

7-25-86



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

25 JUL 1986

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

Memorandum

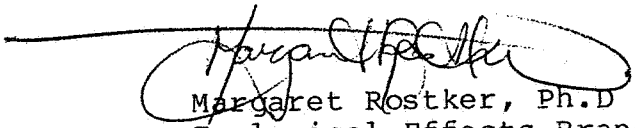
To: George LaRocca, PM 15  
Insecticide/Rodenticide Branch  
Registration Division (TS-767C)

Thru: Harry Craven, Registration Standards Coordinator  
Ecological Effects Branch  
Hazard Evaluation Division (TS-769C)

Thru: Michael Slimak, Chief  
Ecological Effects Branch  
Hazard Evaluation Division (TS-769C)

Subject: Diazinon Registration Standard

Attached are EEB's Topical Discussions, Disciplinary Review, and Generic Data Requirements Table for Diazinon. The Data Evaluation Records will be provided at a later date under separate cover.

  
Margaret Rostker, Ph.D.  
Ecological Effects Branch  
Hazard Evaluation Division (TS-769C)

cc: Margaret Rostker, SIS(EEB)/HED  
Judy Heckman, MSS/HED

72-1

1

ECOLOGICAL EFFECTS  
Disciplinary Review

1. Ecological Effects Profile

a. Manufacturing Use

Avian acute oral toxicity data indicate diazinon is "very highly toxic" to the species tested, with LD<sub>50</sub> values ranging from 3.2 mg/kg for Red-winged Blackbirds (Hudson *et al.*, 1984, HC0STA01) to 10 mg/kg for Bobwhite Quail (Hill and Camardese, 1983, R00DI002). Avian dietary toxicity data indicate diazinon is "highly toxic" for species tested, with LC<sub>50</sub> values ranging from 167 ppm for Japanese Quail (Hill and Camardese, 1986, R00DI003) to 245 ppm for Bobwhite Quail (Hill *et al.*, 1975, 00034769).

Freshwater invertebrate acute toxicity data indicate diazinon is "very highly toxic" to the species tested, with LC<sub>50</sub> values as low as 0.2 ppb for Gammarus fasciatus (Johnson and Finley, 1980, 00003503). Freshwater fish acute toxicity data indicate diazinon is "very highly toxic" to the species tested, with LC<sub>50</sub> values as low as 90 ppb for Rainbow Trout (Johnson and Finley, 1980, 00003503). A single estuarine fish study on Sheepshead Minnow (Goodman *et al.*, 1979, R00DI008) showed diazinon to be moderately toxic at 1400 ppb.

b. Formulated Products

Avian acute oral toxicity data indicate diazinon 14G (14.3% ai granular) is "very highly toxic" to species tested (LD<sub>50</sub>=1.8 mg/kg for Red-winged Blackbirds; Balcomb *et al.*, 1984, R00DI0001). Microencapsulated diazinon (23% ai) is "highly toxic", on an acute oral basis, to Bobwhite Quail (LD<sub>50</sub>=108.5 mg/kg, Pennwalt, 1979, R00DI004). Microencapsulated 23% ai diazinon is also "highly toxic" to birds on a dietary basis (LC<sub>50</sub>=345 ppm for Bobwhite Quail; Pennwalt, 1979, R00DI004). Data indicate AG500 (48% ai EC) is "highly toxic" to Japanese Quail tested in dietary studies (LC<sub>50</sub>=101 ppm, Hill and Camardese, 1986, R00DI003). The 53% ai wettable powder is also "highly toxic" to Bobwhite Quail on a dietary basis (LC<sub>50</sub>=140 ppm, Woodard Research Corp., 1964, 00104923).

Microencapsulated diazinon (23% ai) is "very highly toxic" to freshwater invertebrates (LC<sub>50</sub>=.522 ppb for Daphnia magna; Agchem, 1982, 00121283) and to fish (LC<sub>50</sub>=512 ppb for Bluegill Sunfish; Calmbacher, 1978, R00DI009).

Numerous pen studies have been conducted with Bobwhite Quail and waterfowl (see bird topical summary).

## 2. Ecological Hazard Assessment

Diazinon is an organophosphate insecticide presently registered in 964 end-use products for use on 127 crops and other sites (EPA Draft Index, March 13, 1986). The highest application rates are generally on citrus and vegetables (e.g., beans, beets, carrots, cabbage, radish, turnip, corn, lettuce, peas, tomatoes) with maximum rates of 10 lb ai/A. Orchard crops (e.g., almonds, apples, pears) have maximum rates of 6 lb ai/A. Grass sites have rates as high as 11 lb ai/A. Based on the Preliminary Quantitative Usage Analysis (PQUA, 1986) for diazinon, about 40% of the market is professional applicators/golf course uses, another 40% is home and garden use, and the remaining 20% is used in agriculture. In the agriculture category, the major use is on fruit and nut crops, with the largest volume of use in almonds (53,700 lb ai), followed by prune plums (41,000 lb ai) and apples (27,000 lb ai) (PQUA, 1986).

### GOLF COURSES AND SOD FARMS

Based on avian hazard, in January, 1986, the EPA initiated a Special Review of diazinon use on golf courses and sod farms. The Special Review identified an unreasonable risk to birds and proposed cancellation of diazinon use on these two sites. The scientific case for the proposed cancellation was approved by the EPA Scientific Advisory Panel in May, 1986. A public document announcing the EPA final decision to cancel diazinon use on golf courses and sod farms is scheduled for publication on September 30, 1986.

### LAWNS, PARKS AND OTHER GRASSY SITES

Hazard to birds from grassy sites such as home lawns, athletic fields, parks, etc. is substantially the same as the hazard on golf courses and sod farms. Exposure to residues on grass is the same, and data on diazinon residues on grass (Wildlife Inter., 1986, R00DI006) are applicable to these various grassy sites. The data showed average residue

per unit dose (RUD) as 53 ppm per application to turf grass of one pound active ingredient followed by irrigation with 0.25 inches water. The data were obtained from a test with the 48% ai emulsifiable concentrate.

A record of at least 30 bird kills on grassy sites such as lawns and parks supports the concern that hazardous exposure regularly and routinely occurs. In total, over 80 bird kills associated with diazinon have been reported to the EPA. Over 50 of these incidents occurred on grassy sites, including lawns, parks and golf courses.

Based upon the toxicity of diazinon, measured residues on grass, and confirmed exposure of birds to diazinon as indicated by the record of bird kills the Special Review criterion for avian hazard from use of diazinon on all grassy sites is met. No additional data are needed to permit a full hazard assessment of the avian hazard on grassy sites (see Special Review documents).

#### AGRICULTURAL AND OTHER SITES

Dietary exposure to diazinon on gardens, ornamental plantings, and crops occurs when birds feed on grass, roots, seed, nuts, grain, fruit, and/or the invertebrates associated with the site. Birds may also ingest diazinon granules accidentally while feeding. Dermal exposure to diazinon residues may also occur as they feed.

Exposure to high concentrations of diazinon in water may also occur. Rain or irrigation (watering in) after diazinon application may result in the formation of pools of contaminated water (puddling), which poses an additional hazard to birds. Irrigation is recommended by the label for control of certain pests. If the water is not immediately absorbed by the soil, puddles with high concentrations of diazinon may form.

Bird kills from diazinon application have been associated with irrigation and puddling. The Agency is concerned that even if applicators comply with label directions, diazinon may still be hazardous because of the practical difficulties in achieving proper irrigation.

In addition to the potential hazard from exposure to residues on food items, birds may accidentally ingest granules because the granules may be mistaken for dietary grit. Diazinon granules are within the size range of grit for birds, and ingestion of only a few granules has been shown to be lethal to small birds.

Over 80 bird kills associated with use of diazinon have been reported to the Agency. The record of kills, which includes applications made by trained pesticide applicators, includes grass sites, orchards, and other agricultural sites. The kills are reported from States throughout the country and occurred throughout the year. Waterfowl were frequently involved but 23 species in total have been reported as killed from exposure to diazinon.

Based upon residue data and reports of bird kills, diazinon appears to pose an extremely serious hazard to birds. Additional data are needed to permit a full hazard assessment of the avian hazard on agricultural sites. Residue monitoring is needed to help determine if hazardous residues are present on avian food items. Avian field studies are needed to determine if birds are being killed by exposure to diazinon, and if reproduction or survivorship of birds is being adversely affected by exposure to non-lethal but physiologically impairing levels of residues.

### Aquatic Hazards

EEB reviewed several valid ecological effects studies which characterize diazinon as very highly toxic to fish and aquatic invertebrates. The median lethal concentration which kills 50 percent of the test organisms (LC<sub>50</sub>) ranged, for freshwater invertebrates, from 0.2 ppb for Gammarus fasciatus and 0.522 ppb for Daphnia magna to, for fish, 90 ppb for rainbow trout and 168 ppb for Bluegill Sunfish. These data demonstrate that diazinon is very highly toxic to fish and aquatic invertebrates.

As a result of this toxicity, EEB is concerned about the hazard of diazinon to aquatic organisms. Eight fish kills that implicate diazinon have been reported to the Agency. In most cases other pesticides may have been involved and in most situations misuse appears to have occurred. In a few instances diazinon residues were found in the fish samples analysed. The reported kills include loss of 1,150 fish in

Westwood, Pennsylvania; loss of 50 fish in Chester County, Pennsylvania; loss of 1,210 fish in Honolulu, Hawaii; loss of over 100 Cutthroat Trout in Hood River, Oregon; loss of over 200 Rainbow Trout in Milton-Freewater, Oregon; loss of 35,000 suckers and sticklebacks in Sonia County, Michigan; loss of 25-50 fish in Sacramento, California; and an non-quantified loss of fish in Grove, Oklahoma.

Drift and/or runoff from application to agricultural and home sites may pose a hazard to aquatic communities. One study (Ritter et. al, 1974) reported maximum runoff of 17 ppb for diazinon. More data are necessary in order to determine the extent of aquatic hazard from agricultural and other site uses of diazinon. However, based upon the toxicity of diazinon, runoff data, and reported fish kills, diazinon appears to potentially pose an environmental hazard to nontarget aquatic organisms.

## Endangered/Threatened Species

Based on terrestrial residue analysis, aquatic runoff data, and incident data, it appears that certain use patterns of diazinon have sufficient exposure to pose a hazard to endangered/threatened species. This confirms the analysis of the various crops covered under the Cluster approach. The analysis shows hazard to birds, aquatic organisms, amphibians, reptiles and insects.

Since 1982 cotton, corn, small grains (wheat, barley, rye, and oats), sorghum, soybeans, rangeland, forest, and mosquito larvicide registrations have been reviewed under the cluster project. Diazinon has labeled uses for some of these sites. The hazard to endangered species for other uses of diazinon can be determined by review, which may or may not lead to formal consultation, or by examining consultations of pesticide with "similar" toxicity and with the same use pattern(s). In these investigations, use of diazinon was found to pose potential hazards to the following endangered species:

A. Cluster Opinions: The various cluster opinions and subsequent communications resulted in the following jeopardy findings which apply to diazinon:

- Alabama cavefish (cotton)
- Aleutian Canada goose (corn)
- Attwater's Greater Prairie chicken (corn, cotton, soybeans, sorghum)
- Bayou darter (cotton)
- Comanche Springs pupfish (cotton)
- Delta green ground beetle (corn)
- Everglade kite (corn)
- Fountain darter (cotton)
- Gila topminnow (cotton)
- Houston toad (cotton)
- Kern Primrose sphinx moth (corn and soybeans)
- Leopard darter (cotton)
- Mollusks (corn, soybeans and sorghum)
- San Marcos gambusia (cotton)
- San Marcos salamander (cotton)
- Scioto madtom (corn and soybeans)
- Slackwater darter (corn, soybeans and cotton)

A. Cluster Opinions: (continued)

Texas Blind salamander (cotton)  
Valley Elderberry Longhorn beetle (corn)  
Woundfin (corn and sorghum)

(grass and pastureland)

|                                     |                                   |
|-------------------------------------|-----------------------------------|
| Aleutian Canada goose               | Kendall warm springs dace         |
| California condor                   | Leon Springs pupfish              |
| Whooping crane                      | Fountain darter                   |
| Masked bobwhite                     | San Marcos gambusia               |
| Santa Cruz long-toed salamander     | Comanche Springs pupfish          |
| Eastern indigo snake                | Arizona (Apache) trout            |
| Hawaiian goose                      | Bonytail chub                     |
| New Mexican ridge-nosed rattlesnake | Woundfin                          |
| Mississippi sandhill crane          | Gila topminnow                    |
| San Marcos salamander               | Owens River pupfish               |
| Mollusks                            | Unarmored three-spine stickleback |
| Houston toad                        | Paiute cutthroat trout            |
| Wyoming toad                        | Little kern golden trout          |
| Slackwater darter                   | Greenback cutthroat trout         |
| Desert tortoise                     | Colorado squawfish                |
| Snail darter                        | Humpback chub                     |
| Valley elderberry longhorn beetle   | Ash Meadows speckled dace         |
| Watercress darter                   | Ash Meadows Amargosa pupfish      |
| Kern primrose sphinx moth           | Cui-ui                            |
| Alabama cavefish                    | Devils hole pupfish               |
| Delta green ground beetle           | Pahrump killifish                 |
| Okaloosa darter                     | Warm Springs pupfish              |
| Socorro isopod                      | Pahranagat bonytail               |
| Maryland darter                     | Pecos gambusia                    |
| Bayou darter                        | Gila trout                        |
| Spotfin chub                        | Chihuahua chub                    |
| Scioto madtom                       | Leopard darter                    |
| Yellowfin madtom                    | Borax Lake chub                   |
| Slender chub                        | Clear Creek gambusia              |
| Blunt-nosed leopard lizard          |                                   |

(non-crop)

Awaiting completion of Non-crop Cluster and referral to OES for formal opinion.

- B. Other opinions: Biological opinions for other pesticides with similar non-cluster uses resulted in the following conclusions consistent with diazinon listed species triggers:

Species in Jeopardy (assumptions of jeopardy)

Carbosulfan (apples and pears)

Aleutian Canada goose  
American peregrine falcon  
Blunt-nosed leopard lizard  
Mollusks  
Santa Cruz long-toed salamander  
Slackwater darter  
Valley Elderberry longhorn beetle  
Woundfin

Chlorpyrifos (alfalfa)

|                          |                       |
|--------------------------|-----------------------|
| Cui-ui                   | Pahranagat bonytail   |
| Colorado squawfish       | Pahrump killifish     |
| Comanche Springs pupfish | Pecos gambusia        |
| Fountain darter          | Sam Marcos gambusia   |
| Houston toad             | Unarmored three-spine |
| Mussels                  | stickleback           |
|                          | Woundfin              |

Chlorpyrifos (apples)  
Colorado squawfish  
Insects  
Mussels  
Pecos gambusia  
Woundfin

Chlorpyrifos (cole crops)

Listed insects  
Mussels  
Spotfin chub  
Unarmored three-spine stickleback

Chlorpyrifos (peanuts)  
Attwater's greater prairie chicken  
Mussels

Chlorpyrifos (tobacco)  
Mussels  
Slackwater darter  
Spotfin  
Yellowfin madtom

Captafol (fruits and vegetables)

- Bonytail chub
- Colorado Squawfish
- Delta green ground beetle
- Everglade kite
- Humpback chub
- Kern primrose sphinx moth
- Leopard darter
- Maryland darter
- Mussels
- Ozark cavefish
- Slackwater darter
- Slender chub
- Spotfin chub
- Unarmored three-spine stickleback
- Valley elderberry longhorn beetle
- Woundfin
- Yellowfin madtom

Endrin (sugarcane)

- Everglade kite

Furadan (rice, peanuts, grains)

- Aleutian Canada goose
- Attwater's greater prairie chicken
- Kern Primrose sphinx moth

Bolero (rice)

- Fat pocketbook pearly mussel

Bolero (celery and lettuce in Florida)

- Everglade kite

Tilt (pecans)

- Mussels

Temik (peanuts)

- Attwater's greater prairie chicken

Non-jeopardy decisions [Biological Opinions for the following active ingredients had indicated that OES considered the following uses, but did not specifically indicate jeopardy to any species resulting from their use on these sites (assumptions of non-jeopardy)]

Furadan (tobacco, peppers, sugarbeets, potatoes, sugarcane, strawberries, sweet potatoes and grapes)

Chlorpyrifos (broccoli, brussel sprouts, cabbage, citrus, cauliflower, nectarines, radish and tomatoes)

Temik (tomatoes and citrus)

Thimet (hops, tomatoes, sugarcane, sugarbeets, alfalfa, beans, lettuce, potatoes and brussel sprouts.

C. Remaining uses:

Diazinon is registered for several uses that have not been reviewed in the cluster project or in registration submissions. It is anticipated that little exposure to additional listed species will occur with the rest of the uses: almonds, banana, beans, beets, Bermudagrass, berries, cabbage, cantalope, carrots, casava melon, collards, cauliflower, cherry, clover, coffee, cowpeas, crenshaw melon, cucumbers, dewberry, endive, fig, filbert, forage-fodder, guar, honeydew melon, kale, kidney beans, lespedeza, lima beans, melons, olive, onion, parsely, parsnips, peas, pineapple, plum, prune, pumpkins, radish, spinach, squash, swiss chard, turnips, walnuts, watermelon, watercress, ornamentals, greenhouse crops, cranberries, and indoor uses. Though these (future) crop reviews may add endangered species to the list thus far established, few additions are likely due to the broad geographical distribution of the crops already reviewed (hence the likelihood that these uses will involve only those species already identified for existing crops).

The following are endangered species labeling information for Diazinon. Labels are based on the bulletin approach. It is hoped that bulletins will be ready before labels containing this endangered species information 'hit the streets'. Any labeling submitted to the Agency as a result of the Diazinon Standard or Special Review must come through EEB to ensure accuracy.

## Data Requirements

See Generic Data Requirements table.

## Labeling Requirements (Under "Environmental Hazards")

### Manufacturing-Use Products

"This pesticide is extremely toxic to fish and wildlife. Do not discharge effluent containing this product directly into lakes, streams, ponds, estuaries, oceans or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the Environmental Protection Agency." [40 CFR 156.80 (Proposed Rule, 9-26-84)]

### End-Use Products

"This pesticide is extremely toxic to fish and wildlife." [40 CFR 156.55 (Proposed Rule, 9-26-84)]

"Keep out of lakes, ponds, or streams" (40 CFR 162.10)

[Note: The following statement is currently proposed to replace the above statement: "Do not apply directly to water or wetlands (swamps, bogs, marshes, and potholes)." A shorter version of this appears in 40 CFR 156.55 [Proposed Rule, 9-26-84]

"Do not contaminate water by cleaning equipment or disposal of wastes." [40 CFR 162.10 and 40 CFR 156.55 (Proposed Rule, 9-26-84)]

"Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas." [40 CFR 156.55 (Proposed Rule, 9-26-84)]

Additional Statement for Granular End-Use Products: "Cover or incorporate granules that are spilled during loading or are visible on soil surface in turn areas." [40 CFR 156.55 (Proposed Rule, 9-26-84)]

## Classification

As per 40 CFR 162.11, Classification Criteria for Previously Registered Products, diazinon is ineligible for general use classification and should be designated as a restricted use pesticide. This classification is for all formulations and for both home and agricultural use products. The very high toxicity to birds and the record of bird kills from exposure to diazinon indicate diazinon poses lethal exposure to birds. Further, as shown below, residues are estimated to exceed 1/5 the subacute dietary LC<sub>50</sub> measured in avian test animals when diazinon is applied to grass and agricultural crops:

Mallard Duck LC<sub>50</sub> = 191 ppm      Bobwhite Quail LC<sub>50</sub> = 245 ppm

### Diazinon Residues

GRASS: Average residue per 1 lb application (RUD) = 53 ppm (Wildlife International, 1986, R00DI006). At typical application rate of 4 lb ai/A, residues estimated at 212 ppm.

FORAGE CROPS: Estimated typical residue (Kenaga, 1972): RUD = 33 ppm. At typical application rate of 6 lb ai/A, residues estimated at 198 ppm.

LEAVES AND LEAFY CROPS: Estimated typical residue (Kenaga, 1972): RUD = 35 ppm. At typical application rate of 6 lb ai/A, residues estimated at 210 ppm.

GRANULAR PRODUCTS: Diazinon granules are very highly toxic to birds: one granule of 14.3% ai killed 40% of test House Sparrows (Balcomb et al, 1984, R00DI001) and 5 granules of 14.3% ai killed 100% of test Red-winged Blackbirds (Balcomb et al, 1984, R00DI001).

Inasmuch as only a few granules are required to kill birds, residues in terms of number of granules will exceed 1/5 the LC<sub>50</sub> under all application rates and practices. Diazinon granules are of a size that birds will ingest the granules as dietary grit and also when granules are adhered to food items such as insects, leaves, and grass.

Additional Statements to Protect Endangered/Threatened Species:  
See following pages.

## ECOLOGICAL EFFECTS

### Topical Discussions

#### Effects on Birds

Thirty-two studies in 21 documents were evaluated under this topic. Twenty-nine studies were acceptable for use in a hazard assessment.

| <u>Author</u>                    | <u>Date</u> | <u>MRID No:</u> |
|----------------------------------|-------------|-----------------|
| Balcomb et al.                   | 1984        | ROODI001        |
| Fink                             | 1974        | 00109021        |
| Fink                             | 1976        | 00109015        |
| Fink                             | 1983        | 00131004        |
| Gulf South Research<br>Institute | 1968        | 00109019        |
| Hill & Camardese                 | 1983        | ROODI002        |
| Hill & Camardese                 | 1986        | ROODI003        |
| Hill et al.                      | 1975        | 00034769        |
| Hudson et al.                    | 1984        | HCOSTA01        |
| Knott et al.                     | 1973        | 00109020        |
| McEwen et al.                    | 1972        | 00058747        |
| Pennwalt                         | 1979        | ROODI004        |
| Sachsse                          | 1976        | 00109014        |
| Schafer                          | 1972        | 00020560        |
| Stromborg                        | 1975        | 00104083        |
| Stromborg                        | 1981        | ROODI010        |
| Voelker                          | 1975        | 00114052        |
| Wildlife International           | 1982        | ROODI005        |
| Wildlife International           | 1986        | ROODI006        |
| Woodard Research Corp.           | 1964        | 00104923        |

In order to establish the toxicity of diazinon to birds, the following tests are required using the technical material: Two avian dietary studies on one species of waterfowl (preferably the mallard) and on one species of upland game bird (preferably the bobwhite or other native quail or the ring-necked pheasant); one avian single-dose oral study on one species used in the avian dietary studies (preferably the mallard or bobwhite).

The acceptable acute oral toxicity data for use in a hazard assessment are listed below:

| <u>Species</u>         | <u>% ai</u> | <u>LD<sub>50</sub><br/>(mg/kg)</u> | <u>Author</u>       | <u>Date</u> | <u>Fiche<br/>ID No.</u> | <u>Fulfills<br/>Requirement</u> |
|------------------------|-------------|------------------------------------|---------------------|-------------|-------------------------|---------------------------------|
| Mallard                | 89          | 3.54                               | Hudson<br>et al.    | 1984        | HCOSTA01                | No <u>1</u> /                   |
| Ringnecked<br>Pheasant | 89          | 4.33                               | Hudson<br>et al.    | 1984        | HCOSTA01                | No <u>1</u> /                   |
| Bobwhite<br>Quail      | 99          | 10.0                               | Hill &<br>Camardese | 1983        | ROODI002                | No <u>1</u> /                   |
| Bobwhite<br>Quail      | 89          | 5.2<br>(3.5-7.6)                   | Fink                | 1976        | 00109015                | No <u>1</u> /                   |
| House<br>Sparrow       | > 90        | 7.5                                | Schafer             | 1972        | 00020560                | No <u>1</u> /                   |
| Redwinged<br>Blackbird | > 90        | 3.2                                | Schafer             | 1972        | 00020560                | No <u>1</u> /                   |

1/ In combination, these studies fulfill the Guideline requirement.

The data indicate that technical diazinon is very highly toxic to birds on an acute oral basis. The Guidelines requirement for an avian acute oral toxicity study is fulfilled.

The acceptable avian dietary toxicity studies for use in a hazard assesment are listed below:

| <u>Species</u>         | <u>% ai</u> | <u>LC<sub>50</sub><br/>(ppm)</u> | <u>Author</u>       | <u>Date</u> | <u>Fiche<br/>ID No.</u> | <u>Fulfills<br/>Requirement</u> |
|------------------------|-------------|----------------------------------|---------------------|-------------|-------------------------|---------------------------------|
| Japanese<br>Quail      | 99          | 167                              | Hill &<br>Camardese | 1986        | ROODI003                | No <u>1</u> /                   |
| Bobwhite<br>Quail      | 99          | 245                              | Hill<br>et al.      | 1975        | 00034769                | Yes                             |
| Mallard<br>Duck        | 99          | 191                              | Hill<br>et al.      | 1975        | 00034769                | Yes                             |
| Ringnecked<br>Pheasant | 99          | 244                              | Hill<br>et al.      | 1975        | 00034769                | Yes                             |

1/ Study is valid but not conducted on recommended species.

15  
CONF-50

The data indicate that technical diazinon is highly toxic to birds on a subacute dietary basis. The Guideline requirements for avian dietary studies are fulfilled.

Avian reproduction studies with technical diazinon are required by 40 CFR 158.145, since birds may be subjected to repeated exposure preceding and/or during the breeding season. Current labeling permits repeat applications for many use sites and rates (e.g., apples, cherries, citrus, grapes, peaches, strawberries, broccoli), sometimes without specific restrictions as to the number of such applications.

The following avian reproduction studies were evaluated:

| <u>Species</u>                   | <u>%ai</u> | <u>Formulation</u>                                           | <u>Author</u> | <u>Date</u> | <u>Fiche<br/>ID No</u> | <u>Results</u>                                                                              | <u>Fulfills<br/>Requirement</u> |
|----------------------------------|------------|--------------------------------------------------------------|---------------|-------------|------------------------|---------------------------------------------------------------------------------------------|---------------------------------|
| Bobwhite<br>Quail                | 48         | AG500                                                        | Stromborg     | 1981        | ROODI010               | Weight loss;<br>reduced egg<br>production<br>at 35 ppm.                                     | No                              |
| Ring-<br>necked<br>Pheas-<br>ant |            | Pen study of<br>treated corn<br>seed fed to<br>breeding hens | Stromborg     | 1975        | 00104083               | 6-12% of daily<br>daily food<br>intake equals<br>reprod. effect.<br>NOEL=1.05-2.1<br>mg/day | No                              |

These studies identify some negative effects due to three week dietary exposure to diazinon, especially weight loss and reduced egg productivity. Results are similar for both Bobwhite Quail and Ring-necked Pheasants. Avian reproduction studies with Bobwhite Quail and Mallard Ducks are required.

In addition to the above required tests with technical diazinon, special testing for avian oral and dietary toxicity with technical grade sulfotepp is required. This is necessary because certified limits for diazinon show sulfotepp contamination at levels up to 100 ppm. Under 40 CFR 158.145(b) testing may be required when, among other possible conditions, an ingredient in the end-use product other than the active ingredient is expected to enhance the toxicity of the active ingredient. Sulfotepp is very highly toxic to mammals (Rat LD<sub>50</sub>=10 mg/kg) and may be toxic to birds also.

Formulated diazinon product testing is required because the technical grade is very highly toxic to birds. Both oral and dietary testing is required.

The following acute oral studies were evaluated:

| <u>Species</u>         | <u>% ai</u> | <u>Formulation</u>     | <u>LD<sub>50</sub><br/>(mg.ai<br/>kg)</u> | <u>Author</u>       | <u>Date</u> | <u>Fiche<br/>ID No.</u> | <u>Requirement</u> |
|------------------------|-------------|------------------------|-------------------------------------------|---------------------|-------------|-------------------------|--------------------|
| Bobwhite<br>Quail      | 14          | Granular               | 8(6-11)                                   | Hill &<br>Camardese | 1983        | ROODI002                | Yes <sup>1/</sup>  |
| Bobwhite<br>Quail      | 23          | Microen-<br>capsulated | 108.5                                     | Pennwalt            | 1979        | ROODI004                | Yes <sup>1/</sup>  |
| House<br>Sparrow       | 14          | Granular               | 2.5                                       | Balcomb<br>et al.   | 1984        | ROODI001                | Yes <sup>1/</sup>  |
| Redwinged<br>Blackbird | 14          | Granular               | 1.8                                       | Balcomb<br>et al.   | 1984        | ROODI001                | Yes <sup>1/</sup>  |

<sup>1/</sup> In combination, these studies characterize the acute oral toxicity of 14G to bobwhite quail and small passerine birds. The 14G and microencapsulated product must be tested with a waterfowl. Granular products containing 2%, 5%, and 10% ai must be tested with a waterfowl and bobwhite quail. Number of granules to equal an LD<sub>50</sub> may be tested instead of mg ai/kg.

The following dietary studies were evaluated:

| <u>Species</u>    | <u>% ai</u> | <u>Formulation</u>          | <u>LC<sub>50</sub><br/>(ai;ppm)<br/>(95% CI)</u> | <u>Author</u>       | <u>Date</u> | <u>Fiche<br/>ID No.</u> | <u>Fulfills<br/>Requirement</u> |
|-------------------|-------------|-----------------------------|--------------------------------------------------|---------------------|-------------|-------------------------|---------------------------------|
| Bobwhite<br>Quail | 23          | microencap-<br>sulated      | 345                                              | Pennwalt            | 1979        | ROODI004                | Yes <sup>1/</sup>               |
| Bobwhite<br>Quail | 53          | wettable<br>powder          | 140<br>(97-205)                                  | Woodard<br>Res.Corp | 1964        | 00104923                | No <sup>3/</sup>                |
| Mallard<br>Duck   | 23          | microencap-<br>sulated      | 149<br>(107-209)                                 | Pennwalt            | 1979        | ROODI004                | Yes <sup>1/</sup>               |
| Mallard<br>Duck   | 53          | wettable<br>powder          | 180<br>(135.3-239.4)                             | Woodard<br>Res.Corp | 1964        | 00104923                | No <sup>3/</sup>                |
| Japanese<br>Quail | 48          | emulsifiable<br>concentrate | 101<br>(81-126)                                  | Hill &<br>Camardese | 1986        | ROODI003                | Yes <sup>2/</sup>               |

<sup>1/</sup> In combination these studies characterize the dietary toxicity of 23% ai microencapsulated diazinon to bobwhite quail and the mallard duck. <sup>2/</sup> The formulated product testing with the 48%

ai emulsifiable concentrate is adequate to characterize dietary toxicity to the Japanese quail but waterfowl testing must be done with this product. 3/ The 53% ai wettable powder is characterized for the mallard and the bobwhite quail.

Also evaluated were the following studies which tested for the number of granules necessary to induce avian mortality on an acute oral basis:

| <u>Species</u>      | <u>% ai</u> | <u>Formulation</u> | <u>No. Granules=<br/>% Mortality</u> | <u>Author</u>  | <u>Date</u> | <u>Fiche<br/>ID No.</u> | <u>Fulfills<br/>Requirement</u> |
|---------------------|-------------|--------------------|--------------------------------------|----------------|-------------|-------------------------|---------------------------------|
| House Sparrow       | 14          | Granular           | 1 = 40;<br>5-10 = 80                 | Balcomb et al. | 1984        | ROODI001                | No <sup>1/</sup>                |
| Redwinged Blackbird | 14          | Granular           | 5 = 100                              | Balcomb et al. | 1984        | ROODI001                | No <sup>1/</sup>                |

<sup>1/</sup> These studies characterize the acute oral toxicity in terms of number of granules necessary to induce mortality in House Sparrows and Redwinged Blackbirds.

The following field and simulated field (pen) studies were evaluated under the topic of avian hazard:

| <u>Species</u> | <u>Conditions</u>                                                                                       | <u>Results</u>                                                           | <u>Author</u>                 | <u>Date</u> | <u>Fiche<br/>ID No.</u> | <u>Fulfills<br/>Require.</u> |
|----------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------|-------------|-------------------------|------------------------------|
| Bobwhite Quail | Pen with 48%ai EC @ 1.5lb/A;<br>14.3%ai G @ 17.5 lb/A & 14.3%ai G soil incorp. @ 3-4 inches in seed bed | no effects                                                               | Gulf South Research Institute | 1974        | 00109019                | No                           |
| Bobwhite Quail | Pen with 5%ai liquid @ 3lb/1000 ft <sup>2</sup>                                                         | no effects                                                               | Fink                          | 1974        | 00109021                | No                           |
| Bobwhite Quail | Pen with 5%ai G @ approx. 20 lb/1000 ft <sup>2</sup>                                                    | 27.8% mortality in first 5 days.<br>Mortality not affected by irrigation | Knott                         | 1973        | 00109020                | No                           |

|                        |                                                                  |                                                                                                 |                      |      |          |    |
|------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------|------|----------|----|
| Bobwhite Quail         | Pen with 23%ai microencapsulated                                 | no effects                                                                                      | Pennwalt             | 1979 | ROODI004 | No |
| Mallards, Canada Geese | Pen with 48%ai EC @ 6 lb ai/A & 14.3%ai G @ 6.2 lb ai/A          | No mallard mortality, 1 mortality of goose @ 2.5 hours of first day. Weight loss for all groups | Fink                 | 1983 | 00131004 | No |
| Mallards, Canada Geese | Brain AcHE                                                       | Response dose dependent with critical level @ 10mg/kg                                           | Wildlife Inter.Ltd.  | 1982 | ROODI005 | No |
| Song Birds             | Range Spray                                                      | 3-8oz/A resulted in sig. population reductions                                                  | McEwen et al.        | 1972 | 00058747 | No |
| Canada Geese           | Turf/Pen with 48%ai EC and 0.25inches irrigation @ 2,4,6 lb ai/A | no mortality, weight losses for all groups, RUD=53ppm/lb ai/A                                   | Wildlife Inter. Ltd. | 1986 | ROODI006 | No |
| Residues               | Turf/Pen with 48%ai EC @ 6 lb ai/A & 14.3%ai G @ 6.2lb ai/A      | Max. residues of 144ppm for 48%ai EC & 19ppm for 14.3% ai G, without irrigation                 | Wildlife Inter. Ltd. | 1982 | ROODI005 | No |

These studies do not fulfill guideline requirements for field testing of formulated products using sensitive species under actual or realistically simulated test conditions.

Actual field testing with birds is required as per 40 CFR 158.145. Due to the very high acute toxicity of diazinon to birds, there is a potential hazard to wild birds at virtually any application site where they would be exposed. Also, some formulated products have been shown to be more toxic to birds than is the technical grade.

#### Test Material/Sites

The company is required to identify which formulated products are most commonly used on these sites, and these products should be tested. Also, those products with the greatest amount ai and labeled for use on these sites should be tested, for a worst-case situation.

19

### Emulsifiable Concentrate

The emulsifiable concentrate should be field tested on almonds, plums, and alfalfa.

### Granular

Granular formulations should be field tested on apples, cherries, and citrus.

### Test Parameters

Testing must include a study of dietary exposure and thorough carcass searching to determine whether there is diazinon-induced mortality, and if so, its extent. Research on the almond, apple, and alfalfa areas must also determine, by nest survey, whether avian breeding is disrupted, and collect complete natality, mortality, emigration, and immigration data.

Bird populations must be defined and a determination made if the populations are affected by use of diazinon. Multiple sites, a minimum of three sites and a control per crop, are required for all use patterns that must be tested. A minimum of two years study per site is required. Cancellation of any of the above use patterns would obviate the need for testing of such uses. However, since many crop registrations are intended to be supported by these test crops, other representative sites may be required to be substituted. Protocols that identify proposed sites and site-specific methodology must be approved by the Agency prior to initiation of the studies. Acceptable protocols must be submitted to the Agency no later than 90 days prior to the proposed date for study initiation. The studies are due 30 months from publication of this Registration Standard.

### Precautionary Labeling

As per 40 CFR 162.10 and proposed 40 CFR 156.55, the statement "This pesticide is extremely toxic to wildlife" is appropriate since the lowest avian acute oral LD<sub>50</sub> is  $\leq$  100 mg/kg, the lowest avian dietary LC<sub>50</sub> is  $\leq$  500 ppm, and approximately 80 cases are reported of avian mortality (see Disciplinary Review).

### Effects on Wild Mammals

Diazinon is considered to be only "moderately toxic" to laboratory mammals, based on acute oral LD<sub>50</sub> information

available from Toxicology Branch (see Disciplinary Review). However, diazinon has a reported two-generation reproductive no-effect level of 4 ppm for the rat, and a three-generation reproductive no-effect level of 8 ppm for the rat. Also, as previously noted, sulfotepp, a contaminant of diazinon, is very highly toxic to mammals, with a rat LD<sub>50</sub>=10 mg/kg. Residues of diazinon may approach or exceed these levels in wild mammal habitat (as adapted from Kenaga (1972): at 6 lb ai/A, estimated average residues immediately after application to forage crops may equal 193 ppm, and after six weeks, 6 ppm). For many crops repeated applications are permitted, and residues may be increased as a result. Therefore, due to concern for wild mammal exposure, additional data on wild mammals are required as per 158.145 (Guideline 71-3). The initial tests required are eight-day dietary studies, using technical and formulated materials. These tests must include an emulsifiable concentrate product and a granular material in addition to a test with technical material. The test species should be a native species of rodent (e.g., the subfamily Microtinae). These tests will provide information on a species actually exposed in the field, with an exposure more closely similar to that in the field than occurs with LD<sub>50</sub> testing. Reproductive testing may be required pending results of the dietary studies.

As previously noted, sulfotepp, is very highly toxic in laboratory tests with rats. Special testing for toxicity of sulfotepp to wild mammals is required.

#### Effects on Freshwater Invertebrates

Six studies, within three references, were evaluated under this topic. All were acceptable for use in hazard evaluation.

| <u>Author</u>    | <u>Date</u> | <u>MRID No.</u> |
|------------------|-------------|-----------------|
| Vilkas           | 1976        | 00109022        |
| Johnson & Finley | 1980        | 00003503        |
| Agchem           | 1982        | 00121283        |

The minimum data required to establish the acute toxicity of diazinon to freshwater invertebrates are the results of an acute LC<sub>50</sub> study using technical diazinon.

The acceptable studies are listed below:

| <u>Species</u>            | <u>% ai</u> | LC <sub>50</sub><br>and<br>95% CI<br>(ug/L) | <u>Author</u>       | <u>Date</u> | <u>MRID</u><br><u>No.</u> | <u>Fulfills</u><br><u>Guideline</u><br><u>Requirement</u> |
|---------------------------|-------------|---------------------------------------------|---------------------|-------------|---------------------------|-----------------------------------------------------------|
| <u>Daphnia magna</u>      | >89         | 0.96<br>(0.83-1.1)<br>NOEL=0.56             | Vilkas              | 1976        | 00109022                  | Yes                                                       |
| <u>Daphnia pulex</u>      | 89          | 0.8<br>(0.6-1.1)                            | Johnson &<br>Finley | 1980        | 00003503                  | Yes                                                       |
| <u>Gammarus fasciatus</u> | 89          | 0.2<br>(0.15-0.28)                          | Johnson &<br>Finley | 1980        | 00003503                  | Yes                                                       |
| <u>Pteronarcys</u>        | 89          | 2.5<br>(2.0-3.0)                            | Johnson &<br>Finley | 1980        | 00003503                  | Yes                                                       |
| <u>Simocephalus</u>       | 89          | 1.4                                         | Johnson &<br>Finley | 1980        | 00003503                  | Yes                                                       |

There is sufficient information to place diazinon in the EEB category "very highly toxic" for all invertebrates tested. The Guideline requirement for a freshwater invertebrate LC<sub>50</sub> with technical diazinon has been met.

Testing, for acute toxicity to a freshwater invertebrate, with technical grade sulfotepp, a contaminant of diazinon is required as per 40 CRF 158.145(b) and as detailed under the avian topical review.

The following study using formulated product was evaluated:

| <u>Species</u>       | <u>% ai</u> | <u>Formulation</u>     | LC <sub>50</sub><br>(ug/L) | <u>Author</u> | <u>Date</u> | <u>Fiche</u><br><u>ID No</u> | <u>Fulfill</u><br><u>Require.</u> |
|----------------------|-------------|------------------------|----------------------------|---------------|-------------|------------------------------|-----------------------------------|
| <u>Daphnia magna</u> | 23          | microencap-<br>sulated | 0.522<br>(0.459-0.585)     | Agchem        | 1982        | 00121283                     | Yes                               |

The requirement for testing for acute toxicity to a freshwater invertebrate with the 23% ai microencapsulated formulated product is fulfilled.

Acute LC<sub>50</sub> studies of freshwater invertebrates using the 48% ai emulsifiable concentrate and the 14% ai granular formulated products are required for hazard evaluation since the LC<sub>50</sub> of the technical grade of active ingredient is  $\leq$  the maximum measured residue level of 19 ppb reported in runoff water (Ritter et.al., 1974: Core study from EAB/HED).

An invertebrate life cycle study using D. magna is required as per 40 CFR 158.145 because 1) invertebrate LC<sub>50</sub> values are below 1 mg ai/L, and 2) diazinon has broad and repeated use on numerous use sites.

EEB presumes substantial acute hazard to aquatic invertebrates from diazinon (see 40 CFR 154.7). Estimates of aquatic exposure are greater than many acute LC<sub>50</sub> values, and aquatic field kills have been reported (see Disciplinary Review).

Aquatic residue monitoring and field studies are required of formulated materials. These studies are detailed under the section concerning effects on freshwater fish.

#### Precautionary Labeling

Labeling for aquatic invertebrate hazard is not specified by current 40 CFR 162.10. Proposed 40 CFR 156.55 indicates that a specific statement is not required for invertebrates since a hazard statement is already specified for fish (see below).

#### Effects on Freshwater Fish

Fourteen studies, within five references, were evaluated under this topic. Thirteen studies are acceptable for use in hazard assessment.

| <u>Author</u>           | <u>Date</u> | <u>MRID No.</u> |
|-------------------------|-------------|-----------------|
| Johnson & Finley        | 1980        | 00003503        |
| Allison & Hermanutz     | 1977        | ROODI007        |
| Goodman, <u>et. al.</u> | 1979        | ROODI008        |
| Woodard Research Corp.  | 1964        | 00104923        |
| Calmbacher              | 1978        | ROODI0009       |

The minimum data required to establish the acute toxicity of diazinon to freshwater fish are the results from two 96-hour LC<sub>50</sub> studies using technical material, one using a coldwater species (preferably the rainbow trout), and one using a warmwater species (preferably the bluegill sunfish).

The acceptable studies are listed below:

| <u>Species</u>      | <u>% ai</u> | <u>LC<sub>50</sub><br/>and<br/>95% CI<br/>(ug/L)</u> | <u>Author</u>          | <u>Date</u> | <u>Fiche<br/>ID No</u> | <u>Fulfills<br/>Requirements</u> |
|---------------------|-------------|------------------------------------------------------|------------------------|-------------|------------------------|----------------------------------|
| Bluegill<br>Sunfish | 92          | 168<br>(120-220)                                     | Johnson &<br>Finley    | 1980        | 00003503               | Yes                              |
| Bluegill<br>Sunfish | 92          | 460                                                  | Allison &<br>Hermanutz | 1977        | ROODI007               | Yes                              |
| Bluegill<br>Sunfish | 91          | 136<br>(100-186)                                     | Woodard Res.<br>Corp.  | 1964        | 00104923               | Yes                              |
| Rainbow<br>Trout    | 89          | 90                                                   | Johnson &<br>Finley    | 1980        | 00003503               | Yes                              |
| Rainbow<br>Trout    | 91          | 400<br>(230-700)                                     | Woodard Res.<br>Corp.  | 1964        | 00104923               | Yes                              |
| Cutthroat<br>Trout  | 92          | 1700<br>(1390-2090)                                  | Johnson &<br>Finley    | 1980        | 00003503               | Yes                              |
| Lake Trout          | 92          | 602<br>(400-906)                                     | Johnson &<br>Finley    | 1980        | 00003503               | Yes                              |
| Fathead<br>Minnow   | 92          | 7800                                                 | Allison &<br>Hermanutz | 1977        | ROODI007               | No                               |
| Flagfish            | 92          | 1600                                                 | Allison &<br>Hermanutz | 1977        | ROODI007               | No                               |
| Brook<br>Trout      | 92          | 770                                                  | Allison &<br>Hermanutz | 1977        | ROODI007               | No                               |

There is sufficient information to characterize diazinon as "very highly toxic" to all of the fish species tested. The Guideline requirement for freshwater fish acute LC<sub>50</sub> data with technical material has been met.

Testing with technical grade sulfotepp is required as per 40 CFR 158.145(b) and as detailed in the avian topical review section.

Two acceptable 96-hour LC<sub>50</sub> studies have been conducted

with formulated material as follows:

| <u>Species</u>                                    | <u>Formu-<br/>lation<br/>&amp; % ai</u> | <u>LC<sub>50</sub><br/>and<br/>95% CI<br/>(ug/L)</u> | <u>Author</u> | <u>Date</u> | <u>Fiche<br/>ID No</u> | <u>Fulfills<br/>Guideline<br/>Requirements</u> |
|---------------------------------------------------|-----------------------------------------|------------------------------------------------------|---------------|-------------|------------------------|------------------------------------------------|
| Bluegill<br>Sunfish (mic-<br>roencap-<br>sulated) | 23                                      | 512<br>(392-672)                                     | Calmbacher    | 1978        | ROODI009               | Yes                                            |
| Rainbow<br>Trout (mic-<br>roencap-<br>sulated)    | 23                                      | 635<br>(420-960)                                     | Calmbacher    | 1978        | ROODI009               | Yes                                            |

The testing required for 23% ai microencapsulated products is fulfilled.

A fish embryolarvae study is required as per 40 CFR 158.145 because 1) fish LC<sub>50</sub> values are below 1 mg ai/L, and 2) diazinon has broad and repeated use on numerous use sites.

Following submission and review of the fish embryolarvae study specified above, a fish full life cycle study may be required as per 40 CFR 158.145.

EEB presumes substantial acute hazard to fish from diazinon (see 40 CFR 154.7). Estimates of aquatic exposure are greater than many acute LC<sub>50</sub> values, and aquatic field kills have been reported. Aquatic residue monitoring is required on alfalfa, almonds, apples, citrus, and cranberry sites.

Additional residue monitoring studies are reserved pending results of these studies. Full field testing examining effects on aquatic invertebrates and fish in addition to residue monitoring is required on alfalfa, almonds, apples and citrus. Additional field testing may be required on other sites pending results from these tests.

Cancellation of any of the above use patterns would obviate the need for testing of these uses. However, since further studies are pending the results of the above initial testing, other sites may be required to be substituted. Protocols for conducting the studies must be submitted to the Agency for review and approval well in advance of the anticipated study initiation.

### Precautionary Labeling

As per 40 CFR 162.10 and proposed 40 CFR 156.155, the statement "This pesticide is extremely toxic to fish" is required, based on toxicity data and reported fish kills.

### Effects on Estuarine and Marine Organisms

Acute toxicity studies with estuarine and marine organisms are needed for hazard evaluation as per 40 CFR 158.145 due to existing registrations on crops (e.g., cotton, soybeans) with greater than 300,000 acres in coastal counties of the U.S.

One study under one citation was evaluated. The study was acceptable for use in a hazard assessment.

| <u>Species</u>       | <u>%ai</u> | <u>LC50</u><br><u>(ug/L)</u> | <u>Author</u>             | <u>Date</u> | <u>Fiche No</u> | <u>Fulfills</u><br><u>Requirement</u> |
|----------------------|------------|------------------------------|---------------------------|-------------|-----------------|---------------------------------------|
| Sheepshead<br>Minnow | >89        | 1400                         | Goodman<br><u>et. al.</u> | 1979        | ROODI008        | Yes <sup>1/</sup>                     |

1/ This study fulfills the portion of the data requirement concerning testing with a fish.

This study fulfills the requirement to test for toxicity to a fish, but testing must be done with a shrimp and oyster.

## Ecological Effects

The following studies were sent to EEB via the Pesticide Document Management System (PDMS) but are not cited in the Topical Discussions. They received only abbreviated reviews.

| <u>Author</u>              | <u>Mrid No.</u> |
|----------------------------|-----------------|
| Bathe <u>et al</u>         | 00109024        |
| DeWitt <u>et al</u>        | 00030114        |
| Fink                       | 00114081        |
| Heath <u>et al</u>         | 00058746        |
| Hill <u>et al</u>          | 00022923        |
| Posner & Reimer            | 00109012        |
| Sanders                    | 00097842        |
| Scott & Sons               | 00004352        |
| US Fish & Wildlife Service | 00014476        |

[DIAZINON ENDANGERED SPECIES LABELING INFORMATION FOR CROP USES]

ENDANGERED SPECIES RESTRICTIONS

The use of any pesticide in a manner that may kill or otherwise harm an endangered or threatened species or adversely modify their habitat is a violation of federal laws. The use of this product is controlled to prevent death or harm to endangered or threatened species that occur in the following counties or elsewhere in their range.

Before using this pesticide in the following counties you must obtain the EPA Cropland Endangered Species Bulletin. The use of this pesticide is prohibited in these counties unless specified otherwise in the Bulletin. The EPA Bulletin is available from either your County Agricultural Extension Agent, the Endangered Species Specialist in your State Wildlife Agency Headquarters or the appropriate Regional Office of either the U.S. Fish and Wildlife Service (FWS) or the U.S. Environmental Protection Agency. THIS BULLETIN MUST BE REVIEWED PRIOR TO PESTICIDE USE.

| STATE (Regional office FWS)<br>Species | COUNTY     |             |
|----------------------------------------|------------|-------------|
| ALABAMA (Atlanta, GA.)                 | LAUDERDALE | MADISON     |
| Slackwater darter                      | LIMESTONE  |             |
| Alabama cavefish                       | LAUDERDALE |             |
| Freshwater mussels                     | COLBERT    | MARSHALL    |
|                                        | JACKSON    | MORGAN      |
| ARIZONA (Albuquerque, N.M.)            |            |             |
| Woundfin                               | MOHAVE     |             |
| Bonytail chub                          | MOHAVE     |             |
| Gila topminnow                         | GRAHAM     | PINAL       |
|                                        | MARICOPA   | SANTA CRUZ  |
|                                        | PIMA       |             |
| ARKANSAS (Atlanta, GA.)                | CLAY       | RANDOLPH    |
| Freshwater mussels                     | CLARK      | SHARP       |
|                                        | CROSS      | ST. FRANCIS |
|                                        | LAWRENCE   |             |
| Ozark cavefish                         | BENTON     |             |
| Leopard darter                         | POLK       |             |

|                                      |             |                 |
|--------------------------------------|-------------|-----------------|
| CALIFORNIA (Portland, OR.)           |             |                 |
| Delta green ground beetle            | SOLANO      |                 |
| Valley elderberry<br>longhorn beetle | MERCED      |                 |
|                                      | SACRAMENTO  |                 |
| Aleutian Canada goose                | COLUSA      | SUTTER          |
|                                      | MERCED      | STANISLAUS      |
| Kern primrose sphinx moth            | KERN        |                 |
| American peregrine falcon            | HUMBOLT     | SAN LUIS OBISPO |
|                                      | LOS ANGELES | SAN MATEO       |
|                                      | MARIPOSA    | SANTA CLARA     |
|                                      | MENDOCINO   | SANTA CRUZ      |
|                                      | MONTEREY    | SONOMA          |
|                                      | SAN DIEGO   | TUOLUMNE        |
| Blunt-nosed leopard lizard           | FRESNO      | MONTEREY        |
|                                      | KERN        | SAN LUIS OBISPO |
|                                      | KINGS       | SANTA BARBARA   |
|                                      | MADERA      | STANISLAUS      |
|                                      | MERCED      | TULARE          |
| Santa Cruz long-toed<br>salamander   | MONTEREY    | SANTA CRUZ      |
| Unarmored three-spine<br>stickelback | LOS ANGELES | SANTA BARBARA   |
| COLORADO (Denver, CO.)               |             |                 |
| Colorado squawfish                   | BLANCO      | MOFFAT          |
|                                      | DELTA       | RIO             |
|                                      | GARFIELD    | ROUTT           |
|                                      | MESA        |                 |
| Humpback chub                        | MESA        |                 |
| FLORIDA (Atlanta, GA.)               |             |                 |
| Everglade Kite                       | BROWARD     | GLADES          |
|                                      | DADE        | PALM BEACH      |
| KENTUCKY (Atlanta, GA.)              |             |                 |
| Freshwater mussels                   | BALLARD     | MCCRACKEN       |
|                                      | EDMUNDSON   | PULASKI         |
|                                      | JACKSON     | ROCKCASTLE      |
|                                      | LAUREL      | WARREN          |
|                                      | MARSHALL    | WAYNE           |
| MARYLAND (Newton Corners, MA.)       |             |                 |
| Maryland darter                      | HARFORD     |                 |
| MICHIGAN (Twin Cities, MN.)          |             |                 |
| American peregrine falcon            | LEE VANAU   |                 |
| MINNESOTA (Twin Cities, MN.)         |             |                 |
| American peregrine falcon            | CHISAGO     | WABASHA         |
|                                      | DAKOTA      | WASHINGTON      |
|                                      | GOODHUE     | WINONA          |
|                                      | HOUSTON     |                 |
| MISSISSIPPI (Atlanta, GA.)           |             |                 |
| Bayou darter                         | CLAIBORNE   |                 |
|                                      | COPIAH      |                 |
| MISSOURI (Twin Cities, MN.)          |             |                 |
| Ozark cavefish                       | CHRISTIAN   | NEWTON          |
|                                      | GREENE      | BARRY           |
|                                      | JASPER      | STONE           |
|                                      | LAWRENCE    |                 |
| NEVADA (Portland, OR.)               |             |                 |
| Woundfin                             | CLARK       |                 |
| Pahrnagat bonytail                   | LINCOLN     |                 |
| Cui-ui                               | WASHOE      |                 |
| Pahrump killifish                    | CLARK       | WHITE PINE      |

| STATE (Regional office FWS)<br>Species                                                 | COUNTY                                                                               |                                                                                |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| NEW MEXICO (Albuquerque, N.M.)<br>Pecos gambusia                                       | CHAVES<br>EDDY                                                                       |                                                                                |
| NORTH CAROLINA (Atlanta, GA.)<br>Spotfin chub                                          | MACON                                                                                | SWAIN                                                                          |
| OHIO (Twin Cities, MN.)<br>Scioto madtom                                               | CHAMPAGNE<br>FRANKLIN<br>LOGAN                                                       | MADISON<br>PICKAWAY<br>UNION                                                   |
| OKLAHOMA (Albuquerque, N.M.)<br>Leopard darter<br>Ozark cavefish                       | MCCURTAIN<br>PUSHMATAHA<br>DELAWARE                                                  |                                                                                |
| OREGON (Portland, OR.)<br>American peregrine falcon                                    | CLACKAMUS <sup>R</sup><br>DOUGLAS<br>HOOD RIVER<br>JACKSON                           | MARION<br>UMATILLA<br>WASCO                                                    |
| TENNESSEE (Atlanta, GA.)<br>Slackwater darter<br>Slender chub<br>Spotfin chub          | LAWRENCE<br>WAYNE<br>CLAIBORNE<br>CUMBERLAND<br>FENTRESS                             | HANCOCK<br>MORGAN                                                              |
| Freshwater mussels                                                                     | BLOUNT<br>CLAIBORNE<br>DECATUR<br>FRANKLIN<br>HANCOCK<br>HARDIN<br>LINCOLN<br>LOUDON | MARSHALL<br>MAURY<br>RHEA<br>ROANE<br>SCOTT<br>SEQUATCHIE<br>SMITH<br>SULLIVAN |
| Yellowfin madtom                                                                       | CLAIBORNE                                                                            | HANCOCK                                                                        |
| TEXAS (Albuquerque, N.M.)<br>Attwater's Greater<br>Prairie Chicken                     | ARANSAS<br>AUSTIN<br>COLORADO<br>FORT BEND                                           | GOLIAD<br>REFUGIO<br>VICTORIA                                                  |
| Comanche Springs<br>pupfish                                                            | JEFF DAVIS<br>REEVES                                                                 |                                                                                |
| Pecos gambusia                                                                         | JEFF DAVIS<br>PECOS                                                                  | REEVES                                                                         |
| Texas blind salamander                                                                 | HAYS                                                                                 |                                                                                |
| San Marcos salamander                                                                  | COMAL                                                                                | HAYS                                                                           |
| San Marcos gambusia                                                                    | HAYS                                                                                 |                                                                                |
| Houston toad                                                                           | BASTROP<br>BURLESON                                                                  | HARRIS                                                                         |
| Fountain darter                                                                        | COMAL                                                                                | HAYS                                                                           |
| UTAH (Denver, CO.)<br>Woundfin<br>Humpback chub<br>Bonytail chub<br>Colorado squawfish | WASHINGTON<br>GRAND<br>GRAND<br>CARBON<br>DUCHESNE<br>EMERY<br>GARFIELD<br>GRAND     | KANE<br>SAN JUAN<br>UINTAH<br>WAYNE                                            |

| STATE (Regional office FWS)<br>Species | COUNTY   |             |
|----------------------------------------|----------|-------------|
| VIRGINIA (Newton Corners, MA.)         |          |             |
| Spotfin chub                           | SCOTT    | WASHINGTON  |
| Freshwater mussels                     | LEE      | TAZEWELL    |
|                                        | RUSSELL  | WASHINGTON  |
|                                        | SCOTT    | WISE        |
|                                        | SMYTH    |             |
| Yellowfin madtom                       | LEE      | SCOTT       |
|                                        | RUSSELL  |             |
| WASHINGTON (Portland, OR.)             |          |             |
| American peregrine falcon              | SKAMANIA |             |
| WISCONSON (Twin Cities, MN.)           | CRAWFORD | RICHLAND    |
| American peregrine falcon              | DANE     | SAUK        |
|                                        | DOOR     | TREMPEALEAU |

[DIAZINON LABELING INFORMATION FOR RANGE AND PASTURELAND USES]

ENDANGERED SPECIES RESTRICTIONS

The use of any pesticide in a manner that may kill or otherwise harm an endangered or threatened species or adversely modify their habitat is a violation of federal laws. The use of this product is controlled to prevent death or harm to endangered or threatened species that occur in the following counties or elsewhere in their range:

STATE (Regional Office FWS/EPA)

| <u>Species</u>                                 | <u>County</u> (unless specified otherwise)                                                                 |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| ALABAMA (Atlanta, GA.)                         |                                                                                                            |
| Alabama cavefish                               | Lauderdale                                                                                                 |
| Slackwater darter                              | Lauderdale, Limestone and Madison                                                                          |
| Snail darter                                   | Jackson and Madison                                                                                        |
| Watercress darter                              | Jefferson                                                                                                  |
| Freshwater mussels                             | Colbert, Jackson, Marshall and Morgan and Monroe                                                           |
| ARIZONA (Albuquerque, N.M./San Francisco, CA.) |                                                                                                            |
| Arizona (Apache) trout                         | Apache, Graham and Greenlee                                                                                |
| Bonytail chub                                  | Mohave                                                                                                     |
| Woundfin                                       | Mohave                                                                                                     |
| Gila and Yaqui topminnow                       | Graham, Maricopa, Pima, Pinal and Santa Cruz                                                               |
| Masked Bobwhite                                | Pima                                                                                                       |
| ARKANSAS (Atlanta, GA./Dallas, TX.)            |                                                                                                            |
| Freshwater mussels                             | Clark, Clay, Cross, Lawrence, Randolph, Sharp and St. Francis                                              |
| CALIFORNIA (Portland, OR.)                     |                                                                                                            |
| Owens River pupfish                            | Inyo and Mono                                                                                              |
| Unarmored threespine stickleback               | Los Angeles and Santa Barbara                                                                              |
| Aleutian Canada goose                          | Colusa, Merced, Stanislaus and Sutter                                                                      |
| California condor                              | Fresno, Kern, Kings, Los Angeles, Monterey, San Benito, San Luis Obispo, Santa Barbara, Tulare and Ventura |
| Blunt-nosed leopard lizard                     | Kern, Kings, Fresno, Madera, Merced, Monterey, San Luis Obispo, Santa Barbara, Stanislaus and Tulare       |

| <u>STATE (Regional Office FWS)</u><br><u>Species</u> | <u>County (unless specified otherwise)</u>                                                      |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| CALIFORNIA (continued)                               |                                                                                                 |
| Paiute cutthroat trout                               | Alpine, Madera and Mono                                                                         |
| Little Kern golden trout                             | Tulare                                                                                          |
| Santa Cruz long-toed salamander                      | Monterey and Santa Cruz                                                                         |
| Delta green ground beetle                            | Solano                                                                                          |
| Valley elderberry longhorn beetle                    | Merced                                                                                          |
| Kern Primrose sphinx moth                            | Kern                                                                                            |
| COLORADO (Denver, CO.)                               |                                                                                                 |
| Greenback cutthroat trout                            | Boulder, Larimer, Gilpin, Park and Fremont                                                      |
| Colorado squawfish                                   | Blanco, Delta, Garfield, Mesa, Moffat<br>Rio and Routt                                          |
| Bonytail chub                                        |                                                                                                 |
| Humpback chub                                        |                                                                                                 |
| FLORIDA (Atlanta, GA.)                               |                                                                                                 |
| Okaloosa darter                                      | Okaloosa and Walton                                                                             |
| Eastern indigo snake                                 | Statewide                                                                                       |
| GEORGIA (Atlanta, GA.)                               |                                                                                                 |
| Snail darter                                         | Catoosa                                                                                         |
| Eastern indigo snake                                 | S.E. Georgia                                                                                    |
| HAWAII (Portland, OR.)                               |                                                                                                 |
| Hawaiian goose                                       | Islands of Maui and Hawaii                                                                      |
| IDAHO (Portland, OR.)                                |                                                                                                 |
| Whooping crane                                       | Caribou, Bear Lake and Bonneville                                                               |
| KENTUCKY (Atlanta, GA.)                              |                                                                                                 |
| Freshwater mussels                                   | Ballard, Edmundson, Jackson, Laurel, Marshall, McCracken, Pulaski, Rockcastle, Warren and Wayne |
| MARYLAND (Newton Corners, MA./Philadelphia, PA.)     |                                                                                                 |
| Maryland darter                                      | Harford                                                                                         |
| MISSISSIPPI (Atlanta, GA.)                           |                                                                                                 |
| Bayou darter                                         | Claiborne and Copiah                                                                            |
| Mississippi sandhill crane                           | Jackson                                                                                         |

| <u>STATE (Regional Office FWS)</u><br><u>Species</u> | <u>County (unless specified otherwise)</u>                 |
|------------------------------------------------------|------------------------------------------------------------|
| NEVADA (Portland, OR./San Francisco, CA.)            |                                                            |
| Ash Meadows speckled dace                            | Nye                                                        |
| Ash Meadows Amargosa pupfish                         | Nye                                                        |
| Cui-ui                                               | Washoe                                                     |
| Devils hole pupfish                                  | Nye                                                        |
| Pahranagat bonytail                                  | Lincoln                                                    |
| Pahrump killifish                                    | Clark and White Pine                                       |
| Warm springs pupfish                                 | Nye                                                        |
| Woundfin                                             | Clark                                                      |
| NEW MEXICO (Albuquerque, N.M./Dallas, TX.)           |                                                            |
| Chihuahua chub                                       | Grant                                                      |
| Gila trout                                           | Catron and Grant                                           |
| New Mexican ridge-nosed rattlesnake                  | Hidalgo                                                    |
| Pecos Gambusia                                       | Chaves, Eddy                                               |
| Socorro isopod                                       | Socorro                                                    |
| NORTH CAROLINA (Atlanta, GA.)                        |                                                            |
| Spotfin chub                                         | Macon and Swain                                            |
| OHIO (Twin Cities, MN./Chicago, IL.)                 |                                                            |
| Scioto Madtom                                        | Champagne, Franklin, Logan, Madison,<br>Pickaway and Union |
| OKLAHOMA (Albuquerque, N.M./Dallas, TX.)             |                                                            |
| Leopard darter                                       | Pushmataha and McCurtain                                   |
| OREGON (Portland, OR./Seattle, WA.)                  |                                                            |
| Borax lake chub                                      | Harney                                                     |

STATE (Regional Office FWS)

Species

County (unless specified otherwise)

TENNESSEE (Atlanta, GA.)

Freshwater mussels

Blount, Claiborne, Decatur, Franklin,  
Hancock, Hardin, Hawkins, Lincoln,  
Loudon, Marshall, Maury, Rhea, Roane,  
Scott, Sequatchie, Smith and Sullivan

Slackwater darter

Lawrence, Wayne,

Slender chub

Claiborne and Hancock

Snail darter

Bradley, Hamilton, Knox, Loudon,  
Marion, Meigs and Polk

Spotfin chub

Cumberland, Fentress and Morgan

Yellowfin madtom

Claiborne, Hancock and Monroe

TEXAS (Albuquerque, N.M./Dallas, TX.)

Clear creek gambusia

Menard

Comanche springs pupfish

Jeff Davis and Reeves

Fountain darter

Comal and Hays

Houston toad

Bastrop, Burleson and Harris

Leon springs pupfish

Pecos

Pecos gambusia

Jeff Davis, Pecos and Reeves

San Marcos gambusia

Hays

San Marcos salamander

Hays

UTAH (Denver, CO.)

Desert tortoise

Washington

Colorado squawfish

Bonytail chub

Humpback chub

Carbon, Duchesne, Emery, Garfield,  
Grand, Kane, San Juan, Uintah and  
Wayne

Woundfin

Washington

STATE (Regional Office FWS)

| <u>Species</u>                                   | <u>County</u> (unless specified otherwise)                |
|--------------------------------------------------|-----------------------------------------------------------|
| VIRGINIA (Newton Corners, MA./Philadelphia, PA.) |                                                           |
| Slender chub                                     | Lee and Scott                                             |
| Spotfin chub                                     | Scott and Washington                                      |
| Yellowfin madtom                                 | Lee, Russell and Scott                                    |
| Freshwater mussels                               | Lee, Russell, Scott, Smyth, Tazewell, Washington and Wise |
| WYOMING (Denver, CO.)                            |                                                           |
| Kendall Warm Springs dace                        | Sublette                                                  |
| Wyoming toad                                     | Albany                                                    |
| Whooping crane                                   | Lincoln and Sublette                                      |

Before using this pesticide in the above counties you must first obtain the Rangeland Endangered Species Bulletin (EPA/ES-RANGE). The use of this pesticide is prohibited in these counties unless specified otherwise in the Bulletin. The EPA Bulletin is available from either your County Agricultural Extension Agent, the Endangered Species Specialist in your State Wildlife Agency Headquarters or the appropriate Regional Office of either the U.S. Fish and Wildlife Service (FWS) or the U.S. Environmental Protection Agency (EPA). THIS BULLETIN MUST BE REVIEWED PRIOR TO PESTICIDE USE.

TABLE A

## GENERIC DATA REQUIREMENTS FOR DIAZINON

| Data Requirement | Composition <sup>1/</sup> | Use Pattern <sup>2/</sup> | Does EPA Have                     |                        | Bibliographic Citation | Must Additional Data Be Submitted Under FIFRA Section 3(c)(2)(B)? |
|------------------|---------------------------|---------------------------|-----------------------------------|------------------------|------------------------|-------------------------------------------------------------------|
|                  |                           |                           | Data To Satisfy This Requirement? | (Yes, No or Partially) |                        |                                                                   |

## §158.145 Wildlife and Aquatic Organisms

## AVIAN AND MAMMALIAN TESTING

|                                                               |      |                                      |                   |                   |                                           |    |
|---------------------------------------------------------------|------|--------------------------------------|-------------------|-------------------|-------------------------------------------|----|
| 71-1 - Avian Single-Dose Oral LD <sub>50</sub>                | TGAI | A, B, C, (E, I) <sup>17</sup> ,<br>H | Yes <sup>3/</sup> | No                | HC0STA01, R00DI002,<br>00109015, 00020560 | No |
| (SULFOTEPP)                                                   | TGAI | A, B, C, (E, I) <sup>17</sup> ,<br>H | No                | Yes <sup>9/</sup> |                                           |    |
|                                                               | TEP  | A, B, C, H                           | Partially         | Yes <sup>4/</sup> | R00DI001, R00DI002,<br>R00DI004           |    |
| 71-2 - Avian dietary LC <sub>50</sub>                         | TGAI | A, B, C, (E, I) <sup>17</sup> ,<br>H | Yes               | No                | 00034769                                  |    |
| (SULFOTEPP)                                                   | TGAI | A, B, C, (E, I) <sup>17</sup> ,<br>H | No                | Yes <sup>9/</sup> |                                           |    |
|                                                               | TEP  | A, B, C, H                           | Partially         | Yes <sup>5/</sup> | R00DI004, R00DI003,                       |    |
| 71-3 - Wild Mammal Toxicity                                   | TGAI | A, B, C, H                           | No                | Yes <sup>6/</sup> |                                           |    |
| (SULFOTEPP)                                                   | TGAI | A, B, C, H                           | No                | Yes <sup>9/</sup> |                                           |    |
|                                                               | TEP  | A, B, C, H                           | No                | Yes <sup>6/</sup> |                                           |    |
| 71-4 - Avian Reproduction                                     | TGAI | A, B, C, H                           | No                | Yes <sup>7/</sup> |                                           |    |
| 71-5 - Simulated and Actual Field Testing for Mammals & Birds | TEP  | A, B, C, H                           | No                | Yes <sup>8/</sup> |                                           |    |

37

TABLE A

## GENERIC DATA REQUIREMENTS FOR DIAZINON (cont)

| Data Requirement                                                 | Composition <sup>1/</sup> | Use Pattern <sup>2/</sup>         | Does EPA Have Data To Satisfy This Requirement? (Yes, No or Partially) | Bibliographic Citation | Must Additional Data Be Submitted Under FIFRA Section 3(c)(2)(B)? |
|------------------------------------------------------------------|---------------------------|-----------------------------------|------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------|
| <u>AQUATIC ORGANISM TESTING</u>                                  |                           |                                   |                                                                        |                        |                                                                   |
| 72-1 - Freshwater Fish LC <sub>50</sub>                          | TGAI                      | A, B, C, (E, I) <sup>17, 18</sup> | Yes                                                                    | 00003503               | No                                                                |
| (SULFOTEPP)                                                      | TGAI                      | A, B, C, H                        | No                                                                     |                        | Yes <sup>9/</sup>                                                 |
|                                                                  | TEP                       | A, B, C, H                        | Partially                                                              | ROODI009               | Yes <sup>10/</sup>                                                |
| 72-2 - Acute LC <sub>50</sub> Aquatic Invertebrates              | TGAI                      | A, B, C, (E, I) <sup>17, H</sup>  | Yes                                                                    | 00109022, 00003503     | No                                                                |
| (SULFOTEPP)                                                      | TGAI                      | A, B, C, H                        | No                                                                     |                        | Yes <sup>9/</sup>                                                 |
|                                                                  | TEP                       | A, B, C, H                        | Partially                                                              | 00121283               | Yes <sup>10/</sup>                                                |
| 72-3 - Acute LC <sub>50</sub> Estuarine and Marine Organisms     | TGAI                      | A, B, C                           | Partially                                                              | ROODI008               | Yes <sup>11/</sup>                                                |
|                                                                  | TEP                       | A, B, C                           | No                                                                     |                        | Reserved <sup>12/</sup>                                           |
| 72-4 - Fish Early Life-Stage and Aquatic Invertebrate Life-Cycle | TGAI                      | A, B, C                           | No                                                                     |                        | Yes <sup>13/</sup>                                                |
| 72-5 - Fish Life-Cycle                                           | TGAI                      | A, B, C, H                        | No                                                                     |                        | Reserved <sup>14/</sup>                                           |
| 72-6 - Aquatic Organism Accumulation                             | TGAI                      | A, B, C                           | No                                                                     |                        | Yes <sup>15/</sup>                                                |
| 72-7 - Simulated or Actual Field Testing for Aquatic Organisms   | TEP                       | A, B, C, H                        | No                                                                     |                        | Yes <sup>16/</sup>                                                |

38

TABLE A

## GENERIC DATA REQUIREMENTS FOR DIAZINON (cont)

| Data Requirement                                | Composition/<br>Pattern <sup>2</sup> /<br>Use | Does EPA Have<br>Data To Satisfy<br>This Requirement?<br>(Yes, No or<br>Partially) | Biblio-<br>graphic<br>Citation | Must Additional<br>Data Be Sub-<br>mitted Under<br>FIFRA Section<br>3(c)(2)(B)? |
|-------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------|--------------------------------|---------------------------------------------------------------------------------|
| <u>§158.150 Plant Protection</u>                |                                               |                                                                                    |                                |                                                                                 |
| <u>TARGET AREA PHYTOTOXICITY</u>                |                                               |                                                                                    |                                |                                                                                 |
| 121-1 - Target area<br>Phytotoxicity            | TEP                                           | No                                                                                 |                                | No                                                                              |
| <u>NONTARGET AREA PHYTOTOXICITY</u>             |                                               |                                                                                    |                                |                                                                                 |
| TIER I                                          |                                               |                                                                                    |                                |                                                                                 |
| 122-1 - Seed Germination/<br>Seedling Emergence | TGAI                                          | No                                                                                 |                                | Yes                                                                             |
| 122-1 - Vegetative Vigor                        | TGAI                                          | No                                                                                 |                                | Yes                                                                             |
| 122-2 - Aquatic Plant Growth                    | TGAI                                          | No                                                                                 |                                | Yes                                                                             |
| TIER II                                         |                                               |                                                                                    |                                |                                                                                 |
| 123-1 - Seed Germination/<br>Seed Emergence     | TGAI                                          | No                                                                                 |                                | Reserved <sup>19</sup> /                                                        |
| 123-1 - Vegetative Vigor                        | TGAI                                          | No                                                                                 |                                | Reserved <sup>19</sup> /                                                        |
| 123-2 - Aquatic Plant<br>Growth                 | TGAI                                          | No                                                                                 |                                | Reserved <sup>19</sup> /                                                        |
| TIER III                                        |                                               |                                                                                    |                                |                                                                                 |
| 124-1 - Terrestrial Field                       | TGAI                                          | No                                                                                 |                                | Reserved <sup>20</sup> /                                                        |
| 124-2 - Aquatic Field                           | TGAI                                          | No                                                                                 |                                | Reserved <sup>20</sup> /                                                        |

39

TABLE A

GENERIC DATA REQUIREMENTS FOR DIAZINON (cont)

FOOTNOTES

- 1/ Composition: TGAI = Technical grade of the active ingredient; TEP = Typical end-use product.
- 2/ The use patterns are coded as follows: A = Terrestrial, Food Crop; B = Terrestrial, Nonfood; C = Aquatic, Food Crop; D = Aquatic, Nonfood; E = Greenhouse, Food Crop; F = Greenhouse, Nonfood; G = Forestry; H = Domestic Outdoor; I = Indoor.
- 3/ None of the studies fulfills the requirement individually, but the combination of all studies does fulfill the requirement.
- 4/ Avian single-dose oral LD50 testing with waterfowl and upland gamebird species required with granular products containing 2%, 5%, and 10% ai, and with emulsifiable concentrate products containing 3%, 12.5%, 20%, 32%, and 48% ai.
- 5/ Avian dietary LC50 testing with waterfowl and upland gamebird species required with emulsifiable concentrate products containing 3%, 12.5%, 20%, and 32% ai. Testing with waterfowl species with 48% ai emulsifiable concentrate product is required.
- 6/ An eight-day dietary study is required as per 40 CFR 158.145 to provide information on a species actually exposed in the field, with a dietary feeding type of ingestion. Test species should be a native species of rodent. Technical grade ai plus 5% and 14.3% ai granular products and 3%, 20%, 32%, and 48% ai emulsifiable concentrate products should be tested.
- 7/ Avian reproduction studies with technical grade ai are required for an upland gamebird and waterfowl species. The standard protocol, as in the guidelines, should be expanded to include behavioral monitoring for such effects as decreased nest attentiveness (i.e., birds must be allowed to naturally incubate eggs). Protocol must be submitted to Agency for approval a minimum of 90 days prior to anticipated date of test initiation.

TABLE A

GENERIC DATA REQUIREMENTS FOR DIAZINON (cont)

- 8/ Actual field testing with birds is required as per 40 CFR 158.145. With a 48% ai emulsifiable concentrate product, initial crops to be tested are almonds, plums, and alfalfa. With a 14.3% ai granular product, initial crops to be tested are citrus, cherries, and apples. Initial testing must include 3 sites plus a control in one location per crop, residue analysis of avian food items, and carcass searching to determine the extent of diazinon-induced mortality. These are single use season studies for the plum, citrus and cherry crops. The research on the almond, alfalfa and apple sites must additionally determine by nest survey whether avian breeding is disrupted, and must obtain natality, mortality, emigration and immigration data. The duration for these studies on almond, alfalfa, and apple sites is a minimum of two (2) years. Additional field testing is reserved pending results of these studies.

Cancellation of any of the above use patterns would obviate the need for testing of these uses. However, since further studies are pending the results of the above initial testing, other sites may be required to be substituted. Protocols for conducting the studies, including quantitative descriptions of the proposed test sites and detailed descriptions of proposed methodology and sample sizes, must be submitted to the Agency no later than 90 days prior to the anticipated date of study initiation. The study is due 30 months from publication of this Registration Standard.
- 9/ Technical sulfotepp, a very highly toxic contaminant of diazinon, must be tested for acute toxicity to wild mammals, birds, freshwater invertebrates, and fish as per guideline procedures for basic tests.
- 10/ Acute EC50 studies with a freshwater invertebrate and warm and cold water fish species are required. Formulated products to be tested include a 14.3% ai granular product and a 48% ai emulsifiable concentrate.
- 11/ Acute toxicity testing with the technical grade ai is required because diazinon is labeled for use on crops grown in more than 300,000 acres in coastal counties. Shrimp and oyster tests are required.
- 12/ Formulated product testing for acute toxicity to estuarine and marine organisms is reserved pending the results of testing with technical grade ai.
- 13/ Both the fish early life stage and aquatic invertebrate life cycle studies are required.

TABLE A

GENERIC DATA REQUIREMENTS FOR DIAZINON (cont)

- 14/ Testing is reserved pending the results of the the fish early life-stage testing.
- 15/ Testing is required as per 158.165.5 Environmental Chemistry Data Requirements (Exposure Assessment Branch).
- 16/ Aquatic residue monitoring is required on a cranberry crop. A minimum of three sites for cranberry monitoring is required; the study duration is a single use season. Additional residue monitoring studies are reserved pending results of this study. Full field testing, plus aquatic residue monitoring, to exam effects on aquatic invertebrates and fish is also required on alfalfa, almonds, apples, and citrus. A minimum of three sites per crop are required. The study duration is a minimum of two (2) years. Mesocosm studies are an alternative to full field testing, and would satisfy both residue and full field study requirements for the above crops. Additional field testing may be required on other sites pending results of these initial studies. Cancellation of any of the above uses would obviate the need for testing of those uses. However, since further studies are pending the results of the above initial testing, other sites may be required to be substituted. Protocols for conducting the studies, including quantitative descriptions of the proposed test sites and detailed descriptions of proposed methodology and sample sizes, must be submitted to the Agency no later than 90 days prior to the anticipated date of study initiation. The study is due 30 months from publication of this Registration Standard.
- 17/ To support the manufacturing use product used to reformulate the end-use product.
- 18/ Only one species is required.
- 19/ Reserved pending results of Tier 1.
- 20/ Reserved pending results of Tier 11.