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

DEC 8 1987

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

Memorandum

Subject: 88-CA-07. Proposed Section 18 Exemption for Sethoxydim (Poast®, EPA Reg. No. 7969-58) on Lettuce, Broccoli and Cauliflower.
No Acc. Number / No MRID Number
RCB #3029

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To: Emergency Response and Minor Use Section
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and

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The California Department of Food and Agriculture recently issued a Section 18 Crisis Exemption and now requests a Specific Exemption authorizing application of the herbicide Poast® to a maximum of 12,200 acres of lettuce, broccoli and cauliflower to control watergrass. Applications would be made in Imperial and Riverside counties. Poast® is a 20% a.i. emulsifiable concentrate.

Tolerances are established for the combined residues of the herbicide sethoxydim [2-[1-(ethoxyimino)butyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexene-1-one] and its metabolites containing the 2-cyclohexene-1-one moiety (calculated as the herbicide) ranging from 0.05(N) ppm in milk to 75 FA ppm in peanut soapstock. Numerous tolerances are pending including those for Brassica leafy vegetables (5 ppm); celery, head lettuce and leaf lettuce (1.0 ppm); and spinach (3.0 ppm). A Registration Standard has not been completed for sethoxydim.

The proposed use includes a maximum of 2 applications at 1.5 pints product (4.5 oz.a.i.)/A/application. Applications would be made in a minimum of 10 gallons per acre by ground or 5 gallons per acre by air; and a 30-day PHI would be imposed. A minimum interval between applications is not specified.

The metabolism of sethoxydim has been previously reviewed and is considered adequately understood in plants and animals (see M. J. Nelson, Ph.D., 4/9/87). The residue of concern includes parent and metabolites containing the 2-cyclohexene-1-one moiety.

Residue data for broccoli and cauliflower were submitted with PP#6F3452 (Acc. No. 264612-3) with BWC Analytical Method No. 30G used for analysis. Residue data for head lettuce and leaf lettuce were submitted with PP#8F3577 (MRID Nos. 403757-02, -03) with the same method used for analysis. This method is similar to Method No. 30 found in PAM II (Method I). The raw agricultural commodity is extracted with methanol followed by calcium hydroxide precipitation. The residue is oxidized to DME and DME-OH with hydrogen peroxide, and the oxidized products are esterified, cleaned-up using silica gel and C_{18} columns, and analyzed by GC using a flame photometric detector. The limit of quantitation for the subject crops is 0.05 ppm. Recoveries are summarized in the table below. The method is suitable for enforcement.

Recovery of Sethoxydim and Its Metabolites from Lettuce, Broccoli and Cauliflower

Crop	Fortification (ppm)			Recovery Range[1] (%)		
	Sethoxydim	MSO	5-OH MSO	Sethoxydim	MSO	5-OH MSO
Broccoli	0.1 -5.0	0.1 -5.0	0.1 -5.0	92 - 97	94 - 98	78 - 97
Cauliflower	-[2]	0.05-5.0	0.05-5.0	-	92 - 96	78 - 90
Lettuce, leaf	0.05-1.0	0.05-2.5	0.05-2.5	78 - 88	74 - 89	72 -116
Lettuce, head	0.05-2.4	0.05-2.5	0.05-2.5	75 - 94	72 - 94	71 - 94

[1]Compounds recovered as oxidized methyl esters
[2]Recovery data not available

Residue data are summarized below. Data for lettuce were submitted from CA, MN, MI, FL, NJ, MA, WA, OR and AZ: data for broccoli from NJ, OR, TX, CA and KS; and data for cauliflower from MS and CA. All applications were made using ground equipment only.

Summary of Combined Sethoxydim Residues in Lettuce, Broccoli and Cauliflower

Crop	Application Rate (lbs.a.i./A)	PHI Range (days)	Residue Range (ppm)
Leaf lettuce	0.3	36 - 39	<0.1
	0.3 + 0.3	13 - 18	<0.1 - <0.86
		30	<0.1 - <0.22
Head lettuce	0.3 + 0.3	12, 14	<0.18 - <0.40
		19, 22	<0.15 - <0.33
		28 -32	<0.10 - <0.47
	0.5	19	<0.30, <0.33
Broccoli	0.3 + 0.3	26 - 34	<0.38 - 0.51
	0.3 + 0.3 + 0.3 (161 days between last 2 apps.)	24	<1.6 - 3.6
		30	<1.3 - 1.7
	0.5	40	<0.2
	0.25 + 0.25	83	<0.2
	0.5 + 0.5	83	<0.23
Cauliflower	0.3 + 0.3 + 0.3 (161 days between last 2 apps.)	27	0.26
	0.5	31	0.55
	1.0	31	0.87

Based on these data, and for the purposes of this Section 18 only, we conclude that combined residues of sethoxydim and its metabolites are not likely to exceed the following values as a result of the proposed use:

Crop	Maximum Likely Residue (ppm)
Lettuce	1.0
Broccoli	5.0
Cauliflower	5.0

Meat, Milk, Poultry and Eggs

The subject crops are not major animal feed items. Therefore, secondary residues are not likely to be found in eggs, milk or in the meat, fat and meat by-products of cattle, goats, hogs, horses, poultry and sheep as a result of the proposed use.

Conclusions

(1) The metabolism of sethoxydim in plants and animals is adequately understood. The residue of concern includes parent plus metabolites containig the 2-cyclohexene-1-one moiety.

(2) Analytical methods are available for enforcement (BWC Analytical Method No. 30G, a modification of PAM II, Method I). A non-CBI copy of this method is available.

(3) Combined residues of sethoxydim and its metabolites are not likely to exceed the following values as a result of the proposed use:

Crop	Maximum Likely Residue (ppm)
Lettuce	1.0
Broccoli	5.0
Cauliflower	5.0

(4) Since residue data reflect only ground applications of the pesticide to these commodities, applications made under the authority of this Section 18 should be restricted to ground applications only.

(5) The subject commodities are not major animal feed items. Therefore, secondary residues are not likely to be found in eggs, milk or in the meat, fat and meat by-products of cattle, goats, hogs, horses, poultry and sheep as a result of the proposed use.

(6) Analytical reference standards are available from the Pesticides and Industrial Chemicals Repository.

Recommendations

Provided applications are restricted to ground applications only, RCB has no objections to this Section 18. An agreement should be made with the FDA regarding the legal status of the treated commodities in commerce.

cc: Sethoxydim (Poast®) S.F., R.F., Section 18 S.F., Circu, M. Metzger, PMSD/ISB
RDI:E.Zager:EZ:12/7/87:RDS:12/7/87
TS-769C:RCB:M.Metzger:MM:Rm803a:CM#2:12/7/87