPR monographs is that of The Netherlands: 45 g ai/ha and a 7-day PHI (1984 JMPR).

The Meeting was provided with current labels for approved Australian uses of formulations containing either fenvalerate or esfenvalerate as active ingredients. These included a 50 EC formulation (Shell) containing 50 g ai esfenvalerate/1 and formulations containing 75 or 200 g ai fenvalerate/1 (Sumitomo). Information pertinent to questions raised on brassicas is summarized in Table 1. It is significant that the maximum CAP rate, 78 g ai/ha, is twice that in confirmed CAP previously provided and the PHI is 2 days compared to the 7-day basis for brassica limits. The CAP for formulations containing esfenvalerate instead of fenvalerate as the active ingredient is also new.

## RESIDUES RESULTING FROM SUPERVISED TRIALS

The Meeting received additional residue trials data for cabbage and new information on current CAP and also re-examined previous JMPR data, in order to consider questions raised at the CCPR on proposed limits for Brussels sprouts.

## Cabbages

The meeting received data on residue trials conducted in Australia in 1977 and 1978 (Perret, 1978) (Table 2). Multiple applications were made at rates of about 1-2 times the maximum label rates (see Table 1). Mature commercial hearts or discard leaves were sampled at intervals from 2 to 14 days after application; the PHI is 2 days. Results were not corrected for controls.

Maximum residues in the hearts at application rates approximating CAP and the 2-day PHI were 0.13 mg/kg, well within the current 3 mg/kg limit. The extent of trimming was not stated, although the discard leaves were described as those which "would normally be left in the field to be ploughed under...". Residues in discard leaves were 50 times those in the hearts at a 15-fold application rate. Doubling the application rate more than doubled the residues (3 to 8 times increase, depending on the pre-harvest interval).

## Brussels sprouts

The original recommendation of 2 mg/kg for Brussels sprouts was apparently based in part on data on other brassicas for which 2 mg/kg maximum levels were estimated, since residues on Brussels sprouts per se after 7 days were  $\leq 0.13$  mg/kg from rates approximating what are now known to be

CAP application rates in Australia (up to 78 g ai/ha) and 0.6 mg/kg at a twofold rate. With one exception of 5.2 mg/kg, residues in other brassicas were  $\leq 1.2$  mg/kg after 7 days.

Table 1. Australian uses of fenvalerate and esfenvalerate on brassicas

Formulation		Application		Interval (days) between applications	Pre-harvest interval (days)
		Formulation, ml/ha (ml/100 l)	Active ingredient (g/100 l)		
50 EC <sup>1</sup>	Low volume	250-380	12.5-19	7-10	2
	High volume	(25)	3.1-19 <sup>2</sup> (1.25)		
	Low insect activity	190-250	9.5-12.5		
	High insect activity	250-380	12.5-19		
75 Insecticide <sup>3</sup>				7-10	2
	Low insect activity	500-670	37.5-50		
	High insect activity	670-1000	50-75		
	Other	(70)	13.1-78.8 <sup>2</sup> (5.25)		
200 Insecticide <sup>4</sup>	Low volume	250-380	50-76	7-10	2
	High volume	(25)	12.5-75 <sup>2</sup> (5)		
	Low insect activity	190-250		38-50	

1/ Formulation contain 50 g esfenvalerate ai/l

2/ Estimated ai/ha based on recommended 250-1500 l/ha volume according to maturity of commodity

3/ Formulation contains 75 g fenvalerate ai/l

4/ Formulation contains 200 g fenvalerate ai/l

Table 2. Fenvalerate residues in cabbages from supervised trials in Australia

Year	Application				Residues (mg/kg) at intervals (days) after application						
	No.	Rate kg ai/ha	Formu- lation	Interval between applications (days)		2	3	5	10	14	Control
1977	9	0.118	20%EC	7-9	Hearts <sup>1</sup>		0.21	0.05	0.09		0.02
					Discard Leaves <sup>2</sup>	10.8	7.5	4.9			
1978	4	0.073	7.3%EC	7-16	Hearts <sup>1</sup>	0.13		0.17	0.15	0.05	0.04
	4	0.146	7.3%EC	7-16	Hearts <sup>1</sup>	1		0.88	0.5	0.05	

<sup>1</sup> Mature commercial hearts.  
<sup>2</sup> Leaves normally left in the field to be ploughed in.

In data submitted to the 1981 JMPR, residues in Canadian Brussels sprouts were 0.12 mg/kg at 3 days from 70 g ai/ha and, except for one residue of 10.6 mg/kg,  $\leq 4.3$  mg/kg in other brassicas (US and Canadian). The present Meeting noted that residues were up to 5.2 mg/kg at 3 days and  $\leq 1.4$  mg/kg at 7 days in data from the USA reviewed by the 1988 JMPR, although the proposed GAP application rate of 0.22 kg ai/ha is almost three times any rates known to be GAP.

#### METHODS OF RESIDUE ANALYSIS

The analytical method used for the additional residue trials on cabbage (Perret, 1978) was Woodstock Analytical Method Series 231-1, "Determination of Residues of WL 43775 in Crops". It is based on extraction of fenvalerate residues with acetone /petroleum spirit, elimination of the acetone with a water wash, clean-up of the petroleum fraction on Florisil and determination by GLC with electron-capture detection. No validation data were provided for cabbage, although the limit of determination was reported to be 0.01 mg/kg for apples, pears, grapes and maize. Apparent residues in cabbage controls in the residue trials were  $\leq 0.04$  mg/kg.

#### NATIONAL MAXIMUM RESIDUE LIMITS

The Meeting was informed of the revised national MRLs of The Netherlands for animal products shown below.

Commodity	MRL, mg/kg
milk	0.02 F1
meat (mammalian)	0.02 F2
other animal products	0*(0.02)

F1 = Fat soluble

F2 = Applies to product. If product contains >10% fat, MRL is 10 times the product-based MRL.

## APPRAISAL

Fenvalerate has been reviewed by the JMPR on numerous occasions (1979-1988). The present Meeting examined questions raised at the 1989 CCPR on a 1988 JMPR proposal to increase the limit for Brussels sprouts from 2 mg/kg to 5 mg/kg and on whether the data base reflected GAP. New residue data for fenvalerate on cabbage were also examined. Although it was unclear whether the portion of the commodity analysed conformed to Codex recommendations, the new cabbage data did not require revision of the current CXL.

On the basis of confirmation that the 1988 JMPR Brussels sprouts data base did not in fact reflect GAP, but proposed GAP; on re-examination of all the data on Brussels sprouts, taking into account data on other brassicas and available information on current GAP, the Meeting recommended that the limit should not be increased from 2 to 5 mg/kg as proposed by the 1988 JMPR.

The Meeting took note of the fact that current GAP allows for application at approximately twice the rate previously confirmed as GAP and at a 2-day PHI compared to the 7-day basis of the current limits for brassicas. Although limited data reflecting this treatment were available for cabbage, the Meeting considered it desirable that additional residue data from trials on brassicas reflecting this use in which the Codex recommended portion of the commodity is analysed should be provided in order to confirm current limits.

The Meeting also noted the availability of, and GAP for, formulations using esfenvalerate instead of fenvalerate as the active ingredient. Current Codex limits are based on data from the use of the latter. The Meeting noted further that application rates of the active ingredient to Brussels sprouts in at least one formulation containing esfenvalerate are approximately one quarter of those in formulations containing fenvalerate. The Meeting thought it desirable that information should be provided to enable a future Meeting to consider the adequacy of current fenvalerate MRLs for regulating residues resulting from the new formulations.

## RECOMMENDATIONS

The Meeting recommends that the maximum residue level shown below is suitable for use as an MRL.

Definition of the residue: fenvalerate (fat-soluble).

Commodity	MRL (mg/kg)		PHI (days) on which recommendation is based
	Recommended	Previous	
VB 0402 Brussels sprouts	2 <sup>1</sup>	5 <sup>2</sup>	7 <sup>1</sup>

1/ Proposed by 1984 JMPR for Brassica leafy vegetables (except cabbage (headed)).

2/ Proposed by 1988 JMPR for Brussels sprouts

## FURTHER WORK OR INFORMATION

Desirable

1. Data on additional brassica residue trials based on the higher application rates and shorter PHI which are now GAP and in which the Codex recommended portion of the commodity is analysed, in order to confirm the adequacy of the current limits for brassicas.

2. GAP information and residue trials data reflecting that GAP in which esfenvalerate is used instead of fenvalerate as the active ingredient.

#### REFERENCES

Perret, GR. 1978. Report on Residues of WL43775 In Cabbages for Shell Chemical (Australia) Proprietary Limited. Report submitted to FAO by Department of Primary Industries and Energy, Agricultural & Veterinary Chemicals Section, Australia, 7/18/90.