SHAUGHNESSEY NO. _____ REVIEW NO. _____

EEB BRANCH REVIEW

DATE: IN 4-27-83 OUT 5/25/83

FILE OR REG. NO. 239-2404

PETITION OR EXP. PERMIT NO. _____

DATE OF SUBMISSION 4/5/83

DATE RECEIVED BY HED 4/26/83

RD REQUESTED COMPLETION DATE 7/7/83

EEB ESTIMATED COMPLETION DATE 6/30/83

RD ACTION CODE/TYPE OF REVIEW 310/Amendment

TYPE PRODUCT(S): I, D, H, F, N, R, S Insecticide

DATA ACCESSION NO (S). _____

PRODUCT MANAGER NO. W. Miller (16)

PRODUCT NAME(S) Monitor 4 Spray

COMPANY NAME Chevron Chemical Company

SUBMISSION PURPOSE proposed conditional registration of sugarbeets use

SHAUGHNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.
084701	Terrazole	95

Environmental Safety Review Fish and Wildlife

100.0 Submission Purpose - Chevron Chemical Company is requesting the addition of Sugarbeets to their label for Monitor, Reg No 239-2404.

100.1 Application Methods/Direction

The following use directions are proposed to be added to the Monitor label:

Sugar Beets (Arizona and California Only): Green Peach Aphid: 1 to 2 pts (0.5 to 1.0 lb active) per acre. Repeat at 14 day intervals as needed. Do not apply more than 6 applications of Monitor 4 Spray per crop season. Do not apply within 30 days of harvest.

100.2 Application Rates

The registared label, states that Monitor may be applied by either air or ground application at rates specified above. For air the label instructions state that the product should be used with 3 to 10 gallons of water per acre and for ground 25 to 125 gallons of water.

100.3 Precautionary Labeling

The following Environmental hazard statements appear on the current registared label:

This product is toxic to birds and other wildlife. Birds and other wildlife in treated areas may be killed. Do not apply directly to water. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water by cleaning of equipment or disposal of wastes.

The submission proposes to delete the last statement which would be replaced by a statement in the prohibitions sectionn of the label with, "Do not contaminate water, food or feed by storage, disposal or cleaning of equipment."

101.0 Chemical and Physical Properties

See previous reviews

102.0 Behavior in the Environment

See previous reviews

103.0 Toxicological Properties

See previous reviews and discussion below

104.0 Hazard Assessment

104.1 Discussion

The proposed label amendment, the additional use of Monitor on sugarbeets in Arizona and California, would add an additional two million acres where this product could be used, an approximate 10% increase.

Available information on methamidophos potential impacts to aquatic and terrestrial species was recently reviewed in the Registration Standard on this chemical and, therefore, will not be reiterated here indepth, but only summarized. For further details the reader is referred to the above mentioned document.

The Standard indicated that methamidophos was unlikely to cause significant impacts on fish populations. The LC50 of this chemical to rainbows, the most sensitive fish species tested, was estimated to be 25 ppm. At the maximum use rate, if applied directly to a 6-inch acre deep body of water the maximum concentration would be 0.73 ppm a value well below toxic levels of indicator species.

However, for aquatic invertebrates this maximum concentration exceeds reported LC50 values, Daphnia magna LC50= 0.025 ppm. The standard, however, points out that this maximum hazard calculation is somewhat unrealistic. Based on similar chemicals, the standard continues, from 0.5 to 1.5 percent of the total pesticide applied usually reaches aquatic habitat via runoff alone. At the maximum application rate, 1 lb a.i./A, the concentration in water would be between .004 to 0.01 ppm, vary close to the LC50 value for freshwater invertebrates.

In relation to chronic problems posed to aquatic organisms the Standard concludes that data are currently insufficient to fully understand the environmental fate of methamidophos. However, it continues, available data indicate that methamidophos residues will not accumulate in aquatic organisms and will be transformed (hydrolysis) upon entering aquatic systems. Hence, it is unlikely, even with repeated applications, that methamidophos will pose a significant chronic hazard to aquatic organisms.

For avian species methamidophos is reported to be very highly toxic, Bobwhite LD50= 8.0 mg/kg; Bobwhite LC50= 42 ppm. For mammalian species, this chemical is considered highly toxic via acute oral dosing (Rat LD50= 18-21 mg/kg), but only slightly toxic via dietary exposure (Rat LC50=894 ppm). Comparing these figures to estimated environmental concentrations, which range from 7 to 240 ppm, indicates potential acute hazard to avian species.

This conclusion is strengthened by a report cited in the standard from Wisconsin on a bird kill involving the use of Monitor on cabbage. At least 14 birds were reported dead or dying around a cabbage field which had been aerially sprayed with Monitor. Brain cholinesterase activity tests and chemical analysis of gastrointestinal tracts of the birds verified the cause of death.

In addition to acute hazard to birds, methamidophos appears to impair reproduction in avian species. The no effect level in bobwhite quail has been shown to be >3 ppm but <5 ppm under 18 weeks of dietary exposure. Significant impairment occured at 5 ppm. While initial environmental residues are expected to exceed this level, current information is inadequate to determine if the normal use of monitor would provide dietary residues over time that would create a chronic hazard to avian wildlife. Considering the available data, and that repeated applications of methamidophos are used, (up to six for proposed use on sugarbeets) reproductive impairment is possible.

104.2 Endangered Species Consideration

The potential of exposing endangered species from the proposed label amendment appears remote.

104.3 Adequacy of Toxicity Data

The Registration Standard for Monitor indicates that all minimum data requirements have been satisfied for registration. Also required, due to the properties of this chemical and found adequate to meet data requirements for registration were avian reproduction studies for bobwhites and mallards.

104.4 Additional Data Required

The following additional studies are specified in the Registration Standard as required to support registration:

(1) Short term field study on birds

(2) Acute toxicity studies on estuarine/marine invertebrates

105.0 Classification

Based on the available data it appears, as do current registered uses, the proposed additional use exceed at least two of the criteria used to classify pesticides in the restricted category. They are:

(1) Occurs as a residue immediately following application in or on the feed of an avian species representative of the species likely to be exposed to such feed in amounts equivalent to the average daily intake of such representative species at levels equal to or greater than 1/5 the subacute dietary LC50 measured in avian test animals as specified in the Registration Guidelines.

(2) Results in a maximum calculated concentration following direct application to a 6-inch layer of water equal to or greater than 1/10 the acute LC50 for aquatic organisms representative of the organisms likely to be exposed as measured in test animals as specified in the Registration Guidelines.

Therefore this proposed use of Monitor should be restricted.

105.1 RPAR Criteria

This proposed use also exceeds at least two of the criteria established by the Agency for determination of "Unreasonable Adverse Effects." They are:

(1) Occurs as a residue immediately following application in or on avian feed of an avian species, representative of the species likely to be exposed to such feed in amounts equivalent to the average daily intake of such representative species, at levels equal to or greater than the subacute dietary LC50 measured in avian test animals as specified in the Registration Guidelines.

(2) Results in a maximum calculated concentration following direct application to a 6-inch layer of water more than 1/2 the acute LC50 for aquatic organisms representative of the organisms likely to be exposed as measured on test animals specified in the Registration Guidelines.

105.2 Labeling

Based on available data the current labeling should be improved to reflect better potential hazards of this chemical to non-targets. While the Environmental Hazard section of the label does indicate that this pesticide should be kept out of aquatic habitats, it does not reflect its toxicity to aquatic invertebrates. Therefore, we suggest the following statement replace the first sentence of the Environmental Hazard section of the label:

The product is toxic to aquatic organisms and wildlife species and Extremely toxic to birds.

107.0 Conclusions

EEB has completed on incremental risk assessment (3)(c)(7) Finding) of the proposed conditional registration of Monitor for use on sugarbeets. Based upon the available data EEB concludes that the proposed use provides for a minimal increase in exposure; however, there are significant acute and chronic risks to non-targets.

EEB wants to emphasize, as pointed out in the Registration Standard, that not all data required for registration have been submitted and these are needed to fully assess the impacts of the proposed use.

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