

AOSchlosser:REney:mbs
October 20, 1970

Evaluation of Pesticide Petition 1F1024 for 2,4,5,6-
tetrachloroisophthalonitrile (Daconil) and its metabolite
4-hydroxy-2,5,6-trichloroisophthalonitrile
Submitted by Diamond Shamrock Corporation
Filed September 2, 1970

INTRODUCTION

Other petitions PP-7F0599 and PP-9F0743.

The metabolite 4-hydroxy-2,5,6-trichloroisophthalonitrile is designated
as (DAC-3701).

Petitioner proposes the following tolerances for (Daconil) and its
metabolite. DAC-3701.

<u>Crops</u>	<u>Total Residue Tolerance as</u> <u>2,4,5,6-tetrachloroisophthalonitrile</u>
Celery	15.0 PPM
Beans (snap)	5.0 PPM
Broccoli	5.0 PPM
Brussels sprouts	5.0 PPM
Cabbage	5.0 PPM
Carrot (tops removed)	5.0 PPM
Cauliflower	5.0 PPM
Cucumber	5.0 PPM
Melons	5.0 PPM
Cantaloupe	5.0 PPM
Honeydew	5.0 PPM
Muskmelon	5.0 PPM
Watermelon	5.0 PPM
Pumpkin	5.0 PPM
Squash (summer and winter)	5.0 PPM
Tomato	5.0 PPM
Beans, lima (pods removed)	1.0 PPM
Corn, sweet (husks removed)	1.0 PPM
Peanuts	0.1 PPM
Sugar beet (roots only)	0.1 PPM
Peanut vine hay	20.0 PPM
Sugar beet tops	20.0 PPM
Sweet corn forage	20.0 PPM

These are new uses. Daconil is presently registered for use on potatoes.

DIRECTIONS FOR USE

<u>Summary Table</u>			
<u>Crops</u>	<u>Rates</u> <u>(Lb Bravo W-75/A)</u>	<u>Application</u> <u>Schedule</u>	<u>Preharvest</u> <u>Interval</u>
<i>Deleted</i> Bean(lima)	2	7 day (2)	7 days
Bean(snap) <i>do not feed to livestock</i>	3	7 day (2)	7 days
Cabbage, Cauliflower	1.5 to 2 (1)	7 to 10 (2)	None
Broccoli, Brussels sprouts			
Carrot	1.5 to 2	7 to 10 (2)	None
Calary	1 to 3 (1)	3 to 7 (3)	7 days
Corn (sweet) <i>do not make or feed forage fresh market crop only</i>	1.5 to 2	4 to 7 (2)	14 days
Cucumber	1.5 to 3 (1)	7 (4)	None
Cantaloupe	1.5 to 3 (1)	7 (4)	None
Muskmelon	1.5 to 3 (1)	7 (4)	None
Honeydew	1.5 to 3 (1)	7 (4)	None
Watermelon	1.5 to 3 (1)	7 (4)	None
Squash(summer and Winter)	1.5 to 3 (1)	7 (4)	None
Pumpkin	1.5 to 3 (1)	7 (4)	None
Peanut <i>do not feed hay or chaff</i>	1 to 1.5	10 to 14 (2)	14 days
Potato	1 to 1.5	7 to 10 (2)	None
<i>Deleted</i> Sugar Beet	1.5 to 2	10 to 14 (2)	14 days
Tomato	1.5 to 3	7 to 10 (4)	None

- (1) Rates for control of certain diseases vary within this range.
- (2) Schedule may be more or less frequent depending on disease conditions.
- (3) Application schedules vary depending on disease involved.
- (4) Schedule may be more frequent under severe disease conditions.

(Note 1 Lb. of Bravo W-75 equals 0.75 active).

The directions for use include the following additional cautions and restrictions:

Bean(lima): Do not feed treated vines to livestock within 30 days of slaughter or to lactating dairy animals.

Corn(sweet): Do not feed treated forage to livestock within 30 days of slaughter or to lactating dairy animals.

Peanut: Do not feed vine hay to livestock within 30 days of slaughter or to lactating dairy animals.

Sugar Beet: Do not feed treated tops to livestock within 30 days of slaughter or to lactating dairy animals.

ANALYTICAL METHOD

MC-GLC. A Dohrmann gas chromatograph equipped with a microcoulometric titration cell was used for routine analysis of Daconil 2787 and methylated DAC-3701. Occasional samples were analyzed on a Beckman (GC-4) equipped with an electron capture detector. The chopped crop is initially extracted in acetone. Cleanup on a Florisil column is included in the procedure which is also used to separate the Daconil 2787 from its (4-hydroxy-2,5,6-trichloro)

metabolite DAC-3701. DAC-3701 is subsequently methylated with diazomethane and the two compounds are determined separately in the gas-chromatograph. Recoveries from samples fortified at 0.05 ppm level with Daconil 2787 and DAC-3701 were in the range of 80-100%. The sensitivity of detection for both Daconil 2787 and DAC-3701 was approximately 0.02 ppm.

Note: Surface extraction of residues on crops does not appear to be adequate.

Note: If chlorobenzic acid or acids or a degradation product they may not be determined by method.

DISCUSSION OF DATA

Calery (field trimmed and field washed) (15 ppm)

	Rate Lbs W-75 A/Acre	Days last applic to Harvest	No. of Applic	Residue PPM (mean)
Florida	2.0	0	24	15.1
	2.0	7	24	10.9
	1.0	7	20	5.52

Data support the proposed tolerance assuming crop is field-washed and trimmed. However, this practice appears to be limited to Florida.

Snap Beans:

Data submitted are for surface extraction only. We should have some data on macerated sample and also data for the metabolite DAC-3701.

Lima Beans (pods removed):

There is insufficient residue data to support the proposed tolerance and no data for the metabolite DAC-3701 on the beans. Recovery data are poor. We should have data macerated pods since they are fed to livestock. We should have more data for DACONIL 2787 and DAC-3701 on the vines. It is noted that no tolerances were requested for the vines and pods.

Broccoli.

	Daconil 2787		Macerated Sample	
	Rate Lbs W-75 A/Acre	Days Last Applic to Harvest	Number of Applications	Residue PPM
Florida	3.0	0	8	.34 mean
California	1.5	1	9	6.05 mean
California	1.5	8	9	.49 mean

The data are inconclusive. We should have more data for macerated samples at maximum dosages and 0 days. We should also have more recovery data for this crop.

Brussels Sprouts.

Daconil-2787

Macerated Unwashed Samples

	Rate Lbs W-75 A/Acre	Days Last Applic to Harvest	Number of Applications	Residue PPM
Florida	3.0	0	8	1.04 mean
Canada	2.0	8	5	5.00 mean
New York	3.0	14-18	4	3.48 mean

There is insufficient data on which to base an opinion. We should have more data on macerated samples treated at maximum dosages rates up to 0 days before harvest.

Cabbage.

Daconil - 2787

	Rate Lbs. W-75 A/Acre	Days Last Applic to Harvest	Number of Applications	Residue PPM
Texas	2.0	0	9	1.60
Ohio	3.0	0	9	.03
Canada	2.0	0	5	1.33

We should know if samples were surface extracted or macerated. More data would also be useful.

Cauliflower.

We should have more data on macerated samples at 0 days. Data submitted is insufficient. No data was submitted for the metabolite DAC-3701.

Carrot.

Daconil - 2787

	Rate Lbs W-75 A/Acre	Days Last Applic to Harvest	Number of Applications	Residue PPM
Ohio	2.0	0	9	2.78(mean)
Unwashed roots and crown	2.0	7	9	1.33(mean)
Ohio Tops removed	3.0	0	7	0.18
Canada Tops removed	2.0	0	9	0.27

Data appear to support the proposed tolerance for carrots with tops removed. However, we should know if the samples were macerated or surface extracted.

Cucumber.

Daconil - 2787

	Rate Lbs W-75 A/acre	Days Last Applic to Harvest	Number of Applications	Residue PPM
Vigginia whole macerated	1.0	0	7	0.83(mean) 4

Virginia whole macerated	2.0	0	7	0.96(mean)
Canada whole macerated	3.0	0	6	0.61(mean)
Ohio macerated	3.0	0	6	0.35(mean)
Ohio surface extracted	3.0	0	12	1.02(mean)
Ohio surface extracted	3.0	0	13	2.52(mean)

The data appear to support the proposed tolerance.

Cantaloupe.

The data are insufficient. We should have data on macerated whole melons at 0 days to harvest from several geographical areas.

Honeydew.

The data are insufficient. We should have data on macerated whole melons at 0 days to harvest from several geographical areas. We should also have recovery data, and data on the metabolite DAC-3701.

Muskmelon.

Data are insufficient. We should have more data from different geographical areas. No data was submitted for the metabolite DAC-3701.

Watermelon.

Data are insufficient. We should have recovery data for the surface extracted whole fruit. More data is needed on rinds especially at a 3.0 lb. per acre dosage and at 0 days before harvest. Data do not state whether rinds were macerated or surface extracted. It is noted that no tolerance is proposed for the rind. Additional data needed on rind at 0 PHI.

Tomato.

	Daconil - 2787		Whole macerated	
	Rate Lbs W-75 A/Acre	Days Last Applic to Harvest	Number of Applications	Residue PPM
California	1.5	0	6	.01
Maryland	3.0	0	6	1.56
Maryland	3.0	0	7	1.90
Maryland	3.0	0	8	4.38
Canada	3.0	0	9	3.79

The data appear to support the tolerance.

Pumpkins.

The data are insufficient. We should have data on macerated samples at the maximum dosage rate of 3.0 lbs. per acre. No recovery data are submitted and no data on the metabolite DAC-3701.

Squash.

The data are insufficient. We should have more data for multiple applications at 3.0 lbs/acre, and data for macerated samples. No data was submitted for the metabolite DAC-3701 on squash. The data sheet indicates that 'spreader stickers' such as B-1956 and Triton X-77 were added to tank mix. We should have data on the amounts and concentrations of all additives used along with their complete chemical identities.

Corn, sweet (husks removed).

The data submitted for the kernels plus cob with husk removed appear to support the proposed tolerance. We need data for the metabolite DAC-3701 on this crop.

Sweet Corn Forage.

The data are insufficient. We should have data on macerated samples which represent all of the plant parts used for forage. We should also have residue data on the metabolite DAC-3701.

Peanuts.

The analytical method is not sensitive enough to detect confidently residues at the level of 0.1 ppm. In some tests background residues or instrument responses for check plots exceed those for the treated plots. Some data for non-treated check plots have not been included. Much of the data is for pre-harvest intervals in excess of 14 days. We should have more and better data at intervals of 14 days or less.

Peanut Vine Hay.

The data appear to support the proposed tolerance of 20.0 ppm.

Sugar Beet (roots only).

The data do not support the proposed tolerance. We should have data for 6 applications at a 14 day pre-harvest interval for Daconil-2787 and its metabolite DAC-3701.

Sugar Beet Tops.

The data are insufficient. More data is needed for 6 applications at a 14 day pre-harvest interval for Daconil and its metabolite DAC-3701.

Animal Metabolism

At 3% feeding levels 85-90% of the ingested Daconil 2787 is excreted unchanged in the feces of dogs and rats within 48 hours. (7F0599).

Residues in Milk-Daconil 2787

Twelve dairy cows were fed rations containing Daconil-2787 at rates from 25 to 250 ppm for 30 days. Milk samples were analyzed for residues. Most analyses showed a residue level of Daconil at 0.02 ppm. Only 2 of 144 analyses showed residue levels at the maximum of 0.04 ppm.

Residues in Milk (DAC-3701)

DAC-3701 residues as high as 0.78 ppm were found in milk from cows fed rations containing 0.2 ppm to 2.0 ppm. DAC-3701 and 25 ppm to 250 ppm Daconil 2787. These residues account for 10 to 16% of the dose consumed by the cows. No residues of DAC-3701 were detected in the milk after 21 days withdrawal from the diet.

Residues in tissue of Dairy cows fed Daconil 2787 and DAC 3701.

Four dairy cows were fed Daconil 2787 at 25 ppm and DAC 3701 at 0.2 ppm for 30 days. Half of the animals were slaughtered. No significant Daconil 2787 residues were detected in the tissues. 0.6 ppm of DAC 3701 was detected in the kidney with no significant residue found in muscle, liver or fat.

Cows fed 75 ppm Daconil 2787 and 0.6 ppm DAC 3701 for 30 days contained the following DAC 3701 residue in the various tissues: muscle 0.14 ppm; fat 0.52 ppm; kidney 1.25 ppm; liver 0.27 ppm. Cows fed 250 ppm Daconil 2787 and 2.0 ppm DAC 3701 for 30 days showed DAC 3701 residues in the various tissues of 0.51 ppm in muscle; 2.1 ppm in fat; 3.7 ppm in kidney; 0.93 ppm in liver. No significant residue of either compound was found in the same tissues of similarly treated animals after a withdrawal.

Soil Data

These data, from Petition 750599, have been reviewed. Daconil is decomposed in soils; its half-life ranges from about one week to 54 days.

Movement in plants: Isotopic Daconil 2787 did not evidence translocation from topical applications on cucumber and tomato leaves and other plant parts when treatments of C^{14} at 0.0024 uc per application were employed. The C^{14} isotope was not translocated into aerial parts of corn or tomato when these species were cultivated for 23 days in soil amended C^{14} Daconil 2787 at 0.0021 uc per gram of soil.

CONCLUSIONS

We have information that similar compounds degrade or metabolize to chlorobenzoic acids. We need to know if chlorobenzoic acids would be present as a residue on crops and soil.

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We need recovery data on representative fortified samples stored at room conditions and frozen storage at intervals of 0,6,12,18 and 24 days. This study should include surface extraction of samples and maceration of samples for analysis. This data is needed as petitioner has not proved that surface extraction is complete and that method detects weathered residues. Residues vary too greatly to give an opinion.

The above questions should be answered before petitioner does any other work because additional studies maybe needed besides the ones listed below. Some of the data needed below may not be needed when the above studies are submitted.

The data appear to support the proposed tolerances for carrot, cucumber and tomato but we need to know if analytical method determines weathered residues. The data submitted for the other crops do not support the proposed tolerances.

Snap beans: Data are lacking for macerated samples and for residues of the metabolite DAC 3701. *OK*

Q: asked
Lima beans (pods removed): Data submitted are generally insufficient. Recovery data are poor. No data has been submitted for the metabolite DAC 3701 on the beans. We should have more data for macerated samples of pods and vines. It is noted that no tolerances were requested for the vines and pods which are fed to livestock.

Broccoli: *OK* The data are inconclusive. We need more data for macerated samples at maximum dosages and 0 days, and more recovery data.

Brussels sprouts: *OK* Data are insufficient. We need more data on macerated samples treated at maximum dosages up to 0-24 hours after app. before harvest.

Cabbage: *OK* Data do not indicate whether the samples were surface extracted or macerated.

Cauliflower: *OK* We need more data on macerated samples at 0-24 hours after app. and data for the metabolite DAC 3701.

Cantaloupe: *OK* We need data on macerated samples at 0-24 hours after app. to harvest from several geographical areas. Recovery data are lacking for surface extracted samples.

Honeydew: *OK* We need data on macerated samples at 0-24 hours after app. to harvest from several geographical areas. We also need recovery data, and data on the metabolite DAC 3701.

Muskmelon: *OK* We need data for the metabolite DAC 3701, and data from other geographical areas.

Watermelon: *OK* We need recovery data for the surface extracted whole fruit more data is needed on rinds especially at a 3.0 lb per acre dosage and at 0-24 hours before harvest. Data do not state whether rinds were macerated or surface extracted. It is noted that no tolerance is proposed for the rind.

Pumpkins: The data are insufficient. We need data on macerated samples at the maximum dosage rate of 3.0 lbs/acre. We need recovery data and data on the metabolite DAC 3701.

Squash: The data are insufficient. We need data for multiple applications at 3.0 lbs/acre, and data for macerated samples. We need data for the metabolite DAC 3701. We need data on the amounts and concentrations used and the complete identities of any spreader sticker or other additives used for application. B-1956 and Triton X-77 are mentioned in the data.

for corn
Corn: We need data for the metabolite DAC 3701.

for corn
Sweet corn forage: Data are insufficient. We need data on macerated samples which represent all of the plant parts used for forage. We need data on the metabolite DAC 3701.

Peanuts: The analytical method is not sensitive enough to detect residues at the 0.1 ppm level with confidence for this crop. We need more and better data at pre-harvest intervals of 14 days or less.

Peanut vine hay: Final evaluation should await submission of the requested data for peanuts.

data
Sugar Beet (roots only, Sugar Beet Tops): The data are insufficient. More data is needed for 6 applications at a 14 day pre-harvest interval for Daconil and its metabolite DAC 3701.

RECOMMENDATION

No opinion is given. See conclusion.

We need answers to PR Notice 70-15 very toxic to fish.