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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM:

SUBJECT: ID #3125-338
[RCB: #2552]
[MRID: #402244-01]

Azinphos-Methyl[GUTHION®-3F]:
Ammendment on Apples & Pears.

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The Agricultural Chemicals Division, Mobay Chemical Corp., requests the registration of their formulation GUTHION®-3F [EPA Reg.#3125-338], an insecticide, to be used on apples and pears to control several pests.

The formulation, which contains 30% of the active ingredient, azinphos-methyl, is currently registered for use on several RACs.

Tolerances are established for residues of azinphos-methyl [O,O-Dimethyl-S-[(4-oxo-1,2,3-benzotriazin-3(4H)-yl)methyl]phosphorodithioate] on numerous RACs, including apples and pears at 2.0 ppm each[40 CFR 180.154].

Established tolerances also exist for residues of azinphos-methyl on the fat, meat, and meat-by-products of cattle, goats, horses, and sheep at 0.1 ppm.

A tolerance of 0.04 ppm(negligible residue) is established for residues of azinphos-methyl and/or its metabolites calculated as azinphos-methyl in milk[40 CFR 180.154a].

Registered Use

There are several GUTHION® formulations registered for use on apples and pears for multiple foliar applications with aerial or ground equipment, with variable PHI's ranging from 7 to 15 days.

Restriction: Livestock are not permitted to graze in treated orchards or groves for 21 days after treatment.

Note: According to the Registration Standard for Azinphos-Methyl, "Residue Chemistry Chapter", pp.146,154, 4/4/86, "...The available data are insufficient to support the established tolerance for residues of azinphos-methyl in or on apples..."

The above data gap is based on: (1) inadequacy of geographic representation; (2) residue data did not correspond to the maximum registered application rates with an established PHI; and (3) there were no submissions of residue data for their processed products.

The current request for the registered use of GUTHION®-3F on apples and pears does partially resolve the above deficencies by the submission of new residue data which includes multiple foliar application with a designated PHI and a wide geographical application.

Proposed Use

Apply two(2) pints(12 oz.a.i.)/A in up to 400 gals diluent; a total of eight (8) pints of GUTHION®-3F may be applied per season. This would permit up to a maximum of 48 oz a.i./A/per season. There will be a minimum of 7 days between application; and a seven(7) day PHI.

A comparison of the maximum application of two formulations, GUTHION&-50%W [EPA Reg.#3125-193] and GUTHION®-2S[EPA Reg.# 3125-123], which are registered for use on apples & pears is shown below:

		GUTHION®-50%WP	GUTHION®-2S	GUTHION®-3F
Total App.(a.i)/A	=	24 oz(3 lbs)	16 oz(4 pts)	12 oz(2 pts)
Total App.(a.i.)/A/ per season	=	90 oz(10 lbs)	80 oz(20 pts)	48 oz(8 pts)

GUTHION®-50%WP contains 8 oz a.i./lb [Apples & pears]
GUTHION®-2S " 4 oz a.i./pt [Apples only]
GUTHION®-3F 6 oz a.i./pt.[Apples & pears]

Nature of Residue

The metabolism of azinphos-methyl in plants is not adequately understood. Studies in which residues were most completely characterized were only in kidney bean leaves.[Registration Standard for Azinphos-methyl, "Nature of Residue in Plants", p.2, 4/4/86].

Analytical Methods

The residue data in this report were obtained by using the analytical procedure described in the Mobay Report #69523(EPA Acc. #245795). This method identifies only azinphos-methyl and its oxygen analogue.

Following the iso-propanol extraction of residue from samples, the extract is "cleaned-up" via a column (packed with Super-Gel, Sea Sorb 43, alumina, and sodium sulfate). The eluant, containing the "purified" residue is evaporated to dryness. The dried residue is dissolved in benzene, passed through another "cleanup" column packed with silica gel. After discarding the eluant, a 2% solution of acetonitrile in benzene is added to the column and the eluant saved. A 20% solution of acetonitrile in benzene is then added and the eluant, which contains the azinphos-methyl oxygen analogue, is collected. Both eluants are evaporated to dryness. The residue is dissolved in ethyl acetate and analyzed by GLC using a column packed with 15%QF-1 on 100/200 mesh Gas Chrom Q and by flame photometric detection.

Method Validation

The recoveries for azinphos-methyl [R-P=S] and its oxygen analogue [R-P=O] using method #69523, are shown below:

Six apple samples were spiked with varying concentrations of R-P=S and seven apple samples were spiked with varying concentrations of R-P=O in a blender,

% Recoveries for R-P=S & R-P=O in Apples

R-P=S		R-P=O	
ppm	%	ppm	%
0.05	78,114	0.05	114
0.10	67,84	0.10	97,117
0.50	77,83	0.20	75,110
---	---	0.50	86
---	---	1.00	85
	84±16% (ave)		98±15% (ave)

The control values ranged from 0.01 to 0.04 ppm. Sensitivity of method #69523 is considered to be 0.04ppm.

Residue Data

New residue data were submitted with this amendment. Storage stability: Apple and pear samples were kept in frozen storage at temperatures 0° to -10°F for 199 weeks(apples) and 204 weeks(pears). Residue levels on re-analysis were 70% of original value for apples and 90% of original value for pears.

The residue data on apples were gathered from from six studies, which included the States of New York, Washington(2), California, North Carolina, and Michigan.

Representative gas chromatograms were also submitted. All samples reflect foliar ground applications sprayed with two(2)pts(12 oz.a.i.)GUTHION®-3F/A/per application, with a total of four(4) applications. The residue values varied from 0.11 ppm(R-P=S plus R-P=O) to 1.24 ppm at a 14 day PHI. None of the control values in any of the six studies exceeded 0.04ppm, the detection limit for Mobay's method #69523.

Residue Data on apples(whole) ††

[ppm]

Study	Days between Application	PHI/Days	R-P=S	R-P=O	Total
Sodus,N.Y	14,14,14	7	1.18	0.03	1.21
	"	14	0.86	0.03	0.89
	"	21	0.87	<0.02	0.87
Yakima, WA	"	7	0.34	0.02	0.36
	"	14	0.61	0.03	0.64
	"	21	0.36	0.02	0.38
Yakima,WA	"	7	1.04	0.03	1.07
	"	14	1.20	0.04	1.24
	"	21	0.15	0.05	0.20
Patterson,CA	9,10,10	7	0.29	<0.02	0.29
	"	14	0.53	<0.02	0.53
	"	21	0.94	<0.02	0.94
Fletcher,NC	14,13,15	7	0.18	<0.02	0.18
	"	14	0.11	<0.02	0.13
	"	21	0.04	<0.02	0.04
Fennville, MI	14,15,13	7	0.84	0.02	0.86
	"	14	0.41	<0.02	0.41
	"	21	0.55	0.02	0.57

†† All apple samples in these studies were kept in frozen storage, ranging up to 20 weeks before analysis.

We conclude, based on the submitted residue data, which included data from a a broad geographical representation and multiple foliar applications of GUTHION®-3F with a designated PHI, that the residues of azinphos-methyl [R-P=S] and its oxygen analogue[R-P=O] are not likely to exceed the established tolerance of 2.0 ppm in/on apples or pears.

Conclusions

(1) a. The submitted data indicate that residues if azinphos-methyl and its oxygen analogue are not likely to exceed the 2 ppm tolerance in/on apples.

b. No residue data have been submitted for pears.

(2) There are numerous Registration Standard deficiencies still outstanding, including: lack of adequate plant metabolism data and apple processing studies. These will be needed to be resolved before RCB recommends for any additional uses of azinphos-methyl.

Recommendation

For reasons listed in conclusions #1b and #2, RCB recommends against this ammended registration.

cc:RF;SF[Azinphos-Methyl,GUTHION®];PM#12;Reviewer;PMSD/ISB;B.Boodee.
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