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

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

July 7, 1986

MEMORANDUM

SUBJECT: APPLICATION PRACTICE DATA NECESSARY FOR EBDC SPECIAL REVIEW

FROM: J. Dean Hansen, Plant Pathologist
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TO: Edward Zager, Section Head
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Application practice information is herewith supplied for mancozeb, maneb, and Metiram® as requested by your memorandum of May 27, 1986. This should assist you in making the necessary dietary exposure analyses.

APPLICATION PRACTICES FOR FOOD CROP USAGE

FOR SELECTED EBDC FUNGICIDES

(Mancozeb, Maneb, Metiram and Nabam)

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Application Practices for Food Crop Usage for Selected EBDC Fungicides

(Mancozeb, Maneb, Metiram and Nabam)

Nabam (Usage and percentage of crop treated): According to usage data provided by The Economic Analysis Branch, nabam is not currently used on agricultural sites (Ballard, 1985). Nabam's applications are limited to use as a biocide for industrial sites such as cooling towers, paper mills and sugar mills. (For agricultural use, the standard practice was to tank mix nabam with zinc sulfate prior to application to form a product equivalent to zineb.) Thus agricultural use practices for nabam are not addressed in this report.

Mancozeb, Maneb and Metiram - Use Rates:

Use rates and number of applications for individual EBDC fungicides vary not only with the type and variety of crop, but also vary with the growth stage of the crop, the anticipated disease pressure, and the environmental conditions under which a crop is grown. For example, apples grown in the midwest require more frequent applications of an EDBC fungicide than the apples grown in the Northwest, because environmental conditions in the midwest are more conducive to disease development than conditions in the Northwest. Therefore, dosage (number of applications times use rate) must be presented as a dosage range.

Sites:

The sites are representative of the major uses for mancozeb, maneb and metiram. These are presented in table 1A, 1B, 1C and 1D for mancozeb; 2A, 2B, 2C, 2D, 2E and 2F for maneb and 3A and 3B for metiram.

Percentage of Crops Treated:

The estimated percentage of crops treated with EBDC fungicide is based on 1979 estimates of the number of US acres receiving EBDC treatments and the total US acres in production. The 1979 estimates were obtained as part of the EBDC RPAR process and the US acreage production figures were obtained from the 1978 Census of Agriculture. It is assumed that the EBDC treated acreage has not significantly changed since 1979. This information is presented in table 4.

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Table 1A. SITES, APPLICATION RATES, AND USE PRACTICES FOR EBDC'S

(For representative crops for which MANCOZEB is registered)

CROP	USE RATES A.I POUNDS/ACRES	NUMBER SEASONAL APPLICATIONS MINIMUM	NUMBER SEASONAL APPLICATIONS MAXIMUM	DOSAGE RANGE A.I. (No. appl. x rate) (pounds)	PREHARVEST INTERVALS (PHI) AND LIMITATIONS
Apples Fruit rots Leaf spots Twig blight	Index is wrong, map is right 0.8-~~1.6~~ 1b/100 gal (200-600 gal/A)	5	12	8 to 120 96	21 days PHI. for a few states. 30 days PHI. for all others through 10 pounds per acre. Delayed dormant and cover sprays.
Asparagus Rust	1.6-2.4 lb/A	4	4	6.4 to 9.6	Apply to field after harvest.
Bananas Cercospora leaf spot	1.6-3.4 lb/A	8	16	12.8 to 54.4	0 days PHI. Begin when disease first appears and repeat at 2 to 3 week intervals.
Cabbage Downy mildew Alternaria	0.8-2.4 lb/A	6	9	4.8 to 21.6	7 day PHI. 3 to 10 day intervals.
Cantaloupe Downy mildew	1.6-2.4 lb/A	8	14	12.8 to 33.6	5 day PHI. 5 to 7 day intervals.
~~Caprifigs~~ ~~(internal fruit rot)(Fusarium)~~ ~~Molds~~	~~3.3 lb/100 gal (as a dip)~~		~~1~~		~~After 4 to 5 loads, replace mixture.~~
Carrots Alternaria leaf spot	1.2-1.6 lb/A	6	12	7.2 to 19.2	0 day PHI. 7 to 10 day interval Begin at first disease occurrence.

Table 1B. SITES, APPLICATION RATES, AND USE PRACTICES FOR EBDC'S (cont'd)

(For representative crops for which MANCOZEB is registered)

CROP	USE RATES A.I. POUNDS/ACRES	NUMBER SEASONAL APPLICATIONS MINIMUM	MAXIMUM	DOSAGE RANGE A.I. (No. appl. x rate)	PREHARVEST INTERVALS (PHI) AND LIMITATIONS
Celery Blights (Transplant to harvest= 85 to 100 days)	1.6-1.7 lb/A	7	12	11.2 to 20.4	14 day PHI. Field application every 7 to 10 days. Or: Every 3 to 5 days for plant-bed.
Crabapples Fruit rots Leaf spots Twig blight	0.8-1.7 lb/100 gal (200-500 gal/A)	5	12	8 to 120	15 days PHI. through 8.4 pounds per acre Delayed dormant and foliar applications
Cranberries	2.4-5.0 lb/A	5	12	12 to 60	30 day PHI.
Cucumber Downy mildew	1.57-2.5 lb/A	6	15	9.4 to 37.5	5 day PHI. Begin when first true leaf emerges or at first disease occurrence, then every 5 to 14 days.
Fennel	1.57-1.7 lb/A	7	12	11 to 20.4	7 day PHI. Apply at emergence and at 7 day intervals.
Grapes Black rot Bunch rot	1.2-3.4 lb/A	3	6	3.6 to 20.4	66 day PHI. for all states except CA. For CA: Do not apply after fruit sets.
Melons (Misc) Downy mildew	1.6-2.4 lb/A	8	14	12.8 to 33.6	5 day PHI. 5 to 7 day intervals.
Onion Blotch Blast and Downy mildew	2.4 lb/A	6	8	14.4 to 19.2	7 day PHI. Begin when disease first becomes visible.

Table 1C. SITES, APPLICATION RATES, AND USE PRACTICES FOR EBDC'S (cont'd)

(For representative crops for which MANCOZEB is registered)

CROP	USE RATES A.I. POUNDS/ACRES	NUMBER SEASONAL APPLICATIONS MINIMUM	NUMBER SEASONAL APPLICATIONS MAXIMUM	DOSAGE RANGE A.I. (No. appl. x rate) (pounds)	PREHARVEST INTERVALS (PHI) AND LIMITATIONS
Onion Blotch Downy mildew Blast	1.6-2.4 lb/A	6	8	9.6 to 19.2	7 day PHI. 7 day interval.
Papaya Anthracnose Phytophthora fruit rot	1.57-2.1 lb/A	6	14	9.4 to 29.4	0 days PHI. Apply at flowering to crown, blossom area, central column and developing fruit.
Peanuts Cercospora leaf spot	0.8-1.7 lb/A	6	14	4.8 to 23.8	14 day PHI. 7 to 14 day interval.
Pears Fruit rots Leaf spots Twig blight	0.8-1.7 lb/100 gal (200-500 gal/A)	5	12	8 to 120	15 days PHI. through 8.4 pounds per acre Delayed dormant and foliar applications
~~Pineapple~~	~~25.2-27 lb/100 gal/A~~ (at planting)			~~25.2 to 27~~	~~Preplant dip for treatment of planting material.~~
Potato Blights	0.8-1.6 lb/A	6	9	Max rate 9.6 - 14.4	0 days PHI. Apply when plants are 4 to 6 inches tall.
Quince Fruit rots Leaf spots Twig blight	0.8-1.7 lb/100 gal (200-500 gal/A)	5	12	8 to 120	15 days PHI. through 8.4 pounds per acre Delayed dormant and foliar applications

Table 1D. SITES, APPLICATION RATES, AND USE PRACTICES FOR EBDC'S (cont'd)

(For representative crops for which MANCOZEB is registered)

CROP	USE RATES A.I. POUNDS/ACRES	NUMBER SEASONAL APPLICATIONS MINIMUM	NUMBER SEASONAL APPLICATIONS MAXIMUM	DOSAGE RANGE A.I. (No. appl. x rate) (pounds)	PREHARVEST INTERVALS (PHI) AND LIMITATIONS
Squash, summer Downy mildew	1.57-2.5 lb/A	8	15	12.6 to 37.5	5 day PHI. Begin when first true leaf emerges or at first disease occurrence, then every 5 to 14 days.
Sweet Corn Helminthosporium	1.2 lb/A	10	18	18 to 21.6	7 day PHI. 4 to 7 day intervals.
Sweet Corn Rust	1.2 lb/A	2	5	2.4 to 6	7 day PHI. Begin when disease appears and repeat at 10 to 14 day intervals.
Sugar beet Cercospora leaf spot	1.2-1.7 lb/A	4	12	4.8 to 20.4	14 day PHI. Apply at first disease occurrence. Repeat at 7-10 day intervals.
Tomato Blights	1.2-2.4 lb/A	4	15	4.8 to 36	5 day PHI. Begin application when the first fruit clusters are visible and continue every 7 to 12 days.
Watermelons Downy mildew	1.6-2.4 lb/A	8	14	12.8 to 33.6	5 day PHI. Apply at 5 to 7 day intervals.

Table 4. Estimated Percentage of Food Crops Treated with EBDC Fungicides

Crop	Estimated Acres Treated	Total US Acres	Percentage of Crop Treated
Fruit			
Apples	184,000	577,000	32
Apricots	<500	30.562	2
Cherries	<500	129,563	<1
Citrus	46,000	1,302,612	3
Grapes	8,000	762,536	1
Nectarines	250	23,127	1
Peaches	2,700	262,587	1
Pears	40,000	95,425	41
Plums & Prunes	2,300	141,439	1.6
Vegetables			
Cabbage	43,400	102,239	42
Cantaloupe	21,400	110,572	19
Celery	15,000	37,881	39
Cucumber	86,600	125,892	68
Lettuce	66,900	253,020	26
Lima beans	9,000	72,144	12
Onions	52,600	127,697	41
Peppers	24,000	87,247	27
Potatoes	1,156,000	1,395,150	85
Snap beans	58,400	341,374	17
Spinach	7,000	33,031	21
Sweet corn	183,100	674,128	27
Tomatoes	145,700	425,317	34
Watermelons	141,000	181,436	77
Field Crops			
Barley	400,000	8,975,538	4
Dry beans	50,000	1,317,141	3.8
Peanuts	275,000	1,434,353	19
Sugar beets	10,000	1,248,823	<1
Wheat	1,000,000	54,457,876	1.9
Wild rice	15,000	- - - -	