US Environmental Protection Agency
Office of Pesticide Programs

Difenoconazole Tolerance Petition

October 2, 2006

VOLUME ____ OF ____ OF SUBMISSION

DIFENOCONAZOLE: TOLERANCE PETITION

TITLE

Petition Proposing a Tolerance
For Difenoconazole
In or On
Pome Fruit, Sugarbeets, Tuberous and Corm Vegetables, Fruiting Vegetables and an Import Tolerance on Papaya

DATA REQUIREMENT

Series 860 Residue Chemistry Test Guidelines 860.1000 through 860.1900 Summarized

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COMPLETION DATE

October 2, 2006

PERFORMING LABORATORY

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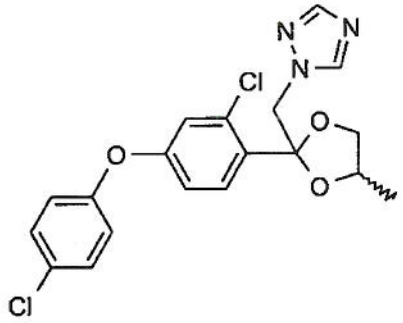
SECTION A

THE NAME, CHEMICAL IDENTITY, AND COMPOSITION OF DIFENOCONAZOLE

Formulations:	Inspire®/Difenoconazole 2EC
EPA Registration No.:	100-
CAS No.:	119446-68-3
CAS Chemical Name:	(1-[2-[2-chloro-4-(4-chlorophenoxy)phenyl]-4-methyl-1,3-dioxolan-2-ylmethyl]-1H-1,2,4-triazole)

Chemical Structure:



SECTION B

THE AMOUNT, FREQUENCY AND TIME OF APPLICATION OF DIFENOCONAZOLE
ON
POME FRUIT, FRUITING VEGETABLES, POTATOES, SUGARBEETS AND ORNAMENTALS

INSPIRE®/DIFENOCONAZOLE 2EC

EPA Reg. No. 100-

SPECIFIC USE DIRECTIONS

Crop	Target Diseases	Use Rate fl. oz. product/A (lb. ai)	Remarks
Fruiting Vegetables Eggplant Groundcherry Pepino Pepper (includes bell pepper, chili pepper, cooking pepper, pimento, sweet pepper) Tomatillo Tomato	Early blight (*Alternaria solani*) Black mold (*A. alternata*) Gray leafspot (*Stemphylium botryosum*) Powdery mildew (*Leveillula taurica*) Septoria leafspot (*S. lycopersici*) Target spot (*Corynespora cassiicola*) Anthracnose (*Colletotrichum coccodes, C. acutatum, C. gloeosporioides*) Leaf mold (*Fulvia fulva*)	4-7 (0.07-0.11)	Begin applications at first sign of disease or when conditions are conducive for disease development. Apply Inspire on a 7-14 day schedule. Inspire can be used in blocking program using a maximum of two consecutive applications before rotating to fungicides with another mode of action that are registered for these diseases.
	Application: For best results, sufficient water volume should be used to provide thorough coverage. Inspire can be applied by either ground, chemigation, or aerial application. A minimum of 15 gals./A for ground applications is recommended. For aerial applications a minimum of 5 gals./A of water is recommended. For chemigation, apply in 0.1-0.25 inches/A of water. Chemigation with excessive water may lead to a decrease in efficacy.		

Specific Use Restrictions:
1) Do not apply more than 28 fl. ozs./A of Inspire per crop.
2) May be applied the day of harvest (0 day PHI).

Crop	Target Diseases	Use Rate fl. oz. product/A (lb. ai)	Remarks
Pome Fruit Apple Crabapple Loquat Mayhaw Pear Pear, Oriental Quince	Scab (*Venturia* spp.)	2-4 (0.03-0.07)	**Protective Schedule:** Apply every 7-10 days starting at ¼-½ inch green tip or when environmental conditions become conducive for scab. Continue through petal fall until the threat of primary scab is complete. For improved fruit scab control, combine with a protectant fungicide beginning at bloom. After petal fall, switch to a 12-14 day schedule. **Curative Schedule:** Use a forecasting system beginning at green tip. Apply 3-4 ozs./A within 96 hours of the onset of an infection period. Apply a follow up spray within 7 days. For improved fruit scab control, combine with a protectant fungicide beginning at bloom. To help prevent resistance, it is recommended to make no more than 2 consecutive applications with Inspire or another Group 3 fungicide before alternating to a different mode of action. Use the higher rates and shorter intervals on more susceptible varieties or when under heavy disease pressure.
	Alternaria blotch (*Alternaria* spp.) Brooks fruit spot (*Mycosphaerella pomi*) Flyspeck (*Schizothyrium ppmi*) Cedar apple rust (*Gymnosprangium juniperi-virginianae*) Quince rust (*Gymonsporangium* spp.) Sooty blotch (*Gloeodes pomigena*)	2-4 (0.03-0.07)	Begin applications preventively. Apply alone or in a tank mixture with a protectant fungicide on a 7-10 day schedule through petal fall. Use the higher rates and shorter intervals on susceptible varieties or when under heavy disease pressure. After petal fall, apply on a 7-14 day schedule. To help prevent resistance, it is recommended to make no more than 2 consecutive applications with Inspire or another Group 3 fungicide before alternating to a different mode of action.
	Powdery mildew (*Podosphaera leucotricha*)	4 (0.07)	Beginning at tight cluster, apply on a 7-10 day schedule.
	Rates are based on a dilute volume of 400 gallons per acre. **Application:** For best results, sufficient water volume should be used to provide thorough coverage. Inspire can be applied by either ground or aerial application. A minimum of 40 gals./A for ground applications is recommended. For aerial applications a minimum of 5 gals./A of water is recommended.		

Specific Use Restrictions:

1) Do not apply more than 20 fl. ozs./A of Inspire per crop.
2) Do not apply within 14 days of harvest.

Crop	Target Diseases	Use Rate fl. oz. product/A (lb. ai)	Remarks
Potatoes For other crops in this subgroup, please see below	Black dot (*Colletotrichum coccodes*) Brown spot (*Alternaria alternata*) Early blight (*Alternaria solani*) Powdery mildew (*Erysiphe cichoracearum*) Septoria leafspot (*S. lycopersici*)	4-7 (0.07-0.11)	Begin applications at first sign of disease or when conditions are conducive for disease development. Apply Inspire on a 7-14 day schedule. Inspire can be used in blocking program using a maximum of 2 consecutive applications before rotating to fungicides with another mode of action that are registered for these diseases.
	Application: For best results, sufficient water volume should be used to provide thorough coverage. Inspire can be applied by either ground, chemigation, or aerial application. A minimum of 15 gals./A for ground applications is recommended. For aerial applications a minimum of 5 gals./A of water is recommended. For chemigation, apply in 0.1-0.25 inches/A of water. Chemigation with excessive water may lead to a decrease in efficacy.		
Vegetables, tuberous and corm, subgroup: Arracacha, Arrowroot, Artichoke (Chinese and Jerusalem), Burdock, Canna, Cassava (bitter and sweet), Chayote (root), Chufa, Dasheen (Taro), Ginger, Leren, Tanier, Tumeric, and Yam (bean and true).			
Specific Use Restrictions: 1) Do not apply more than 28 fl. ozs./A of Inspire per crop. 2) Do not apply within 14 days of harvest.			

Crop	Target Diseases	Use Rate fl. oz. product/A (lb. ai)	Remarks
Sugar Beets	Cercospora leafspot (*C. beticola*) Powdery mildew (*Erysiphe polygoni*)	4-7 (0.07-0.11)	Apply Inspire on a 7-28 day schedule, alternating with a non-triazole fungicide that is registered on sugar beets for these diseases.
	Application: For best results, sufficient water volume should be used to provide thorough coverage. Inspire can be applied by either ground, chemigation, or aerial application. A minimum of 15 gals./A for ground applications is recommended. For aerial applications a minimum of 5 gals./A of water is recommended. For chemigation, apply in 0.1-0.25 inches/A of water. Chemigation with excessive water may lead to a decrease in efficacy.		

Specific Use Restrictions:

1) Do not apply more than 28 fl. ozs./A of Inspire per crop.
2) Do not apply within 7 days of harvest.

Ornamentals – For outdoor application to ornamentals by commercial and non-professional (i.e., homeowner) applicators. May be used to apply to ornamentals around residential landscapes.

Crop	Disease	Rate Oz./Acre (lb. ai)	Spray interval days	Timing of application
Carnation	Rust	7 (0.11)	7-10	Begin applications when flowers are half opened or when conditions are conducive for disease development. Apply Inspire on a 7-10 schedule. Particular care should be taken to achieve thorough coverage.
Gladiolus	Rust	7 (0.11)	7-14	Begin applications at the 2-3 leaf stage or when conditions are conducive for disease development. Apply Inspire on a 7-10 schedule. Particular care should be taken to achieve thorough coverage.
Iris	Rust	2-4 (0.03-0.07)	7-21	Begin applications at the first sign of disease or when conditions are conducive for disease development. Apply Inspire on a 7-10 schedule. Particular care should be taken to achieve thorough coverage.
Roses	Black spot Rust Powdery mildew	8.0 (0.13)	7-14	Begin applications at the first sign of disease or when conditions are conducive for disease development. Apply Inspire on a 7-10 schedule. Particular care should be taken to achieve thorough coverage.

Restrictions: Do not apply more than 32.0 ounces (0.56 lb. ai) per acre in a year.

SECTION C

FULL REPORT OF INVESTIGATIONS MADE WITH RESPECT TO THE

SAFETY OF THE PESTICIDE CHEMICAL

Difenoconazole

Technical Difenoconazole is classified as a Toxicity Category III pesticide with the signal word "Caution". For the Inspire formulation, the signal word is Warning and there are no skin sensitization properties. Difenoconazole (DFZ) is highly toxic to aquatic animals and slightly to practically non-toxic to birds and mammals.

Chemical Characteristics	
Physical State	Solid crystal
Color	Beige-grey
Odor	Slightly sweet
Melting Point	78.6°C
Boiling Point	NA
Density	1.37 g/cm^3 typical @ 20°C
Solubility	15 mg/L (ppm) @ 25°C
Vapor Pressure	2.5 x 10^{-10} mmHg @ 25°C
Dissociation Constant	pK_a = < 0
K_{ow}	275
PH	6-8 typical @ 20°C

Acute Toxicity:

Difenoconazole has a low order of acute toxicity. The oral rat LD_{50} is 1,453 milligram/kilogram (mg/kg). The rabbit acute dermal LD_{50} is >2,010 mg/kg and the rat inhalation LC_{50} is >3.285 milligrams per liter (mg/L). Difenoconazole is not a skin sensitizer in guinea pig and shows slight eye and dermal irritation in the rabbit.

Subchronic Toxicity:

A 13-week rat feeding study identified liver as a target organ and had a NOAEL of 20 ppm. A 13-week mouse feeding study also identified liver as a target organ and had a NOAEL of 20 ppm. A 26-week dog feeding study further identified liver, and also the eyes, as target organs and had a NOAEL of 100 ppm. A 21-day dermal study in rabbits had a NOAEL of 10 mg/kg/day based on decreased body weight gain at 100 and 1,000 mg/kg/day.

Teratology

An oral teratology study in rats had a maternal no-observed adverse effect level (NOAEL) of 16 mg/kg/day based on excess salivation and decreased body weight gain and food consumption. The developmental NOAEL of 85 mg/kg/day was based on effects seen secondary to maternal toxicity including slightly reduced fetal body weight and minor changes in skeletal ossification. An oral teratology study in rabbits had a maternal NOAEL of 25 mg/kg/day based on decreased body weight gain, death, and abortion. The developmental NOAEL of 25 mg/ kg/day was based on effects seen secondary to maternal toxicity including a slight increase in post-implantation loss and resorptions, and decreased fetal weight. A 2-generation reproduction study in rats had a parental and reproductive NOAEL of 25 part per million (ppm) based on significantly reduced female body weight gain, and reductions in male pup weights at 21-days.

Mutagenicity

There was no evidence of the induction of point mutations in an Ames test, no evidence of mutagenic effects in a mouse lymphoma test or in a nucleus anomaly test with Chinese hamsters, and no evidence of induction of DNA damage in a rat hepatocyte DNA repair test or in a human fibroblast DNA repair test.

Mechanism of Pesticidal Action

Difenoconazole is a demethylation inhibitor of sterol biosynthesis (DMI) which disrupts membrane synthesis by blocking demethylation. Inspire Fungicide is a broad spectrum triazole fungicide with preventative, systemic and curative properties recommended for the control of many important plant diseases. Inspire provides excellent disease control of many leaf spots and powdery mildews. Inspire is applied as a foliar spray and can be used in block, alternating spray, or tank mix programs with other crop protection products.

SECTION D

Guideline Reference 860.1300: Nature of the Residue in Plants, Livestock

1. *Plant Metabolism*

The metabolism of difenoconazole in plants is well understood. Plant metabolism studies with [phenyl-^{14}C] difenoconazole or [triazole-^{14}C] difenoconazole were carried out in four crop groupings – fruit (tomato and grape), cereals (wheat), root vegetables (potato) and pulses/oilseeds (canola). The metabolism of difenoconazole in crops involves hydrolysis of the dioxolane ring to form the ketone CGA-205374, which is then reduced to the corresponding alcohol CGA-205375. Oxidation of CGA-205375 occurred resulting in cleavage of the alkyl bridge to form the acid CGA-189138 and 1,2,4-triazole CGA-71019 (≤ 10% TRR where detected). Hydroxylation of parent compound and the metabolites CGA-205374 and CGA-205375 was also observed. Sugar conjugation of parent compound and hydroxylated metabolites, and conjugation of 1,2,4-triazole were observed as secondary metabolic processes. Conjugation of 1,2,4-triazole resulted in the formation of triazole alanine (CGA-131013), which was further degraded to triazole acetic acid (CGA-142856). These plant metabolism studies in four diverse plants serve to define the metabolism of difenoconazole.

2. *Animal Metabolism*

The metabolism of difenoconazole in animals is well understood. The metabolic pathway of difenoconazole in domestic animals involves hydrolysis of the dioxolane ring to form the ketone CGA205374, with subsequent reduction of CGA205374 to give the corresponding alcohol CGA205375 as a major metabolite. Oxidation of CGA205374 resulted in cleavage of the alkyl bridge, leading to the formation of the acid CGA186138 and 1,2,4-triazole CGA71019. A second pathway involves hydroxylation of difenoconazole to form the hydroxylated CGA205374 and CGA205375. Suphate ester, glycine and glucuronide conjugation were observed as secondary metaboilsm processes in the goat. Studies with ^{14}C-difenoconazole in the rat, goat, and hen demonstrate that the majority of the administered dose (76 to >98%) is eliminated via the excreta as parent and metabolites. Very low concentrations of radioactivity, accounting for <1 to 4% of the applied dose, remain in tissues. The liver and kidney typically show the highest radioactivity, but in the rat, the highest concentration in any tissue was found in the fat. Concentrations in goat milk reached a plateau on day 6 of the study at 0.043 ppm for the triazole label and 0.007 ppm for the phenyl label when goats were fed approximately 5 ppm for 10 days. Similarly, very little radioactivity was deposited in eggs; radioactivity reached a plateau of 0.248 to 0.299 ppm in yolks after 7 to 8-days, and 0.007 to 0.153 ppm in whites after 5 days, in hens fed at a rate equivalent to 5 ppm in the diet for 14 consecutive days. The metabolite patterns in the excreta of hens, goats, and rats are similar.

Guideline Reference 860.1340: Residue Analytical Methods

Analytical Method Determination of Residues of Difenoconazole in Crops (MRID No. 42806504)

An adequate analytical method (AG-575B) is available for enforcement purposes. Residues are quantified by gas chromatography equipped with a nitrogen-phosphorous detector. The Limit of Quantitation (LOQ) is 0.01 ppm for difenoconazole parent. The analytical method, AM-575B is available in the Pesticide Analytical Manual, Vol. II.

Analytical Method Determination of Residues of Difenoconazole in Livestock (MRID No. 42818004)

An adequate analytical method (AM-544) is available for enforcement purposes. Residues are quantified by gas chromatography equipped with a nitrogen-phosphorous detector. The Limit of Quantitation (LOQ) is 0.01 ppm for difenoconazole parent in meat milk and eggs. The analytical method, AM-544 is available in the Pesticide Analytical Manual, Vol. II.

Guideline Reference 860.1380: Storage Stability

Storage Stability of Difenoconazole in Potatoes, Tomatoes, Lettuce, Soybeans,Wherat Forage, Bananas, Wheat and Cotton

Storage stability studies with difenoconazole were conducted on a wide range of crops as listed below. Difenoconazole residues were stable for at least two years in tomato fruit, potato tubers, cottonseed, cottonseed oil, cottonseed meal, wheat forage, wheat straw and wheat grain under freezer storage conditions (ca. -20°C). Stability of difenoconazole residues was also demonstrated in lettuce heads, soybeans, wheat forage and whole bananas stored for one year at ca. -20°C.

Crop	*Author*	*MRID No.*	*Study No.*
Potatoes	*WT Beidler*	*42090059*	*ABR-90070*
Tomatoes	*WT Beidler*	*42090058*	*ABR-90069*
Lettuce, Soybeans, Wheat Forage	*WT Beidler*	*42818003*	*ABR-91024*
Bananas	*H Kühne-Thu*	*43673202*	*125/93*
Wheat and Cotton Products	*CG Hayworth*	*44619401*	*ABR-98061*

The longest storage period in this tolerance petition is 12 months. Therefore, based on these results, the residues of difenoconazole are stable in pome fruit, fruting vegetables, tuberous and corm vegetables, sugarbeets, and papaya were not affected by freezer storage and are an accurate representation of samples at harvest.

Guideline References 860.1500, 860-1520: Magnitude of the Residue

Magnitude of the Residues in or on Fruit, Pome, Group 11 (T002884-03)

The purpose of the study was to generate residue data for difenoconazole, also called CGA169374, in or on apple and pear (representative commodities) to establish tolerance in or on pome fruits (Group 11). This final report summarizes residue data collected from a total of 19 field test trials in 10 states: Illinois, New York (2), Michigan, Virginia, Pennsylvania (2), Colorado, Idaho, California (4), Washington (4), Oregon (2), in accordance with EPA Residue Chemistry Test Guidelines OPPTS 860.1000, Background, OPPTS 860.1500, Crop Field Trials and OPPTS 860.1520, Processed Food/Feed (August 1996).

Apple and pear trees were treated 5 times each with difenoconazole 250EC (31 grams a.i/A) by (1) post foliar concentrate cover spray and (2) by post foliar dilute cover spray. An additional treatment was made by post foliar dilute cover spray at an exaggerated rate (155 g a.i./A). The intervals between applications were 7 days and all applications were made between 10 – 100 gallons/Acre (GPA) for concentrate cover sprays and 101 – 400 GPA for dilute cover sprays. Approximately 14 days after the last application (DALA), apple and pear fruit samples of all treatment regimes were collected for residue analysis. In the decline trials, samples were collected at 0, 5, 10, 14 and 19 DALA. In processing studies, apple samples were processed to wet pomace and juice for residue analysis. Residues of difenoconazole were analyzed using Syngenta Analytical Method AG-575B with modifications. The limit of quantitation (LOQ) was 0.01 ppm for difenoconazole. In addition, samples were analyzed for triazoles using Morse Laboratories Inc. Analytical Method # Meth-160. The LOQ was 0.01 ppm for each of the triazole residues.

With five post foliar applications of difenoconazole each at 31 g a.i./A (target 1X rate) and 14 days after last application (DALA), the maximum (1X) residues of difenoconazole found were 0.59 ppm in apple fruits and 0.30 ppm in pear fruits. The maximum (1X) residues of triazole alanine were 0.14 ppm in apple fruits and 0.04 ppm in pear fruits. In most cases, residues of triazole alanine were found in controls. The maximum (1X) residues of triazole acetic acid were <0.01 ppm and 0.01 ppm in apple and pear fruits, respectively. No residues of 1, 2, 4-triazole (<0.01 ppm) were found in any of the apple and pear fruit samples.

In the process study, the maximum (1X) residues of difenoconazole were 1.8 ppm in wet pomace and <0.01 ppm in juice generated from apples treated with targeted 1X rate and 14 DALA. The maximum (1X) residues of triazole alanine were found to be 0.07 ppm in wet pomace and 0.16 ppm in juice. No residues of triazole acetic acid or 1, 2, 4-triazole were found in processed commodities.

In the decline study, residues of difenoconazole remained unchanged at 0, 5, 10, 14 and 19 days DALA in apple fruits. Slight decline was observed in pears. Residues of triazole alanine were unchanged over the time intervals. No residues of triazole acetic acid or 1, 2, 4-triazole were found in any of the decline samples.

Guideline References 860.1500, 860-1520: Magnitude of the Residue

Magnitude of the Residues in or on Vegetable, Fruiting, Group 8 (T003262-03)

The purpose of the study was to generate residue data for difenoconazole, also called CGA169374, in or on tomato (including processed tomato commodities) and peppers as representative commodities of the Vegetable, Fruiting, Group 8. This final report summarizes residue data collected from a total of 20 field test trials in 10 states: California (10), Florida (2), Illinois, North Carolina, New York, New Mexico, Ohio, South Carolina, and Texas (2), in accordance with EPA Residue Chemistry Test Guidelines OPPTS 860.1000, Background, OPPTS 860.1500, Crop Field Trials and OPPTS 860.1520, Processed Food/Feed (August 1996). One additional trial (VO-FR-04-5217), located in Florida, was lost due to flooding associated with Hurricane Wilma.

Tomato and peppers were treated 4 times each with difenoconazole (52 grams a.i/A) by a post foliar broadcast spray (Treatment 2). An additional treatment (Treatment 3) was made by post foliar broadcast spray at an exaggerated 5X rate (260 g a.i./A) to tomatoes for processing. The intervals between treatments were 7 days and all treatments were made between 2 – 100 gallons/Acre (GPA). Mature fruit samples were collected on Day-0, after the spray was completely dry. Mature fruit samples were also harvested 7 days after the last application (7 DALA). In the decline trials, samples were collected at 0, 1, 4, 7 and 9 days after the last application (DALA). In processing studies, tomato samples were processed tomato paste and tomato puree for residue analysis. Residues of difenoconazole (parent) were analyzed using Syngenta Analytical Method AG-575B with modifications. The limit of quantitation (LOQ) was 0.01 ppm for difenoconazole. In addition, samples were analyzed for triazoles (1,2,4-triazole, triazole alanine, and triazole acetic acid) using Morse Laboratories Inc. Analytical Method # Meth-160. The LOQ was 0.01 ppm for each of the triazole metabolites. With a targeted treatment rate of 4 X 52 g a.i./A, and a 0 and 7 day PHI, the maximum residues of difenoconazole obtained in this study are tabulated below:

Matrix	PHI (days)	Maximum (1X) Residues (ppm)			
		Parent (Difen.)	1,2,4-Triazole (T)	Triazole Alanine (TA)	Triazole Acetic Acid (TAA)
Tomato	0 day	0.41	<0.01	0.21	0.01
Tomato Paste	0 day	0.38	<0.01	0.05	<0.01
Tomato Puree	0 day	0.11	<0.01	0.02	<0.01
Pepper (Bell)	0 day	0.20	<0.01	0.05	<0.01
Pepper (Hot)	0 day	0.29	<0.01	0.06	<0.01
Tomato	7 day	0.48	<0.01	0.21	<0.01
Tomato Paste	7 day	0.11	<0.01	0.06	<0.01
Tomato Puree	7 day	0.05	<0.01	0.02	<0.01
Pepper (Bell)	7 day	0.16	<0.01	0.10	<0.01
Pepper (Hot)	7 day	0.19	<0.01	0.09	0.01

Residues of difenoconazole showed minimal tendency to decline or accumulate with respect to time in either the tomato or pepper samples.

Guideline References 860.1500, 860-1520: Magnitude of the Residue

Magnitude of the Residues in or on Vegetables, Tuberous and Corm, Subgroup 1C, (T003263-03)

The purpose of the study was to generate residue data for difenoconazole, also called CGA-169374, in or on potato (including processed potato commodities) as the representative commodity of vegetables, tuberous and corm, subgroup 1C, to support the establishment of a tolerance for vegetables, tuberous and corm, subgroup 1C.

This final report summarizes residue data collected from a total of 16 field test trials in 13 states: California, Colorado, Florida, Idaho (3), Maine, Michigan, Minnesota, New York, North Carolina, North Dakota, Oregon, Washington (2), and Wisconsin; in accordance with EPA Residue Chemistry Test Guidelines OPPTS 860.1000, Background, OPPTS 860.1500, Crop Field Trials and OPPTS 860.1520, Processed Food/Feed (August 1996).

Potato plants were treated with difenoconazole 250EC by 4 post foliar broadcast spray applications of 52 grams active ingredient/acre (g a.i./A), yielding a total annual application of 208 g a.i./A. An exaggerated treatment rate of 4 x 260 g a.i./A (1040 g a.i./A total) was made, in the processing trials, also by post foliar broadcast spray. The intervals between treatments were 7-days and all treatments were made between 2 – 50 gallons/Acre (GPA). Approximately 14 days after the last application (DALA), potato tuber samples of all treatment regimes were collected for residue analysis. Duplicate samples were taken from each treated plot. In the decline trials, samples were collected at 0, 5, 10, 14 and 19 DALA. In processing studies, composite potato tuber samples were processed to granules/flakes, chips, and wet peel, for residue analysis.

Residues of difenoconazole were analyzed using Syngenta Analytical Method AG-575B[i] with modifications. The limit of quantitation (LOQ) was 0.01 ppm for difenoconazole. In addition, samples were analyzed for triazoles using Morse Laboratories Inc. Analytical Method # Meth-160[ii]. The LOQ was 0.01 ppm for each of the triazole residues. With a targeted treatment rate of 208 g a.i./A total, and a sampling interval of 14 days after the last application, the maximum residues of difenoconazole, 1,2,4-triazole (T), triazole alanine (TA), and triazole acetic acid (TAA) obtained in this study are tabulated below:

Maximum Residues (ppm) at 208 g a.i./A total treatment

Substrate	Difenoconazole	1,2,4-Triazole (T)	Triazole Alanine (TA)	Triazole Acetic Acid (TAA)
Potato tubers	0.01	<0.01	0.17	0.02
Potato granules/flakes	<0.01	<0.01	0.02	<0.01
Potato chips	<0.01	<0.01	<0.01	<0.01
Potato wet peel	0.03	<0.01	<0.01	<0.01

Residues of difenoconazole were too small to definitively identify a decline against time in potato tuber.

Guideline References 860.1500, 860-1520: Magnitude of the Residue

Magnitude of the Residues in or on Sugarbeet (T003264-03)

The purpose of the study was to generate residue data for difenoconazole, also called CGA169374, in or on sugar beets to establish tolerance. This final report summarizes residue data collected from a total of 12 field test trials in 8 states: California (2), Colorado, Idaho (2), Michigan, Minnesota (2), Nebraska, North Dakota (2), and Wyoming in accordance with EPA Residue Chemistry Test Guidelines OPPTS 860.1000, Background, OPPTS 860.1500, Crop Field Trials and OPPTS 860.1520, Processed Food/Feed (August 1996).

Sugar beets plants were treated 4 times each with difenoconazole (52 grams a.i/A) by post foliar broadcast spray. An additional treatment rate for processing purposes was made by post foliar broadcast spray at an exaggerated rate (4 x 260 g a.i./A). The intervals between applications were 7 days and all applications were made between 2 – 50 gallons/Acre (GPA). Approximately 7 days after the last application (7-DALA), sugar beet samples of all treatment regimes were collected for residue analysis. In the decline trials, samples were collected at 0, 2, 4, 7 and 9 DALA. In processing studies, sugar beets were processed into refined sugar, dried pulp, and molasses for residue analysis. Residues of difenoconazole in sugar beet roots and tops along with processed commodities were analyzed using Syngenta Analytical Method AG-575B with modifications. The limit of quantitation (LOQ) was 0.01 ppm for difenoconazole. In addition, samples were analyzed for the triazole metabolites, 1,2,4-triazole (T), triazole alanine (TA) and triazole acetic acid (TAA) using Morse Laboratories Inc. Analytical Method # Meth-160. The LOQ was 0.01 ppm for each of the triazole residues. With a

targeted treatment rate of 52 g a.i./A, the maximum residues of difenoconazole and the triazole metabolites in this study are tabulated below:

		Maximum 1X Residue		
Matrix	Difenoconazole	1,2,4-triazole (T)	Triazole alanine (TA)	Triazole Acetic Acid (TAA)
Sugar Beet Roots	0.28	<0.01	0.02	<0.01
Sugar Beet Tops	5.8	<0.01	0.05	<0.01
Refined Sugar	<0.01	<0.01	<0.01	<0.01
Dried Pulp	0.23	<0.01	<0.01	<0.01
Molasses	<0.01	<0.01	0.03	<0.01

In sugar beet tops, residues of parent difenoconazole showed a tendency to decline over time. Residues of parent difenoconazole in tops were all at or below the LOQ so no decline was observed. No substantial residues of 1,2,4-triazole (T), triazole alanine (TA) or triazole acetic acid (TAA) were found in any of the decline samples, so no noticeable decline or accumulation was observed..

Magnitude of the Residues in or on Papaya (T002975-06, T002976-06, T002981-06, T002982-06)

Four residue trials were conducted at two rates with the highest rate being approximately 2 times the lower rate. Applications were made using ground equipment with spray volumes ranging from 749 to 886.3 L/ha. The application rates for plot 1 in each trial ranged from 58.9 to 65.6 g ai/ha (1X rate). The application rates for plot 2 in each trial ranged from 112.4 to 132.9 g ai/ha (2X rate). Samples were collected at multiple sampling intervals from each plot in each trial. Samples of papaya whole fruit, peel and pulp were analyzed for residues of difenoconazole using Method AG-575A. The method is adequate for data collection based on acceptable concurrent method recovery data at the LOQ and 10X LOQ, 0.01 and 0.1 ppm respectively. Apparent residues of difenoconazole were below the method LOQ (<0.01 ppm) in/on all samples of untreated papaya whole fruit, peel and pulp.

Residues of difenoconazole were 0.02-0.10 ppm in/on whole papaya from the 4 trials harvested 14 days following the last of four broadcast foliar applications of the EC formulation, at a total rate of 248.2-260.4 g ai/ha.

SECTION E

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PRACTICAL METHODS FOR REMOVING RESIDUE THAT EXCEEDS ANY PROPOSED TOLERANCE

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Since it is unlikely that residues of Difenoconazole will exceed the proposed tolerances in or on pome fruit, tuberous and corm vegetables, sugarbeets, fruiting vegetables, and papaya, methods for removing the residues are unnecessary.

SECTION F

PROPOSED DOMESTIC TOLERANCES FOR THE PESTICIDE CHEMICAL DIFENOCONAZOLE USE IN OR ON POME FRUIT, FRUITING VEGETABLES, POTATOES, AND SUGARBEETS AND AN IMPORT TOLERANCE IN OR ON PAPAYA

Syngenta Crop Protection, Inc. hereby requests that 40 CFR 180.475 be amended by establishment of a tolerance for the residues of the fungicide Difenoconazole, (1-[2-[2-chloro-4-(4-chlorophenoxy)phenyl]-4-methyl-1,3-dioxolan-2-ylmethyl]-1H-1,2,4-triazole), in or on the following raw agricultural commodities:

Commodities	Proposed Tolerance
Fruit, Pome Group	0.6 ppm
Vegetable, Fruiting, Group	0.5 ppm
Vegetable, Tuberous and Corm, subgroup	0.02 ppm
beet, sugar	0.3 ppm
beet, sugar, tops	7.0 ppm

Syngenta Crop Protection, Inc. hereby requests that 40 CFR 180.475 be amended by establishment of an import tolerance for the residues of the fungicide Difenoconazole, (1-[2-[2-chloro-4-(4-chlorophenoxy)phenyl]-4-methyl-1,3-dioxolan-2-ylmethyl]-1H-1,2,4-triazole), in or on the following raw agricultural commodity:

Commodities	Proposed Tolerance
Papaya	0.3 ppm

SECTION G

Reasonable Grounds in Support of Petition

G.1 Adequacy of Proposed Tolerances

Tolerances are based on combined worst-case residues of Difenoconazole on pome fruit, potatoes, fruiting vegetables, sugarbeets and papaya. Tolerances in animal commodities are based on maximum aniticipated residues in the animal diets (tabled below) and data from the livestock feeding studies. Corresponding dose levels in the cow and hen feeding studies submitted concurrent with this petition indicate that resulting difenoconazole residues will be below existing tolerances. Therefore, revised meat, milk and egg tolerances are not necessary.

Tolerance Based Livestock Diet Constructs for Estimation of Theoretical Dietary Burden

Fed Commodity	Theoretical % of Diet	Maximum % of Diet	Residue (ppm)	% Dry Matter	% Crop Treated	Theoretical Contribution (ppm)
Beef Cattle††						
Beet, sugar, tops†	1	1	7.000000	23	100	0.304348
Apple, pomace, wet	40	40	5.616000	40	100	5.616000
Beet, sugar pulp, dried	20	20	2.376000	88	100	0.540000
Potato, proc. waste	9	75	0.320000	15	100	0.192000
Barley grain	30	50	0.100000	88	100	0.034091
Total	**100**					**6.686439**
Dairy Cattle††						
Apple, pomace, wet	20	20	5.616000	40	100	2.808000
Beet, sugar pulp, dried	20	20	2.376000	88	100	0.540000
Potato, proc. waste	30	40	0.320000	15	100	0.640000
Barley grain	30	40	0.100000	88	100	0.034091
Total	**100**					**4.022091**
Swine††						
Barley grain	80	75	0.100000	N/A	100	0.080000
Rye grain	20	50	0.100000	N/A	100	0.020000
Total	**100**					**0.100000**
Poultry†						
Barley grain	20	80	0.100000	N/A	100	0.020000
Wheat grain	80	80	0.100000	N/A	100	0.080000
Total	**100**					**0.100000**

†Average field trial residue values used; N/A: not applicable

G.2 **Discussion of Selection of Difenoconazole for tolerance setting.**

Based on the results of metabolism studies on Difenoconazole, human dietary exposure from use of Difenoconazole on pome fruit, fruiting vegetables, sugarbeets, tuberous and corm vegetables, and papaya can be adequately assessed by analysis for Difenoconazole parent.

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[i]. Syngenta Analytical Method # AG-575B, "Difenoconazole (CGA-169374) Analytical Method for the Determination of CGA-169374 in Wheat Raw Agricultural Commodities by Gas Chromatography with Nitrogen/Phosphorus Detection," (MRID 4280650).

[ii]. Westberg, Gary L., "Determination of 1,2,4-Triazole, Triazole Alanine and Triazole Acetic Acid Residues in Plant and Animal Matrices," Analytical Method No. Meth-160, Revision #2, Morse Laboratories, Inc., Sacramento, CA 95825, April 13, 2005, Syngenta Number T002388-06, (MRID No. 46840813)