004805

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: January 21, 1980

SUBJECT: EPA File Symbol: 1812-EIR
Maneb; Caswell #539

FROM: Deloris F. Graham
FHB/TSS

TO: Henry Jacoby
Product Manager (21)

Applicant: Griffin Corporation
P.O. Box 1847
Valdosta, GA 31601

Active Ingredients:
Maneb 37%

Inert Ingredients 63%

Background:

Acute Oral, Acute Dermal, Acute Inhalation, Eye and Skin Irritation studies were submitted in support of the conditional registration of this product. These studies were conducted by Cannon Laboratories, Inc. of Reading, Pennsylvania. Alternate Method of Support is used.

Recommendations:

1. The Acute Oral, Acute Dermal, Eye and Skin Irritation studies are adequate and acceptable for the conditional registration of this product.

2. The Acute Inhalation study is not acceptable for conditional registration as stated in the Federal Register, Volume 43 number 163 - Tuesday August 22, 1978. Section 163.81-3 outlines acceptable testing and reporting procedures for the Acute Inhalation study. The toxicity category is based on atmospheric concentration not on the nominal concentration.

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3. FHB/TSS would have no objections, on the basis of hazard to humans and domestic animals, to the conditional registration of this product, provided that the labeling revisions noted below are made. Further revisions may be necessary in the labeling when the data required on the Inhalation study is received and reviewed.

4. According to the data, the signal word CAUTION is appropriate as proposed by the applicant.

Labeling:

1. KEEP AWAY FROM FIRE AND SPARKS must be deleted from front panel.

2. Directions concerning the storage and disposal of the pesticide and its container must appear under the heading, "Storage and Disposal" after the set of Directions for Use.

3. The statement KEEP OUT REACH OF CHILDREN should appear directly above signal word on front panel.

4. "CAUTION" should be deleted from side panel; the signal word should appear only in conjunction with statements concerning hazards to humans and domestic animals.

5. On Side Panel add the heading PRECAUTIONARY STATEMENT: Subheading - ENVIRONMENTAL HAZARD: This product is toxic to fish, etc.

6. See enclosed copy for correct labeling procedures and label format.

Review:

1. Acute Oral Toxicity Study; Cannon Lab., September 11, 1979; Accession No. 241434.

   Procedure: 5M and 5F Sprague-Dawley rats (200-263g) were administered a single oral dose of 'Manex-Flowable Maneb' at a dose level of 5g/kg, by way of oral tubation. Each animal was observed at 1, 3, and 6 hours following dosing. Each animal was observed at 1 and 3 days and daily thereafter for 14 days. At termination of study survivors were sacrificed; all animals were subjected to gross pathological examinations.

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Results: No mortalities. 7/10 animals were sedate within six hours of dosing. On day one abnormal defecation was observed in all ten animals. On day two, abnormal defecation was observed in 8/10. By day four abnormal defecation had stopped. Symptoms included nasal discharge, ptosis, piloerection. LD_{50} for M, F was greater than 5g/kg. Necropsis revealed 1M with large nodule on left lung; 1F with slightly congested lungs; no other gross pathological alterations were observed.

Study Classification: Core Guideline Data

Toxicity Category: IV-CAUTION

2. Acute Dermal Toxicity Study; Cannon Lab. September 14, 1979; Accession No. 241435.

Procedure: 5M and 5F New Zealand white rabbits (2.09 - 2.53kg) were administered 'Manex' at a dose level of 2g/kg on an abraded skin surface. Exposure was for 24 hours under occlusive wrap. Observations were made at the end of the exposure period, then daily thereafter for 14 consecutive days. Individual body weights were determined on the day of dosing, weekly thereafter, and at death. All animals were sacrificed after 14 days and subjected to gross necropsy.

Results: No mortalities. At 24 hours, 9/10 animals exhibited erythema, while one of these nine also exhibited edema. The skin sites of all animals were free of irritation at 48 hours. No pharmacotoxic signs were observed. The body weight values were within normal limits. Necropsy revealed dark red areas in the lung and white masses of the liver, but these observations were not attributed to the test material administered as these are conditions often seen in control animals.

Study Classification: Core Minimum Data.
Individual necropsy results should be reported.

Toxicity Category: III-CAUTION

3. Acute Inhalation Study; Cannon Lab., September 5, 1979; Accession No. 241437.

Procedure: 5M and 5F, Sprague-Dawley rats (211-260g) were exposed to a nominal concentration of 5.2 mg/l and the actual atmosphere concentration was 0.48 ± 0.015 mg/l for four hours. The test was conducted in a 40-liter glass exposure chamber. The sides and bottoms of the chamber had centered holes to allow access to the chamber for testing and exhaust of the atmosphere. A raised, tightly-fitting, wire mesh screen was placed over the bottom of the chamber and served as flooring for the test animals. The test substance was administered through a syringe; a syringe infusion pump was used to meter the substance into a stainless steel 1/4 J spraying atomizer.

Results: Three animals displayed nasal discharge during the last hour of the 4-hour exposure and continued for the first six hours past-exposure. All other animals appeared normal throughout the 14 day observation period. During this 14-day observation period, all male rats showed normal weight gain while all females rats showed minor weight fluctuation. Gross necropsy of all animals showed their organs within normal limits.

Study Classification: Core-Supplementary Data. Actual atmospheric concentration was too low to determine appropriate toxicity category.

4. Eye Irritation Study, Cannon Lab., September 6, 1979; Accession No. 241436.

Procedure: 0.1 ml of Manex, was applied into one eye of each of nine New Zealand white rabbits with six rabbits remaining unwashed (Group 1); while the test eyes of three rabbits were washed (Group 2) for one minute with lukewarm water beginning 20 seconds after application. The ocular reactions were graded at 24, 48, and 72 hours as well as four and seven days after application of test material.

Results: No corneal opacity or iris irritation observed in either group. At 24 hours redness observed in 6/6 unwashed eyes (2/6=1); no chemosis was observed in unwashed

eyes. Discharge observed in 6/6 unwashed eyes (3/6=1, 3/6=2) and in 3/3 washed eyes (3/3=1). All washed eyes appeared normal by day four. All unwashed eyes appeared normal by day seven.

Study Classification: Core-Guideline

Toxicity Category: III-CAUTION

5. Skin Irritation Study, Cannon Lab. September 6, 1979 Accession No. 241438.

Procedure: 2M and 4F New Zealand white rabbits were exposed to 0.5 ml dose of 'Manex.' Four test sites, two abraded and two nonabraded, were exposed for 24 hours under occlusive wrap. The test sites were evaluated at 24 and 72 hours.

Results: At 24 hours very slight erythema was observed on 7/12 abraded and 5/12 nonabraded skin sites. No edema was observed. All skin sites were free of irritation at 72 hrs. The primary dermal irritation index of 'Manex' was 0.25.

Study Classification: Core-Guideline

Toxicity Category: IV-CAUTION

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GPEE PEE

manex

maneb flowable WITH ZINC ADDED

37% MANEB DISPERSION **4 POUNDS OF MANEB PER GALLON**

Agricultural Fungicide

ACTIVE INGREDIENTS:
MANEB (MANGANESE ETHYLENEBISDITHIOCARBAMATE) . . 37%
(Total manganese as metallic.....7.6%)
INERT INGREDIENTS: 63%
100%

CAUTION: KEEP OUT OF REACH OF CHILDREN.
SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONS.
MAY CAUSE IRRITATION OF EYES, NOSE, THROAT AND SKIN. AVOID BREATHING SPRAY MIST. AVOID CONTACT WITH EYES, SKIN OR CLOTHING. IN CASE OF CONTACT, FLUSH WITH PLENTY OF WATER. FOR EYES, GET MEDICAL ATTENTION. KEEP AWAY FROM FIRE AND SPARKS.

GRIFFIN CORPORATION
VALDOSTA, GEORGIA

NET CONTENTS ________
LOT NO. ________

EPA Reg. No. 1812-
EPA Est. No. 1812 GA 3

DIRECTIONS FOR USE AS A SPRAY

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

MANEX is approved for application in sufficient water to provide good coverage with available equipment as either dilute sprays or in concentrate ground or aerial sprays. Rates listed are per acre unless otherwise noted.

AGRICULTURAL FRUIT AND NUT CROP USES

ALMONDS: Brown Rot Blossom and Twig Blight, Leaf Blight, Scab—1.2 to 1.6 quarts. Apply in prebloom, full bloom, and petal fall or every 7 to 10 days if bloom is staggered. [illegible]—1.2 to 1.6 quarts. Begin in dormant stage. Repeat at 7 to 10 day intervals through petal fall. If applied after petal fall, do not feed hulls to dairy animals or animals being finished for slaughter. Do not apply later than 5 weeks after petal fall.

APPLES: Black Rot, Bitter Rot, Botryosphaeria (White Rot), Bullseye Rot, Cedar Apple Rust, Flyspeck, Scab, and Sooty Blotch—1.2 to 1.6 quarts plus suitable spreader-sticker. Begin in prebloom, calyx, or first cover stages. Repeat at 7 to 14 day intervals as necessary. Do not graze livestock in treated areas. Do not apply within 15 days of harvest in Arkansas, Delaware, Illinois, Indiana, Kansas, Kentucky, Maryland, Missouri, New Jersey, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia and West Virginia. Do not apply within 30 days of harvest in other states.

APRICOTS: Brown Rot Blossom, Twig and Fruit—1.2 to 1.6 quarts. Begin at red bud stage. Repeat in early bloom, full bloom, petal fall and at 7 to 14 day intervals as necessary up to 2 weeks before harvest. Jacket Rot (Green Rot)—1.6 quarts at full bloom and petal fall. Shothole—1.6 quarts from dormant through petal fall stages in regular schedule. Do not apply later than 14 days before harvest.

BANANAS: Crown Rot, Surface Molds (Cladosporium, Thielaviopsis, Fusarium Species)—1.6 to 3.2 quarts per 100 gallons. Use 5.0 gallons of dilute suspension/100 trays of fruit as a post harvest spray to fruit crowns after they passage through hydrocooler or water rinse spray, or dip cut crowns in dilute suspension. Sigatoka (Cercospora musae)—2.4 to 4.0 quarts/acre in sufficient water to cover. Apply at 2 week intervals beginning at first sign of disease.

CRANBERRIES: Fruit Rots (Massachusetts)—1.6 to 2.4 quarts. Begin at midbloom. Repeat at 10 to 14 day intervals for 3 applications. Twig Blight (Lophodermium), Fruit Rots (Washington and Oregon)—1.6 quarts per 100 gallons. Apply 250.0 gallons per acre. Begin after blooming. Repeat between July 10 and 20, August 1 and 10, and August 10 and 25. Fruit Rots (Guignardia, Sporonema, and Glomerella) (New Jersey and Wisconsin)—1.6 quarts. Begin after midbloom. Repeat 10 to 14 days later, 4 weeks after midbloom, and 2 to 3 weeks later. Do not apply within 30 days of harvest.

FIGS (Rodents) Surface Molds and Rot (Alternaria, Cladosporium Species)—0.8 quart. Make one application 10 to 20 days before harvest. Do not apply within 10 days of harvest.

GRAPES: Black Rot (Bunch Rot)—1.2 to 1.6 quarts. Begin just before bloom. Repeat just after bloom and again 10 days later; do not apply later than 10 days after bloom. Or use 1.4 quarts in sufficient water/acre. Apply as necessary; do not apply within 7 days of harvest.

NECTARINES: Brown Rot, Shothole—1.2 to 1.6 quarts. Begin at red bud. Repeat in early bloom, full bloom, petal fall, and at 7 to 14 day intervals up to 2 weeks before harvest. Do not apply within 14 days of harvest.

PAPAYAS: Anthracnose (Colletotrichum), Black Spot (Cercospora)—1.6 to 2.4 quarts in sufficient water to cover (not less than 50.0 gallons) per acre. Add 4.0 ounces of spreader-sticker/100 gallons of spray suspension. Begin when fruit is set. Repeat at 10 to 14 day intervals during winter and early spring and every 7 days during wet weather. Direct spray to central column of tree to cover developing fruit.

PEACHES: Brown Rot, Scab, Shothole—See under Nectarines. Peach Leaf Curl—1.2 to 1.6 quarts. Apply in spring dormant period. Do not apply within 7 days of harvest. If applied within 14 days of harvest, remove residues by brushing.

AGRICULTURAL VEGETABLE CROP USES

ASPARAGUS: Rust—2.4 quarts/50 to 210 gallons/acre. Begin in established fields immediately after harvest. Repeat at 10 day intervals as long as necessary. In young fields which will not be harvested, begin when disease appears and repeat at 10 day intervals. Postharvest application only on established fields.

BEANS (Lima): Anthracnose, Downy Mildew—1.2 to 1.6 quarts. Begin at first sign of disease. Repeat at 4 to 7 day intervals. Do not apply within 4 days of harvest of succulent beans.

BEANS (Green and Dry): Anthracnose, Downy Mildew, Rust—1.2 to 1.6 quarts. Begin when plants are small. Repeat at 5 to 7 day intervals. Do not apply within 4 days of harvest of succulent beans.

BROCCOLI: Alternaria Leaf Spot, Downy Mildew—1.2 to 1.6 quarts. Begin when disease threatens. For downy mildew begin in plant bed and repeat at 3 day intervals. In field, repeat at 7 to 14 day intervals. If applied within 3 days of harvest, remove residues by washing or trimming.

BRUSSELS SPROUTS, CAULIFLOWER, AND KOHLRABI: Alternaria Leaf Spot, Downy Mildew—1.2 quarts. Begin when disease threatens. Repeat at 3 day intervals in plant beds and at 7 to 10 day intervals in field.

CABBAGE: Alternaria Leaf Spot, Downy Mildew—1.2 to 1.6 quarts. Begin 7 to 10 days after planting. Repeat at 3 to 5 day intervals in plant bed and field. Do not apply within 7 days of harvest.

CANTALOUPE, CASSABAS, CRENSHAWS, HONEYDEW MELONS, HONEY BALLS, MUSKMELONS, PERSIAN MELONS, AND WATERMELONS: Anthracnose, Cercospora Leaf Spot, Downy Mildew, Gummy Stem Blight—1.2 to 1.6 quarts. Begin at late bunching when vines begin to run or when disease first appears. Repeat at 7 to 10 day intervals. Do not apply within 5 days of harvest.

CARROTS: Alternaria and Cercospora Leaf Spots—1.2 to 1.6 quarts. Begin when plants are 6 weeks old. Repeat at 7 to 10 day intervals.

CASSABA MELONS: See under Cantaloupes

CAULIFLOWER: See under Brussels Sprouts

CELERY: Early Blight (Cercospora), Late Blight (Septoria)—1.2 to 1.6 quarts. Begin when plants emerge in plant beds. Repeat at 3 to 5 day intervals in plant beds and at 7 to 10 day intervals after plants are set in field. Remove excess residues by stripping, trimming, and washing. Do not apply within 14 days of harvest.

COLLARDS, KALE, MUSTARD GREENS, TURNIPS: Alternaria Leaf Spot and Downy Mildew—Use .8 to 2.4 quarts per acre and start applications when disease first appears in area and repeat at 7 to 10 day intervals. Do not apply within 10 days of harvest. Remove excess residues by washing.

CORN (Sweet): Helminthosporium Blight—1.2 quarts. Begin when plants are 6 inches high. Repeat at 4 to 7 day intervals until harvest. Do not feed treated forage to livestock.

CRENSHAW MELONS: See under Cantaloupes

CUCUMBERS: Alternaria (Macrosporium) Leaf Spot, Angular Leaf Spot, Anthracnose, Downy Mildew, Pythium Fruit Rot—1.2 to 1.6 quarts. Begin when disease threatens or plants begin to run. Repeat at 7 to 10 day intervals or at 3 to 5 day intervals under severe disease conditions. Do not apply within 5 days of harvest.

EGGPLANT: Anthracnose, Early Blight (Alternaria), Phomopsis Blight or Fruit Rot—1.2 to 1.6 quarts. Begin when fruit starts to form. Repeat at 7 to 10 day intervals.

ENDIVE, LETTUCE: Downy Mildew—1.2 to 1.6 quarts. Begin when disease appears. Repeat at 7 to 10 day intervals. Do not apply within 7 days of harvest. Remove residues from head lettuce by stripping [illegible] trimming, and from leaf lettuce and endive by washing or other effective [illegible]. Do not apply within 10 days of harvest.

HONEY BALL MELONS: See under Cantaloupes

HONEYDEW MELONS: See under Cantaloupes

KOHLRABI: See under Brussels Sprouts

LETTUCE: See under Endive

MELONS: See under Cantaloupes.

MUSKMELONS: See under Cantaloupes.

ONIONS: Botrytis Leaf Blight (Blast), Downy Mildew, Purple Blotch—1.2 to 1.6 quarts. Begin at first sign of disease. Repeat at 7 to 10 day intervals.

PEPPERS: Anthracnose, Cercospora Leaf Spot (Frogeye Spot), Ripe Rot—1.2 to 1.6 quarts. Begin when disease threatens. Repeat at 7 to 10 day intervals.

PERSIAN MELONS: See under Cantaloupes

POTATOES: Early and Late Blights—1.2 to 1.6 quarts. Begin when plants are 2 to 8 inches high. Repeat at 5 to 10 day intervals, more often under severe late blight conditions.

POTATOES (Seed Pieces): Fusarium Seed Piece Decay—1.0 quart/50 gallons. Dip whole or cut tubers. Second or seed pieces if held before planting. Seed piece treatment only. Do not use treated seed pieces for food or feed.

PUMPKINS: Angular Leaf Spot, Downy Mildew—2.4 quarts/acre in sufficient water to cover or 1.2 to 1.6 quarts/100 gallons. Begin when disease threatens. Repeat at 7 to 10 day intervals.

RHUBARB (Greenhouse, Michigan): Botrytis Leaf Rot—1.6 quarts. Begin 4 weeks before harvest. Make 4 applications at 7 day intervals.

SPINACH: Downy Mildew (Blue Mold), White Rust—1.2 to 1.6 quarts. Begin when disease appears. Repeat at 7 to 10 day intervals. Do not apply within 10 days of harvest. Remove excess residues by washing.

SQUASH (Summer and Winter): Anthracnose, Downy Mildew—1.2 to 1.6 quarts. Begin when plants start to run. Repeat at 7 to 10 day intervals. Do not apply within 5 days of harvest.

TOMATOES (Greenhouse and Field): Cladosporium Leaf Mold, Early and Late Blights, Gray Leaf Spot (Stemphylium), Septoria Leaf Spot—1.2 to 1.6 quarts. Begin at first fruit cluster or [illegible] at 7 to 10 day intervals. Anthracnose—2.4 quarts. Begin when fruit first forms. Repeat at 7 to 10 day intervals. Do not apply within 5 days of harvest.

WATERMELONS: See under Cantaloupes

AGRICULTURAL FIELD CROP USES

GRASSES (Grown for Seed—Grown for Replanting Seed Purposes Only): Leaf, Stem, and Stripe Rust—1.6 to 2.4 quarts/10 to 100 gallons per acre. Begin when rust pustules first seen. Repeat at 7 to 14 day intervals. Do not feed [illegible].

SUGAR BEETS: Leaf Spot (Cercospora)—1.2 to 2.4 quarts in sufficient water/acre. Begin when disease first appears. Repeat at 7 to 10 day intervals for 3 to 5 applications. Do not apply within 14 days of harvest. Do not feed treated tops to livestock.

TOBACCO: Blue Mold—0.4 to 1.2 quarts. Use 2.5 to 5.0 gallons of diluted suspension/100 square yards of plant bed. Begin when plants are about the size of a dime. [illegible] leaf appears in area. Repeat twice weekly until plants are set in field. Use [illegible] weekly applications increasing to 3.2 quarts as plants increase in size.

AGRICULTURAL ORNAMENTAL CROP USES

CARNATIONS, DAHLIAS: Alternaria Leaf Spot, Anthracnose, Botrytis Blight—0.8 to 1.2 quarts. Begin when new growth starts. Repeat weekly.

CHRYSANTHEMUMS: Ascochyta Ray Blight, Botrytis Petal Spot, Septoria Leaf Spot. Use 12.8 ounces MANEX plus [illegible] pound Captan per 100 gallons of water. Apply twice weekly during the blooming season for petal spot and ray blight. For septoria leaf spot apply weekly throughout the season.

DAHLIAS: See under Carnations

DOGWOOD: Anthracnose—0.8 to 1.2 quarts. Begin when buds open. Repeat when bracts fall 4 weeks later and in late summer.

GLADIOLUS: Botrytis Blight, Curvularia and Stemphylium Leaf Spots—1.2 quarts. Begin when leaves are [illegible] developing. Repeat 2 to 3 times at weekly intervals.

GRASSES (Turf and Recreational Areas): Brown Patch—4.0 fluid ounces in sufficient water/1000 square feet. Begin at first sign of disease. Repeat at 7 to 14 day intervals. Dollar Spot—9.6 to 12.8 fluid ounces in sufficient water/1000 square feet. Apply as for brown patch, above. Melting-Out—4.8 to 6.4 fluid ounces in sufficient water/1000 square feet. Apply as for brown patch, above. Leaf, Stem and Stripe Rusts—2.4 quarts/100 gallons/acre. Begin when rust pustules are first seen. Repeat at 7 to 14 day intervals. Do not graze treated areas. Do not feed clippings to livestock.

LILIES: Botrytis Blight—0.8 to 1.2 quarts. Begin with new growth. Repeat weekly.

PANSIES: Anthracnose—0.8 to 1.2 quarts. Begin with new growth. Repeat weekly.

PEONIES: Alternaria Leaf Spot, Botrytis Blight, Phytophthora Blight—0.8 to 1.2 quarts. Apply to foliage and soil in early spring and early fall.

ROSES: Black Spot, Cercospora Leaf Spot (Rose), Rust (California)—0.8 to 1.2 quarts. Begin when leaf buds unfold. Repeat at 7 to 10 day intervals.

SNAPDRAGONS: Rust—0.8 to 1.2 quarts. Begin with emergence. Repeat weekly.

ZINNIAS: Alternaria Leaf Spot, Leaf Blight—0.8 to 1.2 quarts. Begin with emergence. Repeat weekly.

Our recommendations for use are based on tests believed reliable. Since the use is beyond our control, we can not guarantee the results if such use is not in accordance with directions. We disclaim any responsibility for damages resulting from careless or improper handling or use.

CAUTION: This product is toxic to fish. Keep out of any body of water. Apply this product only as specified on this label. Do not contaminate water by cleaning of equipment or disposal of wastes.

GRIFFIN CORPORATION — VALDOSTA, GEORGIA