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SHAUGHNESSEY NO.

REVIEW NO.

EEB BRANCH REVIEW

DATE: IN 10-14-82 OUT 12-16-82

FILE OR REG. NO. 7969-53

PETITION OR EXP. PERMIT NO.

DATE OF SUBMISSION 10-5-82

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RD REQUESTED COMPLETION DATE 12-22-82

EEB ESTIMATED COMPLETION DATE 12-15-82

RD ACTION CODE/TYPE OF REVIEW 336/Resubmission-Amendment - New Food/Feed Uses

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

DATA ACCESSION NOS(S).

PRODUCT MANAGER NO. H. Jacoby (21)

PRODUCT NAME(S) Ronilan 50 W

COMPANY NAME Basf Wyandotte Corporation

SUBMISSION PURPOSE Proposed Conditional Registration of stonefruit crops

| SHAUGHNESSEY NO. | CHEMICAL, & FORMULATION | % A.I. |
|---|---|---|
| 113201 | 3-(3,5-Dichlorophenyl)-5-Ethenyl-5-Methyl-2,4-Oxazolidinedione | 50% |
| | Inert Ingredients | 50% |

Ronilan Fungicide 50W

100 Pesticide Label Information

100.1 Pesticide Use

Ronilan is a contact fungicide to be used to control brown rot (blossom blight and fruit rot stages) of stonefruit.

100.2 Formulation Information

3-(3,5-Dichlorophenyl)-5-Ethenyl-5-Methyl-2,4-Oxazolidinedione .....50%
Inert Ingredients .....50%

100.3 Application Methods, Directions, Rate

Time and Rate of Application: On stonefruit, two applications (minimum) should be made for control of brown rot blossom and twig blight and two applications for control of fruit brown rot as specified below (see table). Additional blossom sprays may be needed if disease conditions persist.

| Application | Crop | Timing | Rate *Low Disease Pressure | Rate *High Disease Pressure |
|---|---|---|---|---|
| Brown Rot Blossom and Twig Blight | | | | |
| First | Apricots | Bud swell to Red Bud | 3/4 lb. product per 100 gal. on a dilute spray basis not to exceed 1 1/2 lb. product per acre | 1 lb. product per 100 gal. on a dilute spray basis not to exceed 2 lb. product per acre |
| | Cherries | Bud swell to early popcorn | | |
| | Nectarines | Bud swell to pink bud | | |
| | Peaches | Bud swell to pink bud | | |
| | Plums | Bud swell to green tip | | |
| | Prunes | Bud swell to green tip | | |
| Second | Same as Above | 14 days after first application | | |
| Subsequent | Up to 3 additional blossom sprays may be needed on a 7-10 day interval if wet conditions which favor disease occur. | | | |
| | | | | |
| Fruit Brown Rot | | | 3/4 lb product per 100 gal. on a dilute spray basis not to exceed 1 1/2 lb. product per acre. | 1 lb. product per 100 gal. on a dilute spray basis not to exceed 2 lb product per acre |
| First | Same as above | 21 days before harvest | | |
| Second | Same as above | 10-14 days before harvest | | |

* Based on previous history of disease infestation in the orchard or adjacent orchards.

Method of Application: Applications made in accordance with good orchard spray practice that provide thorough coverage of the trees will give good results. Spray volume should be determined by tree size, stage of crop development and equipment being used.

Amount, Frequency and Time of Application

Up to five applications may be made to control blossom and twig blight as follows-two applications initially at a 14-day interval followed by three applications at 7-10 day intervals, if needed. Then, two more applications may be made to control fruit rot as follows - the first application may be made 21 days before harvest and the second, 10-14 days before harvest. Depending on disease pressure, up to 2 lbs product per acre per application may be needed for a total of 14 lbs. product per acre per season. A preharvest interval of 3 days is imposed.

100.4 Target Organisms

Brown rot (blossom blight and fruit rot stages) of stonefruit.

100.5 Precautionary Labeling

The following environmental hazards labeling appears on the proposed label:

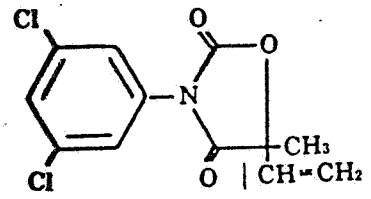
> Do not apply directly to wetlands and other water bodies.
> Do not contaminate water by cleaning of equipment or disposal of wastes.

101 Physical and Chemical Properties

101.1 Chemical Name

3-(3,5-Dichlorophenyl)-5-Ethenyl-5-Methyl-2,4-Oxazolidinedione

101.2 Structural Formula




101.3 Common Name

Vinclozolin; BAS 352 04F

101.4 Trade Name

Ronilan Fungicide 50W

101.5 Molecular Weight

286.1

101.6 Physical State

State - solid

Color - white

Odor - slight odor, characteristic of aromatic compounds

101.7 Solubility (g compound in 100g solvent at 20°C)

| | | | |
|---|---|---|---|
| Water - | <0.1 | cyclohexane - | 0.9 |
| ethyl alcohol - | 1.4 | ether - | 6.3 |
| acetone - | 43.5 | benzene - | 14.6 |
| ethylacetate - | 25.3 | Chloroform - | 31.9 |

102 Behavior in the Environment

102.1 Soil

Taken from Environmental Chemistry EUP review for Ronilan on strawberries; E.B. Britton 6/16/78. The aerobic study was conducted for 240 days at 20°C on a standard loamy soil (2.5% OM, 40% wet, pH 6.8) spiked with BAS 325F ($^{14}$C-phenyl) at 7.0 ppm. The data show that about 99.5% of the applied remained after 45 days, either bound (38%), as metabolite B (10%) or as extractable parent (37%).

102.2 Water

(From Environmental Chemistry EUP review for Ronilan on strawberries; E.B. Britton 6/16/78).

| | Parent Half-Life | |
|---|---|---|
| pH | 25°C | 45°C |
| 3 | 70 days | 12 days |
| 6 | 55 hours | 10 hours |
| 9 | 14 min. | 15 min. |

At pH's encountered under natural conditions, pH 5-7 (and also at more basic conditions) vinclozolin hydrolyzes mainly to 3,5-dichlorophenylcarbamic acid (1-carboxy-1-methyl) allyl ester (Metabolite B. N-(3,5-dichlorophenyl)-2-methyl-3-butenoic acid amide (Metabolite E) is formed mainly at more acidic conditions.

102.3 Plant

When 0.75 Kg a.i./ha (0.67 lb. a.i./acre) was applied to 1-3 cm. diameter peaches as a 50% wettable powder in an aqueous solution the half-life of the total radioactive residues was 16 days. More than 80% of the total residues was extractable at all time periods.

102.4 Animal

Taken from Temporary Tolerance and EUP review for vinclozolin on strawberries; R.A. Gessert, 4/17/78.

Metabolism; Repeated Oral Dosing in Rats:

Rats (body weight ca. 200g) were given daily oral doses of $^{14}C$-labelled vinclozolin for 7 days at ca. 40 mg/kg/day. After daily oral administration of vinclozolin, excretion of radioactivity was fairly rapid and was similar in both male and female rats. Approximately 43% and 50% of the daily administered dose was excreted in the urine and feces, respectively, during each day of the dosing period. Six days after the final dose, an average of 47% and 54% of the total dose had been excreted in urine and feces respectively. On the average, 0.1% and 0.4% of the total dose was retained in the gastrointestinal tract and liver, respectively. No radioactivity was detected in the remainder of the body six days after the final dose.

103 Toxicological Properties

103.1 References from Toxicology Branch

Rat acute oral $LD_{50}$ >10,000 mg/kg (male and female)
Guinea pig acute intraperitoneal $LD_{50}$ = 3,000 mg/kg
Rat acute intraperitoneal $LD_{50}$ = 5,000 mg/kg
Rat acute dermal $LD_{50}$ >2,500 mg/kg

103.2 Minimum Requirements

103.2.1 Avian Acute Oral $LD_{50}$

Bobwhite quail (Colinus virginianus)
$LD_{50}$ >2150 mg/kg - (96.5%)
Core - Felthousen (7/24/78)

103.2.2 Avian Dietary $LC_{50}$s

Bobwhite quail
$LC_{50}$ > 5620 ppm - (96.5%)
Core - Balcomb (5/9/78)

Mallard duck (Anas platyrhynchos)
$LC_{50}$ >5620 ppm - (96.5%)
Core - Felthousen (7/24/78)

103.2.3 Fish Acute $LC_{50}$s

Bluegill (Lepomis macrochirus)
96-hour $LC_{50}$ = 47.3 (37.1 - 60.3) ppm (96.5%)
Supplemental - Balcomb (5/9/78)

Rainbow trout (Salmo gairdneri)
96-hour $LC_{50}$ > 18 ppm (96.5%)
Supplemental - Balcomb (5/9/78)

103.2.4 Aquatic Invertebrate $LC_{50}$

Daphnia magna

48-hour $LC_{50}$ = 4.0 ppm (96.5%)
Core - Felthousen (7/24/78)

103.3 Additional Aquatic Laboratory Tests

Pumpkinseed (Lepomis gibbosus)
(96-hour $LC_{50}$ = 49.8 ppm (96.5%)
Supplemental*

Sun

*This study was determined to be acceptable to support the strawberry registration, and for other registrations that will result in a warmwater aquatic environmental concentration of less than 1/100,000th the warmwater fish 96-hour $LC_{50}$ (See EEB review by J. Leitzke 12/10/80).

103.3.1 Avian Reproduction Studies

Avian reproduction - mallard duck
Core - Tice (5/24/82)
The study indicates that mallard reproduction may be affected at exposure levels between 5 and 50 ppm if continuously available in the food. At 50 ppm, the mallard fertility rate was reduced, however, not to the point where reproduction ceased.

Avian reproduction - bobwhite quail
Core - Tice 5/24/82
The study indicates that avian reproduction is relatively unaffected at dietary exposure levels of 5 and 50 ppm. Treatment groups did exhibit a slight decrease in fertility as compared to the controls (not significant; $P<0.05$).

104 Hazard Assessment

104.1 Discussion

According to an earlier submission by the Registrant, there are six major stonefruit production areas in the U.S., which are best represented by the states of: 1) California, 2) Washington and Oregon, 3) Arkansas, 4) South Carolina, 5) New Jersey and 6) Michigan. Commercial acreages can also be found in Alabama, Delaware, Georgia, Illinois, Idaho, Indiana, Kentucky, Louisiana, Montana, New York, Pennsylvania, North Carolina, Ohio, Tennessee, Utah, Virginia, West Virginia and Wisconsin.

According to the Economics, Statistics and Cooperative Service Crop Reporting Board, U.S. Department of Agriculture, there were 1,667,600 acres of major deciduous fruits cultivated in the U.S. in 1981. Apples and grapes account for >1,000,000 acres, leaving approximately 500,000 acres covered by this request.

104.2 Likelihood of Adverse Effects to Non-Target Organisms

Assuming a direct application to water, application at recommended label rates would result in the following range of residues

| Depth of water body | Residues (ppb) |
|---|---|
| 6 in. | 551-734 |
| 1 ft. | 275-367 |
| 2 ft. | 137-183 |
| 5 ft. | 55-73 |

These residues are well below the available acute toxicity values for aquatic organisms. Minimal exposure of aquatic organisms to this pesticide is expected from the proposed use pattern.

At application rates of 0.75 - 1.0 lb. a.i./A, the following ranges of maximum residues are expected immediately after one application:

| Vegetation/Animal matter | Residues (ppm) |
|---|---|
| short rangegrass | 180-240 |
| long grass | 82-110 |
| leaves and leafy crops | 95-125 |
| forage/small insects | 44-58 |
| pods/large insects | 9-12 |
| fruit | 5.5-7 |

These residue levels are well below the available acute toxicity values for waterfowl and upland gamebirds.

However, given two applications at 1.0 lb. a.i./A (14 days apart) followed by three applications (10 days apart) at 1.0 lb. a.i./A, the following accumulated residues are expected: (See Appendix I)

Maximum Residues (ppm)

| Day | Fruit | Seeds/ Large Insects | Small Insects | Leaves/ Leafy Crops | Long Grass | Short Rangegrass |
|---|---|---|---|---|---|---|
| 0 | 5.5 | 9.0 | 44.0 | 95.0 | 82.0 | 180.0 |
| 14 | 7.37 | 12.06 | 58.0 | 127.31 | 109.89 | 241.23 |
| 24 | 9.22 | 15.09 | 73.79 | 159.33 | 137.53 | 301.90 |
| 34 | 9.77 | 15.98 | 78.16 | 168.76 | 145.67 | 319.76 |
| 44 | 10.02 | 16.40 | 80.18 | 173.12 | 149.43 | 328.03 |

According to Gusey and Maturgo (1972) avian wildlife utilization of stonefruit crops for nesting, brood-rearing and loafing is moderate to high during spring and summer. Use of cherries for food is particularly high among songbirds. Additionally birds will be feeding on plant and insect food items in and around treated areas.

Given the number of repeat applications allowed (up to 5 blossom sprays), the reported half-life on peaches (9.4 days), and the time of application (March - May) small, insectivorous birds may be exposed to prolonged residues high enough to cause reproductive effects. However, no significant population reductions are expected to result from the proposed use.

104.3 Endangered Species Considerations

No Federally listed endangered species are expected to be jeopardized by the proposed use pattern.

104.4 Adequacy of Toxicity Data

No additional fish and wildlife toxicity data were submitted with this request.

107 Conclusions

EEB has completed an incremental risk assessment (3(c)(7) Finding) of the proposed conditional registration of Ronilan for use on apricots, cherries, nectarines, peaches, plums and prunes. Based upon the available data, EEB concludes that the proposed uses provide for no significant increase in exposure or risks to nontarget organisms.

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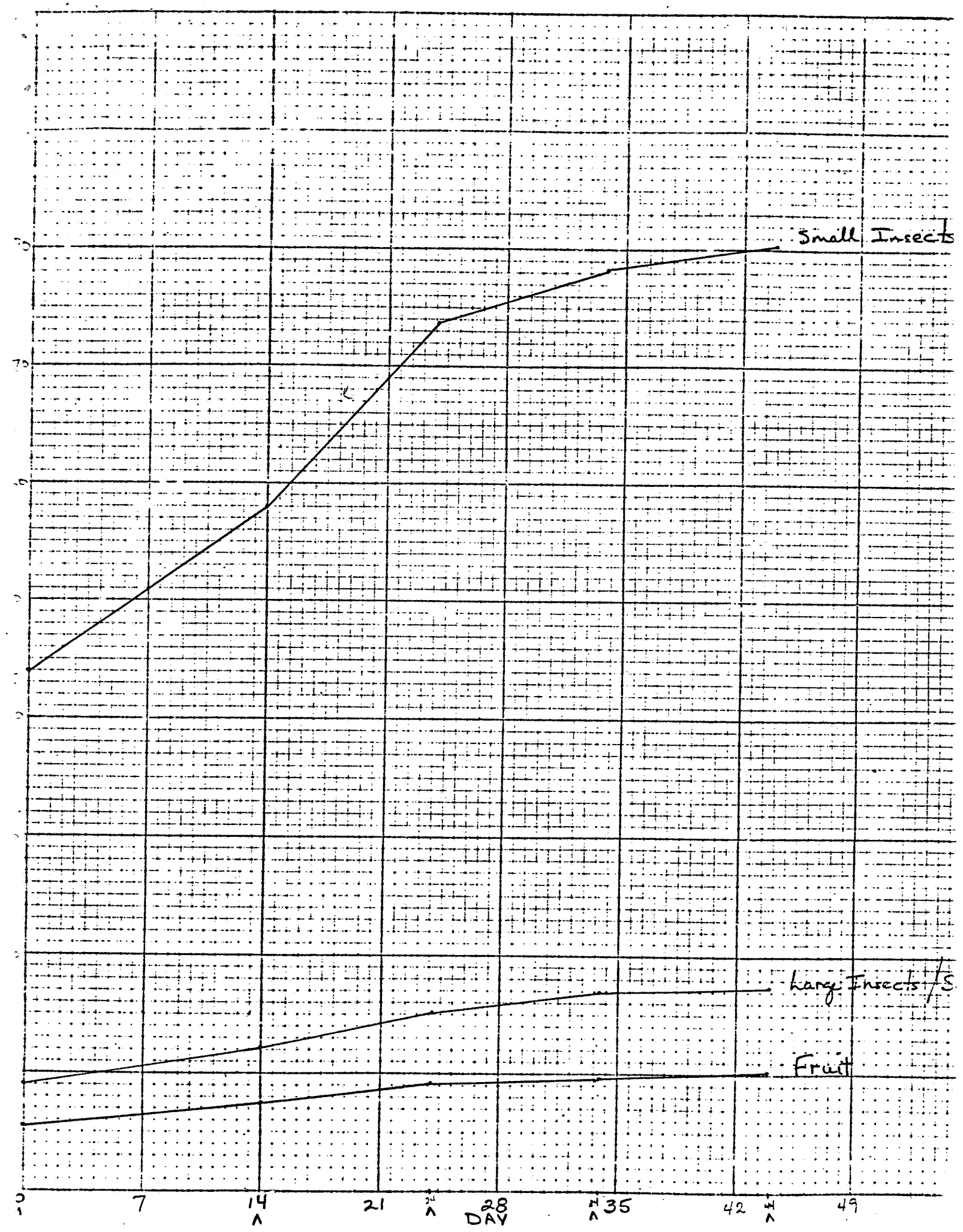
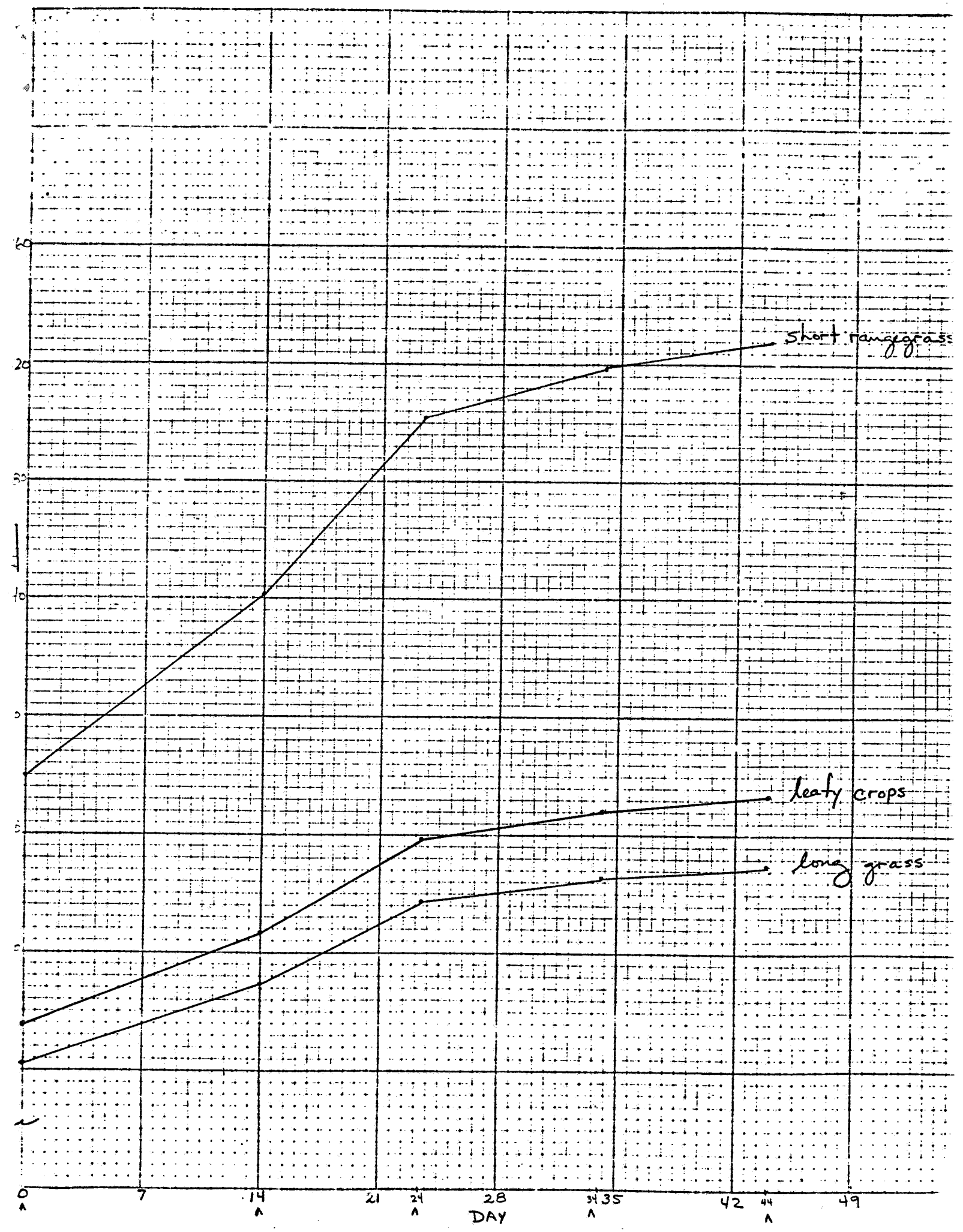
## References

Gusey, W.F. and Z.D. Maturgo. 1972. Wildlife utilization of croplands. Environmental Conservation Department, Shell Oil Co., Houston Texas.

U.S. Department of Agriculture. 1981. Agricultural Statistics 1981. United States Government Printing Office, Washington, D.C. 601 pp.

U.S. Department of Agriculture. 1975. Fruits and tree nuts: blooming, harvesting, and marketing dates. Statistical Reporting Service, Crop Reporting Board, Washington, D.C. Agricultural Handbook No. 186. 52 pp.


Small Insects
Large Insects/S
Fruit
7
14
21
28
35
42
49
DAY


60
20
10
5
0
7
14
21
24
28
34
35
42
44
49
DAY
short ranggrass
leafy crops
long grass