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PREVENTION, PESTICIDES, AND
TOXIC SUBSTANCES

MEMORANDUM

DATE: 09-NOV-2000

SUBJECT: ID#: 00ID0034. SECTION 18 EMERGENCY EXEMPTION FOR THE USE OF **MYCLOBUTANIL** ON **SUGAR BEETS** IN **IDAHO.**

DP Barcode:	D268379	MRID No.:	None
Submission No.:	S583875	PRAT Case:	293340
Chemical No.:	128857	Class:	Fungicide
Trade Name:	Laredo EC	EPA Reg No.:	707-222
40 CFR:	§180.443		

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INTRODUCTION

The Idaho Department of Agriculture is proposing a specific emergency exemption for the use of myclobutanil [α-butyl-α(4-chlorophenyl)-1H-1,2,4-triazole-1-propanenitrile] on sugar beets for control of Powdery Mildew, *Erysiphe* spp. This is the **first** year that this myclobutanil use has been requested. The proposed program will entail application of 6,250 lb a.i. of Laredo EC on 50K acres throughout the state starting August 10, 2000 to September 26, 2000.

SUMMARY

HED concludes that occupational exposure and aggregate acute, intermediate-term and chronic risk estimates do not exceed HED's level of concern. This Section 18 exemption should not pose an unacceptable aggregate risk to infants, children, or adults. Provided the Section B is amended to indicate a 28-day preharvest interval (PHI), HED's database supports the issuance of this Section 18 exemption for the use of myclobutanil on sugar beets in Idaho. The following time-limited tolerances for residues of myclobutanil and its alcohol metabolite should be established to support this Section 18 exemption:

Beet, sugar, roots	0.05 ppm
Beet, sugar, tops	1.0 ppm
Beet, sugar, dried pulp	1.0 ppm
Beet, sugar, molasses	1.0 ppm
Beet, sugar, refined sugar	0.70 ppm

Adequate enforcement methods are available for determination of the regulated myclobutanil in plant and livestock commodities.

Aggregate Exposure and Risk Assessment

Acute aggregate risk estimates do not exceed HED's level of concern for females 13-50 years old. The acute dietary risk estimates (food only) are based upon 100% crop treated (%CT) and tolerance level residues. HED has estimated that the acute dietary exposure to myclobutanil from food for females 13-50 years old will utilize 2% of the acute Population Adjusted Dose (aPAD). For acute dietary risk, HED's level of concern is for exposures >100% aPAD. The Environmental Fate and Effects Division (EFED) supplied surface and ground water Estimated Environmental Concentrations (EECs) which do not exceed HED's calculated Drinking Water Level Of Comparison (DWLOCs). Therefore, HED does not expect the acute aggregate exposure estimates to exceed HED's level of concern.

No acute endpoint was chosen for the general U.S. population (including infants and children). Therefore, an acute risk assessment for those subpopulations was not performed.

Chronic aggregate risk estimates do not exceed HED's level of concern for the general U.S. population or any population subgroup. The chronic dietary risk estimates (food only) are based upon tolerance level residues and average %CT data for several commodities. The most highly exposed population subgroup for chronic dietary exposure (children 1-6 years old) will utilize 54% of the chronic Population Adjusted Dose (cPAD). For chronic dietary risk, HED's level of concern is for exposures >100% cPAD. EFED supplied surface and ground water modeling estimates which do not exceed HED's calculated DWLOCs for any subpopulation. The registered residential uses do not constitute a chronic scenario. Therefore, HED does not expect the chronic aggregate exposure estimates to exceed HED's level of concern.

HED Hazard Identification Assessment Review Committee (HIARC) determined that oral and dermal exposures can not be aggregated due to differences in the toxicological endpoints via the oral (developmental) and dermal (no systemic toxicity) routes (Memo, M. Copley, 9/2/99). **Therefore, a short-term aggregate exposure risk assessment was not performed.**

Intermediate-term aggregate risk estimates do not exceed HED's level of concern. HED aggregated the chronic dietary exposure (food only) and residential exposure (dermal from garden uses) for the general U.S. Population and those population subgroups for which residential exposure is expected. The total MOEs for the general U.S. Population and infants/children are 650 and 300, respectively (HED's acceptable level for myclobutanil is for MOEs $\geq$100). EFED supplied surface and ground water modeling estimates which do not exceed HED's calculated DWLOCs for the general U.S. population or infants/children. Therefore, HED does not expect the intermediate-term aggregate exposure estimates to exceed HED's level of concern.

Occupational Exposure

Based on the proposed use patterns, private handlers are expected to have short-term exposure and commercial handlers may have short- and intermediate-term exposures. The estimated short-term and intermediate-term MOEs are **2040 and 357** or greater for all mixer/loader and applicator activities. Therefore, since HED's level of concern for myclobutanil is for MOEs less than 100, potential risk to handlers is well below the level of concern. There are no identified cultural post application activities that will result in dermal exposure for sugar beets. Harvesting is mechanical. Therefore a post application exposure assessment is not necessary and was not conducted.

DETAILED DISCUSSION

FQPA CONSIDERATIONS AND DOSE RESPONSE ASSESSMENT

On August 12, 1999 (HED Doc. No. 013740, dated 9/2/99), the HIARC reassessed the need for an acute dietary endpoint. The HIARC had previously met on October 21, 1997 (HED Doc. No. 012378, dated 11/3/97) to evaluate the toxicology database of myclobutanil with special reference to the reproductive, developmental and neurotoxicity data. These data were re-reviewed at that time specifically to address the sensitivity of infants and children from exposure to myclobutanil as required by the Food Quality Protection Act (FQPA) of 1996. In addition, the HIARC also re-assessed the doses and endpoints for acute dietary, chronic dietary, as well as occupational and residential exposure risk assessments that had been previously established. There were previous meetings of the HED Reference Dose (RfD) Committee on April 28, 1994 (HED Doc. No. 011074, dated 6/16/94) and of the HED Toxicology Endpoint Selection (TES) Committee (HED Doc. No. 013469, dated 7/13/94). The FQPA Safety Factor

Committee (SFC) met on August 16, 1999 (HED Doc. 013734, dated 9/13/99) and addressed the potential enhanced sensitivity to infants and children as required by FQPA. The Committee recommended that the 10x FQPA Safety Factor not be retained (i.e., reduced to 1x) since there is no evidence of increased susceptibility of young rats or rabbits to myclobutanil; a developmental neurotoxicity study is not required; and the exposure assessments will not underestimate the potential dietary (food and drinking water) and residential (non-occupational) exposures for infants and children from the use of myclobutanil.

The aPAD and cPAD are modifications of the acute and chronic RfDs to accommodate the FQPA Safety Factor. The PAD is equal to the acute or chronic RfD divided by the FQPA Safety Factor. Therefore, because the 10x Safety Factor was not retained (i.e., reduced to 1x), the aPAD and cPAD are equal to the acute and chronic RfD, respectively.

The dose at which no adverse effects are observed (NOAEL) from the toxicology study identified as appropriate for use in risk assessment is used to estimate the toxicological level of concern (LOC). However, the lowest dose at which adverse effects of concern are identified (LOAEL) is sometimes used for risk assessment if no NOAEL was achieved in the toxicology study selected. An uncertainty factor (UF) is applied to reflect uncertainties inherent in the extrapolation from laboratory animal data to humans and in the variations in sensitivity among members of the human population as well as other unknowns. An UF of 100 is routinely used, 10X to account for interspecies differences and 10X for intra species differences.

For dietary risk assessment (other than cancer), HED uses the UF to calculate an acute or chronic reference dose (acute RfD or chronic RfD) where the RfD is equal to the NOAEL divided by the appropriate UF (RfD=NOAEL/UF). Where an additional safety factor is retained due to concerns unique to the FQPA, this additional factor is applied to the RfD by dividing the RfD by such additional factor. The aPAD or cPAD is a modification of the RfD to accommodate this type of FQPA Safety Factor.

For non-dietary risk assessments (other than cancer), the UF is used to determine the LOC. For example, when 100 is the appropriate UF (10X to account for interspecies differences and 10X for intraspecies differences) the LOC is 100. To estimate risk, a ratio of the NOAEL to exposures (MOE = NOAEL/exposure) is calculated and compared to the LOC.

The doses and toxicological endpoints selected for various exposure scenarios are summarized in Table 1. See Section 3 risk assessment for details (Memo, J. Rowell, et. al., 3/14/00, D244901).

Table 1. Summary of Toxicological Dose and Endpoints for Myclobutanil for Use in Human Risk Assessment

Exposure Scenario	Dose Used in Risk Assessment, UF	FQPA SF and LOC for Risk Assessment	Study and Toxicological Effects
Acute Dietary females 13-50 years of age	NOAEL = 60 mg/kg/day UF = 100 **Acute RfD** = 0.60 mg/kg/day	FQPA SF = 1 **aPAD** = acute RfD / FQPA SF = 0.60 mg/kg/day	Developmental Toxicity - rabbit[1] LOAEL = 200 mg/kg/day based on increased resorptions, decreased litter size and a decrease in the viability index.
Acute Dietary general population including infants and children	none	not applicable	not applicable
Chronic Dietary all populations	NOAEL= 2.49 mg/kg/day UF = 100 **Chronic RfD** = 0.025 mg/kg/day	FQPA SF = 1 **cPAD** = chronic RfD / FQPA SF = 0.025 mg/kg/day	Chronic Toxicity/ Carcinogenicity - rat LOAEL = 9.94 mg/kg/day based on decreased testicular weights and increased testicular atrophy.
Short-Term Dermal (1-7 days) (Occupational/ Residential)	dermal study NOAEL= 100 mg/kg/day	**acceptable MOE** = 100 (Occupational) **acceptable MOE** = 100 (Residential, includes the FQPA SF)	28-day Dermal Toxicity- rat LOAEL = >100 mg/kg/day based on no signs of toxicity at the high dose of 100 mg/kg a.i.
Intermediate-Term Dermal (1 week - several months) (Occupational/ Residential)	oral study NOAEL= 10 mg/kg/day (dermal absorption rate = 50%)	**acceptable MOE** = 100 (Occupational) **acceptable MOE** = 100 (Residential, includes the FQPA SF)	2 Generation Reproduction Toxicity - rat LOAEL = 50 mg/kg/day based on atrophy of the testes and prostate as well as an increase in the number of stillborn pups and a decrease in pup weight gain during lactation.
Long-Term Dermal (several months - lifetime) (Occupational/ Residential)	oral study NOAEL= 2.49 mg/kg/day (dermal absorption rate = 50%)	**acceptable MOE** = 100 (Occupational) **acceptable MOE** = 100 (Residential, includes the FQPA SF)	Chronic Toxicity/ Carcinogenicity - rat LOAEL = 9.94 mg/kg/day based on decreased testicular weights and increased testicular atrophy.
Short-Term Inhalation (1-7 days) (Occupational/ Residential)	oral study NOAEL= 10 mg/kg/day (inhalation absorption rate = 100%)	**acceptable MOE** = 100 (Occupational) **acceptable MOE** = 100 (Residential, includes the FQPA SF)	2 Generation Reproduction Toxicity - rat LOAEL = 50 mg/kg/day based on atrophy of the testes and prostate as well as an increase in the number of stillborn pups and a decrease in pup weight gain during lactation.

Exposure Scenario	Dose Used in Risk Assessment, UF	FQPA SF and LOC for Risk Assessment	Study and Toxicological Effects
Intermediate-Term Inhalation (1 week - several months) (Occupational/ Residential)	oral study NOAEL= 10 mg/kg/day (inhalation absorption rate = 100%)	**acceptable MOE** = 100 (Occupational) **acceptable MOE** = 100 (Residential, includes the FQPA SF)	2 Generation Reproduction Toxicity - rat LOAEL = 50 mg/kg/day based on atrophy of the testes and prostate as well as an increase in the number of stillborn pups and a decrease in pup weight gain during lactation.
Long-Term Inhalation (several months - lifetime) (Occupational/ Residential)	oral study NOAEL= 2.49 mg/kg/day (inhalation absorption rate = 100%)	**acceptable MOE** = 100 (Occupational) **acceptable MOE** = 100 (Residential, includes the FQPA SF)	Chronic Toxicity/ Carcinogenicity - rat LOAEL = 9.94 mg/kg/day based on decreased testicular weights and increased testicular atrophy.
Cancer (oral, dermal, inhalation)	"Group E"	not applicable	not applicable

1. The HIARC document (dated 9/2/99) table incorrectly lists this as rat.

RESIDUE CHEMISTRY

Proposed use

Laredo EC (EPA Reg No. 707-222) contains 2 lbs. of the a.i./gallon. Tolerances are established for residues of the fungicide myclobutanil [α-butyl-α(4-chlorophenyl)-1H-1,2,4-triazole-1-propanenitrile] and its alcohol metabolite in or on numerous plant and livestock commodities (40 CFR 180.443).

The Section 18 supplemental label proposes a maximum of 2 applications of Laredo EC at 10- to 14-day intervals. Each application will be made at 0.125 lbs a.i/A, for a total of 0.25 lbs a.i/A/year. The proposed PHI is 14 days. **The submitted residue data support a 28-day PHI. Therefore, a revised Section B should be submitted with this PHI (See Magnitude of Residues Section).** Laredo EC-treated fields can be rotated at any time to crops that are included on the product label. All other crops can be planted 30 days following the last application of Laredo EC.

Nature of the Residue in Plants and Livestock

The nature of the residue in plants is adequately understood. The nature of the residue in plants was determined by HED in previous reviews of myclobutanil metabolism in wheat (PP#4G3149, Memo, R. Loranger, 1/9/85), and grapes and apples (PP#7G3479, Memo, R. Loranger, 6/16/87). The residues of concern are myclobutanil [α-butyl-α-(4-chlorophenyl)-1H-1,2,4-triazole-1-

propanenitrile] and its metabolite [α-(3-hydroxybutyl)-α-(4-chlorophenyl)-1H-1,2,4-triazole-1-propanenitrile] (free and bound), as specified in 40 CFR 180.443(a).

The nature of the residue in livestock is adequately understood. Myclobutanil metabolism in meat, milk, poultry, and eggs has been reviewed in conjunction with PP#7F3476 (Memo, M. Nelson, 2/8/88) and summarized in conjunction with the temporary tolerance petition for almond nuts and hulls (PP#9G3786, Memo, J. Smith, 12/6/89). The residues of concern in livestock commodities except milk are myclobutanil [α-butyl-α-(4-chlorophenyl)-1H-1,2,4-triazole-1-propanenitrile] and its metabolite α-(3-hydroxybutyl)-α-(4-chlorophenyl)-1H-1,2,4-triazole-1-propanenitrile (free). The residues of concern in milk are myclobutanil [α-butyl-α-(4-chlorophenyl)-1H-1,2,4-triazole-1-propanenitrile] and its metabolites, α-(3-hydroxybutyl)-α-(4-chlorophenyl)-1H-1,2,4-triazole-1-propanenitrile (free and bound) and α-(4-chlorophenyl)-α-(3,4-dihydroxybutyl)-1H-1,2,4-triazole-1-propanenitrile.

Analytical Enforcement Methodology

An adequate enforcement method (Rohm and Haas Method 34S-88-10, MRID# 408033-02) is available to enforce the proposed tolerances. Quantitation is by GLC using a nitrogen/phosphorus detector for myclobutanil and an electron capture detector (Ni^{63}) for the alcohol metabolite (Memo, M. Nelson, 4/14/88). This method has been submitted for publication in Pesticide Analytical Method Volume II (PAM II) (PP#7F3476, M.J. Nelson, 7/18/89).

Magnitude of Residues

In support of this Section 18 request, summaries of several southern European residue trials of myclobutanil on sugar beets were submitted. A total of 4 trials were conducted in Spain. Two applications of myclobutanil, formulated as Systhane (EPA Reg. 707-253; 40% lb. ai/A), were made at a rate of 0.056 lb. ai/A (0.0623 kg ai/ha), resulting in a total application rate of 0.11 lb ai/A (0.44x the proposed maximum application rate). The applications were made at 20- to 21-day intervals. No field residue data were submitted using applications at the proposed maximum individual application rate of 0.25 lb a.i./A, the proposed PHI of 14 days or the proposed application interval of 10 to 14 days. Therefore, for purposes of this Section 18 request, HED calculated the residues expected at the proposed maximum application rate assuming a linear relationship between the application rate and the residue level. Table 2 lists the results of the European residue trials as well as the calculated anticipated residues.

Table 2. Summary of the European Residue Data for Myclobutanil and Anticipated Residues for Section 18 for Use on Sugar Beets.

Location	Portion Analyzed	# App.	PHI (days)	Actual Data					Anticipated Residue Data		
				Application Rate (lb ai/A)		Residues (ppm)			Application Rate (lb ai/A)		Residues (ppm)
				Per App.	Total	RH-3866	RH-9090	Total	Per App.	Total	Total
Spain 4919447	leaves, crowns	2	28	0.056	0.112	0.03-0.04 (0.04)	0.24-0.27 (0.25)	0.27-0.31 (0.29)	0.125	0.25	0.60-0.69 (0.65)
	roots	2				<0.01 (<0.01)	<0.01 (<0.01)	<0.02 (<0.02)	0.125	0.25	0.045 (0.045)
Spain 4919448	leaves, crowns	2	28	0.056	0.112	0.02-0.02 (0.02)	0.23-0.26 (0.25)	0.25-0.28 (0.27)	0.125	0.25	0.56-0.63 (0.60)
	roots	2				<0.01 (<0.01)	<0.01 (<0.01)	<0.02 (<0.02)	0.125	0.25	0.045 (0.045)
Spain 4919449	leaves, crowns	2	28	0.056	0.112	<0.01-0.01 (0.01)	0.16-0.13 (0.14)	0.17-0.14 (0.15)	0.125	0.25	0.38-0.31 (0.35)
	roots	2				<0.01 (<0.01)	<0.01 (<0.01)	<0.02 (<0.02)	0.125	0.25	0.045 (0.045)
Spain 4919450	leaves, crowns	2	28	0.056	0.112	0.09-0.10 (0.09)	0.18-0.22 (0.20)	0.27-0.31 (0.29)	0.125	0.25	0.60-0.69 (0.65)
	roots	2				<0.01 (<0.01)	<0.01 (<0.01)	<0.02 (<0.02)	0.125	0.25	0.045 (0.045)

The available residue data for sugar beets indicate that the combined residues of myclobutanil and its metabolite RH-9090 will not exceed the 1.0 ppm in sugar beet tops and 0.05 ppm in sugar beet roots when treated at the proposed maximum application rate of 0.25 lb. ai./A/year and harvested at a PHI of 28 days. **Therefore, the data support the following time-limited tolerances for residues of myclobutanil and its alcohol metabolite in/on sugar beets:**

Beet, sugar, roots	**0.05 ppm**
Beet, sugar, tops	**1.0 ppm**

This recommendation is applicable for purposes of this Section 18 only. For permanent tolerances and a Section 3 registration, the petitioner must submit adequate residue field trial data. A final decision on the appropriate tolerance levels will be withheld pending submission of the requisite residue data. **The submitted residue data support a 28-day PHI. Therefore, a revised Section B should be submitted with this PHI.**

Processed Commodity

No processed commodity data were submitted in support of the Section 18 request. Therefore, in order to represent the worst case scenario, the following maximum theoretical concentration factors were used to determine the appropriate tolerances on sugar beet processed commodities: 20x for sugar beet molasses (Table 1, Residue Chemistry Test Guidelines OPPTS 860.1520), 12.5x for sugar beet sugar (Table 3, Residue Chemistry Test Guidelines OPPTS 860.1520), and 20x for sugar beet pulp, dry (Table 4, Residue Chemistry Test Guidelines OPPTS 860.1520). **The data support the following time-limited tolerances for residues of myclobutanil and its alcohol metabolite:**

Beet, sugar, dried pulp	**1.0 ppm**
Beet, sugar, molasses	**1.0 ppm**
Beet, sugar, refined sugar	**0.70 ppm**

This recommendation is applicable to this Section 18 only. Adequate processed commodity data must be submitted for a Section 3 registration and permanent tolerances. Once these data are submitted and reviewed, HED will determine if tolerances on sugar beet processed commodities are needed.

Meat, Milk, Poultry, and Eggs

No livestock feeding studies were submitted in support of this Section 18 request. The following meat, milk, poultry and egg (MMPE) tolerances have been established (40 CFR 180.443(a)):

meat *	0.1 ppm
meat by-products (except liver) *	0.2 ppm
liver *	1.0 ppm
fat *	0.05 ppm
milk	0.2 ppm
eggs	0.02 ppm
poultry **	0.02 ppm

* of cattle, goats, hogs, horses, and sheep
** meat, fat, and meat by-products

These tolerances are based on an estimate of the maximum theoretical dietary burden (MTDB) of myclobutanil and alcohol metabolite (free and bound) of 23.2 ppm based on a hypothetical diet of 25% almond hulls, 30% grape pomace (wet), and 10% raisin waste (Memo, M. Peters, D193006, D198460 and D198461). Grape pomace and raisin wastes are not currently considered to be livestock feed items (Table 1 of OPPTS Residue Chemistry Test Guidelines OPPTS 860.1000). Therefore, the MTDB is expected to be less than the previously calculated burden. The livestock feed items associated with the Section 18 are sugar beet tops, dried pulp, and molasses. However, residues in these livestock feed items are not expected to increase the dietary burden. **Therefore, the current MMPE tolerances are adequate for purposes of the Section 18 only.** For a Section 3 registration and permanent tolerances on sugar beets, HED will reevaluate the adequacy of the existing MMPE tolerances.

Rotational Crop Restriction

Data from a confined rotational crop study (1998; MRID 44621901) were submitted by Rohm and Haas Company in support of all pending IR-4 myclobutanil petitions. These data were reviewed by HED in conjunction with PP#7E04861 (Memo, J. Rowell, 9/13/99; D250160). Based on the results of the submitted confined rotational crop study, Rohm and Haas and IR-4 have proposed a 30-day plantback interval (PBI). HED determined that crop rotational tolerances associated with the conditional registration may be established based on residues of the parent compound only (Memo, J. Rowell 1/27/00; D261896). However, the petitioner should attempt to analyze for the alcohol metabolite in the field rotational crop study. If the petitioner is unable to recover the alcohol metabolite from rotational crops, a detailed explanation as to why the alcohol metabolite could not be recovered should be provided.

Tolerances of 0.03 ppm for inadvertent residues of myclobutanil, expressed as the parent only, along with a 30-day PBI have been established for the commodities listed below when rotated with crops that had been treated with myclobutanil (40 CFR 180.443(a)): vegetable, root and

tuber, group; vegetable, leaves of root and tuber, group; vegetable, leafy, except *Brassica*, group; vegetable, *Brassica* leafy, group; vegetable, legume, group; vegetable, fruiting, group; grains, cereal, group; and grains, cereal, forage, fodder, and straw, group. Conditional registrations were established for cucurbits, mint, snap beans, strawberries and tomatoes until the requisite field rotational crop study is submitted.

International Residue Limits

There are no CODEX, Canadian, or Mexican Maximum Residue Limits (MRL) for myclobutanil on sugar beets. Thus, harmonization is not an issue for this Section 18. A copy of the IRLS (International Residue Limit Status) sheet is attached to this memorandum.

DIETARY EXPOSURES AND RISKS

Dietary Exposure (Memo, J. Rowell, 11/01/00, D269950)

HED conducts dietary risk assessments using the Dietary Exposure Evaluation Model (DEEM™), which incorporates consumption data generated in USDA's Continuing Surveys of Food Intakes by Individuals (CSFII), 1989-1992. For acute dietary risk assessments, one-day consumption data are summed and a food consumption distribution is calculated for each population subgroup of interest. The consumption distribution can be multiplied by a residue point estimate for a deterministic exposure/risk assessment, or used with a residue distribution in a probabilistic (Monte Carlo) type risk assessment. Acute exposure estimates are expressed in mg/kg bw/day and as a percent of the aPAD. For chronic risk assessments, residue estimates for foods or food-forms of interest are multiplied by the averaged consumption estimate of each food/food-form of each population subgroup. Chronic exposure estimates are expressed in mg/kg bw/day and as a percent of the cPAD.

HED notes that there is a degree of uncertainty in extrapolating exposures for certain population subgroups which may not be sufficiently represented in the consumption surveys, (e.g., nursing and non-nursing infants or Hispanic females). Therefore, risks estimated for these subpopulations were included in representative populations having sufficient numbers of survey respondents (e.g., all infants or females 13-50 years old).

Acute Dietary Exposure Analysis

The acute analysis was performed for females 13-50 years old using published and proposed tolerance level residues and 100% CT for all commodities. Therefore, the acute risk was analyzed at the 95th percentile. The aPAD for females 13-50 years old is 0.6 mg/kg/day. For acute dietary risk, HED's level of concern is >100% aPAD. Dietary exposure estimates and associated acute risk for females 13-50 years old is shown in Table 3.

No acute dietary exposure analysis was performed for the general U.S. population , including infants and children, because no endpoint was chosen for these population subgroups.

Table 3. Summary of Results of Acute DEEM ™ Analysis for Myclobutanil (Females 13-50 years old)

Subgroups	95th Percentile	
	Exposure (mg/kg/day)	% aPAD
Females (13-50 years old)	0.011171	2

Chronic Dietary Exposure Analysis

For the chronic analysis, published and proposed tolerances level residues were used. The following average % CT information was used: apples, 40%; apricots, 15%; cherries, 40%; grapes, 45%; nectarines, 20%; peaches, 10%; plums, 15%; and cotton, 1%. This information was obtained from the Biological Economic and Analysis Division (BEAD) (Memo, F. Hernandez, 9/7/99). 100% CT was assumed for all other commodities. The cPAD for the U.S. population and all subgroups is 0.025 mg/kg/day. For chronic dietary risk, HED's level of concern is >100% cPAD. Dietary exposure estimates for the U.S. population and other population subgroups (i.e., children, infants, females, and males) are presented in Table 4.

Table 4. Summary of Results from Chronic DEEM ™ Analysis of Myclobutanil.

Subgroups	Exposure (mg/kg/day)	% cPAD
U.S. Population (48 states)	0.004446	18
All Infants (< 1 year old)	0.012431	50
Children 1-6 years old	0.013395	54
Children 7-12 years old	0.006644	27
Females 13-50 years old	0.002844	11
Males 13-19 years old	0.003872	16
Males 20+ years old	0.002776	11
Seniors 55+ years old	0.003396	14

Drinking Water Exposure (Memo, T. Nguyen, 2/7/00, D260065/D260111)

HED does not have monitoring data available to perform a quantitative drinking water risk assessment for myclobutanil at this time. EFED provided environmental fate and drinking water assessments for myclobutanil.

EECs

EFED provided Tier I EECs of myclobutanil in surface and ground water using EFED's Generic Expected Environmental Concentration (GENEEC) and Screening Concentration in Ground Water (SCI-GROW) models, respectively. The acute and chronic EECs for ground water were 2

ppb; and the acute and chronic EECs for surface water were 115 ppb and 92 ppb, respectively. According to OPP drinking water guidance (HED Standard Operating Procedure (SOP) 98.4) the 56-day GENEEC chronic value may be divided by 3 to obtain a value for chronic risk assessment calculations. Therefore, the surface water value for use in the chronic risk assessment was **31 ppb**.

Environmental Fate Assessment

Based on previously submitted environmental fate studies, myclobutanil is stable to hydrolysis at pH 5, 7 and 9, and to photolysis in water. However, it photodegrades with a half-life of about 143 days in soil. The aerobic metabolism half-life values are 61 to 71 days, and the terrestrial field dissipation values are 92 to 292 days. Typically, half-lives from the field studies are excluded from the models, but since there is a noticeable difference between the laboratory and the field results, and since the field results are significantly higher, the average of both sets of data will be used in this assessment. Myclobutanil has low to medium mobility in soils as indicated by the K_{oc} values (224 for clay loam to 919 for silty clay) and McCall classification.

No drinking water assessment was performed on myclobutanil's major metabolite (1,2,4 triazole) due to an incomplete environmental fate database for this degradate. 1,2,4-triazole has much lower K_{oc} values suggesting it would be more mobile than the parent compound. However, a review of the adsorption (average $K_a$ads of 0.651) and desorption coefficients (average $K_a$des of 1.15) indicates that this degradate may be irreversibly bound to soils and may not be as mobile as one would predict from the adsorption results alone. HED will investigate the potential concern for this metabolite in the near future for this chemical class as a whole.

DWLOCs

A DWLOC is a theoretical upper limit on a pesticide's concentration in drinking water in light of total aggregate exposure to a pesticide in food, drinking water, and through residential uses. A DWLOC will vary depending on the toxic endpoint, drinking water consumption, body weights, and pesticide uses. Different populations will have different DWLOCs. HED uses DWLOCs in the risk assessment process to assess potential concern for exposure associated with pesticides in drinking water. DWLOC values are not regulatory standards for drinking water.

HED has calculated DWLOCs for acute and chronic exposure to myclobutanil in surface and ground water (Table 6). To calculate the DWLOC for acute exposure relative to an acute toxicity endpoint, the acute dietary food exposure (from DEEM™) was subtracted from the aPAD to obtain the acceptable acute exposure to myclobutanil in drinking water. To calculate the DWLOC for chronic exposure relative to a chronic toxicity endpoint, the chronic dietary food exposure (from DEEM™) was subtracted from the cPAD to obtain the acceptable chronic exposure to myclobutanil in drinking water. DWLOCs were then calculated using the default body weights and drinking water consumption figures listed in Table 5.

Table 5. Default Body Weight and Drinking Water Consumption Figures.

DEEM Population	Body Weights (kg)	Drinking Water Consumption (liters/day)
U.S. Population/48 States	70	2
Females 13-50 years old	60	2
Infants/children	10	1

Calculation for acute and chronic exposures:

$$DWLOC\ (\mu g/L) = \frac{water\ exposure\ (mg/kg/day)\ x\ body\ weight\ (kg)}{consumption\ (L/day)\ x\ 0.001\ mg/\mu g}$$

Table 6. Acute and Chronic DWLOCs.

Scenario/Population Subgroup	DWLOC (ppb)
Acute	
Females 13-50 years old	18000
Chronic	
U.S. Population (total)	720
All Infants (< 1 year old)	130
Children 1-6 years old	120
Children 7-12 years old	180
Females 13-50 years old	740
Males 13-19 years old	740
Males 20+ years old	780
Seniors 55+ years old	760

RESIDENTIAL EXPOSURE/RISK CHARACTERIZATION

This Residential Exposure Assessment is based on a memo from D. Vogel; 7 March 2000 (Barcode D24490). End-use products containing the active ingredient, myclobutanil, are marketed for homeowner use on turf, roses, flowers, shrubs and trees. Recommended applications of the soluble concentrate are made with a hose-end or trigger bottle sprayer. The homeowner use with the greatest potential for exposure is small scale lawn application. Since myclobutanil is applied at 7 to 14-day intervals, only short-term exposure is expected for the residential handler. Short and Intermediate-term exposures are expected for residential post-application scenarios. HIARC has determined that a 50% dermal absorption factor should be applied for intermediate-term risk assessments. However, dermal absorption is not required for the short-term dermal exposure assessment since a dermal dose from a 28-day dermal toxicity study was selected for this time period.

Residential Handler Exposure Assessment

Based on the residential use-patterns associated with myclobutanil, there is potential for exposures to handlers of myclobutanil. In order to present a high-end scenario of residential exposure, it was assumed that one person would complete all mixing, loading and application of myclobutanil. Exposure scenarios were assessed, at the maximum application rate, for mixing, loading, and application of a soluble concentrate product by trigger bottle sprayer (treating ornamental plants), and by hose-end sprayer (treating turfgrass) to represent the worst-case scenario for the proposed uses. There are no chemical specific data available to support the residential use scenarios of myclobutanil. Therefore, the PHED v 1.1 surrogate table was used to represent the highest potential for exposure from homeowner application of myclobutanil. Short-term dermal and inhalation exposure and risk assessments for homeowners are presented in Table 7.

Table 7. Baseline Short-Term Exposure and Risk Assessments for Homeowner Use of Myclobutanil.

Exposure Scenario-Mix/Load/Apply	Unit Exposures (mg/lb ai)[a] Dermal/Inhalation		AR (lb ai/acre)[b]	Acres/ Day[c]	Total Daily Dose (mg ai/kg/day)[d] Dermal/Inhalation		Short-Term MOE[e] Dermal/Inhalation		Combined MOE- turf + ornamental treatment Dermal[f]/Inhalation[g]	
Garden Hose application to lawn turfgrass	30	0.01	0.62	0.50	$1.3x10^{-1}$	$4.4x10^{-5}$	$7.7x10^{2}$	$2.4x10^{5}$	$7.5x10^{2}$	$2.3x10^{5}$
Trigger Sprayer application to ornamentals	100	0.03	0.01	0.25	3.6E-03	$1.1x10^{6}$	$2.8x10^{4}$	$9.3x10^{6}$		

a. PHED Version 1.1 data in the Draft SOPs for Residential Exposure Assessments dated December 18, 1997, represents short pants, short sleeve shirt, no gloves, and open loading. Low confidence (9-80 replicates of ABC grade data) for dermal exposure. Medium confidence (80 replicates of ABC grade data) for inhalation.
b. Myclobutanil label, EPA reg # 9688-123
c. Draft SOPs for Residential Exposure Assessments dated December 18, 1997.
d. Total Daily Exposure (mg ai/day) = Unit exposure (mg/lb ai) x Application Rate (lbs ai/acre) x Acres Treated /body weight (BW kg).
e. Short-term MOE = NOAEL (mg/kg/day)/Daily Dose (mg/kg/day); NOAEL = 100mg/kg/day for dermal and 10 mg/kg/day for inhalation.
f. Combined Dermal MOE = NOAEL/Total Daily Dose (dermal exposure-treating turf + dermal exposure-treating ornamentals).
g. Combined Inhalation MOE = NOAEL/Total Daily Dose (inhalation exposure-treating turf + inhalation exposure-treating ornamentals).

All calculated MOEs are greater than 100 and therefore do not exceed HED's level of concern. Assuming that a homeowner treats his/her lawn and garden plants/trees on the same day, the combined short-term MOEs are **750** and **2.3E+05** for dermal and inhalation, respectively.

Residential Post-Application Exposure Assessment

Potential residential exposures are expected following applications to lawns and ornamental garden sites. Chemical-specific data are available to determine the potential risks from post-application activities. The registrant submitted a dislodgeable foliar residue (DFR) study on grapes for myclobutanil (MRID # 404893-02). This study was reviewed by HED in June 1988 and considered acceptable (Memo, F. Davido, 6/11/88). Short-term post-application exposure

estimates were done using the study determined DFR of 0.175 ug/cm^2 (on day 0). For intermediate-term post-application exposure, an average of DFRs from day 0 through day 14 was used.

The post-application risk assessment is based on DFR data from the submitted study on grapes and generic assumptions as specified by the recently revised Residential SOPs. Changes to the Residential SOPs have been proposed that alter the residential post-application scenario assumptions. The proposed assumptions are expected to better represent residential exposure and are considered high-end, screening level assumptions. HED management have authorized the use of the revised residential SOPs that were presented to the FIFRA SAP in September 1999. Therefore, HED has used the most recently proposed assumptions to calculate exposure estimates.

Based on the use pattern, exposure to myclobutanil-treated ornamentals is expected to be incidental and short-term. Both short- and intermediate-term exposures are expected following lawn applications of myclobutanil. Short-term aggregate post-application exposure for the adult was done for dermal exposure to treated turf and ornamentals. Since there is no intermediate-term exposure for the residential handler, there is no aggregate intermediate-term exposure for the adult.

Short-term, non-dietary ingestion exposure to toddlers is not assessed since HIARC did not select an acute dietary or oral endpoint applicable to infants and children. Therefore, short-term toddler exposure consists of dermal post-application exposure only. However, intermediate-term, non-dietary ingestion exposure for toddlers is possible and was assessed using the intermediate-term dose and endpoint identified from the two generation reproduction toxicity study in rats. Intermediate-term aggregate exposure for toddlers combines non-dietary ingestion and dermal exposure from treated turf. Residential post-application exposures are summarized in Table 8.

Table 8. Residential Post-application Exposures. [a]

Scenario	DFR (µg/cm2)[b] day 0/ day 0-14		Daily Dose (mg/kg/day)[c] short/interm		Short-Term MOE[d]	Intermediate-Term MOE[d]	Combined MOE short[e]/interm[f]	
Adult dermal - turf	0.175	0.105	0.073	0.022	1400	910	1000	--
Adult dermal - ornamentals			0.017	--	6000	--		
Toddler- hand-to-mouth			--	0.0013	--	7500	--	510
Toddler dermal - turf			0.12	0.036	830	550		
Youth dermal -ornamentals			0.0074	--	14000	--	--	

a. *The level of concern is for MOEs below 100.*
b. DFR based on a registrant submitted study reviewed by HED (Memo, F. Davido, 6/1/88).

c. **Short-term Turf** Daily Dermal Dose = DFR (μg/cm²) x Tc (14,500 cm²/hr for adults and 5,200 cm²/hr for toddlers) x (1 mg/1,000 μg unit conversion) x 2 hours/day/ Body Weight (BW kg).
Short-term Ornamentals Daily Dermal Dose = DFR (μg/cm²) x Tc (10,000 cm²/hr for adults and 5,000 cm²/hr for youths) x (1 mg/1,000 μg unit conversion) x hours/day(0.67 for adults and 0.33 for youths) / Body Weight (BW kg -70 for adults and 39 for youths).
Intermediate-term Turf Daily Dermal Dose = DFR (μg/cm²) x Tc (7,300 cm²/hr for adults and 2,600 cm²/hr for toddlers) x (1 mg/1,000 μg unit conversion) x 2 hours/day/ Body Weight (BW kg).
Intermediate Turf Hand to mouth = DFR X 20 cm²/event X 9.5 events/hr X 2hrs/day X 50% mouthing removal rate X conversion factor (1mg/1000μg) /BW (15 kg).
d. MOE = NOAEL /Daily Dose; Short-term NOAEL = 100mg/kg/day (for dermal); Intermediate-term NOAEL = 10mg/kg/day (for dermal(incorporating a 50% dermal absorption factor) and oral-hand2mouth exposures).
e. Aggregate Short-term MOE (for adult)= NOAEL/Total Daily Dose (dermal to turf+ dermal to ornamentals); NOAEL = 100 mg/kg/day.
f. Aggregate Intermediate MOE (for toddler)= NOAEL/Total Daily Dose (dermal + hand2mouth); NOAEL = 10 mg/kg/day.

HED's level of concern for myclobutanil is for MOEs below 100. The aggregate short-term post-application MOE is estimated to be 1000 for adults. The aggregate intermediate-term post-application MOE is estimated to be 510. These estimates indicate that potential post-application exposures to myclobutanil are below HED's level of concern.

The total dermal exposure for the handler treating both turf and ornamentals in one day can be aggregated to the total dermal post application exposure to turf and ornamentals for the short-term duration. Since intermediate exposure is not expected for the handler or for post-application to ornamentals, an aggregate intermediate-term assessment for handler and post-application exposures is not warranted. Table 9 lists the combined residential exposures for adults.

Table 9. Combined Residential Handler and Post-application Dermal Exposures.

Scenario	Short-term MOE	Combined Short-term MOE
Handler applying to turf and ornamentals	750	430
Adult post-application exposure to turf and ornamentals	1000	

Combined Short-term dermal MOE = NOAEL/Total Daily Dose (handler exposure + post-application exposure); NOAEL = 100 mg/kg/day.

The aggregate short-term MOE is estimated to be 430 and is therefore does not exceed HED's level of concern.

AGGREGATE RISK ASSESSMENT

Acute Aggregate Risk (Food + Water)

Acute aggregate risk estimates do not exceed HED's level of concern for females 13-50 years old. Using the conservative exposure assumptions described in the Dietary Exposures and Risk Section, and taking into account the completeness and reliability of the toxicity data, HED has estimated that the acute exposure to myclobutanil from food for females 13-50 years old will utilize **2%** of the aPAD, as shown in Table 3.

The maximum EECs of myclobutanil in surface and ground water are less than HED's DWLOCs for myclobutanil as a contribution to acute aggregate exposure (Table 10). Therefore, taking into account the present uses and uses proposed in this action, HED concludes with reasonable certainty that residues of myclobutanil in drinking water (when considered along with other sources of exposure for which HED has reliable data) would not result in unacceptable levels of aggregate human health risk at this time. HED bases this determination on a comparison of EECs of myclobutanil in surface waters and ground waters to back-calculated DWLOCs for myclobutanil. These DWLOCs were determined after HED considered all other non-occupational human exposures for which it has reliable data, including all current uses, and uses considered in this action. The estimates of myclobutanil in surface waters are derived from water quality models that use conservative assumptions (health-protective) regarding the pesticide transport from the point of application to surface and ground water. Because HED considers the aggregate risk resulting from multiple exposure pathways associated with a pesticide's uses, DWLOC may vary as those uses change. If new uses are added in the future, HED will reassess the potential impacts of myclobutanil on drinking water as a part of the aggregate risk assessment process.

Table 10. Acute Aggregate Exposure.

Population Category	Acute RfD (mg/kg/day)	aPAD (mg/kg/day)	Food Exposure (mg/kg/day)	Max. Water Exposure[2] (mg/kg/day)	DWLOC [1,3,4,5] (μg/L)	EEC[6] (μg/L)
Females (13-50 years old)	0.6	0.6	0.011171	0.0588829	18000	115

1. Values are expressed to 2 significant figures.
2. Maximum Water Exposure (Acute) (mg/kg/day) = aPAD (mg/kg/day) - Food Exposure (mg/kg/day).
3. DWLOC(μg/L) = Max. water exposure (mg/kg/day) x body wt (kg) ÷ [(10^{-3} mg/μg) x water consumed daily (L/day)].
4. HED Default body weight for females 13-50 years old: 60 kg.
5. HED Default daily drinking rate is 2 L/day for females 13-50 years old.
6. EEC: Estimated Environmental Concentration, acute surface water value.

Short-Term Aggregate Risk (Residential + Chronic Food + Chronic Water)
The short-term aggregate risk assessment estimates risks likely to result from 1-7 day exposure to myclobutanil residues in food, drinking water, and residential pesticide uses. High end estimates of the residential exposure are used in the short-term assessment. Average values are used for food and drinking water exposure. HIARC determined that oral and dermal exposures can not be aggregated due to differences in the toxicological endpoints via the oral (developmental) and dermal (no systemic toxicity) routes (Memo, M. Copley, 9/2/99). **Therefore, a short-term aggregate exposure risk assessment was not performed.**

Intermediate-Term Aggregate Risk (Residential + Chronic Food + Chronic Water)
Intermediate-term aggregate risk estimates do not exceed HED's level of concern. HED aggregated the chronic dietary exposure (food only) and residential exposure (oral and dermal from garden uses) for the general U.S. Population and those population subgroups for which

residential exposure is expected. As indicated in Table 11, the total MOEs for the general US Population and infants/children are 650 and 300, respectively (HED's acceptable level for myclobutanil is for MOEs ≥100).

The average EECs of myclobutanil in surface and ground water are less than HED's DWLOCs for myclobutanil in drinking water as a contribution to intermediate-term aggregate exposure (Table 11). Therefore, HED concludes with reasonable certainty that residues of myclobutanil in drinking water do not contribute significantly to the intermediate-term aggregate human health risk at the present time considering the present uses and uses proposed in this action. HED bases this determination on a comparison of myclobutanil EECs in surface waters and ground waters to DWLOCs for myclobutanil. The estimates of myclobutanil in surface and ground waters are derived from water quality models that use conservative assumptions regarding the pesticide transport from the point of application to surface and ground water. Because HED considers the aggregate risk resulting from multiple exposure pathways associated with a pesticide's uses, DWLOCs may vary as those uses change. If new uses are added in the future, HED will reassess the potential impacts of myclobutanil on drinking water as a part of the aggregate intermediate-term risk assessment process.

Table 11. Intermediate-Term Aggregate Risk Estimates for Myclobutanil.

Population Subgroups		General US Population	Infants/ Children
Acceptable Interm-Term Aggregate MOE		**100**	**100**
Food Only	Intermediate-term NOAEL (mg/kg/day)	10	10
	Chronic Food Exposure (mg/kg/day)	0.004446	0.013395 (children 1-6 yrs. old)
	Chronic Food MOE	2,300	750
Residential Oral (Toddlers, hand-to-mouth)	Intermediate-term NOAEL (mg/kg/day)	NA	10
	ADD Oral Exposure (mg/kg/day)		0.0013
	Oral MOE		7500
Residential Dermal (adult and child, DA = 50%)	Intermediate-term NOAEL (mg/kg/day)	10	10
	ADD Dermal Exposure (mg/kg/day) (turf)	0.022 (50%DA)	0.036 (50%DA)
	Dermal MOE	910	550
	Food + residential AGGREGATE MOE[1]	650	300
Drinking water	Intermediate-term NOAEL (mg/kg/day)	10	10
	Allowable Intermediate-term water exposure (mg/kg/day)[2]	0.08466	0.067152
	Intermediate-term DWLOC (ppb)	3000	670
	Surface water EEC (ppb)	31	31
	Ground water EEC (ppb)	2	2

1. Aggregate $MOE_{(general\ U.S.\ population)} = 1/[(1/MOE_{(food)} + 1/MOE_{(residential\ dermal)}]$; Aggregate $MOE_{(infants/children)} = 1/[(1/MOE_{(food)} + (1/MOE_{(residential\ oral)} + 1/MOE_{(residential\ dermal)}]$.
2. Allowable intermediate-term surface water exposure (mg/kg/day) for general U.S. population = $NOAEL/\{1/[1/MOE_{(Agg)} - (1/MOE_{(food)} + 1/MOE_{(residential\ dermal)})]\}$; Allowable intermediate-term drinking water exposure (mg/kg/day) for infants/children = $NOAEL/\{(1/[1/MOE_{(Agg)} - (1/MOE_{(food)} + 1/MOE_{(residential\ oral)} + 1/MOE_{(residential\ dermal)})]\}$; $MOE_{(Agg)}$ = acceptable MOE = 100.

Chronic Aggregate Risk (Food + Water)

Chronic aggregate risk estimates do not exceed HED's level of concern for the general U.S. population or any population subgroup. Using the partially refined exposure assumptions described above in the Dietary Exposures and Risk Section, and taking into account the completeness and reliability of the toxicity data, HED has estimated that the chronic exposure to myclobutanil from food for the most highly exposed population subgroup (children 1-6 years old) will utilize **54%** of the cPAD, as shown in Table 4. It was determined that an acceptable chronic dietary exposure (food plus water) of 100% or less of the cPAD is needed to protect the safety of all population subgroups.

The average EECs of myclobutanil in surface and ground water are less than HED's DWLOCs for myclobutanil in drinking water as a contribution to chronic aggregate exposure (Table 12). Therefore, HED concludes with reasonable certainty that residues of myclobutanil in drinking

water do not contribute significantly to the chronic aggregate human health risk at the present time considering the present uses and uses proposed in this action. HED bases this determination on a comparison of myclobutanil EECs in surface waters and ground waters to DWLOCs for myclobutanil. The estimates of myclobutanil in surface and ground waters are derived from water quality models that use conservative assumptions regarding the pesticide transport from the point of application to surface and ground water. Because HED considers the aggregate risk resulting from multiple exposure pathways associated with a pesticide's uses, DWLOCs may vary as those uses change. If new uses are added in the future, HED will reassess the potential impacts of myclobutanil on drinking water as a part of the aggregate chronic risk assessment process.

Table 12. Chronic Aggregate Risk.

Population Category	Chronic RfD (mg/kg/day)	cPAD (mg/kg/day)	Food Exposure (mg/kg/day)	Max. Water Exposure[2] (mg/kg/day)	DWLOC [1,3,4,5] (μg/L)	EEC[6] (μg/L)
U.S. Population (48 states)	0.025	0.025	0.004446	0.020554	720	31
All Infants (< 1 yr. old)	0.025	0.025	0.012431	0.012569	130	31
Children 1-6 yrs. old	0.025	0.025	0.013395	0.011605	120	31
Children 7-12 yrs. old	0.025	0.025	0.006644	0.018356	180	31
Females 13-50 yrs. old	0.025	0.025	0.002844	0.022156	740	31
Males 13-19 yrs old	0.025	0.025	0.003872	0.021128	740	31
Males 20+ yrs old.	0.025	0.025	0.002776	0.022224	780	31
Seniors 55+ yrs. old	0.025	0.025	0.003396	0.021604	760	31

1. Values are expressed to 2 significant figures.
2. Maximum Water Exposure (Chronic) (mg/kg/day) = cPAD (mg/kg/day) - Food Exposure (mg/kg/day).
3. DWLOC(μg/L) = Max. water exposure (mg/kg/day) x body wt (kg) ÷ [(10^{-3} mg/μg) x water consumed daily (L/day)].
4. HED Default body weights are: General U.S. Population, 70 kg; Males (13^{+} years old), 70 kg; Females (13^{+} years old), 60 kg; Other Adult Populations (Males, Seniors), 70 kg; and, All Infants/Children, 10 kg.
5. HED Default daily drinking rates are 2 L/day for adults and 1 L/day for children.
6. EEC: Estimated Environmental Concentration, chronic surface water value.

OCCUPATIONAL EXPOSURE AND RISK ASSESSMENT/CHARACTERIZATION

Based on the proposed use patterns, private handlers are expected to have short-term exposure and commercial handlers may have short-term and intermediate term exposures. The HIARC determined that a 50% dermal absorption factor should be applied to the intermediate term risk assessment. A dermal absorption factor is not applied to the short-term dermal exposure assessment since a dermal dose from a 28-day dermal toxicity study was selected for this time period. Myclobutanil is classified as not likely to be a human carcinogen. A cancer risk assessment is not required.

Handler Exposure Assessment

Since chemical specific data are not available for this formulation and use pattern, Unit Exposure Data are taken from the "PHED SURROGATE EXPOSURE GUIDE" "Estimates of Worker Exposure from The Pesticide Handler Exposure Database Version 1.1 August 1998"; pages 17 (All Liquids Open Mixing and Loading [MLOD], 28 (Groundboom Application, Open Cab [APPL]), and 44 (Liquid/Open Pour Groundboom/Open Cab [MLAP]). Data for acres treated per day are taken from the Science Advisory Council for Exposure Policy No. 9, Revised 5 July 2000. **It should be noted** that the label directs the use of **coveralls over** long sleeved shirt and long pants, **chemical resistant gloves** such as barrier laminate or Viton > 14 mils, **chemical resistant footwear** plus socks, **protective eyewear**, **chemical resistant apron** for cleaning equipment, mixing or loading. The estimates of exposure assume a **single layer** of clothes with gloves. Therefore the estimates of exposure are considered conservative as the label directs the use of a second layer of clothing and other PPE than are factored into the estimates in this document. Table 13 contains a summary of the exposures and risks to workers believed to represent the "worst case" i.e., most highly exposed persons per job functions.

Table 13 Summaries of Exposure and Risk for Workers Using Myclobutanil on Sugar Beets.

Job Function	Unit Exposure[a] Dermal/Inhalation mg a.i./lb a.i. handled	Max[b] AR lb a.i./A	Acres/ Day[c]	Average Daily Dose[d] mg a.i./kg bw/day dermal/inhalation	Short-term MOE[e] dermal/inhalation	Intermediate[f] term MOE
mixer/loader open pour aerial fixed wing	derm 0.023 inhal 0.0012	0.125	1200	derm 0.049 inhal 0.003	dermal 2040 inhalation 3,333	360
applicator groundboom open cab	derm 0.014 inhal 0.00074	0.125	200	derm 0.005 inhal 0.0003	dermal 20,000 inhalation 33,333	3300
mix/load/applicat groundboom open cab open pour	derm 0.057 inhal 0.0013	0.125	200	derm 0.02 inhal 0.00046	dermal 5,000 inhalation 21,740	1000

a. Unit exposures are taken from PHED SURROGATE EXPOSURE GUIDE Estimates of Worker Exposure from The Pesticide Handler Exposure Database Version 1.1 August 1998 pages 17 (single layer with gloves; data confidence high for dermal and inhalation); 28 (single layer with gloves; data confidence medium for dermal high for inhalation); and 44 (single layer with gloves; data confidence medium for dermal, high for inhalation.

b. Application rate from FAX letter from the State of Idaho; M. Everett to M. Laws/USEPA; 9 August 2000

c. Acres/Day from Science Advisory Council for Exposure Policy No. 9 Revised 5 July 2000

d. Average Daily Dose (ADD) = Unit Exposure * AR * Acres/day ÷ 70 kg bw

e. Short-term MOE dermal or inhalation = NOAEL (100 mg a.i./kg bw/day dermal) (10 mg a.i./kg bw/day inhalation) ÷ ADD

f. Intermediate term MOE = NOAEL ÷ Total ADD (dermal + inhalation) where the dermal ADD is corrected for dermal absorption by 50%; Dermal and Inhalation NOAEL = 10 mg a.i./kg bw/day

Worker Post-application Exposure Assessment

There are no identified cultural post-application activities that will result in dermal exposure. Harvesting is mechanical. Therefore a post application exposure assessment is not necessary and was not conducted.

Re-entry Interval (REI)

The interim Worker Protection Standard (WPS) re-entry period of 24 hours is adequate to protect workers who may be required to re-enter treated fields for other reasons.

Incident Reports

There are incidents of human exposure for myclobutanil. In July 1993, several workers complained of headaches, diarrhea, nausea and bloody noses 3 days after spraying Rally, a registered myclobutanil end use product. In April 1997, 16 workers complained of nausea, vomiting and skin and eye irritation after performing seed treatment with Nuflow M. In September 1995, REFS reports incidents of children eating tainted sunflower seeds and of aerial drift. None of the reported incidents have been confirmed.

NON-OCCUPATIONAL OFF-TARGET EXPOSURE

This assessment for myclobutanil reflects the Agency's current approaches for completing residential exposure assessments based on the guidance provided in the *Draft: Series 875-Occupational and Residential Exposure Test Guidelines, Group B-Postapplication Exposure Monitoring Test Guidelines*, the *Draft: Standard Operating Procedures (SOPs) for Residential Exposure Assessment*, and the *Overview of Issues Related to the Standard Operating Procedures for Residential Exposure Assessment* presented at the September 1999 meeting of the FIFRA Scientific Advisory Panel (SAP). The Agency is, however, currently in the process of revising its guidance for completing these types of assessments. Modifications to this assessment shall be incorporated as updated guidance becomes available. This will include expanding the scope of the residential exposure assessments by developing guidance for characterizing exposures from other sources already not addressed such as from spray drift; residential residue track-in; exposures to farm worker children; and exposures to children in schools.

ENDOCRINE DISRUPTER EFFECTS

EPA is required under the Federal Food Drug and Cosmetic Act (FFDCA), as amended by FQPA, to develop a screening program to determine whether certain substances (including all pesticide active and other ingredients) "may have an effect in humans that is similar to an effect produced by a naturally occurring estrogen, or other such endocrine effects as the Administrator may designate." Following the recommendations of its Endocrine Disrupter Screening and Testing Advisory Committee (EDSTAC), EPA determined that there was scientific bases for including, as part of the program, the androgen and thyroid hormone systems, in addition to the estrogen hormone system. EPA also adopted EDSTAC's recommendation that the Program include evaluations of potential effects in wildlife. For pesticide chemicals, EPA will use FIFRA and, to the extent that effects in wildlife may help determine whether a substance may have an effect in humans, FFDCA authority to require the wildlife evaluations. As the science develops

and resources allow, screening of additional hormone systems may be added to the Endocrine Disruptor Screening Program (EDSP).

When the appropriate screening and/or testing protocols being considered under the Agency's EDSP have been developed, myclobutanil may be subjected to additional screening and/or testing to better characterize effects related to endocrine disruption.

CUMULATIVE EXPOSURE TO SUBSTANCES WITH A COMMON MECHANISM OF TOXICITY

Myclobutanil is a member of the conazole class of fungicides. Other members include azaconazole, bromuconazole, cyproconazole, diclobutrazol, difenoconazole, diniconazole, diniconazole-M, epoxiconazole, etaconazole, fenbuconazole, fluquinconazole, flusilazole, flutriafol, furconazole, furconazole-cis, hexaconazole, imazalil, imibenconazole, ipconazole, metconazole, oxpoconazole, penconazole, prochloraz, propiconazole, quinconazole, simeconazole, tebuconazole, tetraconazole, triadimefon, triadimenol, triflumizole, triticonazole, uniconazole (Per Internet search, J. Rowell, 10/24/00, at http://www.hclrss.demon.co.uk/class_herbicides.html).

EPA does not have, at this time, available data to determine whether myclobutanil has a common mechanism of toxicity with other substances or how to include this pesticide in a cumulative risk assessment. For the purposes of this tolerance action, therefore, EPA has not assumed that myclobutanil has a common mechanism of toxicity with other substances.

On this basis, the petitioner must submit, upon EPA's request and according to a schedule determined by the Agency, such information as the Agency directs to be submitted in order to evaluate issues related to whether myclobutanil shares a common mechanism of toxicity with any other substance and, if so, whether any tolerances for myclobutanil need to be modified or revoked.

CONCLUSIONS

Based on the above discussion, HED concludes that occupational exposure and aggregate acute, intermediate-term and chronic risk estimates do not exceed HED's level of concern. This Section 18 exemption should not pose an unacceptable aggregate risk to infants, children, or adults. Provided the Section B is amended to indicate a 28-day PHI, HED's database supports the issuance of this Section 18 exemption for the use of myclobutanil on sugar beets in Idaho. The following time-limited tolerances for residues of myclobutanil and its alcohol metabolite in/on sugar beets should be established to support this Section 18 exemption:

Beet, sugar, roots	0.05 ppm
Beet, sugar, tops	1.0 ppm
Beet, sugar, dried pulp	1.0 ppm
Beet, sugar, molasses	1.0 ppm
Beet, sugar, refined sugar	0.70 ppm

Attachments : IRLS Sheet
Acute and Chronic DEEM Analyses (J. Rowell, 11/01/00, D269950)
Drinking Water Memorandum (Memo, T. Nguyen, 2/7/00, D260065/D260111)

cc (without attachments): Rowell, Dow, Copley
RDI: G.Herndon (11/9/00), RAB1 (11/8/00), RAB1 Team 1 (11/2/00), RAB1 Chemists (10/4/00)
J.Rowell:806W:CM#2:(703)305-5564: 7509C:RAB1

ATTACHMENT 1

INTERNATIONAL RESIDUE LIMIT STATUS			
Chemical Name: Myclobutanil	Common Name:	X Proposed tolerance Reevaluated tolerance Other	Date: 10/3/00

Codex Status (Maximum Residue Limits)	U. S. Tolerances
No Codex proposal step 6 or above X No Codex proposal step 6 or above for the crops requested	Petition Number: 00ID0034 DP Barcode: 268379 Other Identifier:
Residue definition (step 8/CXL):myclobutanil	Reviewer/Branch: Jennifer Rowell/RAB1
	Residue definition: myclobutanil, (α-butyl-α-(4-chlorophenyl)-1H-1,2,4-triazole-1-propanenitrile) and its metabolite, α-(3-hydroxybutyl)-α-(4-chlorophenyl)-1H-1,2,4-triazole-1-propanenitrile (free and bound)

Crop (s)	MRL (mg/kg)	Crop(s)	Tolerance (ppm)
		Beet, sugar, roots	0.03
		Beet, sugar, tops	1.0
		Beet, sugar, dried pulp	0.6
		Beet, sugar, molasses	0.6
		Beet, sugar, refined sugar	0.4

Limits for Canada	Limits for Mexico
No Limits X No Limits for the crops requested	No Limits X No Limits for the crops requested
Residue definition (plant products): parent and free and conjugated forms of the metabolites (RS)-2-p-chlorophenyl-2-(1H-1,2,4-triazol-1-ylmethyl)-5-hydroxy-hexanenitrile and (RS)-2-p-chlorophenyl-2-(1H-1,2,4-triazol-1-ylmethyl)-5-keto-hexanenitrile.	Residue definition: myclobutanil

Crop(s)	MRL (mg/kg)	Crop(s)	MRL (mg/kg)

Notes/Special Instructions:
S. Funk, 11/06/2000.

ATTACHMENT 2

Acute and Chronic DEEM Analyses (J. Rowell, 11/01/00, D269950)

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

OFFICE OF
PREVENTION, PESTICIDES, AND
TOXIC SUBSTANCES

MEMORANDUM

DATE: 01-NOV-2000

SUBJECT: **Myclobutanil - Acute and Chronic Dietary Exposure Analyses.**
PP#: 00ID0034. Chemical: 128857. DP Barcode: D269950. Case: 293340.
Submission: S583875.

FROM/TO: Jennifer E. Rowell, Chemist
Registration Action Branch 1
Health Effects Division (7509C)

THROUGH: Sheila Piper, Chemist
Tom Bloem, Chemist
Dietary Exposure Science Advisory Council

G. Jeffrey Herndon, Acting Branch Senior Scientist
Registration Action Branch 1
Health Effects Division (7509C)

Action Requested

Provide estimates of the acute and chronic dietary exposures and associated risks for myclobutanil resulting from the existing uses (40 §CFR 180.443) and proposed use on sugar beets (PP# 00ID0034). The most recent dietary exposure analysis was conducted in conjunction with Section 3 requests for the use of myclobutanil on several raw agricultural commodities (RACs) (Memo, J. Rowell 1/31/00; D262351).

Executive Summary

Acute and chronic dietary exposure analyses for myclobutanil were performed using the Dietary Exposure Evaluation Model (DEEM™).

The Tier 1 acute analysis was performed using tolerance level residues and 100% crop treated

(CT) information for all commodities. Therefore, the acute risk was analyzed at the 95th percentile. The acute analysis was performed for females 13-50 years old only. No endpoint was chosen for the general US population, including infants and children. The acute dietary exposure estimates at the 95th percentile for females 13-50 years old accounted for 2% of the aPAD. The chronic analysis was performed using tolerance level residues for all commodities. Percent CT information was used for apples, apricots, cherries, grapes, nectarines, peaches, pears, plums, and cotton; and 100% CT was assumed for all other commodities. The chronic analysis applied to the U.S. population and all subgroups. The chronic exposure estimates for the general U.S. population and all population subgroups accounted for <100% of the cPAD. The most highly exposed population subgroup was children 1-6 years old at 54% of the cPAD. The results of the analyses indicate that the acute and chronic dietary risks associated with the existing and proposed use of myclobutanil do not exceed HED's level of concern for the U.S. population or any population subgroups.

Toxicological Endpoints

On October 21, 1997 (HED Doc. No., 012378, dated 11/3/97), the HED Hazard Identification Review Committee (HIARC) met to evaluate the toxicology database of myclobutanil with special reference to the reproductive, developmental and neurotoxicity data. These data were re-reviewed at that time specifically to address the sensitivity of infants and children from exposure to myclobutanil as required by the Food Quality Protection Act (FQPA) of 1996. In addition, HIARC re-assessed the doses and endpoints selected for acute and chronic dietary (RfD) exposure risk assessments that had previously been selected. On August 12, 1999, the HIARC reassessed the need for an acute dietary endpoint. A summary of the doses and toxicological endpoints chosen by HIARC is listed in Table 1.

Cancer

Myclobutanil is classified as Category E: not carcinogenic in two acceptable animal studies (HED Doc. No. 011074, 6/16/94). Therefore, no cancer dietary exposure analysis was performed.

FQPA Recommendation

The HED FQPA Safety Factor Committee (SFC) met on August 16, 1999 to evaluate the hazard and exposure data for myclobutanil, and recommended that the 10x FQPA Safety Factor be reduced to 1x in assessing the risk posed by myclobutanil (Memo, B. Tarplee 9/13/99; HED Doc. No. 013734).

The acute and chronic Population Adjusted Doses (aPAD and cPAD) are modifications of the acute and chronic RfDs to accommodate the FQPA safety factor. The PAD is equal to the acute or chronic RfD divided by the FQPA safety factor. As the FQPA SFC recommended that the 10x FQPA safety factor be reduced to 1x, the acute and chronic RfDs and PADs are equivalent. The aPAD for females 13-50 years old and the cPAD for the U.S. population and all subgroups

are 0.6 mg/kg/day (RfD of 0.6 mg/kg/day ÷ 1x FQPA safety factor) and 0.025 (RfD of 0.025 mg/kg/day ÷ 1x FQPA safety factor), respectively.

Table 1. Summary of Doses and Toxicological Endpoint Selections for Myclobutanil.

EXPOSURE SCENARIO	DOSE (mg/kg/day)	ENDPOINT	STUDY
Acute Dietary females 13-50 years of age	NOAEL=60 mg/kg/day UF = 100 FQPA SF = 1x	LOAEL = 200 mg/kg/day based on increased resorption, decreased litter size and a decrease in the viability index.	Developmental Toxicity - rat
	Acute RfD [a] = 0.60 mg/kg/day Acute PAD [b] = 0.60 mg/kg/day		
Acute Dietary general population including infants and children	none		
	Acute RfD [a] = none		
Chronic Dietary	NOAEL =2.49 mg/kg/day UF = 100 FQPA SF = 1x	LOAEL = 10 mg/kg/day based on decreased testicular weights and increased testicular atrophy.	Chronic Toxicity/ Carcinogenicity - rat
	Chronic RfD [a] = 0.025 mg/kg/day Chronic PAD [b] = 0.025 mg/kg/day		

a. $RfD = NOAEL / UF$

b. $PAD = RfD\ (\text{acute or chronic}) / \text{FQPA Safety Factor}$

Residues of Concern

The nature of the residue in plants and livestock is adequately understood. The residue of concern is myclobutanil and its alcohol metabolite RH-9090 (free and bound) [as specified in 40 §CFR 180.443].

Residue Information

Permanent tolerances are currently established for residues of the fungicide myclobutanil in/on the several RACs (40 §CFR 180.443). A Section 3 risk assessment (Memo. J. Rowell, et. al. 3/14/00; D244901) was recently completed for the use of myclobutanil on asparagus, caneberries, cucurbits, currants, gooseberries, mint, pome fruit, snap beans, strawberries, and tomatoes. The company then submitted a request for tolerances for residues of myclobutanil in/on apples and mayhaws rather than the entire pome fruit crop group. In a memo dated

4/28/00 (Memo, J. Rowell; D264728), HED recommended that the following tolerances for the residues of myclobutanil be established: 0.70 ppm on apples and mayhaws and 1.3 ppm on apple, wet pomace. Myclobutanil is currently being proposed for use on sugar beets in Idaho. The following tolerances are being recommended for purposes of the Section 18 only:

Beet, sugar, roots	0.05 ppm
Beet, sugar, tops	1.0 ppm
Beet, sugar, dried pulp	1.0 ppm
Beet, sugar, molasses	1.0 ppm
Beet, sugar, refined sugar	0.70 ppm

Tolerance level residues were used for all commodities. For the acute analysis, 100% CT was used for all commodities. For the chronic analysis, average % CT information was used for apples, apricots, cherries, grapes, nectarines, peaches, pears, plums, and cotton. This information was obtained from the Biological Economic and Analysis Division (BEAD) (Memo, F. Hernandez, 9/7/99). 100% CT was assumed for all other commodities.

The DEEM™ default concentration factors were set to 1 for the following processed commodities: grape juice, raisins, grape wine/sherry; mint (spearmint and peppermint) oil, apple juice, prunes, and tomato catsup, tomato juice, tomato paste, and tomato puree. Although residues were found to concentrate in raisins, prunes, and tomato catsup, paste, and puree, the calculated concentration factors were used to determine the appropriate tolerances for these commodities. Residues of myclobutanil and its alcohol metabolite did not appear to concentrate in grape juice, grape wine/sherry, apple juice (Memo, C. Trichilo, 2/8/88); and spearmint and peppermint oil (Memo, J. Rowell, 8/3/99; Barcode D238448). DEEM™ default concentration factors were used for all other commodities.

A summary of the residue information used in the acute and chronic analyses is attached (Attachment 1).

Consumption Data

HED conducts dietary risk assessments using DEEM™, which incorporates consumption data generated in USDA's Continuing Surveys of Food Intake by Individuals (CSFII), 1989-1992. For acute dietary risk assessments, one-day consumption data are summed and a food consumption distribution is calculated for each population subgroup of interest. The consumption distribution can be multiplied by a residue point estimate for a deterministic exposure/risk assessment, or be used with a residue distribution in a probabilistic type risk assessment. Acute exposure estimates are expressed in mg/kg bw/day and as a percent of the aPAD. For chronic risk assessments, residue estimates for foods or food-forms of interest are multiplied by the average consumption estimate of each food/food-form of each population

subgroup. Chronic exposure estimates are expressed in mg/kg bw/day and as a percent of the cPAD.

HED notes that there is a degree of uncertainty in extrapolating exposures for certain population subgroups which may not be sufficiently represented in the consumption surveys, (e.g., nursing and non-nursing infants or Hispanic females). Therefore, risks estimated for these subpopulations were included in representative populations having sufficient numbers of survey respondents (e.g., all infants or females 13-50 years).

Dietary Exposure Assessment

Acute Dietary Exposure Analysis

The acute analysis was performed for females 13-50 years old using published and proposed tolerance levels for all commodities. 100% CT information was used for all commodities. Therefore, the acute risk was analyzed at the 95th percentile. The aPAD for the females (13-50 yrs.) population subgroups is 0.6 mg/kg/day. For acute dietary risk, HED's level of concern is for exposures >100% aPAD. The dietary exposure estimate and associated acute risk for females 13-50 years old is shown in Table 2. A detailed listing of the acute dietary exposure estimates is attached (Attachment 2).

Table 2. Summary of Results of Acute DEEM ™ Analysis for Myclobutanil (Females 13-50 Years Old).

Subgroups	95th Percentile	
	Exposure (mg/kg/day)	% aPAD
Females (13-50 years old)	0.011171	2

Chronic Dietary Exposure Analysis

The chronic analysis was performed using published and proposed tolerance levels for all commodities. For the chronic analysis, average %CT information was used for apples, apricots, cherries, grapes, nectarines, peaches, pears, plums, and cotton (Memo, F. Hernandez (BEAD), 9/7/99). 100% CT was assumed for all other commodities. The cPAD for the U.S. population and all subgroups is 0.025 mg/kg/day. For chronic dietary risk, HED's level of concern is for exposures >100% cPAD. Dietary exposures for the U.S. population and other subgroups (i.e., children, infants, females, and males) are presented in Table 4. A detailed listing of chronic dietary exposure estimates is attached (Attachment 3).

Table 4. Summary of Results from Chronic DEEM ™ Analysis of Myclobutanil.

Subgroups	Exposure (mg/kg/day)	% cPAD
U.S. Population (48 states)	0.004446	18
All Infants (< 1 year old)	0.012431	50
Children 1-6 years old	0.013395	54
Children 7-12 years old	0.006644	27
Females 13-50 years old	0.002844	11
Males 13-19 years old	0.003872	16
Males 20+ years old	0.002776	11
Seniors 55+ years old	0.003396	14

Conclusions

The acute dietary exposure estimates at the 95th percentile for females 13-50 years old accounted for 2% of the aPAD. No acute endpoint was chosen for the general U.S. population, including infants and children. For acute dietary risk, HED's level of concern is for exposures >100% aPAD. The results of the acute analysis indicate that the acute dietary risk for females 13-50 years old associated with the existing and proposed uses of myclobutanil does not exceed HED's level of concern.

The chronic exposure estimates for the general U.S. population and all population subgroups accounted for <100% of the cPAD. The most highly exposed population subgroup was children 1-6 years old at 54% of the cPAD. For chronic dietary risk, HED's level of concern is for exposures >100% cPAD. The results of the chronic analysis indicate that the chronic dietary risk for the general U.S. population and all population subgroups associated with the existing and proposed uses of myclobutanil does not exceed HED's level of concern.

Attachments

Attachment 1: Myclobutanil Residue File for Acute and Chronic DEEM™ Analysis.
Attachment 2: Myclobutanil Acute DEEM™ Analysis (J. Rowell, 10/30/00).
Attachment 3: Myclobutanil Chronic DEEM™ Analysis (J. Rowell, 10/30/00).

cc (w/ Attachments): M.Sahafeyen (CEB1); R. Forrest (RD, 7575C)
RDI: DE SAC [S. Piper (10/30/00), T. Bloem (11/1/00)]; G. Herndon (10/1/00)
J.Rowell:806W:CM#2:(703)305-5564: 7509C:RAB1

Attachment 1: Myclobutanil Residue File for Acute and Chronic DEEM™ Analyses.

Filename: C:\MyFiles\DEEM\Myclobutanil\Section18\128857.rs7
Chemical: Myclobutanil
RfD(Chronic): .025 mg/kg bw/day NOEL(Chronic): 2.49 mg/kg bw/day
RfD(Acute): .6 mg/kg bw/day NOEL(Acute): 60 mg/kg bw/day
Date created/last modified: 10-25-2000/13:43:42/8 Program ver. 7.075
Comment: Section 18 for use on sugar beets. FQPA SF reduced to 1x; PADs and RfDs are equivalent.

Food Code	Crop Grp	Food Name	Def Res (ppm)	Adj.Factors #1	#2	Comment
40	14	Almonds	0.100000	1.000	1.000	0F3876
498	4A	Amaranth	0.030000	1.000	1.000	2F4861; Inadv. res.
52	11	Apples	0.700000	1.000	0.400	7F3476; 9F3812
53	11	Apples-dried	0.700000	8.000	0.400	7F3476; 9F3812
54	11	Apples-juice/cider	0.700000	1.000	0.400	7F3476; 9F3812; CF=1
377	11	Apples-juice-concentrate	0.700000	3.900	0.400	7F3476; 9F3812
410	12	Apricot juice	2.000000	1.000	0.150	1F3954
59	12	Apricots	2.000000	1.000	0.150	1F3954
60	12	Apricots-dried	2.000000	6.000	0.150	1F3954
181	O	Artichokes-globe	1.000000	1.000	1.000	TLT 7/31/00 98CA0029
203	1CD	Artichokes-jerusalem	0.030000	1.000	1.000	2F4861; Inadv. res.
260	O	Asparagus	0.020000	1.000	1.000	7E4862
497	9B	Balsam pear	0.200000	1.000	0.010	2F4155
72	O	Bananas	4.000000	1.000	1.000	2E04141
73	O	Bananas-dried	4.000000	3.900	1.000	2E04141
378	O	Bananas-juice	4.000000	1.000	1.000	2E04141
265	15	Barley	0.030000	1.000	1.000	2F4861; Inadv. res.
258	6C	Beans-dry-blackeye peas/cowpea	0.030000	1.000	1.000	2F4861; Inadv. res.
249	6C	Beans-dry-broadbeans	0.030000	1.000	1.000	2F4861; Inadv. res.
259	6C	Beans-dry-garbanzo/chick pea	0.030000	1.000	1.000	2F4861; Inadv. res.
227	6C	Beans-dry-great northern	0.030000	1.000	1.000	2F4861; Inadv. res.
256	6C	Beans-dry-hyacinth	0.030000	1.000	1.000	2F4861; Inadv. res.
228	6C	Beans-dry-kidney	0.030000	1.000	1.000	2F4861; Inadv. res.
229	6C	Beans-dry-lima	0.030000	1.000	1.000	2F4861; Inadv. res.
230	6C	Beans-dry-navy (pea)	0.030000	1.000	1.000	2F4861; Inadv. res.
231	6C	Beans-dry-other	0.030000	1.000	1.000	2F4861; Inadv. res.
251	6C	Beans-dry-pigeon beans	0.030000	1.000	1.000	2F4861; Inadv. res.
232	6C	Beans-dry-pinto	0.030000	1.000	1.000	2F4861; Inadv. res.
250	6B	Beans-succulent-broadbeans	0.030000	1.000	1.000	2F4861; Inadv. res.
234	6A	Beans-succulent-green	1.000000	1.000	1.000	7E4861

257	6	Beans-succulent-hyacinth	0.030000	1.000	1.000	2F4861; Inadv. res.
233	6B	Beans-succulent-lima	0.030000	1.000	1.000	2F4861; Inadv. res.
235	6A	Beans-succulent-other	1.000000	1.000	1.000	7E4861
236	6A	Beans-succulent-yellow/wax	1.000000	1.000	1.000	7E4861
253	6	Beans-unspecified	1.000000	1.000	1.000	7E4861
323	M	Beef-dried	0.100000	1.920	1.000	3F3876
324	M	Beef-fat w/o bones	0.050000	1.000	1.000	7F3476
325	M	Beef-kidney	0.200000	1.000	1.000	3F3876
327	M	Beef-lean (fat/free) w/o bones	0.100000	1.000	1.000	3F3876
326	M	Beef-liver	1.000000	1.000	1.000	3F3876
321	M	Beef-meat byproducts	0.200000	1.000	1.000	3F3876
322	M	Beef-other organ meats	0.200000	1.000	1.000	3F3876
197	1AB	Beets-garden-roots	0.030000	1.000	1.000	2F4861; Inadv. res.
165	2	Beets-garden-tops(greens)	0.030000	1.000	1.000	2F4861; Inadv. res.
152	9B	Bitter melon	0.200000	1.000	1.000	2F4155
1	13A	Blackberries	2.000000	1.000	1.000	7E4866
380	13A	Blackberries-juice	2.000000	1.000	1.000	7E4866
452	5B	Bok choy	0.030000	1.000	1.000	2F4861; Inadv. res.
2	13A	Boysenberries	2.000000	1.000	1.000	7E4866
168	5A	Broccoli	0.030000	1.000	1.000	2F4861; Inadv. res.
451	5A	Broccoli-chinese	0.030000	1.000	1.000	2F4861; Inadv. res.
169	5A	Brussels sprouts	0.030000	1.000	1.000	2F4861; Inadv. res.
286	15	Buckwheat	0.030000	1.000	1.000	2F4861; Inadv. res.
382	1AB	Burdock	0.030000	1.000	1.000	2F4861; Inadv. res.
170	5A	Cabbage-green and red	0.030000	1.000	1.000	2F4861; Inadv. res.
383	5B	Cabbage-savoy	0.030000	1.000	1.000	2F4861; Inadv. res.
198	1AB	Carrots	0.030000	1.000	1.000	2F4861; Inadv. res.
143	9A	Casabas	0.200000	1.000	1.000	2F4155
222	1CD	Cassava (yuca blanca)	0.030000	1.000	1.000	2F4861; Inadv. res.
171	5A	Cauliflower	0.030000	1.000	1.000	2F4861; Inadv. res.
199	1AB	Celeriac	0.030000	1.000	1.000	2F4861; Inadv. res.
166	4B	Celery	0.030000	1.000	1.000	2F4861; Inadv. res.
384	4B	Celery juice	0.030000	1.000	1.000	2F4861; Inadv. res.
61	12	Cherries	5.000000	1.000	0.400	3F3876
62	12	Cherries-dried	5.000000	4.000	0.400	3F3876
63	12	Cherries-juice	5.000000	1.500	0.400	3F3876
447	4A	Chervil	0.030000	1.000	1.000	2F4861; Inadv. res.
366	P	Chicken-byproducts	0.020000	1.000	1.000	7F3476
368	P	Chicken-fat w/o bones	0.020000	1.000	1.000	7F3476
367	P	Chicken-giblets(liver)	0.020000	1.000	1.000	7F3476
385	P	Chicken-giblets (excl. liver)	0.020000	1.000	1.000	7F3476
369	P	Chicken-lean/fat free w/o bones	0.020000	1.000	1.000	7F3476

114	1AB	Chicory	0.030000	1.000	1.000	2F4861; Inadv. res.
167	4A	Chicory(french/belgian endive)	0.030000	1.000	1.000	2F4861; Inadv. res.
386	9B	Christophine	0.200000	1.000	1.000	2F4155
172	5B	Collards	0.030000	1.000	1.000	2F4861; Inadv. res.
267	15	Corn grain-bran	0.030000	1.000	1.000	2F4861; Inadv. res.
266	15	Corn grain-endosperm	0.030000	1.000	1.000	2F4861; Inadv. res.
289	15	Corn grain-oil	0.030000	1.000	1.000	2F4861; Inadv. res.
268	15	Corn grain/sugar/hfcs	0.030000	1.500	1.000	2F4861; Inadv. res.
388	15	Corn grain/sugar-molasses	0.030000	1.500	1.000	2F4861; Inadv. res.
237	15	Corn/pop	0.030000	1.000	1.000	2F4861; Inadv. res.
238	15	Corn/sweet	0.030000	1.000	1.000	2F4861; Inadv. res.
291	O	Cottonseed-meal	0.020000	1.000	0.010	4F4317
290	O	Cottonseed-oil	0.020000	1.000	0.010	4F4317
55	11	Crabapples	0.700000	1.000	0.400	9F3812
144	9A	Crenshaws	0.200000	1.000	1.000	2F4155
180	4A	Cress-garden/field	0.030000	1.000	1.000	2F4861; Inadv. res.
191	4A	Cress-upland	0.030000	1.000	1.000	2F4861; Inadv. res.
148	9B	Cucumbers	0.200000	1.000	1.000	2F4155
10	13B	Currants	3.000000	1.000	1.000	7E4939
177	4A	Dandelion-greens	0.030000	1.000	1.000	2F4861; Inadv. res.
3	13A	Dewberries	2.000000	1.000	1.000	7E4866
154	8	Eggplant	0.030000	1.000	1.000	2F4861; Inadv. res.
364	P	Eggs-white only	0.020000	1.000	1.000	7F3476
363	P	Eggs-whole	0.020000	1.000	1.000	7F3476
365	P	Eggs-yolk only	0.020000	1.000	1.000	7F3476
178	4A	Endive-curley and escarole	0.030000	1.000	1.000	2F4861; Inadv. res.
124	1CD	Ginger	0.030000	1.000	1.000	2F4861; Inadv. res.
450	1AB	Ginseng	0.030000	1.000	1.000	2F4861; Inadv. res.
330	M	Goat-fat w/o bone	0.050000	1.000	1.000	7F3476
331	M	Goat-kidney	0.200000	1.000	1.000	3F3876
333	M	Goat-lean (fat/free) w/o bone	0.100000	1.000	1.000	3F3876
332	M	Goat-liver	1.000000	1.000	1.000	3F3876
328	M	Goat-meat byproducts	0.200000	1.000	1.000	3F3876
329	M	Goat-other organ meats	0.200000	1.000	1.000	3F3876
12	13B	Gooseberries	2.000000	1.000	1.000	7E4939
13	O	Grapes	1.000000	1.000	0.450	7F3476
15	O	Grapes-juice	1.000000	1.000	0.450	7F3476, CF = 1
392	O	Grapes-juice-concentrate	1.000000	3.600	0.450	7F3476
195	O	Grapes-leaves	1.000000	1.000	0.450	7F3476
14	O	Grapes-raisins	10.000000	1.000	0.450	7H5524
315	O	Grapes-wine and sherry	1.000000	1.000	0.450	7F3476
164	8	Groundcherries	0.030000	1.000	1.000	2F4861; Inadv. res.

287	6C	Guar beans	0.030000	1.000	1.000	2F4861; Inadv. res.
125	O	Hops	5.000000	1.000	1.000	TLT, Exp 12/31/01
334	M	Horsemeat	0.100000	1.000	1.000	3F3876
126	1AB	Horseradish	0.030000	1.000	1.000	2F4861; Inadv. res.
174	5B	Kale	0.030000	1.000	1.000	2F4861; Inadv. res.
175	5A	Kohlrabi	0.030000	1.000	1.000	2F4861; Inadv. res.
243	6C	Lentils	0.030000	1.000	1.000	2F4861; Inadv. res.
182	4A	Lettuce-unspecified	0.030000	1.000	1.000	2F4861; Inadv. res.
176	4A	Lettuce-leafy varieties	0.030000	1.000	1.000	2F4861; Inadv. res.
192	4A	Lettuce-head varieties	0.030000	1.000	1.000	2F4861; Inadv. res.
4	13A	Loganberries	2.000000	1.000	1.000	7E4866
141	9A	Melons-cantaloupes-juice	0.200000	1.000	1.000	2F4155
142	9A	Melons-cantaloupes-pulp	0.200000	1.000	1.000	2F4155
145	9A	Melons-honeydew	0.200000	1.000	1.000	2F4155
146	9A	Melons-persian	0.200000	1.000	1.000	2F4155
398	D	Milk-based water	0.200000	1.000	1.000	0F3876
319	D	Milk-fat solids	0.200000	1.000	1.000	0F3876
318	D	Milk-nonfat solids	0.200000	1.000	1.000	0F3876
320	D	Milk sugar (lactose)	0.200000	1.000	1.000	0F3876
280	15	Millet	0.030000	1.000	1.000	2F4861; Inadv. res.
244	6C	Mung beans (sprouts)	0.030000	1.000	1.000	2F4861; Inadv. res.
183	5B	Mustard greens	0.030000	1.000	1.000	2F4861; Inadv. res.
64	12	Nectarines	2.000000	1.000	0.200	9F3811
399	15	Oats-bran	0.030000	1.000	1.000	2F4861; Inadv. res.
269	15	Oats	0.030000	1.000	1.000	2F4861; Inadv. res.
139	8	Paprika	0.030000	1.000	1.000	2F4861; Inadv. res.
184	4A	Parsley	0.030000	1.000	1.000	2F4861; Inadv. res.
225	1AB	Parsley roots	0.030000	1.000	1.000	2F4861; Inadv. res.
220	1AB	Parsnips	0.030000	1.000	1.000	2F4861; Inadv. res.
65	12	Peaches	2.000000	1.000	0.100	9F3811
66	12	Peaches-dried	2.000000	7.000	0.100	9F3811
402	12	Peaches-juice	2.000000	1.000	0.100	9F3811
240	6C	Peas (garden)-dry	0.030000	1.000	1.000	2F4861; Inadv. res.
241	6AB	Peas (garden)-green	0.030000	1.000	1.000	2F4861; Inadv. res.
405	6B	Peas-succulent/blackeye/cowpea	0.030000	1.000	1.000	2F4861; Inadv. res.
310	O	Peppermint	3.000000	1.000	1.000	7E4877
311	O	Peppermint-oil	3.000000	1.000	1.000	7E4877
156	8	Peppers-chilli incl jalapeno	1.000000	1.000	1.000	TLT, Exp 7/31/00
157	8	Peppers-other	1.000000	1.000	1.000	TLT, Exp 7/31/00
155	8	Peppers-sweet(garden)	1.000000	1.000	1.000	TLT, Exp 7/31/00
158	8	Pimientos	1.000000	1.000	1.000	TLT, Exp 7/31/00
480	O	Plantains-green	4.000000	1.000	1.000	2E04141

94	O	Plantains-ripe	4.000000	1.000	1.000	2E04141
481	O	Plantains-dried	4.000000	3.900	1.000	2E04141
67	12	Plums (damsons)	2.000000	1.000	0.150	1F3954
68	12	Plums-prunes (dried)	8.000000	1.000	0.150	1F3954, CF = 1
69	12	Plums/prune-juice	2.000000	1.400	0.150	1F3954
344	M	Pork-fat w/o bone	0.050000	1.000	1.000	3F3876
345	M	Pork-kidney	0.200000	1.000	1.000	3F3876
347	M	Pork-lean (fat free) w/o bone	0.100000	1.000	1.000	3F3876
346	M	Pork-liver	1.000000	1.000	1.000	3F3876
342	M	Pork-meat byproducts	0.200000	1.000	1.000	3F3876
343	M	Pork-other organ meats	0.200000	1.000	1.000	3F3876
210	1C	Potatoes/white-dry	0.030000	6.500	1.000	2F4861; Inadv. res.
209	1C	Potatoes/white-peeled	0.030000	1.000	1.000	2F4861; Inadv. res.
211	1C	Potatoes/white-peel only	0.030000	1.000	1.000	2F4861; Inadv. res.
208	1C	Potatoes/white-unspecified	0.030000	1.000	1.000	2F4861; Inadv. res.
207	1C	Potatoes/white-whole	0.030000	1.000	1.000	2F4861; Inadv. res.
362	P	Poultry-other-fat w/o bones	0.020000	1.000	1.000	7F3476
361	P	Poultry-other-giblets(liver)	0.020000	1.000	1.000	7F3476
360	P	Poultry-other-lean (fat free) w/	0.020000	1.000	1.000	7F3476
149	9B	Pumpkin	0.200000	1.000	1.000	7F4155
407	1AB	Radishes-japanese (daiken)	0.030000	1.000	1.000	2F4861; Inadv. res.
212	1AB	Radishes-roots	0.030000	1.000	1.000	2F4861; Inadv. res.
213	2	Radishes-tops	0.030000	1.000	1.000	2F4861; Inadv. res.
5	13A	Raspberries	2.000000	1.000	1.000	7E4866
185	4B	Rhubarb	0.030000	1.000	1.000	2F4861; Inadv. res.
408	15	Rice-bran	0.030000	1.000	1.000	2F4861; Inadv. res.
271	15	Rice-milled (white)	0.030000	1.000	1.000	2F4861; Inadv. res.
270	15	Rice-rough (brown)	0.030000	1.000	1.000	2F4861; Inadv. res.
409	15	Rice-wild	0.030000	1.000	1.000	2F4861; Inadv. res.
214	1AB	Rutabagas-roots	0.030000	1.000	1.000	2F4861; Inadv. res.
215	2	Rutabagas-tops	0.030000	1.000	1.000	2F4861; Inadv. res.
274	15	Rye-flour	0.030000	1.000	1.000	2F4861; Inadv. res.
273	15	Rye-germ	0.030000	1.000	1.000	2F4861; Inadv. res.
272	15	Rye-rough	0.030000	1.000	1.000	2F4861; Inadv. res.
216	1AB	Salsify(oyster plant)	0.030000	1.000	1.000	2F4861; Inadv. res.
338	M	Sheep-fat w/o bone	0.050000	1.000	1.000	3F3876
339	M	Sheep-kidney	0.200000	1.000	1.000	3F3876
341	M	Sheep-lean (fat free) w/o bone	0.100000	1.000	1.000	3F3876
340	M	Sheep-liver	1.000000	1.000	1.000	3F3876
336	M	Sheep-meat byproducts	0.200000	1.000	1.000	3F3876
337	M	Sheep-other organ meats	0.200000	1.000	1.000	3F3876
413	6A	Snowpeas	0.030000	1.000	1.000	2F4861; Inadv. res.

275	15	Sorghum (including milo)	0.030000	1.000	1.000	2F4861; Inadv. res.
303	6A	Soybean-other	0.030000	1.000	1.000	2F4861; Inadv. res.
307	6A	Soybeans-flour (defatted)	0.030000	1.000	1.000	2F4861; Inadv. res.
306	6A	Soybeans-flour (low fat)	0.030000	1.000	1.000	2F4861; Inadv. res.
305	6A	Soybeans-flour (full fat)	0.030000	1.000	1.000	2F4861; Inadv. res.
304	6A	Soybeans-mature seeds dry	0.030000	1.000	1.000	2F4861; Inadv. res.
297	6A	Soybeans-oil	0.030000	1.000	1.000	2F4861; Inadv. res.
255	6A	Soybeans-sprouted seeds	0.030000	0.330	1.000	2F4861; Inadv. res.
312	O	Spearmint	3.000000	1.000	1.000	7E4877
313	O	Spearmint-oil	3.000000	1.000	1.000	7E4877
186	4A	Spinach	0.030000	1.000	1.000	2F4861; Inadv. res.
150	9B	Squash-summer	0.200000	1.000	1.000	2F4155
415	9B	Squash-spaghetti	0.200000	1.000	1.000	2F4155
151	9B	Squash-winter	0.200000	1.000	1.000	2F4155
17	O	Strawberries	0.500000	1.000	1.000	4E4302
416	O	Strawberries-juice	0.500000	1.000	1.000	4E4302
282	1A	Sugar-beet	0.700000	1.000	1.000	00ID0034
379	1A	Sugar-beet-molasses	1.000000	1.000	1.000	00ID0034
218	1CD	Sweet potatoes (incl yams)	0.030000	1.000	1.000	2F4861; Inadv. res.
418	2	Sweet potatos-leaves	0.030000	1.000	1.000	2F4861; Inadv. res.
187	4B	Swiss chard	0.030000	1.000	1.000	2F4861; Inadv. res.
201	1CD	Taro-root	0.030000	1.000	1.000	2F4861; Inadv. res.
190	2	Taro-greens	0.030000	1.000	1.000	2F4861; Inadv. res.
163	8	Tomatoes-catsup	0.300000	1.000	1.000	1F4030; CF=1
423	8	Tomatoes-dried	0.300000	14.300	1.000	1F4030
160	8	Tomatoes-juice	0.300000	1.000	1.000	1F4030; CF=1
162	8	Tomatoes-paste	1.000000	1.000	1.000	1F4030; CF=1
161	8	Tomatoes-puree	0.500000	1.000	1.000	1F4030; CF=1
159	8	Tomatoes-whole	0.300000	1.000	1.000	1F4030
355	P	Turkey-byproducts	0.020000	1.000	1.000	7F3476
357	P	Turkey--fat w/o bones	0.020000	1.000	1.000	7F3476
356	P	Turkey-giblets (liver)	0.020000	1.000	1.000	7F3476
358	P	Turkey- lean/fat free w/o bones	0.020000	1.000	1.000	7F3476
449	P	Turkey-other organ meats	0.020000	1.000	1.000	7F3476
137	1CD	Turmeric	0.030000	1.000	1.000	2F4861; Inadv. res.
219	1AB	Turnips-roots	0.030000	1.000	1.000	2F4861; Inadv. res.
188	2	Turnips-tops	0.030000	1.000	1.000	2F4861; Inadv. res.
429	M	Veal-dried	0.100000	1.920	1.000	3F3876
424	M	Veal-fat w/o bones	0.050000	1.000	1.000	3F3876
426	M	Veal-kidney	0.200000	1.000	1.000	3F3876
425	M	Veal-lean (fat free) w/o bones	0.100000	1.000	1.000	3F3876
427	M	Veal-liver	1.000000	1.000	1.000	3F3876

430	M	Veal-meat byproducts	0.200000	1.000	1.000	3F3876
428	M	Veal-other organ meats	0.200000	1.000	1.000	3F3876
147	9A	Watermelon	0.200000	1.000	1.000	2F4155
436	9A	Watermelon-juice	0.200000	1.000	1.000	2F4155
278	15	Wheat-bran	0.030000	1.000	1.000	2F4861; Inadv. res.
279	15	Wheat-flour	0.030000	1.000	1.000	2F4861; Inadv. res.
277	15	Wheat-germ	0.030000	1.000	1.000	2F4861; Inadv. res.
437	15	Wheat-germ oil	0.030000	1.000	1.000	2F4861; Inadv. res.
276	15	Wheat-rough	0.030000	1.000	1.000	2F4861; Inadv. res.
439	9B	Wintermelon	0.200000	1.000	1.000	2F4155
221	1CD	Yam-bean tuber (jicama)	0.030000	1.000	1.000	2F4861; Inadv. res.
224	1CD	Yautia (tanier)	0.030000	1.000	1.000	2F4861; Inadv. res.
6	13A	Youngberries	2.000000	1.000	1.000	7E4866

Attachment 2: Myclobutanil Acute DEEM™ Analysis (J. Rowell, 10/30/00).

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U.S. Environmental Protection Agency                                  Ver. 7.075
DEEM ACUTE analysis for MYCLOBUTANIL                               (1989-92 data)
Residue file: 128857.rs7                          Adjustment factor #2 NOT used.
Analysis Date: 10-30-2000/09:10:28    Residue file dated: 10-30-2000/09:05:40/8
NOEL (Acute) =  60.000000 mg/kg body-wt/day
Daily totals for food and foodform consumption used.
Run Comment: "Section 18 for use on sugar beets.  FQPA SF reduced to 1x; PADs
and RfDs are equivalent."
==============================================================================
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Summary calculations (per capita):

95th Percentile			99th Percentile			99.9th Percentile		
Exposure	% aRfD	MOE	Exposure	% aRfD	MOE	Exposure	% aRfD	MOE
Females 13+ (preg/not nursing):								
0.013696	2.28	4380	0.022054	3.68	2720	0.032728	5.45	1833
Females 13+ (nursing):								
0.019141	3.19	3134	0.041431	6.91	1448	0.058377	9.73	1027
Females 13-19 (not preg or nursing):								
0.011711	1.95	5123	0.017809	2.97	3369	0.033947	5.66	1767
Females 20+ (not preg or nursing):								
0.011619	1.94	5163	0.018701	3.12	3208	0.030230	5.04	1984
Females 13-50 yrs:								
0.011171	1.86	5371	0.018027	3.00	3328	0.033617	5.60	1784

Attachment 3: Myclobutanil Chronic DEEM™ Analysis (J. Rowell, 10/30/00).

U.S. Environmental Protection Agency Ver. 7.075
DEEM Chronic analysis for MYCLOBUTANIL (1989-92 data)
Residue file name: C:\MyFiles\DEEM\Myclobutanil\Section18\128857.rs7
Adjustment factor #2 used.
Analysis Date 10-30-2000/09:07:29 Residue file dated: 10-30-2000/09:05:40/8
Reference dose (RfD, Chronic) = .025 mg/kg bw/day
COMMENT 1: Section 18 for use on sugar beets. FQPA SF reduced to 1x; PADs and RfDs are equivalent.

Total exposure by population subgroup

Population Subgroup	Total Exposure mg/kg body wt/day	Total Exposure Percent of Rfd
U.S. Population (total)	0.004446	17.8%
U.S. Population (spring season)	0.004349	17.4%
U.S. Population (summer season)	0.004316	17.3%
U.S. Population (autumn season)	0.004560	18.2%
U.S. Population (winter season)	0.004557	18.2%
Northeast region	0.004453	17.8%
Midwest region	0.004498	18.0%
Southern region	0.004309	17.2%
Western region	0.004607	18.4%
Hispanics	0.004725	18.9%
Non-hispanic whites	0.004482	17.9%
Non-hispanic blacks	0.003829	15.3%
Non-hisp/non-white/non-black	0.005359	21.4%
All infants (< 1 year)	0.012431	49.7%
Nursing infants	0.005136	20.5%
Non-nursing infants	0.015501	62.0%
Children 1-6 yrs	0.013395	53.6%
Children 7-12 yrs	0.006644	26.6%
Females 13-19 (not preg or nursing)	0.003119	12.5%
Females 20+ (not preg or nursing)	0.002968	11.9%
Females 13-50 yrs	0.002844	11.4%
Females 13+ (preg/not nursing)	0.003817	15.3%
Females 13+ (nursing)	0.004708	18.8%
Males 13-19 yrs	0.003872	15.5%
Males 20+ yrs	0.002776	11.1%
Seniors 55+	0.003396	13.6%
Pacific Region	0.004623	18.5%

ATTACHMENT 3

Drinking Water Memorandum (Memo, T. Nguyen, 2/7/00, D260065/D260111)

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

OFFICE OF PREVENTION, PESTICIDES AND TOXIC SUBSTANCES

PC Code No: 128857
DP Barcode: D260065 / D260111

REVIEW of NEW USES

DATE: February 07, 2000

SUBJECT: Myclobutanil (NOVA 40W) on New Uses (Tomatoes and Cucurbits), Expanded Uses (Pome Fruits), and IR-4 Uses (Asparagus, Caneberry, Currants, Gooseberries, Mint, Snap Beans, and Strawberries)

FROM: Thuy Nguyen, MS, Chemist 02/07/2000
Environmental Risk Branch III
Environmental Fate and Effects Division (7507C)

THRU: Daniel Rieder, Chief 2/7/2000
Environmental Risk Branch III
Environmental Fate and Effects Division (7507C)

TO: Mary Waller, Product Manager
Registration Division (7505C)

The Environmental Risk Branch III of EFED has completed the environmental fate and effects risk assessment for the proposed new uses of myclobutanil.

Application information for the proposed new uses of myclobutanil is tabulated below.

Crop	Application Rate (lb ai/A)	Number of Applications	Interval (days between application)	Maximum lb ai/A/year
Cucurbit	0.05 - 0.0625	10 -12	7	0.6
Tomato	0.0625 - 0.1	Not specified	7	Not specified
Pome Fruit [1]	0.125 - 0.25	8 - 16	7 - 10	2.0
Asparagus	0.125	6	14	0.75
Snap Bean	0.1 - 0.125	5 - 8	7 - 10	0.5
Caneberries	0.03 - 0.0625	4 - 8	10 - 14	0.25
Currant/Gooseberry	0.125	8	10 - 14	0.1
Mint	0.1 - 0.125	3	14 - 21	0.375

[1] Expanded use on apples to include all pome fruits

Note that the maximum number of applications is not specified for tomato. EFED is assuming that, similar to cucurbit, tomato will be applied at a maximum of 10 times per year with a 7-day interval. The maximum single application rate for tomato is 0.1 lb ai/A.

Risk Overview

Myclobutanil is stable to hydrolysis and photolysis, and quite persistent and moderately mobile in laboratory and field study soils. Risks associated with the proposed new uses are summarized below.

	Acute High Risk	Acute Restricted Use	Acute Endangered Species	Chronic Risk
Birds				Pome fruit [1]
Mammals		Pome Fruit [2]	Pome Fruit [3]	Pome Fruit [1]
Freshwater Fish				
Freshwater Invertebrates				
Estuarine/Marine Fish				
Estuarine/Marine Invertebrates		Pome fruit	Pome fruit [4]	
Terrestrial plants	no data	no data	no data	no data

[1] Birds and small mammals (15g or less) feeding on short grass
[2] Small mammals (15g or less) feeding on short grass
[3] Small mammals (35 g or less) feeding on short grass and broadleaf/insects
[4] Currently there are no estuarine/marine endangered invertebrate species.

Overall, the low application rates and the low toxicity of myclobutanil to aquatic and terrestrial organisms did not trigger any high acute risk from the new proposed uses. However, acute risk to endangered mammals, and chronic risk to birds and mammals (therefore chronic effects to endangered birds and mammals) were noted, but limited to pome fruit use only.

Environmental Assessment

Based on previously submitted environmental fate studies, myclobutanil is stable to hydrolysis (Subdivision N guideline 161-1) at pH 5, 7 and 9, and to photolysis in water (161-2). However, it photodegrades with a half-life of about 143 days in soil (161-3). The aerobic metabolism half-life values are 61 to 71 days (162-1), and the terrestrial field dissipation values are 92 to 292 days (164-1). Typically, half-lives from the field studies are excluded from the models, but since there is a noticeable difference between the laboratory and the field results, and since the field results are significantly higher, the average of both sets of data will be used in this

assessment. Myclobutanil has low to medium mobility in soils as indicated by the K_{oc} values (163-1) (from 224 for clay loam to 919 for silty clay) and McCall classification. Myclobutanil major degradate (1,2,4-triazole) has much lower K_{oc} values suggesting it would be more mobile than the parent compound. However, a review of the adsorption (average $K_a$ads of 0.651) and desorption coefficients (average $K_a$des of 1.15) indicates that this degradate may be irreversibly bound to soils and may not be as mobile as one would predict from the adsorption results alone.

Drinking Water Assessment

Tier I surface and ground water estimated environmental concentrations (EEC) were generated using EFED GENEEC (Generic Expected Environmental Concentration) and SCI-GROW (Screening Concentration in Ground Water) models, respectively. The application information was based on hop crop, since hops have the highest use rate among all existing uses (15 applications per year and 0.65 lb ai/A per application at 14 day interval). The detailed drinking water assessment report for hops was issued by Dr. James Lin on January 13, 1998 (DP Barcode: D238936, D238937, D238939, and D238940).

EECs of Surface (GENEEC) and Ground (SCI-GROW)Water for Myclobutanil

GENEEC Peak	115 ppb
GENEEC Average 56 day	92 ppb
SCI-GROW Concentrations	2 ppb

No drinking water assessment was performed on 1,2,4 triazole due to an incomplete environmental fate database for this degradate. However, available fate data indicate that 1,2,4 triazole is more mobile than parent myclobutanil, but is also irreversibly bound to soils (see Environmental Assessment section). Therefore, 1,2,4 triazole may not enter ground water resources at any appreciable level, as one would predict from the adsorption results alone.

Based on application rates, it is not expected that the proposed new uses will result in surface and ground water EECs higher than those previously reported for hop crops.

Estimated Environmental Concentrations (EEC)

Terrestrial:

The terrestrial exposure assessment is based on Hoerger and Kenaga (1972), as modified by Fletcher et al (1994). Terrestrial estimated environmental concentrations (EECs) for nongranular formulations were derived from maximum application rates that incorporated dissipation rates for myclobutanil. Uncertainties arise from lack of data on interception and dissipation from foliar surfaces. For the purpose of this assessment, since foliar dissipation rate is not available, a default half life of 30 days was used. EECs were generated for pome fruits (table

II), tomatoes (table III), and cucurbits (table IV). No EECs were generated for the new proposed IR-4 uses, due to their limited use. Instead, the EECs for IR-4 uses will be estimated based on tomato use rates. The estimated peak residues and long term residues (56-day Average)of myclobutanil found in four plant types commonly consumed by birds and mammals, following multiple applications of this chemical as proposed for the new uses, are summarized below:

Plant Species	Peak EEC[1] (ppm)			56-day Average EEC[1] (ppm)		
	Pome Fruit	*Tomato*	*Cucurbit*	*Pome Fruit*	*Tomato*	*Cucurbit*
Short grass	292 ppm	129 ppm	80 ppm	181 ppm	72 ppm	45 ppm
Broadleaf plants [2]	164 ppm	72 ppm	45 ppm	102 ppm	41 ppm	26 ppm
Tall grass	134 ppm	59 ppm	37 ppm	83 ppm	33 ppm	21 ppm
Fruits/seeds	18 ppm	8 ppm	5 ppm	11 ppm	4 ppm	3 ppm

[1] Initial concentration was the maximum Kenega value for the vegetation type.
[2] Residues on small insects may be similar to broadleaf residues because their surface area to volume ratio are similar.

Since the application rates of the new proposed IR-4 uses are lower than tomatoes, the EEC values for IR-4 uses are expected to be lower than those for tomato.

Aquatic:

The aquatic EECs presented below were generated using the GENEEC model developed by EFED. This program uses a variety of environmental fate parameters listed in table I in conjunction with the application rates of the proposed uses to approximate the maximum exposure of myclobutanil to aquatic organisms from runoff.

Crops	Appli Rate (lb ai/A)	No. of Appl.	Application Interval	Initial EEC (ppb)	21-day EEC (ppb)	56-60 day EEC (ppb)
Asparagus (IR-4 uses)	0.125	6	14	12	11	9
Cucurbits	0.0625	10	7	10	9	8
Tomato	0.1	10	7	16	14	13
Pome Fruit	0.25	8	7	36	33	29

Since GENEEC produces upper bound surface water EECs, a refined Tier II analysis was also performed for pome fruits. However, no significant difference was noted between the two sets of data, and pome fruits will be assessed based on Tier I (GENEEC) estimates.

The application rate for asparagus is the highest among the new proposed IR-4 crops; therefore asparagus EECs represent the upper limits of the estimated concentrations of myclobutanil in surface water resulting from the proposed IR-4 uses.

Ecological Toxicity Data Summary

The following toxicity data has been reviewed in conjunction with the registration of myclobutanil.

Terrestrial Wildlife Toxicity Data:

Common Name	%AI	Toxicity	NOEL	EPA-ID	Category
Bobwhite Quail	84.5	LD_{50} 510 mg/kg		0144286	Core
Bobwhite Quail	84.5	LC_{50} >5000 ppm (Avian Dietary)		0144287	Core
Mallard Duck	84.5	LC_{50} >5000 ppm (Avian Dietary)		0144287	Core
Bobwhite Quail	94.2	LOEC >260 ppm (Avian Reproduction)	260 ppm	43087901	Supplemental
Mallard Duck	94.2	LOEC >260 ppm (Avian Reproduction)	260 ppm	43087902	Supplemental
Laboratory rat	91.9	LD_{50}=1360 g/kg (Acute Oral)		006370	Core
Laboratory rat	84.5	LOEL=1000 ppm (2-gen. Reproduction)	200 ppm	004936	Core

Aquatic Organism Toxicity Data:

Common Name	%AI	Toxicity	NOEL	EPA-ID	Category
Bluegill sunfish	84.5	96 HR LC_{50}=2.4 ppm		0144285	Core
Rainbow trout	84.5	96 HR LC_{50}=4.2 ppm		0141677	Core
Water flea	84.5	48 HR EC_{50} =11 ppm		0141678	Core
Sheepshead minnow	93	96 HR LC_{50} =4.7 ppm		42747903	Core
Eastern oyster	93	96 HR EC_{50} =0.68 ppm		42747901	Supplemental
Mysid	93	96-HR LC_{50} = 0.24 ppm		42747902	Core
Fathead minnow		Early life LOEC=2.2 ppm	0.98 ppm	0266119	Supplemental

Risk Assessment

Risk to Terrestrial Organisms:

Risk Quotients (RQ) were calculated for avians and mammals and presented in table II for pome fruits, table III for tomatoes, and table IV for Cucurbits and IR-4 uses.

Avian

Acute: Table II indicate that for multiple applications of myclobutanil at

maximum proposed rate (pome fruits, 0.25 lb a.i./A 8 application per year at 7-day interval), no acute level of concern (LOC) exceedance was observed. Therefore no acute risk is presumed for any of the new proposed uses.

Chronic: The RQ for pome fruits on short grass is above the level of concern (LOC = 1), however the RQs of tomato, cucurbit, and IR-4 uses are all below 1.

Mammal

Risk quotients for mammals were calculated for three separate weight classes of mammals (15, 35, and 1000g).

Acute: Table II indicates that for multiple applications of myclobutanil at maximum proposed use rates (pome fruits, 0.25 lb a.i./A, 8 application per year at 7-day intervals), acute risk to mammals is low. However, acute restricted use LOC is exceeded for small mammals (15 g body weight) consuming short grass. Acute risk to endangered species is also noted for small mammals consuming short grass (35 g body weight or less) and broadleaf plant/insect (15 g body weight) . The potential of acute risk for tomato, cucurbit, and IR-4 uses is minimal.

Chronic: Chronic risk posed by multiple applications of myclobutanil on pome fruits is presumed for small mammals (15 g). No risk is presumed for tomato, cucurbit, and IR-4 uses.

Risk to Aquatic Organisms:

For this risk assessment, pome fruit (apple), cucurbit (watermelon) and IR-4 (caneberry and strawberry) uses are the only crops considered to be associated with estuarine/marine aquatic animals.

Acute Risk:

For acute risk, peak EEC values estimated from GENEEC are used to calculate the Risk Quotients (RQ). Table V summarizes the RQs associated with the proposed new uses.

Freshwater animals and Estuarine/Marine fish: No acute LOCs are exceeded for bluegill sunfish, rainbow trout, water flea, and sheepshead minnow for any of the new proposed uses.

Estuarine/marine invertebrates: Based on the highest application rate among the proposed new rates (pome fruit, 8 applications at 0.25 lb a.i./A, 7-day interval), acute restricted use risk and acute endangered species risk are presumed. However, note that there are no Federally-listed estuarine/marine endangered invertebrate species. Acute risk is minimal for cucurbit and IR-4 uses.

Chronic Risk:

For chronic risk, 21-day EEC values estimated from GENEEC are used to calculate the Risk Quotients (RQ) for invertebrates, and 56-day EECs for fish. Based on the highest 21-day EEC (0.033 ppm for pome fruit) and the lowest LC_{50} (0.24 ppm for mysid), RQs for all new proposed uses should be less than 1, and no chronic risk to aquatic organisms is presumed.

Risk to Terrestrial Plants: No data on toxicity of myclobutanil to terrestrial species of plants has been reviewed to date. Therefore, no conclusions regarding possible hazard to these species groups can be made at this time.

Risk to Non-Target Insects Toxicity Data: No data has been received for review by the Agency regarding toxicity to non-target insects. Therefore, no conclusions regarding possible hazard to these species groups can be made at this time.

Summary Risk to Endangered Species: Based on toxicity data and predicted environmental concentrations, chronic risk is presumed for endangered birds and small mammals from the expanded use on apples. However, minimal risk is expected to endangered invertebrates and fish. The lack of terrestrial plant data and non-target insect toxicity data precludes any determination of hazard for these species groups.

Risk Characterization

Based on the RQs listed in tables II, III, IV, and V, acute high risk is minimal for all new uses of myclobutanil. However, acute risk to endangered mammals and chronic risk to endangered birds and mammals are predicted for pome fruit use. Acute restricted use is also presumed for mammals and estuarine/marine invertebrates:

- LOCs for chronic risk are exceeded for birds (RQ = 1.12 on short grass) after the 7th application; and for small mammals (15 g body weight category; RQ = 1.4 on short grass) after the 5th application.

- LOCs for acute restricted use (RQ = 0.11 on broadleaf plant, and 0.14 on short grass) and for endangered species (RQ = 0.20 on short grass) are also exceeded for small mammals (35 g and less).

Although acute and chronic effects data are used in the estimation of risk to terrestrial and aquatic organisms, these values may have some level of uncertainty associated with them, especially for terrestrial animals.

1. Due to lack of data, the LOC calculations were based on a default foliar dissipation rate of 30 days. However, myclobutanil may dissipate on foliage more rapidly than 30 days. Therefore, having an actual foliar dissipation rate information would allow refinement of the EEC estimate. But EFED believes that obtaining this additional information is probably of low value,

since the magnitude of exceedance is relatively non significant (between 1 and 1.3 for both birds and mammals), and the toxicity level of myclobutanil to birds and mammals is low.

2. Pome fruit trees are treated via broadcast applications, and interception of myclobutanil by tree foliage is very likely (thus reducing the amount of exposure on ground foliage). But the persistence of this chemical is expected to make the intercepted myclobutanil available for contamination of terrestrial environment through foliar wash off onto mammal and avian food items, especially grass. Therefore, even though the LOC exceedance was not excessive, the use of myclobutanil on pome fruit at the proposed rate presents some adverse effects to small herbivores feeding on short grass and broadleaf plant in the vicinity of the treated areas. However, note that the accumulation of myclobutanil on terrestrial animal food items are estimated assuming that each application deposits the same peak amount of residue at the same location. Consequently, the accumulation could be overestimated since it did not take into account field variability such as wind effect, change in application pattern, and rainfall. While LOC exceedances are noted for birds and mammals from pome fruit uses, uncertainty does exist in assuming chronic risk to these animals.

Labeling Recommendations

Product Label

For terrestrial uses, do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Do not apply when weather conditions favor drift or runoff from areas treated.

Acknowledgment:

The Myclobutanil review team thanks Dr. Jim Lin for providing the Tier II EEC modeling, Ms. Laura Dye for assisting in the ecological risk assessment, and Dr. Ron Bloom for performing the secondary review.

Endangered and Threatened Species Listing:

Small Mammals (body weight of 35g or less) in counties where pome fruits are grown.

SPECIES	GROUP	STATUS	
BAT, GRAY	MAMMAL	E	KNOWN
BAT, INDIANA	MAMMAL	E,CH	POSSIBLE
BAT, LESSER (=SANBORN'S) LONG-NOSED	MAMMAL	E	KNOWN
BAT, OZARK BIG-EARED	MAMMAL	E	KNOWN
BAT, VIRGINIA BIG-EARED	MAMMAL	E,CH	KNOWN
KANGAROO RAT, FRESNO	MAMMAL	E,CH	KNOWN
KANGAROO RAT, GIANT	MAMMAL	E	KNOWN
KANGAROO RAT, MORRO BAY	MAMMAL	E,CH	KNOWN
KANGAROO RAT, STEPHENS'	MAMMAL	T	KNOWN
KANGAROO RAT, TIPTON	MAMMAL	E	KNOWN
MANATEE, WEST INDIAN (FLORIDA)	MAMMAL	E,CH	KNOWN
MOUSE, ALABAMA BEACH	MAMMAL	E,CH	KNOWN
MOUSE, PACIFIC POCKET	MAMMAL	E	KNOWN
MOUSE, PERDIDO KEY BEACH	MAMMAL	E,CH	KNOWN
MOUSE, SALT MARSH HARVEST	MAMMAL	E	KNOWN
SHREW, DISMAL SWAMP SOUTHEASTERN	MAMMAL	T	KNOWN
SQUIRREL, CAROLINA NORTHERN FLYING	MAMMAL	E	KNOWN
SQUIRREL, DELMARVA PENINSULA FOX	MAMMAL	E,XN	KNOWN
SQUIRREL, MOUNT GRAHAM RED	MAMMAL	E,CH	KNOWN
SQUIRREL, VIRGINIA NORTHERN FLYING	MAMMAL	E	KNOWN
VOLE, AMARGOSA	MAMMAL	E,CH	KNOWN
VOLE, HUALAPAI MEXICAN	MAMMAL	E	KNOWN

Endangered and Threatened Species Listing (continued):

Birds in counties where pome fruits are grown.

CONDOR, CALIFORNIA	BIRD	E,CH	POSSIBLE
CRANE, WHOOPING	BIRD	E,CH	KNOWN
CURLEW, ESKIMO	BIRD	E	POSSIBLE
EAGLE, BALD	BIRD	T	KNOWN
FALCON, AMERICAN PEREGRINE	BIRD	E,CH	POSSIBLE
FALCON, ARCTIC PEREGRINE	BIRD	T	POSSIBLE
FALCON, NORTHERN APLOMADO	BIRD	E	KNOWN
FALCON, PEREGRINE	BIRD	E,SA	KNOWN
FLYCATCHER, SOUTHWESTERN WILLOW	BIRD	E,CH	POSSIBLE
GNATCATCHER, COASTAL CALIFORNIA	BIRD	T	KNOWN
GOOSE, ALEUTIAN CANADA	BIRD	T	POSSIBLE
JAY, FLORIDA SCRUB	BIRD	T	KNOWN
KITE, EVERGLADE SNAIL	BIRD	E,CH	POSSIBLE
MURRELET, MARBLED	BIRD	T/CH	POSSIBLE
OWL, MEXICAN SPOTTED	BIRD	T	POSSIBLE
OWL, NORTHERN SPOTTED	BIRD	T,CH	KNOWN
PELICAN, BROWN	BIRD	E	KNOWN
PLOVER, PIPING	BIRD	E,T	KNOWN
PLOVER, WESTERN SNOWY	BIRD	T	KNOWN
PYGMY-OWL, CACTUS FERRUGINOUS	BIRD	E	KNOWN
RAIL, CALIFORNIA CLAPPER	BIRD	E	KNOWN
RAIL, LIGHT-FOOTED CLAPPER	BIRD	E	KNOWN
RAIL, YUMA CLAPPER	BIRD	E	KNOWN
SHRIKE, SAN CLEMENTE LOGGERHEAD	BIRD	E	KNOWN
SPARROW, SAN CLEMENTE SAGE	BIRD	T	KNOWN
STORK, WOOD	BIRD	E	KNOWN
TERN, CALIFORNIA LEAST	BIRD	E	KNOWN
TERN, INTERIOR (POPULATION) LEAST	BIRD	E	KNOWN
TERN, ROSEATE	BIRD	E,T	KNOWN
TOWHEE, INYO BROWN	BIRD	T,CH	KNOWN
VIREO, BLACK-CAPPED	BIRD	E	KNOWN
VIREO, LEAST BELL'S	BIRD	E,CH	KNOWN
WARBLER (WOOD), BACHMAN'S	BIRD	E	POSSIBLE
WARBLER (WOOD), GOLDEN-CHEEKED	BIRD	E	KNOWN
WARBLER (WOOD), KIRTLAND'S	BIRD	E	KNOWN
WARBLER, BACHMAN'S	BIRD	E	POSSIBLE
WOODPECKER, RED-COCKADED	BIRD	E	KNOWN

Table I
Summary of Selected Environmental Fate Properties for Myclobutanil

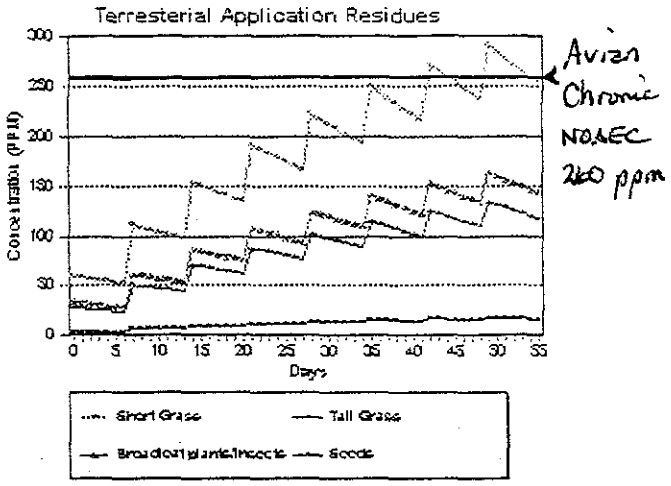
Property	Range	Value used in assessment	Model
Solubility (water)	142 mg/L	142 mg/L	GENEEC
Hydrolysis $t_{1/2}$	stable at pH 5, 7 and 9	stable - (0 day)	GENEEC
Aquatic Photolysis $t_{1/2}$	stable	stable - (0 day)	GENEEC
Aerobic Soil Metabolism $t_{1/2}$	61-71 days in silt loam, but degradation rates slowed after increasing aging, and after 240 days, 34-37% of parent was still present.	see Terrestrial Field Dissipation	GENEEC
Foliar Dissipation $t_{1/2}$	no data	30 days (default)	FATE
Terrestrial Field Dissipation $t_{1/2}$	292 days in sandy loam, 92 days in loam soil	129 days = average of aerobic soil metabolism half-lives and terrestrial field dissipation half-lives	GENEEC/ SCI-GROW
Anaerobic Soil Metabolism $t_{1/2}$	no appreciable degradation in 62 days	not considered	
Aerobic Aquatic Metabolism $t_{1/2}$	no data	(0 day)	GENEEC
K_{ad}	1.46, 2.39, 4.44, 7.08, 9.77	see K_{oc} values	
K_{oc}	224, 265, 581, 595, 936	581 = median	GENEEC/ SCI-GROW

Table II
Terrestrial Risk Quotient Summary - Pome Fruits

Chemical Name:	Myclobutanil
Use	pome fruit
Formulation	dry flowable

Inputs

Application Rate	0.25	lbs a.i./acre
Half-life	30	days
Frequency of Application	7	days
Maximum # Apps./Year	5	



Outputs

	Maximum Concentration (PPM)	56 Day Average Concentration (PPM)	
Short Grass	291.61	181.33	# days Exceeded on short grass (in first 56)
Tall Grass	133.66	83.11	
Broadleaf plants/Insects	164.03	102.00	
Seeds	18.23	11.33	

Avian

Acute LC50 (ppm)	5000	0
Chronic NOAEC (ppm)	260	7

	Acute RQ	Chronic RQ (Max. res. mult. apps.)
Short Grass	0.06	1.12
Tall Grass	0.03	0.51
Broadleaf plants/Insects	0.03	0.63
Seeds	0.00	0.07

days Exceeded on short grass (in first 56)

Mammalian

Acute LD50 (mg/kg)	1360	0
Chronic NOAEL (mg/kg)	290	26

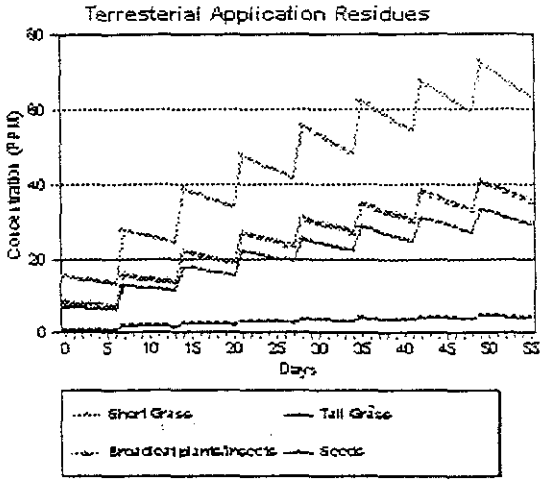
	15 g mammal		35 g mammal		1000 g mammal	
	Acute RQ (mult. apps)	Chronic RQ (Max. res.) mult. apps.)	Acute RQ (mult. apps)	Chronic RQ (Max. res.) mult. apps.)	Acute RQ (mult. apps)	Chronic RQ (Max. res.) mult. apps.)
Short Grass	0.20	1.39	0.14	0.96	0.03	0.22
Tall Grass	0.09	0.63	0.06	0.44	0.01	0.10
Broadleaf plants/Insects	0.11	0.78	0.08	0.54	0.02	0.12
Seeds	0.01	0.09	0.01	0.06	0.00	0.01

Table III
Terrestrial Risk Quotient Summary - Cucurbits

Chemical Name:	Myclobutanil
Use	cucurbits
Formulation	dry flowable

Inputs

Application Rate	0.0625	lbs a.i./acre
Half-life	30	days
Frequency of Application	7	days
Maximum # Apps./Year	10	



Outputs

	Maximum Concentration (PPM)	56 Day Average *Concentration* (PPM)	
Short Grass	80.52	45.33	# days Exceeded on short grass (in first 56)
Tall Grass	36.90	20.78	
Broadleaf plants/Insects	45.29	25.50	
Seeds	5.03	2.83	

Avian

Acute LC50 (ppm)	5000	0
Chronic NOAEC (ppm)	260	0

	Acute RQ	Chronic RQ (Max. res. mult. apps.)	
Short Grass	0.02	0.31	# days Exceeded on short grass (in first 56)
Tall Grass	0.01	0.14	
Broadleaf plants/Insects	0.01	0.17	
Seeds	0.00	0.02	

Mammalian

Acute LD50 (mg/kg)	1360	0
Chronic NOAEL (mg/kg)	200	0

	15 g mammal		35 g mammal		1000 g mammal	
	Acute RQ (mult. apps)	Chronic RQ (Max. res.) mult. apps.)	Acute RQ (mult. apps)	Chronic RQ (Max. res.) mult. apps.)	Acute RQ (mult. apps)	*Chronic RQ* (Max. res.) mult. apps.)
Short Grass	0.06	0.38	0.04	0.27	0.01	0.06
Tall Grass	0.03	0.18	0.02	0.12	0.00	0.03
Broadleaf plants/Insects	0.03	0.22	0.02	0.15	0.00	0.03
Seeds	0.00	0.02	0.00	0.02	0.00	0.00

Table IV
Terrestrial Risk Quotient Summary - Tomatoes

Chemical Name:	Myclobutanil
Use	tomato
Formulation	dry flowable

Inputs

Application Rate	0.1	lbs a.i./acre
Half-life	30	days
Frequency of Application	7	days
Maximum # Apps./Year	10	

Outputs

	Maximum Concentration (PPM)	56 Day Average Concentration (PPM)	
Short Grass	128.82	72.53	# days Exceeded on short grass (in first 56)
Tall Grass	59.04	33.24	
Broadleaf plants/Insects	72.46	40.80	
Seeds	8.05	4.53	

Avian

Acute LC50 (ppm)	5000	0
Chronic NOAEC (ppm)	280	0

	Acute RQ	Chronic RQ (Max. res. mult. apps.)	
Short Grass	0.03	0.50	# days *Exceeded* on short grass (in first 56)
Tall Grass	0.01	0.23	
Broadleaf plants/Insects	0.01	0.28	
Seeds	0.00	0.03	

Mammalian

Acute LD50 (mg/kg)	1360	0
Chronic NOAEL (mg/kg)	200	0

	15 g mammal		35 g mammal		1000 g mammal	
	Acute RQ (mult. apps)	Chronic RQ (Max. res.) mult. apps.)	Acute RQ (mult. apps)	Chronic RQ (Max. res.) mult. apps.)	Acute RQ (mult. apps)	Chronic RQ (Max. res.) *mult. apps.)*
Short Grass	0.09	0.61	0.06	0.43	0.01	0.10
Tall Grass	0.04	0.28	0.03	0.19	0.01	0.04
Broadleaf plants/Insects	0.05	0.34	0.04	0.24	0.01	0.05
Seeds	0.01	0.04	0.00	0.03	0.00	0.01

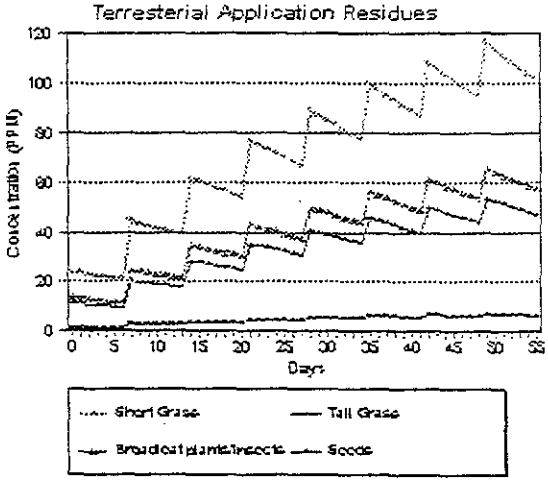


Table V
Aquatic Risk Quotient Summary

Species	LC_{50} or EC_{50} (ppm)	Peak GENEEC EEC (ppm)				RQ			
		Asparagus (IR-4)	Cucurbit	Tomato	Pome Fruit	Asparagus (IR-4)	Cucurbit	Tomato	Pome Fruit
Bluegill sunfish	2.4	0.012	0.010	0.016	0.036	<0.05	<0.05	<0.05	<0.05
Rainbow trout	4.2	0.012	0.010	0.016	0.036	<0.05	<0.05	<0.05	<0.05
Daphnia (Water flea)	11	0.012	0.010	0.016	0.036	<0.05	<0.05	<0.05	<0.05
Sheepshead minnow	4.7	0.012	0.010	0.016	0.036	<0.05	<0.05	<0.05	<0.05
Eastern oyster	0.68	0.012	0.010	0.016	0.036	<0.05	<0.05	<0.05	0.052
Mysid	0.24	0.012	0.010	0.016	0.036	<0.05	<0.05	0.07 [1]	0.15 [2]

[1] Tomato use is not associated with estuarine/marine habitant based on regionally specific usage for myclobutanil.
[2] Currently, there is no estuarine/marine endangered species.

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Chemical:	**Myclobutanil (ANSI)**
PC Code:	**128857**
HED File Code	**14000 Risk Reviews**
Memo Date:	**11/09/2000**
File ID:	**DPD268379**
Accession Number:	**412-01-0123**

HED Records Reference Center
03/20/2001