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

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

DATE: October 26, 2005

MEMORANDUM

SUBJECT: **Flusilazole**: Occupational and Residential Risk Assessment For Section 18-Emergency Exemption On Soybeans To Control Soybean Rust In Minnesota and South Dakota, Chemical ID No. 128835/DP Barcode: D319403.

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The occupational and residential risk assessment for flusilazole evaluates the proposed *Section 18-Emergency Exemption* submitted by the Minnesota Department of Agriculture for control of soybean rust. The submitted labels, as written, specify use of flusilazole on soybeans in Minnesota and South Dakota. Flusilazole is not currently a registered pesticide based on the results of an OPPIN (Office of Pesticide Programs Information Network) search (9/23/05). Two proposed labels are the basis of this action including: (1) DuPont Punch - a 3.3 lb ai/gallon emulsifiable concentrate (37.8%) and (2) DuPont Charisma - a 0.9 lb ai/gallon emulsifiable concentrate (0.9%). [Note: Charisma is a multi-ingredient formulation that also contains 0.8 pounds famoxadone per gallon.] The only uses specified in the proposed labels are for agricultural uses on soybeans to control rust. As such, no residential uses are proposed and only exposures related to agricultural use scenarios have been addressed herein.

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Executive Summary

This occupational and residential risk assessment chapter supports evaluation of the proposed flusilazole Section 18 for controlling soybean rust in Minnesota. Flusilazole is currently not a registered pesticide in the United States. Two proposed Section 18 labels for soybean rust control served as the basis for this assessment (i.e., Punch 3.3 EC and Charisma 0.9 EC). These proposed labels specified maximum application rates of 0.10 and 0.07 lb ai/acre, respectively. These labels also proposed the use of gloves for occupational handlers with otherwise normal work clothing and a restricted entry interval of 12 hours.

Risks were calculated based on both noncancer and cancer endpoints. Noncancer dermal risks were based on a dermal prenatal developmental study in rats (NOAEL = 2.0 mg/kg/day) where the endpoint was rib (various) malformations and unossified sternebrae. Noncancer inhalation risks were calculated based on a 2 generation reproduction study in rats (NOAEL = 2.85 mg/kg/day) where the endpoint was decreased pup viability at birth and decreased post-natal survival. A linear, low-dose extrapolation approach (i.e., $Q_1^* = 2.84\times10^{-3}$) was used to assess cancer risks where the endpoint was based on female mouse liver adenoma and/or carcinoma tumor rates. A 30 percent dermal absorption factor was used in the cancer risk calculations.

The occupational handler results indicate that the noncancer risks are generally not of concern at the levels of personal protection specified by the two proposed flusilazole labels. Two dermal exposure scenarios have risks of concern associated with mixing/loading liquids for very high acreage uses (i.e., 1200 acres) where the MOEs are less than 100 (i.e., 51 and 73 for Punch and Charisma labels, respectively). The risks for these two scenarios are not of concern if closed loading systems are employed (i.e., MOEs = 136 and 194, respectively). Inhalation noncancer risks are not of concern for any scenario considered without respiratory protection as stipulated in the proposed labels. Cancer risks were also generally not of concern. Cancer risks for private applicators (i.e., 10 days use per year) were not of concern for any scenario considered. The trend for commercial applicators (i.e., 30 days use per year) are similar to those noted above for the dermal noncancer risks. For the high acreage mixing/loading events, additional personal protection (e.g., closed loading in one case) compared to the proposed label is needed to achieve cancer risk estimates that are less than 1×10^{-6}.

Both of the proposed flusilazole labels (i.e., Punch 3.3.EC and Charisma 0.9 EC) specify 12 hour restricted entry intervals (REIs). Noncancer risks (i.e., MOEs) are of concern at the currently proposed REI as the MOEs are 52 for the Punch 3.3 EC and 74 for the Charisma 0.9 EC labels, respectively, on the day of application for scouting which is the only anticipated hand labor activity that would lead to routine exposures. The level of concern for noncancer risks is a total uncertainty factor (i.e., target MOE) of 100. Noncancer risks exceed the target uncertainty factor (i.e., MOE $\geq$ 100) at 7 or 3 days after application, respectively, for the Punch (i.e., 0.10 lb ai/acre) and Charisma (0.07 lb ai/acre) labels. Cancer risks are not of concern for all scenarios considered on the day of application for both proposed label or population considered.

All of the key exposure patterns that would be associated with the anticipated use patterns of flusilazole have been addressed in this assessment. Overall, the best available exposure monitoring data have been used to complete this assessment including the Pesticide Handlers Exposure Database (PHED) and data from the Agricultural Reentry Task Force (ARTF). Generally, the PHED exposure estimates are considered to be high quality data and the ARTF data are also considered high quality. Other factors used in this assessment were those commonly used by the Agency as more specific data were not available (e.g., to calculate dislodgeable foliar residues). Chemical-specific data could potentially refine risk estimates (e.g., a dislodgeable foliar residue for postapplication worker risks). Generally, the flusilazole occupational risks should be considered a highly quality assessment that results in upper percentile exposure estimates based on the inputs used.

1.0 Background Information

This section summarizes the background information that has been used to develop this risk assessment. Included are *Section 1.1: Purpose* and *Section 1.2: Criteria For Conducting Exposure Assessments* which describe the scope of the assessment and triggers upon which its based. *Section 1.3: Hazard Summary* provides a description of the toxicity of flusilazole and the uncertainty factors used. Finally, *Section 1.4: Use Information* summarizes available information pertaining to the available products which contain flusilazole and their uses.

1.1 Purpose

This document presents the occupational exposures and risks associated with the use of flusilazole in agricultural settings. No residential scenarios have been included since the proposed flusilazole labels do not specify any uses except for soybeans. Flusilazole is expected to be used in a manner that leads to exposures for those who are involved with handling or the application process. Post-application exposures are also anticipated but are expected to be very limited because of the general lack of hand labor activities associated with soybean production (i.e., only scouts evaluating soybean rust treatments were considered).

1.2 Criteria for Conducting Exposure Assessments

Exposure data requirements have been triggered based on the potential for exposure and the toxicological significance of the active ingredient. All non-dietary exposure and risk assessments completed for flusilazole are presented in this chapter. Flusilazole is used in a manner that can lead to occupational exposures for users. The toxicity of flusilazole has also been evaluated and endpoints have been selected for risk assessment purposes. Short- and intermediate-term exposures are anticipated. Chronic or long-term exposures are not.

1.3 Hazard Summary

A series of toxicological endpoints and calculations were used to complete the handler risk assessment. The endpoints and other pertinent hazard information that has been used to calculate risks for flusilazole are presented in Table 1. The exposures for flusilazole are anticipated to be short- and intermediate-term in nature and via the dermal and inhalation routes. As such, endpoints for each duration and both routes have been selected. The endpoints for dermal and inhalation exposures differ in nature so route-specific risk estimates have been calculated (i.e., it would not be appropriate to add together combined noncancer risks). Flusilazole has also been determined to be carcinogenic. A linear, low-dose extrapolation approach has been used to assess cancer risks (i.e., Q_1*) coupled with an appropriate dermal absorption factor.

Table 1. Endpoints for Assessing Occupational Risks for Flusilazole.			
Exposure Scenario	**Dose (mg/kg/day) UF /MOE**	**Total Uncertainty Factor**	**Endpoint for Risk Assessment**
Dermal Short-Term & (1 - 30 days) Intermediate-Term (1 - 6 Months)	NOAEL= 2.0 mg/kg/day	100	**Dermal Prenatal Developmental Rat Study** LOAEL = 10 mg/kg/day, based on 14^{th} rudimentary ribs, 14^{th} full ribs, 7^{th} cervical ribs, and unossified sternebrae
Inhalation Short-Term & (1 - 30 days) Intermediate-Term (1 - 6 Months)	NOAEL= 2.85 mg/kg/day	100	**2 Generation Reproduction Rat Study** LOAEL = 18 mg/kg/day, based on decreased pup viability at birth and decreased post-natal survival
Cancer	Q_1^* $(mg/kg/day)^{-1}$ = 2.84 x 10^{-3} based on female mouse liver adenoma and/or carcinoma tumor rates		
Dermal Absorption	30 %		
An inhalation absorption factor of 100 percent relative to oral dosing has been used for all calculations which is commonly applied in the absence of appropriate data. Source: Lisa Austin email 9/27/05			

1.4 Use Information

Flusilazole is a systemic fungicide that is proposed for use in the United States to control soybean rust. The purpose of this action is to review the Section 18-Emergency Exemption for flusilazole that has been submitted by the Minnesota Department of Agriculture. *Section 1.4.1: End Use Products* summarizes the available products. *Section 1.4.2: Mode of Action and Targets Controlled* describes the key pests controlled in each use pattern. *Section 1.4.3: Registered Use Categories* describes categories of crops for which flusilazole is registered. *Section 1.4.4: Application Parameters* describes the equipment, application rate, and timing of applications for flusilazole.

1.4.1. End-Use Products

Flusilazole is not currently registered in the United States. Two labels have been submitted for this Section 18 (both DuPont)including: (1) DuPont Punch - a 3.3 lb ai/gallon EC or emulsifiable concentrate (37.8%) and (2) DuPont Charisma - a 0.9 lb ai/gallon emulsifiable concentrate (0.9%). [Note: Charisma is a multi-ingredient formulation that also contains 0.8 pounds famoxadone per gallon.]

1.4.2 Mode of Action and Targets Controlled

Flusilazole is a systemic fungicide which is proposed for the control of soybean rust.

1.4.3 Registered Use Categories

The only uses specified in the proposed labels are for agricultural uses on soybeans to control soybean rust. As such, no residential uses are proposed and only agricultural exposure scenarios have been addressed herein. Soybeans are included in the *Field, Forage, Fiber and Vegetable Crops* group.

1.4.4. Application Parameters

Application parameters are generally defined by the physical nature of the use site, the physical nature of the formulation (e.g., form and packaging), by the equipment required to deliver the chemical to the use site, and by the application rate required to achieve an efficacious dose. The following information was defined based on the proposed labels (i.e., DuPont Punch & DuPont Charisma):

- **Method:** "Apply as a spray with ground, air, or chemigation equipment, except as otherwise directed, using sufficient water to obtain thorough coverage of plants."

- **Equipment:** Chemigation, groundboom, and aerial [Note: In the "Spray Drift Management" section of the proposed labels, an "Air Assisted (Airblast) Field Crop Sprayer" is mentioned. This has not been addressed in this assessment since it is not believed to be an appropriate method for application to soybeans.]

- **Repeat Application Schedule:** 14 to 21 days

- **Pre-Harvest & Plant-Back Intervals:** 30 days

- **Restricted Entry Interval:** 12 hours

- **Repeat Applications:** "Apply no more than 2 applications per 12 month period."

- **Handler Personal Protective Equipment:** Long-sleeved shirt, long pants, chemical-resistant gloves, no respirator.

- **Application Rates:** The application rates on the two proposed labels differ. The ***Punch*** label allows 3 to 4 fluid ounces per acre per application which equates to a maximum application rate of 0.1 pounds active ingredient (ai) per acre since it is a 3.3 lb ai/gallon EC formulation. Conversely, the ***Charisma*** label allows 8 to 10 fluid ounces per acre per application which equates to a maximum application rate of 0.07 lb ai per acre since it is a 0.9 lb ai/gallon EC formulation. The two proposed maximum application rates have been used as the basis for this assessment.

2.0 Occupational Risk Assessment

The proposed flusilazole labels are both for liquid emulsifiable concentrate formulations that are intended to be used as a foliar treatment to soybeans. As such, exposures are expected to occur to individuals involved in the application process who are referred to as handlers. The Agency also routinely considers exposures to workers who reenter treated areas as part of their normal work practices. There are very limited hand-labor practices associated with the production of soybeans which have been addressed in this assessment as well (i.e., scouting).

This section includes the occupational aspects of the risk assessment. Occupational handler exposures and risks are addressed in *Section 2.1: Occupational Handler Exposures and Risks* while occupational post-application worker risks are presented and summarized in *Section 2.2: Occupational Post-Application Exposures and Risks*. The calculated risks are characterized in *Section 2.3: Occupational Risk Characterization.*

2.1 Occupational Handler Exposures and Risks

This section presents the occupational risk assessment that has been developed for flusilazole. Included are *Section 2.1.1: Handler Exposure Scenarios* describes the scope of the assessment. *Section 2.1.2: Exposure Data and Factors* describes the data used to address handler exposures. *Section 2.1.3: Occupational Handler Risk Calculations* provides a summary of the methods used to calculate risks for flusilazole handlers. *Section 2.1.4: Occupational Handler Risk Summary* provides a summary of the risks for flusilazole handlers.

2.1.1 Handler Exposure Scenarios

Occupational handler exposure assessments are completed by the Agency using different levels of personal protection. The Agency typically evaluates all exposures with a tiered approach. The lowest tier is represented by the baseline exposure scenario followed by increasing the levels of personal protection represented by personal protective equipment or PPE (e.g., gloves, extra clothing, and respirators) and engineering controls (e.g., closed cabs and closed loading systems). This approach is always used by the Agency in order to be able to define label language using a risk-based approach and not based on generic requirements for label language. In addition, the minimal level of adequate protection for a chemical is generally considered by the Agency to be the most practical option for risk reduction (i.e., over-burdensome risk mitigation measures are not considered a practical alternative). The levels of protection that formed the basis for the calculations in this assessment include (which were combined to obtain 8 different scenarios):

- **Baseline:** Represents typical work clothing or a long-sleeved shirt and long pants with no respiratory protection. No chemical-resistant gloves are included in this scenario.

- **Minimum Personal Protective Equipment (PPE):** Represents the baseline scenario with the use of chemical-resistant gloves and a dust/mist respirator with a protection factor of 5.

- **Maximum Personal Protective Equipment (PPE):** Represents the baseline scenario with the use of an additional layer of clothing (e.g., a pair of coveralls), chemical-resistant gloves, and an air purifying respirator with a protection factor of 10.

- **Engineering Controls:** Represents the use of an appropriate engineering control such as a closed tractor cab or closed loading system for granulars. Engineering controls are not applicable to handheld application methods which have no known devices that can be used to routinely lower the exposures for these methods.

  [Note: Both proposed flusilazole labels require long pants and long-sleeved shirts, chemical-resistant gloves, footwear, (i.e., the minimum PPE scenario) and no respirator.]

The Agency has determined that there is a potential for exposure in occupational scenarios from handling flusilazole products during the application process (i.e., mixer/loaders and applicators). As a result, risk assessments have been completed for these occupational handler scenarios. [Note: The scenario numbers correspond to the tables of risk calculations included herein.]

Mixing/Loading
(1a) Liquids for Aerial/Chemigation; and
(1b) Liquids for Groundboom.

Applicator:
(2) Aerial/Liquid Application; and
(3) Groundboom Application.

Flaggers:
(4) Flagging For Liquid Sprays.

2.1.2 Exposure Data and Factors

A series of exposure factors served as the basis for completing the occupational handler risk assessments. Each assumption and factor is detailed below on an individual basis. In addition to these values, exposure values were used to calculate risk estimates. These values were taken from the Pesticide Handlers Exposure Database (PHED). No flusilazole-specific exposure monitoring data are available.

Exposure Factors: The factors used in the risk calculations include:

- Average body weight of an adult handler is 70 kg because the endpoints used for the short- and intermediate-term assessments is appropriate to both males and females (i.e., they are not sex-specific).

- All handler calculations are completed at the maximum labeled rate for each crop (i.e., 0.10 and 0.07 lb ai/acre for the ***Punch*** and ***Charisma*** labels, respectively).

- The average occupational workday is assumed to be 8 hours.

- Based on the manner in which flusilazole is expected to be used, the Agency considered two distinct populations in the cancer risk assessment including private growers at 10 use events per year and commercial applicators that would have a more frequent use pattern of 30 days per year.

- The daily areas to be treated were defined for each handler scenario (in appropriate units):

  - 1200 acres treated using aerial equipment for large acreage crops/situations such as soybeans;

  - 200 acres treated using groundboom equipment for large acreage crops/situations such as soybeans;

  - 350 acres for flagging aerial applications [Note: 1200 acres is not used for this scenario as for large acreage situations it is anticipated that GPS or other pilot-assist technology would be used in lieu of flaggers];

  - 350 acres treated using aerial equipment for soybean production on smaller farm situations; and

  - 80 acres treated using groundboom equipment for soybean production on smaller farm situations.

- Handler exposures are calculated using differing levels of mitigation. Protection factors are applied to these risk mitigation options to calculate unit exposure values: second layer of clothing- 50 percent; chemical resistant gloves-90 percent; PF 5 respirator- 80 percent protection, PF 10 respirator- 90 percent protection. Engineering controls may include closed mixing/loading and closed cabs and have a 98 percent protection factor.

Exposure Data: The Agency uses a concept known as *unit exposure* as the basis for the scenarios used to assess handler exposures to pesticides. *Unit exposures* numerically represent the exposures one would receive related to an application. They are generally presented as (mg active ingredient exposure/pounds of active ingredient handled). The Agency has developed a series of unit exposures that are unique for each scenario typically considered in our assessments (i.e., there are different unit exposures for different types of application equipment; job functions; and levels of protection). The *unit exposure* concept has been established in the scientific literature and also through various exposure monitoring guidelines published by the U.S. EPA and international organizations such as Health Canada and OECD (Organization For Economic Cooperation and Development). The concept of unit exposures can be illustrated by the following example. If an individual makes an application using a groundboom sprayer with either 10 pounds of chemical A or 10 pounds of chemical B using the same application equipment and protective measures, the exposures to chemicals A and B would be similar. The unit exposure in both cases would be 1/10th of the total exposure (measured in milligrams) received during the application of either chemical A or chemical B (i.e., milligrams on the skin after applying 10 pounds of active ingredient divided by 10 pounds of active ingredient applied).

The unit exposure values that were used in this assessment were based on the Pesticide Handler Exposure Database (PHED) Version 1.1 August 1998. No flusilazole-specific exposure data were submitted for this assessment. A brief description of PHED is provided below.

Pesticide Handlers Exposure Database (PHED) Version 1.1, August 1998:

PHED was designed by a task force of representatives from the U.S. EPA, Health Canada, the California Department of Pesticide regulation, and member companies of the American Crop Protection Association. PHED is a software system consisting of two parts -- a database of measured exposure values for workers involved in the handling of pesticides under actual field conditions and a set of computer algorithms used to subset and statistically summarize the selected data. Currently, the database contains values for over 1,700 monitored individuals (i.e., replicates).

Users select criteria to subset the PHED database to reflect the exposure scenario being evaluated. The subsetting algorithms in PHED are based on the central assumption that the magnitude of handler exposures to pesticides are primarily a function of activity (e.g., mixing/loading, applying), formulation type (e.g., wettable powders, granulars), application method (e.g., aerial, groundboom), and clothing scenarios (e.g., gloves, double layer clothing).

Once the data for a given exposure scenario have been selected, the data are normalized (i.e., divided by) by the amount of pesticide handled resulting in standard unit exposures (milligrams of exposure per pound of active ingredient handled). Following normalization, the data are statistically summarized. The distribution of exposure values for each body part (e.g., chest upper arm) is categorized as normal, lognormal, or "other" (i.e., neither normal nor lognormal). A central tendency value is then selected from the distribution of the exposure values for each body part. These values are the arithmetic mean for normal distributions, the geometric mean for lognormal distributions, and the median for all "other" distributions. Once selected, the central tendency values for each body part are composited into a "best fit" exposure value representing the entire body.

The unit exposure values calculated by PHED generally range from the geometric mean to the median of the selected data set. To add consistency and quality control to the values produced from this system, the PHED Task Force has evaluated all data within the system and has developed a set of grading criteria to characterize the quality of the original study data. The assessment of data quality is based on the number of observations and the available quality control data (see Agency's August 1998 Surrogate Exposure Guide for PHED for further information). While data from PHED provide the best available information on handler exposures, it should be noted that some aspects of the included studies (e.g., duration, acres treated, pounds of active ingredient handled) may not accurately represent labeled uses in all cases. A series of tables of standard unit exposure values for many occupational scenarios that can be utilized to ensure consistency in exposure assessments have been developed.

There are three basic risk mitigation approaches considered appropriate for controlling occupational exposures. These include administrative controls, the use of personal protective equipment or PPE, and the use of engineering controls. Occupational handler exposure assessments are completed by HED using a baseline exposure scenario and, if required, increasing levels of mitigation (PPE and engineering controls) to achieve an appropriate margin of exposure. [Note: Administrative controls available generally involve altering application rates for handler exposure scenarios. These are typically not utilized for completing handler exposure assessments because of the negotiation requirements with registrants.] The baseline clothing/PPE ensemble for occupational exposure scenarios is generally an individual wearing long pants, a long sleeved shirt, no chemical resistant gloves (there are exceptions pertaining to the use of gloves and these are noted), and no respirator. The next level of mitigation considered in the risk assessment process is the use of maximum PPE which includes use of chemical resistant gloves, double layer clothing, and a dust/mist respirator or combination thereof. The final potential risk mitigation option is the use of appropriate engineering controls which, by design, attempt to eliminate the possibility of human exposure. Examples of commonly used engineering controls include closed mixing/loading/transfer systems, closed tractor cabs, and water soluble packets.

2.1.3 Occupational Handler Risk Calculations

The methods used to calculate handler risks are presented below. The method for noncancer risks is based on the use of a value referred to as the Margin of Exposure (MOE) while cancer risks were calculated using a linear, low-dose extrapolation approach (i.e., the Q_1* which is also referred to as a cancer slope factor). The techniques are presented below in detail.

The first step in the process is to calculate the daily exposure and dose levels for both the dermal and inhalation exposures. First, the daily dermal exposure was calculated using the following:

Daily Dermal Exposure = Dermal Unit Exposure x Application Rate x Daily Acres Treated

Where:

Daily Dermal Exposure = Amount deposited on the surface of the skin that is available for dermal absorption, also referred to as potential dose (mg ai/day);
Dermal Unit Exposure = Normalized exposure value derived from August 1998 PHED Surrogate Exposure Table (mg ai/lb ai);
Application Rate = Normalized application rate based on a logical unit treatment such as acres, a maximum value is generally used (lb ai/A);
Daily Acres Treated = Normalized application area based on a logical unit treatment such as acres (A/day).

Daily dermal dose was then calculated by normalizing the daily dermal exposure value by body weight and accounting for dermal absorption when appropriate. For adult handlers using flusilazole, a body weight of 70 kg was used for all exposure scenarios because the health effects are not sex-specific. This body weight applies to both the noncancer risk or the cancer risk calculations. A dermal absorption factor is not needed for the noncancer risk calculations (i.e., a default of 100% is used in the formula below) because the noncancer endpoint is derived from a study in which flusilazole was administered dermally to the test animals. Conversely, a dermal absorption factor of 30 percent has been used to calculate absorbed dose estimates for the cancer risk calculations since the Q_1* is based on an oral administration study in the test animals. Daily dermal dose was calculated using the following:

Daily Dermal Dose (mg/kg/day) =
Daily Dermal Exposure (mg ai/day) * (Dermal Absorption (%/100)/Body Weight (kg))

The process used to calculate inhalation exposure for handlers is similar to that used to calculate the daily dermal dose to handlers. Daily inhalation exposure levels (μg/lb ai) were based on an inhalation rate of 29 liters/minute. Once the unit exposure value is presented in this form and converted to (mg/lb ai), the calculations essentially mirror those presented above for the dermal route using a value of 100 percent absorption for all calculations (i.e., a daily inhalation dose is calculated in mg/kg/day).

The handler exposure assessment does not include any dietary or drinking water inputs.

Noncancer risk estimates (i.e., Margins of Exposure or MOEs) were calculated based on the daily dermal dose and daily inhalation dose estimates by comparing them to the appropriate NOAEL dose levels. The dermal and inhalation short/intermediate-term MOEs were calculated using

NOAELs of 2.0 mg/kg/day and 2.85 mg/kg/day, respectively (see Table 1 for more information), and the formula below:

$$MOE_{route} = NOAEL_{route}\ (mg/kg/day)/Daily\ Dose_{route}\ (mg/kg/day)$$

In many cases, the Agency calculates combined noncancer risks that simultaneously considers exposures from all routes of exposure. For flusilazole, this is not appropriate because different toxicological effects were observed in the studies from which dermal and inhalation endpoints were selected. A target margin of exposure (MOE) is used to establish the Agency's level of concern. In this case, a total uncertainty factor of 100 was considered for all noncancer risks associated with flusilazole. This factor represents the uncertainty associated with inter-species extrapolation and intra-species sensitivity (i.e., 10 for each area of uncertainty, 10 x 10 = 100).

Cancer risk estimates are the product of an amortized lifetime average daily dose (LADD) and the Q_1^*. In the calculations above, daily dermal and inhalation dose estimates are calculated. These are also known as average daily dose estimates (i.e., ADDs). After the development of the ADD values, the next step required to calculate the carcinogenic risk is to amortize these values over the working lifetime of occupational handlers based on use patterns, this results in the LADD for that use. Based on the manner in which flusilazole is expected to be used, the Agency considered two distinct populations in the cancer risk assessment including private growers at 10 use events per year and commercial applicators that would have a more frequent use pattern of 30 days per year. Finally, a 35 year career and a 70 year lifespan was used to complete the calculations. LADD values were calculated using the following equation:

$$LADD = ADD \times \frac{TreatmentFrequency}{365 Days / year} \times \frac{WorkingDuration}{Lifetime}$$

Where:

Lifetime Average Daily Dose	=	The amount as absorbed dose received from exposure to a pesticide in a given scenario over a lifetime (mg pesticide active ingredient/kg body weight/day, also referred to as LADD);
Average Daily Dose	=	The amount as absorbed dose received from exposure to a pesticide in a given scenario on a daily basis (mg pesticide active ingredient/kg body weight/day, also referred to as ADD);
Treatment Frequency	=	The annual frequency of an application by an individual (days/year);
Working Duration	=	The amount of a lifetime that an individual spends engaged in a career involving pesticide exposure (35 years);
Lifetime	=	The average life expectancy of an individual (70 years).

Cancer risk calculations were completed by comparing the LADD values calculated above to the Q_1^* for flusilazole ($Q_1^* = 2.84 \times 10^{-3}\ (mg/kg/day)^{-1}$, see Table 1 for further information). Cancer risk values were calculated using the following equation:

$$Risk = LADD \times Q_1^*$$

Where:

Risk	=	Probability of excess cancer cases over a lifetime (unitless);
Lifetime Average Daily Dose	=	The amount as absorbed dose received from exposure to a pesticide in a given scenario over a lifetime (mg pesticide active ingredient/kg body weight/day, also referred to as LADD); and
Q_1^*	=	Quantitative dose response factor used for linear, low-dose response cancer risk calculations $(mg/kg/day)^{-1}$.

The Agency has defined a range of acceptable cancer risks based on a policy memorandum issued in 1996 by then office director, Mr. Dan Barolo. This memo refers to a predetermined quantified "level of concern" for occupational carcinogenic risk. In summary, this policy memo indicates occupational carcinogenic risks that are 1×10^{-6} or lower require no risk management action. For those chemicals subject to reregistration, the Agency is to carefully examine uses with estimated risks in the 10^{-6} to 10^{-4} range to seek ways of cost-effectively reducing risks. If carcinogenic risks are in this range for occupational handlers, increased levels of personal protection would be warranted as is commonly applied with noncancer risk estimates (e.g., additional PPE or engineering controls). Carcinogenic risks that remain above 1.0×10^{-4} at the highest level of mitigation appropriate for that scenario remain a concern.

2.1.4: Occupational Handler Risk Summary

The results of the occupational handler risk assessment are summarized in Table 2 below. Table 2summarizes both the noncancer and cancer risks for handlers using equipment based on the proposed flusilazole labels (i.e., Punch and Charisma). For more detailed information, both the noncancer and cancer risk estimates were also calculated at all available levels of personal protection (Appendix A). Appendix A/Table 1 describes the inputs used for the assessment. The noncancer calculations are included in Appendix A/Tables 2 through 5 (each represents a different level of personal protection) while cancer risks are included in Appendix A/Tables 6 and 7 for private growers and commercial applicators, respectively.

The results indicate that the noncancer risks are generally not of concern at the levels of personal protection specified by the two proposed flusilazole labels. Two dermal exposure scenarios have risks of concern associated with mixing/loading liquids for very high acreage uses (i.e., 1200 acres) where the MOEs are less than 100 (i.e., 51 and 73 for Punch and Charisma labels, respectively). The risks for these two scenarios are not of concern if closed loading systems are considered (i.e., MOEs = 136 and 194, respectively). Inhalation noncancer risks are not of concern for any scenario considered without respiratory protection as stipulated in the proposed labels. Cancer risks for private applicators (i.e., 10 days use per year) were not of concern for any scenario considered. The trend for commercial applicators (i.e., 30 days use per year) are similar to those noted above for the dermal noncancer risks. For the high acreage mixing/loading events, additional personal protection over the proposed label to achieve cancer risk estimates that are less than 1×10^{-6}.

Table 2: Summary Of Flusilazole Occupational Handler Risks At Proposed Label Specified Levels Of Personal Protective Equipment During Soybean Application*						
Scenario	Formulation	Area Treated (acres/day) & Rate (lb ai/acre)	Non-Cancer MOEs		Cancer Risks	
			Dermal	Inhalation	Private Growers (10 days/yr)	Comm. Appl. (30 days/yr)
Mixer/Loaders						
Liquids Aerial & Chemigation	Punch 3.3 EC	350A & 0.1 lb ai/A	174	4750	1.6×10^{-7}	4.7×10^{-7}
	Punch 3.3 EC	1200A & 0.1 lb ai/A	51+	1385	5.4×10^{-7}	1.6×10^{-6} +
	Charisma 0.9 EC	350A & 0.07 lb ai/A	248	6786	1.1×10^{-7}	3.3×10^{-7}
	Charisma 0.9 EC	1200A & 0.07 lb ai/A	73+	1979	3.8×10^{-7}	1.1×10^{-6}+
Liquids Groundboom	Punch 3.3 EC	80A & 0.1 lb ai/A	761	20781	3.6×10^{-8}	1.1×10^{-7}
	Punch 3.3 EC	200A & 0.1 lb ai/A	304	8312	9.0×10^{-8}	2.7×10^{-7}
	Charisma 0.9 EC	80A & 0.07 lb ai/A	1087	29687	2.5×10^{-8}	7.8×10^{-8}
	Charisma 0.9 EC	200A & 0.07 lb ai/A	435	11875	6.3×10^{-8}	1.9×10^{-7}
Applicators						
Liquids Aerial Application #	Punch 3.3 EC	350A & 0.1 lb ai/A	727	83824	3.3×10^{-8}	1.0×10^{-7}
	Punch 3.3 EC	1200A & 0.1 lb ai/A	212	24449	1.1×10^{-7}	3.4×10^{-7}
	Charisma 0.9 EC	350A & 0.07 lb ai/A	1039	119748	2.3×10^{-8}	7.0×10^{-8}
	Charisma 0.9 EC	1200A & 0.07 lb ai/A	303	34927	8.0×10^{-8}	2.4×10^{-7}
Liquids Groundboom	Punch 3.3 EC	80A & 0.1 lb ai/A	1250	33699	2.2×10^{-8}	6.6×10^{-8}
	Punch 3.3 EC	200A & 0.1 lb ai/A	500	13480	5.5×10^{-8}	1.6×10^{-7}
	Charisma 0.9 EC	80A & 0.07 lb ai/A	1786	48142	1.5×10^{-8}	4.6×10^{-8}
	Charisma 0.9 EC	200A & 0.07 lb ai/A	714	19257	3.8×10^{-8}	1.2×10^{-7}
Flaggers						
Liquids Flagger	Punch 3.3 EC	350A & 0.1 lb ai/A	333	16286	7.7×10^{-8}	2.3×10^{-7}
	Charisma 0.9 EC	350A & 0.07 lb ai/A	476	23265	5.4×10^{-8}	1.6×10^{-7}

* Both proposed flusilazole labels require long pants and long-sleeved shirts, chemical-resistant gloves, footwear, (i.e., the minimum PPE scenario) and no respirator. The results presented in this table reflect that level of personal protection. As indicated above, additional levels of personal protection were considered in this assessment. Those results are summarized in Appendix A.

Note: Pilots have been assessed in the interior of closed cockpit aircraft. In accordance with the Worker Protection Standard, this scenario is based on normal work clothing only in the cockpit. Gloves are not considered as part of this exposure scenario as they interfere with pilot activities in cockpits.

\+ Additional levels of personal protection are required for risks to reach a level of no concern. For the noncancer MOEs, closed loading systems elevate MOEs >100 (136 & 194, respectively). For the cancer risks, a coverall or closed loading systems, respectively, were required to lower risks to < 1×10^{-6} levels.

2.2 Occupational Post-Application Exposures and Risks

The Agency uses the term "postapplication" to describe exposures to individuals that occur as a result of working in an environment that has been previously treated with a pesticide (also referred to as reentry exposure). The agency believes that there are distinct job functions or tasks related to the kinds of activities that occur in previously treated areas. Job requirements (e.g., the kinds of hand-labor tasks needed to cultivate a crop), the nature of the crop or target that was treated, and the how chemical residues degrade in the environment can cause exposure levels to differ over time. Each factor has been considered in this assessment. The scenarios that serve as the basis for the risk assessment are presented in *Section 2.2.1: Occupational Postapplication Exposure Scenarios*. The exposure data and assumptions that have been used for the calculations are presented in *Section 2.2.2: Data and Assumptions For Occupational Postapplication Exposure Scenarios*. The calculations and the algorithms that have been used are presented in *Section 2.2.3: Occupational Postapplication Risk Calculations*. *Section 2.2.4: Occupational Postapplication Risk Summary* provides a summary of the risks for flusilazole reentry workers.

2.2.1 Occupational Postapplication Exposure Scenarios

The agency uses a concept known as the *transfer coefficient* to numerically represent the post-application exposures one would receive associated with distinct job tasks (i.e., generally presented as cm^2/hour). The transfer coefficient concept has been established in the scientific literature and through various exposure monitoring guidelines published by the U.S. EPA and international organizations such as Health Canada and OECD (Organization For Economic Cooperation and Development). The establishment of transfer coefficients also forms the basis of the work of the Agricultural Reentry Task Force, of which, DuPont is a member (see www.exposuretf.com for more details). The transfer coefficient is essentially a measure of the contact with a treated surface one would have while doing a task or activity. There are separate transfer coefficients for varied hand labor activities. These values are defined by calculating the ratio of an exposure for a given task or activity to the amount of pesticide on leaves (or other surfaces) that can rub off on the skin resulting in an exposure. For postapplication exposures, the amounts that can rub off on the skin are measured using techniques that specifically determine the amount of residues on treated leaves or other surfaces (referred to as transferable residues) rather than the total residues contained both on the surface and absorbed into treated leaves.

The Agency has developed a series of standard *transfer coefficients* that are unique for variety of job tasks or activities that are used in lieu of chemical- and scenario-specific data. However, the scope of this Section 18 is limited to only activities related to soybean production. As such, the Agency believes that the only hand labor activity that would normally be practiced related to soybean production would be for scouting in treated fields in order to determine the level of soybean rust control associated with the use of flusilazole.

The are other possible activities associated with the production of soybeans but these are not believed to be hand labor intensive and would possibly include mechanical cultivation and harvesting. Mechanical harvesting and other similar low/no exposure activities are addressed by the guidance contained in the Worker Protection Standard (40CFR 170) guidance for such activities. These are not quantitatively considered in Agency risk assessments.

2.2.2 Data and Assumptions for Occupational Postapplication Exposure Scenarios

No chemical-specific data were available upon which to base the flusilazole postapplication worker risk assessment. As such, a series of assumptions and exposure factors served as the basis for completing the occupational postapplication worker risk assessments. Each assumption and factor is detailed below. In addition to these values, a transfer coefficient appropriate for soybean scouting was used to calculate risk estimates. The transfer coefficient was taken from the Agency's revised policy entitled *Policy 003.1 Science Advisory Council For Exposure Policy Regarding Agricultural Transfer Coefficients* (August 7, 2000). The assumptions and factors used in the risk calculations include:

- There are many factors that are common to handler and postapplication risk assessments such as body weights, duration, and ranges of application rates. Please refer to the assumptions and factors in Section 2.1.2 for further information concerning these values which are common to both handler and postapplication risk assessments.

- The transfer coefficient for soybean scouting is 1500 cm^2/hour and the daily exposure duration is 8 hours per day.

- Chemical-specific dislodgeable foliar residue (DFR) data were not available for flusilazole. As such, the Agency used the standard approach of calculating the day of application initial DFR estimate using 20 percent of the application rate and also evaluating dissipation at a rate of 10 percent per day.

- As described in the handler section above, noncancer risks were calculated by comparing single day exposures to the NOAEL. This same approach was used in the postapplication assessment where single day exposures were calculated to complete the short-/intermediate-term risk assessments (i.e., single day risks were calculated based on daily DFR values).

- The exposure frequency values for the postapplication cancer risk assessment are intended to consider the exposures of professional farmworkers and those growers/users who do their own hand labor. As a result, cancer risks for all postapplication scenarios have been assessed using 30 days per year for professional farmworkers and 1/3rd of that for private growers analogous to the handler assessment completed above.

- In postapplication cancer risk assessments, the Agency uses a tiered approach. In this case LADD (Lifetime Average Daily Dose) levels were calculated by amortizing single day exposures which are the same values used in the short-term assessment over a lifetime using the 10 and 30 days per year frequency values. This may introduce a level of conservatism into the assessment. However, it does not appear that cancer risks would drive decisions for postapplication exposure scenarios because of the concerns for reentry workers from noncancer risks. Therefore, the analysis was not refined further.

2.2.3 Occupational Postapplication Risk Calculations

The occupational postapplication exposure and risk calculations are presented in this section. As above with the handler calculations (Section 2.1.3), noncancer risks were calculated using the MOE approach and cancer risks were calculated using a linear, low dose extrapolation based on a Q_1^* and determination of a lifetime average daily dose (i.e., LADD). The equations used are very similar except that daily exposures which for postapplication workers are calculated using different a different equation and inputs (see 2.2.2).

Postapplication exposure values on each post-application day were calculated using the following equation (see equation D2-20 from *Series 875-Occupational and Residential Test Guidelines: Group B-Postapplication Exposure Monitoring Test Guidelines*):

$$DE_{(t)}\ (mg/day) = (DFR_{(t)}\ (\mu g/cm^2) \times TC\ (cm^2/hr) \times Hr/Day)/1000\ (\mu g/mg)$$

Where:

DE(t)	=	Daily exposure or amount deposited on the surface of the skin at time "t" attributable for activity in a previously treated area, also referred to as potential dose (mg ai/day);
DFR(t)	=	Dislodgeable foliar residue at time "t" ($\mu g/cm^2$);
TC	=	Transfer Coefficient (cm^2/hour); and
Hr/day	=	Exposure duration meant to represent a typical workday (hours).

[Note: Day 0 DFR values were calculated by converting the application rate to ($\mu g/cm^2$) values and taking 20 percent of that to account for what might be available to rub off on a worker's skin. A dissipation rate of the Day 0 DFR of 10 percent/day was then used to calculate levels for each day thereafter.]

2.2.4: Occupational Postapplication Risk Summary

The results of the postapplication worker (i.e., scouts) risk assessment are provided below (Table 3). Table 3 summarizes both the noncancer and cancer risks based on the proposed flusilazole labels (i.e., Punch 3.3 EC and Charisma 0.9 EC). For more detailed information pertaining to the calculations, see Appendix B. Appendix B/Table 1 describes the inputs used for the assessment. The noncancer calculations are included in Appendix B/Tables 2 and 3 (each represents a different application rate) while cancer risks are included in Appendix B/Tables 4 and 5 for private and commercial workers, respectively.

Both of the proposed flusilazole labels (i.e., Punch 3.3.EC and Charisma 0.9 EC) specify 12 hour restricted entry intervals (REIs). Noncancer risks (i.e., MOEs) are of concern at the currently proposed REI as the MOEs are 52 for the Punch 3.3 EC and 74 for the Charisma 0.9 EC labels, respectively, on the day of application. The level of concern for noncancer risks is a total uncertainty factor (i.e., target MOE) of 100. Noncancer risks exceed the target uncertainty factor (i.e., MOE $\geq$ 100) at 7 or 3 days after application, respectively, for the Punch (i.e., 0.10 lb ai/acre) and Charisma (0.07 lb ai/acre) labels. Cancer risks are not of concern for all scenarios considered on the day of application for both proposed label or population considered.

Table 3: Summary of Flusilazole Postapplication Worker Risks In Soybean Production		
Flusilazole Formulation & Application Rate (lb ai/A)	Risk Descriptor	Results
Punch 3.3 EC (0.10 lb ai/A)	Noncancer MOE Day 0	52
	Days For Noncancer MOE > UF	7
	Cancer Risks Day 0 - Private Grower (10days/yr)	$5x10^{-7}$
	Days For Private Grower Risk $<1x10^{-6}$	0
	Cancer Risks Day 0 - Comm. Worker (30days/yr)	$1x10^{-6}$
	Days For Comm. Worker Risk $<1x10^{-6}$	0
Charisma 0.9 EC (0.07 lb ai/A)	Noncancer MOE Day 0	74
	Days For Noncancer MOE > UF	3
	Cancer Risks Day 0 - Private Grower (10days/yr)	$3x10^{-7}$
	Days For Private Grower Risk $<1x10^{-6}$	0
	Cancer Risks Day 0 - Comm. Worker (30days/yr)	$9x10^{-7}$
	Days For Comm. Worker Risk $<1x10^{-6}$	0
UF = uncertainty factor or target MOE of 100 for noncancer calculations while target cancer risk of concern is $1x10^{-6}$		

The only hand labor practice that is anticipated related to the use of flusilazole on soybeans is expected to be scouting. Other activities (e.g., harvest) are expected but are expected to be mechanized. Mechanized practices can be divided into fully mechanized activities that meet the definition of "No contact" in the Agency's Worker Protection Standard (WPS) and mechanically assisted practices with potential for exposure. In the case of fully mechanized activities, the Agency does not complete a quantitative exposure assessment but addresses these types of potential exposures qualitatively by allowing early entry as described in the WPS.

> "A worker may enter a treated area during a restricted-entry interval if the agricultural employer assures that both of the following are met: (1) The worker will have no contact with anything that has been treated with the pesticide to which the restricted-entry interval applies including, but not limited to, soil, water, air, or surfaces of plants; and (2)

no such entry is allowed until any inhalation exposure level listed in the labeling has been reached or any ventilation criteria established by § 170.110 (c)(3) or in the labeling have been met."

In cases of partially mechanized activities where the potential for exposure exists, the Agency assesses the resulting exposures similarly to those resulting from hand labor activities for "high exposure potential" activities (i.e., transfer coefficients are used to represent exposures associated with the activity). Partially mechanized activities with "low exposure potential"are assessed qualitatively. Available use and usage information have been used to characterize the predominance of these activities that meet the fully mechanized ("No contact") and the mechanically assisted definitions in the risk assessment to allow risk managers flexibility in their decisions with regard to various segments of the exposed population for flusilazole. The Agency also acknowledges that there is some potential for exposure because individuals engaged in fully mechanized activities have short-term excursions from the protected area for various reasons (e.g., unclogging machinery or equipment inspection for breakage). In these cases, the WPS § 170.112(c) *Exception for short-term activities* applies.

2.3 Occupational Risk Characterization

The occupational risk assessments that were completed for flusilazole were based on the label specifications, the types of equipment which would be anticipated for its use in controlling soybean rust, and scouting activities which would also be the only likely hand labor activity associated with its use where exposures could likely occur. No chemical-specific exposure data were available upon which to base this assessment.

The best available data and other inputs were used in order to calculate risk estimates. Occupational handler risks were based on the best available data and included unit exposure estimates from the Pesticide Handlers Exposure Database which, for the scenarios included, are generally considered to be of acceptable quality. The application rates were obtained directly from the proposed labels as was the specified level of personal protection. The daily acres treated values were also the common estimates used by the Agency. The only handler risks that were identified were associated with the high acreage mixing/loading scenarios (i.e., 1200 acres) for which it is believed there may be issues associated with extrapolation to such high acreages from the available monitoring data.

Occupational postapplication estimates are also based on the best available data. The scouting transfer coefficient was defined based on a recent high quality study conducted by the Agricultural Reentry Task Force (ARTF) and the other factors used to calculate risks are standardized inputs commonly used by the Agency (e.g., hours/day, percent dislodgabililty and dissipation rate).

All of the key exposure patterns that would be associated with the anticipated use patterns of flusilazole have been addressed in this assessment. Overall, the best available exposure monitoring data have been used to complete this assessment including the Pesticide Handlers Exposure Database (PHED) and data from the Agricultural Reentry Task Force (ARTF). Generally, the PHED exposure estimates are considered to be high quality data and the ARTF data are also considered high quality. Other factors used in this assessment were those commonly used by the Agency as more specific data were not available (e.g., to calculate dislodgeable foliar residues). Chemical-specific data could potentially refine risk estimates (e.g., a dislodgeable foliar residue for postapplication worker risks). Generally, the flusilazole occupational risks should be considered a highly quality assessment that results in upper percentile exposure estimates based on the inputs used.

3.0 Residential Risk Assessment

No flusilazole uses in the residential market are allowed under the proposed labeling. Therefore, the Agency did not include exposure scenarios/populations for this setting in this assessment.

Appendix A
Occupational Handler Risk Tables

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Appendix A/Table 1 Numerical Values For Flusilazole Occupational Handler Risk Assessment

Number	Scenario	Representative Application Targets/Crops	Application Parameters: Application Rate	Application Parameters: Area Treated	Dermal Unit Exposures (mg/lb ai): Baseline	Dermal: Min PPE	Dermal: Max PPE	Dermal: Eng. Ctrl	Inhalation Unit Exposures (ug/lb ai): Baseline	Inhalation: Min PPE	Inhalation: Max PPE	Inhalation: Eng. Ctrl
				Mixer/Loaders								
1a	Liquids Aerial / Chemigation	Soybeans - Punch 3.3EC	0.1	350	2.9	0.023	0.017	0.0086	1.2	0.24	0.12	0.083
		Soybeans - Punch 3.3EC	0.1	1200	2.9	0.023	0.017	0.0086	1.2	0.24	0.12	0.083
		Soybeans - Charisma 0.9EC	0.07	350	2.9	0.023	0.017	0.0086	1.2	0.24	0.12	0.083
		Soybeans - Charisma 0.9EC	0.07	1200	2.9	0.023	0.017	0.0086	1.2	0.24	0.12	0.083
1b	Liquids Groundboom	Soybeans - Punch 3.3EC	0.1	80	2.9	0.023	0.017	0.0086	1.2	0.24	0.12	0.083
		Soybeans - Punch 3.3EC	0.1	200	2.9	0.023	0.017	0.0086	1.2	0.24	0.12	0.083
		Soybeans - Charisma 0.9EC	0.07	80	2.9	0.023	0.017	0.0086	1.2	0.24	0.12	0.083
		Soybeans - Charisma 0.9EC	0.07	200	2.9	0.023	0.017	0.0086	1.2	0.24	0.12	0.083
				Applicators								
2	Aerial Liquid Application	Soybeans - Punch 3.3EC	0.1	350	NA	NA	NA	0.0055	NA	NA	NA	0.068
		Soybeans - Punch 3.3EC	0.1	1200	NA	NA	NA	0.0055	NA	NA	NA	0.068
		Soybeans - Charisma 0.9EC	0.07	350	NA	NA	NA	0.0055	NA	NA	NA	0.068
		Soybeans - Charisma 0.9EC	0.07	1200	NA	NA	NA	0.0055	NA	NA	NA	0.068
3	Groundboom	Soybeans - Punch 3.3EC	0.1	80	0.014	0.014	0.011	0.0051	0.74	0.148	0.074	0.043
		Soybeans - Punch 3.3EC	0.1	200	0.014	0.014	0.011	0.0051	0.74	0.148	0.074	0.043
		Soybeans - Charisma 0.9EC	0.07	80	0.014	0.014	0.011	0.0051	0.74	0.148	0.074	0.043
		Soybeans - Charisma 0.9EC	0.07	200	0.014	0.014	0.011	0.0051	0.74	0.148	0.074	0.043
				Flaggers								
4	Flagger, Liquid Sprays	Soybeans - Punch 3.3EC	0.1	350	0.011	0.012	0.011	0.0022	0.35	0.07	0.035	0.007
		Soybeans - Charisma 0.9EC	0.07	350	0.011	0.012	0.011	0.0022	0.35	0.07	0.035	0.007

Short/Intermediate-Term Inhalation NOAEL:	2.85
Short/Intermediate-Term Inhalation UF:	100
Source: Short/Intermediate-term Inhalation NOAEL	2 Gen. Repro. Rat
Short/Intermediate-Term Dermal NOAEL	2.00
Short/Intermediate-Term Dermal UF:	100
Source: Short/Intermediate-term Dermal NOAEL:	Dermal Pre-Natal Dev. Rat
Body Weight	70
Cancer Dermal Absorption Factor (%)	30
Inhalation Absorption Factor (%)	100
Professional Ag Worker (days/yr)	30
Private Grower (days/yr)	10
Career (yrs)	35
Lifetime (yr)	70
Days/yr.	365
Q1* (mg/kg/day)-1	0.00284

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Appendix A/Table 2 Margins of Exposure For Flusilazole Occupational Handler Risk Assessment At The Baseline Level Of Personal Protection

Number	Scenario	Representative Application Targets/Crops	Application Parameters: Application Rate	Application Parameters: Area Treated	Dose (mg/kg/day): Potential Dermal	Dose (mg/kg/day): Absorbed Dermal	Dose (mg/kg/day): Inhalation	Short/Int.-Term MOEs: Dermal	Short/Int.-Term MOEs: Inhalation
		Mixer/Loaders							
1a	Liquids, Aerial / Chemigation	Soybeans - Punch 3.3EC	0.1	350	1 45E+000	4 35E-001	6.00E-004	1 4	4750 0
		Soybeans - Punch 3 3EC	0 1	1200	4 97E+000	1 49E+000	2 06E-003	0 4	1385 4
		Soybeans - Charisma 0 9EC	0 07	350	1 02E+000	3 05E-001	4 20E-004	2 0	6785 7
		Soybeans - Charisma 0 9EC	0 07	1200	3 48E+000	1 04E+000	1 44E-003	3 6	1979 2
1b	Liquids Groundboom	Soybeans - Punch 3 3EC	0 1	80	3 31E-001	9.94E-002	1 37E-004	6 0	20781 3
		Soybeans - Punch 3 3EC	0 1	200	8 29E-001	2 49E-001	3 43E-004	2 4	8312 5
		Soybeans - Charisma 0 9EC	0 07	80	2 32E-001	6 96E-002	9 60E-005	8 6	29687 5
		Soybeans - Charisma 0 9EC	0 07	200	5 80E-001	1 74E-001	2 40E-004	3 4	11875 0
		Applicators							
2	Aerial Liquid Application	Soybeans - Punch 3 3EC	0 1	350	NA	NA	NA	NA	NA
		Soybeans - Punch 3 3EC	0.1	1200	NA	NA	NA	NA	NA
		Soybeans - Charisma 0 9EC	0.07	350	NA	NA	NA	NA	NA
		Soybeans - Charisma 0.9EC	0.07	1200	NA	NA	NA	NA	NA
3	Groundboom	Soybeans - Punch 3.3EC	0.1	80	1 60E-003	4.80E-004	8.48E-005	1250.0	33699.3
		Soybeans - Punch 3.3EC	0.1	200	4 00E-003	1 20E-003	2 11E-004	500 0	13479 7
		Soybeans - Charisma 0.9EC	0.07	80	1.12E-003	3.36E-004	5 92E-005	1785.7	48141.9
		Soybeans - Charisma 0.9EC	0 07	200	2.80E-003	8.40E-004	1.48E-004	714.3	19256.8
		Flaggers							
4	Flagger, Liquid Sprays	Soybeans - Punch 3.3EC	0.1	350	5 50E-003	1.65E-003	1.75E-004	363 6	16285.7
		Soybeans - Charisma 0.9EC	0.07	350	3 85E-003	1 16E-003	1.23E-004	519.5	23265.3

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Appendix A/Table 3. Margins of Exposure For Flusilazole Occupational Handler Risk Assessment At The Minimum Level Of Personal Protection

Number	Scenario	Representative Application Targets/Crops	Application Parameters: Application Rate	Application Parameters: Area Treated	Dose (mg/kg/day): Potential Dermal	Dose (mg/kg/day): Absorbed Dermal	Dose (mg/kg/day): Inhalation	Short/Int.-Term MOEs: Dermal	Short/Int.-Term MOEs: Inhalation
		Mixer/Loaders							
1a	Liquids Aerial / Chemigation	Soybeans - Punch 3 3EC	0 1	350	1 15E-002	3.45E-003	1 20E-004	173.9	23750 0
		Soybeans - Punch 3 3EC	0 1	1200	3 94E-002	1 18E-002	4 11E-004	50 7	6927 1
		Soybeans - Charisma 0 9EC	0 07	350	8 05E-003	2 42E-003	8 40E-005	248 4	33928 6
		Soybeans - Charisma 0 9EC	0.07	1200	2 76E-002	8 28E-003	2.88E-004	72.5	9895.8
1b	Liquids Groundboom	Soybeans - Punch 3 3EC	0.1	80	2 63E-003	7 89E-004	2 74E-005	760 9	103906 3
		Soybeans - Punch 3 3EC	0.1	200	5 57E-003	1 97E-003	6.86E-005	304 3	41562.5
		Soybeans - Charisma 0 9EC	0.07	80	1 84E-003	5 52E-004	1 92E-005	1087 0	148437 5
		Soybeans - Charisma 0 9EC	0 07	200	4 60E-003	1 38E-003	4 80E-005	434 8	59375 0
		Applicators							
2	Aerial Liquid Application	Soybeans - Punch 3.3EC	0 1	350	NA	NA	NA	NA	NA
		Soybeans - Punch 3.3EC	0.1	1200	NA	NA	NA	NA	NA
		Soybeans - Charisma 0.9EC	0.07	350	NA	NA	NA	NA	NA
		Soybeans - Charisma 0.9EC	0.07	1200	NA	NA	NA	NA	NA
3	Groundboom	Soybeans - Punch 3 3EC	0.1	80	1 60E-003	4 80E-004	1.69E-005	1250.0	168496 6
		Soybeans - Punch 3.3EC	0.1	200	4 00E-003	1 20E-003	4 23E-005	500.0	67398.6
		Soybeans - Charisma 0.9EC	0.07	80	1.12E-003	3.36E-004	1.18E-005	1785.7	240709.5
		Soybeans - Charisma 0.9EC	0.07	200	2.80E-003	8.40E-004	2.96E-005	714.3	96283.8
		Flaggers							
4	Flagger Liquid Sprays	Soybeans - Punch 3 3EC	0.1	350	6.00E-003	1 80E-003	3.50E-005	333 3	81428.6
		Soybeans - Charisma 0.9EC	0.07	350	4 20E-003	1.26E-003	2.45E-005	476.2	116326 5

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Appendix A/Table 4 Margins of Exposure For Flusilazole Occupational Handler Risk Assessment At The Maximum Level Of Personal Protection

Number	Scenario	Representative Application Targets/Crops	Application Parameters: Application Rate	Application Parameters: Area Treated	Dose (mg/kg/day): Potential Dermal	Dose (mg/kg/day): Absorbed Dermal	Dose (mg/kg/day): Inhalation	Short/Int.-Term MOEs: Dermal	Short/Int.-Term MOEs: Inhalation
		Mixer/Loaders							
1a	Liquids Aerial / Chemigation	Soybeans - Punch 3.3EC	0.1	350	8 50E-003	2 55E-003	6.00E-005	235.3	47500.0
		Soybeans - Punch 3.3EC	0 1	1200	2.91E-002	8.74E-003	2.06E-004	68 6	13854.2
		Soybeans - Charisma 0.9EC	0 07	350	5 95E-003	1 79E-003	4.20E-005	336.1	67857 1
		Soybeans - Charisma 0 9EC	0 07	1200	2 04E-002	6 12E-003	1.44E-004	98.0	19791 7
1b	Liquids Groundboom	Soybeans - Punch 3.3EC	0 1	80	1 94E-003	5 83E-004	1 37E-005	1029.4	207812.5
		Soybeans - Punch 3.3EC	0.1	200	4 86E-003	1 46E-003	3 43E-005	411.8	83125.0
		Soybeans - Charisma 0.9EC	0 07	80	1 36E-003	4.08E-004	9 60E-006	1470.6	296875.0
		Soybeans - Charisma 0 9EC	0 07	200	3 40E-003	1.02E-003	2 40E-005	588.2	118750.0
		Applicators							
2	Aerial Liquid Application	Soybeans - Punch 3 3EC	0 1	350	NA	NA	NA	NA	NA
		Soybeans - Punch 3 3EC	0.1	1200	NA	NA	NA	NA	NA
		Soybeans - Charisma 0 9EC	0 07	350	NA	NA	NA	NA	NA
		Soybeans - Charisma 0.9EC	0.07	1200	NA	NA	NA	NA	NA
3	Groundboom	Soybeans - Punch 3.3EC	0.1	80	1.26E-003	3.77E-004	8 46E-006	1590.9	336993.2
		Soybeans - Punch 3.3EC	0.1	200	3 14E-003	9 43E-004	2 11E-005	636 4	134797.3
		Soybeans - Charisma 0.9EC	0 07	80	8.80E-004	2.64E-004	5 92E-006	2272.7	481418.9
		Soybeans - Charisma 0.9EC	0.07	200	2 20E-003	6 60E-004	1 48E-005	909 1	192567 6
		Flaggers							
4	Flagger Liquid Sprays	Soybeans - Punch 3.3EC	0.1	350	5 50E-003	1.65E-003	1 75E-005	363 6	162857 1
		Soybeans - Charisma 0.9EC	0 07	350	3.85E-003	1 16E-003	1 23E-005	519.5	232653.1

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Appendix A/Table 5 Margins of Exposure For Flusilazole Occupational Handler Risk Assessment Using Engineering Controls

Number	Scenario	Representative Application Targets/Crops	Application Parameters: Application Rate	Application Parameters: Area Treated	Dose (mg/kg/day): Potential Dermal	Dose (mg/kg/day): Absorbed Dermal	Dose (mg/kg/day): Inhalation	Short/Int.-Term MOEs: Dermal	Short/Int.-Term MOEs: Inhalation
		Mixer/Loaders							
1a	Liquids: Aerial / Chemigation	Soybeans - Punch 3.3EC	0.1	350	4.30E-003	1.29E-003	4.15E-005	465.1	68674.7
		Soybeans - Punch 3.3EC	0.1	1200	1.47E-002	4.42E-003	1.42E-004	135.7	20030.1
		Soybeans - Charisma 0.9EC	0.07	350	3.01E-003	9.03E-004	2.91E-005	664.5	98105.7
		Soybeans - Charisma 0.9EC	0.07	1200	1.03E-002	3.10E-003	9.96E-005	193.8	28614.5
1b	Liquids: Groundboom	Soybeans - Punch 3.3EC	0.1	80	9.83E-004	2.95E-004	9.49E-006	2034.9	300451.8
		Soybeans - Punch 3.3EC	0.1	200	2.46E-003	7.37E-004	2.37E-005	814.0	120180.7
		Soybeans - Charisma 0.9EC	0.07	80	6.88E-004	2.06E-004	6.64E-006	2907.0	429216.9
		Soybeans - Charisma 0.9EC	0.07	200	1.72E-003	5.16E-004	1.66E-005	1162.8	171686.7
		Applicators							
2	Aerial Liquid Application	Soybeans - Punch 3.3EC	0.1	350	2.75E-003	8.25E-004	3.40E-005	727.3	83823.5
		Soybeans - Punch 3.3EC	0.1	1200	9.43E-003	2.83E-003	1.17E-004	212.1	24448.5
		Soybeans - Charisma 0.9EC	0.07	350	1.93E-003	5.78E-004	2.38E-005	1039.0	119747.9
		Soybeans - Charisma 0.9EC	0.07	1200	6.60E-003	1.98E-003	8.16E-005	303.0	34926.5
3	Groundboom	Soybeans - Punch 3.3EC	0.1	80	5.83E-004	1.75E-004	4.91E-006	3431.4	579941.9
		Soybeans - Punch 3.3EC	0.1	200	1.46E-003	4.37E-004	1.23E-005	1372.5	231976.7
		Soybeans - Charisma 0.9EC	0.07	80	4.08E-004	1.22E-004	3.44E-006	4902.0	828488.4
		Soybeans - Charisma 0.9EC	0.07	200	1.02E-003	3.06E-004	8.60E-006	1960.8	331395.3
		Flaggers							
4	Flagger: Liquid Sprays	Soybeans - Punch 3.3EC	0.1	350	1.10E-003	3.30E-004	3.50E-006	1818.2	814285.7
		Soybeans - Charisma 0.9EC	0.07	350	7.70E-004	2.31E-004	2.45E-006	2597.4	1163265.3

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Appendix A/Table 6 Flusilazole Occupational Handler Cancer Risks For Private Growers

Number	Scenario	Representative Application Targets/Crops	Application Parameters Application Rate	Area Treated	Baseline	Single Layer, Gloves & No Respirator	Single Layer, Gloves & PF5 Respirator	Single Layer, Gloves & PF10 Respirator	Double Layer, Gloves & No Respirator	Double Layer, Gloves & PF5 Respirator	Double Layer, Gloves & PF10 Respirator	Eng. Controls
							Mixer/Loaders					
1a	Liquids Aerial / Chemigation	Soybeans - Punch 3.3EC	0.1	350	1.7E-005	1.6E-007	1.4E-007	1.4E-007	1.2E-007	1.0E-007	1.0E-007	5.2E-008
		Soybeans - Punch 3.3EC	0.1	1200	5.8E-005	5.4E-007	4.8E-007	4.7E-007	4.2E-007	3.6E-007	3.5E-007	1.6E-007
		Soybeans - Charisma 0.9EC	0.07	350	1.2E-005	1.1E-007	9.7E-008	9.6E-008	8.6E-008	7.3E-008	7.1E-008	3.6E-008
		Soybeans - Charisma 0.9EC	0.07	1200	4.1E-005	3.8E-007	3.3E-007	3.3E-007	2.9E-007	2.5E-007	2.4E-007	1.2E-007
1b	Liquids Groundboom	Soybeans - Punch 3.3EC	0.1	80	3.9E-006	3.6E-008	3.2E-008	3.1E-008	2.8E-008	2.4E-008	2.3E-008	1.2E-008
		Soybeans - Punch 3.3EC	0.1	200	9.7E-006	9.0E-008	7.9E-008	7.8E-008	7.0E-008	5.9E-008	5.8E-008	3.0E-008
		Soybeans - Charisma 0.9EC	0.07	80	2.7E-006	2.5E-008	2.2E-008	2.2E-008	2.0E-008	1.7E-008	1.6E-008	8.3E-009
		Soybeans - Charisma 0.9EC	0.07	200	6.8E-006	6.3E-008	5.6E-008	5.5E-008	4.9E-008	4.2E-008	4.1E-008	2.1E-008
							Applicators					
2	Aerial Liquid Application	Soybeans - Punch 3.3EC	0.1	350	NA	NA	NA	NA	NA	NA	NA	3.3E-008
		Soybeans - Punch 3.3EC	0.1	1200	NA	NA	NA	NA	NA	NA	NA	1.1E-007
		Soybeans - Charisma 0.9EC	0.07	350	NA	NA	NA	NA	NA	NA	NA	2.3E-008
		Soybeans - Charisma 0.9EC	0.07	1200	NA	NA	NA	NA	NA	NA	NA	8.0E-008
3	Groundboom	Soybeans - Punch 3.3EC	0.1	80	2.2E-008	2.2E-008	1.9E-008	1.9E-008	1.8E-008	1.5E-008	1.5E-008	7.0E-009
		Soybeans - Punch 3.3EC	0.1	200	5.5E-008	5.5E-008	4.8E-008	4.8E-008	4.5E-008	3.8E-008	3.8E-008	1.7E-008
		Soybeans - Charisma 0.9EC	0.07	80	1.5E-008	1.5E-008	1.4E-008	1.3E-008	1.3E-008	1.1E-008	1.1E-008	4.9E-009
		Soybeans - Charisma 0.9EC	0.07	200	3.8E-008	3.8E-008	3.4E-008	3.3E-008	3.1E-008	2.7E-008	2.6E-008	1.2E-008
							Flaggers					
4	Flagger Liquid Sprays	Soybeans - Punch 3.3EC	0.1	350	7.1E-008	7.7E-008	7.1E-008	7.1E-008	7.1E-008	6.6E-008	6.5E-008	1.3E-008
		Soybeans - Charisma 0.9EC	0.07	350	5.0E-008	5.4E-008	5.0E-008	4.9E-008	5.0E-008	4.6E-008	4.5E-008	9.1E-009

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Appendix A/Table 7 Flusilazole Occupational Handler Cancer Risks For Commercial Applicators

Number	Scenario	Representative Application Targets/Crops	Application Parameters: Application Rate	Application Parameters: Area Treated	Baseline	Single Layer, Gloves & No Respirator	Single Layer, Gloves & PF5 Respirator	Single Layer, Gloves & PF10 Respirator	Double Layer, Gloves & No Respirator	Double Layer, Gloves & PF5 Respirator	Double Layer, Gloves & PF10 Respirator	Eng Controls
							Mixer/Loaders					
1a	Liquids Aerial / Chemigation	Soybeans - Punch 3 3EC	0 1	350	5 1E-005	4.7E-007	4 2E-007	4 1E-007	3 7E-007	3 1E-007	3 0E-007	1 6E-007
		Soybeans - Punch 3 3EC	0 1	1200	1 7E-004	1 6E-006	1 4E 006	1 4E-006	1 3E-006	1 1E-006	1 0E-006	5 3E-007
		Soybeans - Charisma 0 9EC	0 07	350	3 6E-005	3 3E-007	2 9E 007	2.9E 007	2 6E 007	2 2E-007	2 1E-007	1 1E-007
		Soybeans - Charisma 0 9EC	0 07	1200	1 2E-004	1 1E-006	1 0E-006	9 8E-007	8 8E-007	7 5E-007	7 3E-007	3 7E-007
1b	Liquids Groundboom	Soybeans - Punch 3 3EC	0 1	80	1 2E-005	1 1E-007	9 5E-008	9 4E-008	8 4E-008	7 1E-008	7 0E-008	3 6E-008
		Soybeans - Punch 3 3EC	0 1	200	2 9E-005	2 7E 007	2 4E-007	2 3E-007	2 1E-007	1 8E-007	1 7E-007	8 9E-008
		Soybeans - Charisma 0 9EC	0 07	80	8 1E-006	7.6E-008	6.7E-008	6.6E-008	5 9E-008	5 0E-008	4 9E-008	2 5E-008
		Soybeans - Charisma 0 9EC	0.07	200	2.0E-005	1 9E-007	1 7E-007	1 6E-007	1 5E-007	1 2E-007	1 2E-007	6 2E-008
							Applicators					
2	Aerial Liquid Application	Soybeans - Punch 3 3EC	0 1	350	NA	NA	NA	NA	NA	NA	NA	1.0E-007
		Soybeans - Punch 3.3EC	0 1	1200	NA	NA	NA	NA	NA	NA	NA	3 4E-007
		Soybeans - Charisma 0.9EC	0 07	350	NA	NA	NA	NA	NA	NA	NA	7.0E-008
		Soybeans - Charisma 0.9EC	0.07	1200	NA	NA	NA	NA	NA	NA	NA	2.4E-007
3	Groundboom	Soybeans - Punch 3.3EC	0.1	80	6.6E-008	6 6E-008	5 8E-008	5.7E-008	5.4E-008	4 6E-008	4 5E-008	2 1E-008
		Soybeans - Punch 3.3EC	0.1	200	1 6E-007	1.6E-007	1.4E-007	1.4E-007	1.3E-007	1 1E-007	1 1E-007	5 2E-008
		Soybeans - Charisma 0.9EC	0 07	80	4 6E-008	4.6E-008	4 1E-008	4.0E-008	3 8E-008	3.2E-008	3.2E-008	1 5E-008
		Soybeans - Charisma 0 9EC	0.07	200	1.2E-007	1.2E-007	1 0E-007	1 0E-007	9 4E-008	8.0E-008	7.9E-008	3 7E-008
							Flaggers					
4	Flagger Liquid Sprays	Soybeans - Punch 3.3EC	0.1	350	2 1E-007	2 3E-007	2.1E-007	2.1E-007	2.1E-007	2.0E-007	1.9E-007	3.9E-008
		Soybeans - Charisma 0.9EC	0.07	350	1 5E-007	1 6E-007	1.5E-007	1.5E-007	1.5E-007	1 4E-007	1.4E-007	2.7E-008

Appendix B
Occupational Postapplication Worker Risk Tables

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Appendix B/Table 1 Inputs For Flusilazole Occupational Postapplication Risk Assessment

Occupational Post-Application Risk Assessment Calculator Version 1 (8/9/00)

Chemical	Flusilazole
Reason	Section 18 For Soybean Rust
Date	10/24/05
Assessor	J Dawson

Applicable TC Groups

Field row crop, Low/Medium

[Note Only applicable TC groups are included above]

DFR/TTR Data Defaults:	
Initial Percent of Rate as DFR (%):	20
Dissipation Rate per day (%):	10

Toxicology & Exposure Factor Inputs:	
Short-term Uncertainty Factor:	100
NOAEL (mg/kg/day):	2.0
Source of NOAEL:	Dermal Prenatal Developmental - Rat
Adult Exposure Duration (hrs/day):	8
Adult Body Weight (kg):	70
Short-/Inter.-term dermal absorption (%):	100
Canc dermal absorption (%):	30
Q1* (mg/kg/day)-1:	0.00284
Professional Ag Worker (days/yr)	30
Private Grower (days yr)	10
Years worked	35
Lifetime	70
Days/yr	365

Note: If a dermal administration toxicity study is the source of the endpoint used for risk assessment, then the dermal absorption factor is set to 100 % to satisfy the calculations in this spreadsheet program.

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Appendix B/Table 2. Flusilazole (Punch 3.3 EC) Occupational Postapplication Noncancer Risk Assessment For Short/Medium Field Row Crop Group

Occupational Post-Application Risk Assessment Calculator Version 1 (8/9/00)

Chemical:	Flusilazole
Reason	Section 18 For Soybean Rust
Date:	10/24/05
Transfer Coefficient Group	Field/row crop, low/medium
Specific Crop(s) Considered	Soybeans
Application Rate of Crop (lb ai/A)	0.1

DFR Data Summary

Data Source (enter 1 if data available, 0 if defaults)	0
Source	No data
Slope of Semilog Regression	No data
[Initial] (ug/cm2)	No data
Study Application Rate (lb ai/A)	0.1
Limit of Quantification (ug/cm2)	No data

[Note: Enter application rate of crop if no data available in study rate cell.]

Exposure Inputs Summary

Exposure Potential	Transfer Coefficients (cm2/hour)		Activities
	Used For RA	Range	
Very Low	N/A	N/A	N/A
Low	N/A	N/A	N/A
Medium	1500	486 to 2760	Scouting
High	N/A	N/A	N/A
Very High	N/A	N/A	N/A

DAT	DFR LEVELS (ug/cm2)		DOSE (mg/kg/day)			MOES		
	Not Adjusted	Adjusted For Rate	Low Exposure	Medium Exposure	High Exposure	Low Exposure	Medium Exposure	High Exposure
0	0.224	0.224	NA	0.0385	NA	NA	52	NA
1	0.202	0.202	NA	0.0346	NA	NA	58	NA
2	0.182	0.182	NA	0.0312	NA	NA	64	NA
3	0.164	0.164	NA	0.0280	NA	NA	71	NA
4	0.147	0.147	NA	0.0252	NA	NA	79	NA
5	0.132	0.132	NA	0.0227	NA	NA	88	NA
6	0.119	0.119	NA	0.0204	NA	NA	98	NA
7	0.107	0.107	NA	0.0184	NA	NA	109	NA
8	0.097	0.097	NA	0.0166	NA	NA	121	NA
9	0.087	0.087	NA	0.0149	NA	NA	134	NA
10	0.078	0.078	NA	0.0134	NA	NA	149	NA
11	0.070	0.070	NA	0.0121	NA	NA	166	NA
12	0.063	0.063	NA	0.0109	NA	NA	184	NA
13	0.057	0.057	NA	0.0098	NA	NA	205	NA
14	0.051	0.051	NA	0.0088	NA	NA	227	NA
15	0.046	0.046	NA	0.0079	NA	NA	253	NA
16	0.042	0.042	NA	0.0071	NA	NA	281	NA
17	0.037	0.037	NA	0.0064	NA	NA	312	NA
18	0.034	0.034	NA	0.0058	NA	NA	346	NA
19	0.030	0.030	NA	0.0052	NA	NA	385	NA
20	0.027	0.027	NA	0.0047	NA	NA	428	NA
21	0.025	0.025	NA	0.0042	NA	NA	475	NA
22	0.022	0.022	NA	0.0038	NA	NA	528	NA
23	0.020	0.020	NA	0.0034	NA	NA	587	NA
24	0.018	0.018	NA	0.0031	NA	NA	652	NA
25	0.016	0.016	NA	0.0028	NA	NA	724	NA
26	0.014	0.014	NA	0.0025	NA	NA	805	NA
27	0.013	0.013	NA	0.0022	NA	NA	894	NA
28	0.012	0.012	NA	0.0020	NA	NA	994	NA
29	0.011	0.011	NA	0.0018	NA	NA	1104	NA
30	0.010	0.010	NA	0.0016	NA	NA	1227	NA

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Appendix B/Table 3: Flusilazole (Charisma 0 9EC) Occupational Postapplication Noncancer Risk Assessment For Short/Medium Field Row Crop Group

Occupational Post-Application Risk Assessment Calculator Version 1 (8/9/00)

Chemical:	Flusilazole
Reason	Section 18 For Soybean Rust
Date.	10/24/05
Transfer Coefficient Group:	Field/row crop low/medium
Specific Crop(s) Considered	Soybeans
Application Rate of Crop (lb ai/A)	0.07

DFR Data Summary

Data Source (enter 1 if data available 0 if defaults)	0
Source	No data
Slope of Semilog Regression	No data
[Initial] (ug/cm2)	No data
Study Application Rate (lb ai/A)	0.07
Limit of Quantification (ug/cm2)	No data

[Note: Enter application rate of crop if no data available in study rate cell]

Exposure Inputs Summary

Exposure Potential	Transfer Coefficients (cm2/hour)		Activities
	Used For RA	Range	
Very Low	N/A	N/A	N/A
Low	N/A	N/A	N/A
Medium	1500	486 to 2760	Scouting
High	N/A	N/A	N/A
Very High	N/A	N/A	N/A

DAT	DFR LEVELS (ug/cm2)		DOSE (mg/kg/day)			MOES		
	Not Adjusted	Adjusted For Rate	Low Exposure	Medium Exposure	High Exposure	Low Exposure	Medium Exposure	High Exposure
0	0.157	0.157	NA	0.0269	NA	NA	74	NA
1	0.141	0.141	NA	0.0242	NA	NA	83	NA
2	0.127	0.127	NA	0.0218	NA	NA	92	NA
3	0.115	0.115	NA	0.0196	NA	NA	102	NA
4	0.103	0.103	NA	0.0177	NA	NA	113	NA
5	0.093	0.093	NA	0.0159	NA	NA	126	NA
6	0.083	0.083	NA	0.0143	NA	NA	140	NA
7	0.075	0.075	NA	0.0129	NA	NA	155	NA
8	0.068	0.068	NA	0.0116	NA	NA	173	NA
9	0.061	0.061	NA	0.0104	NA	NA	192	NA
10	0.055	0.055	NA	0.0094	NA	NA	213	NA
11	0.049	0.049	NA	0.0084	NA	NA	237	NA
12	0.044	0.044	NA	0.0076	NA	NA	263	NA
13	0.040	0.040	NA	0.0068	NA	NA	292	NA
14	0.036	0.036	NA	0.0062	NA	NA	325	NA
15	0.032	0.032	NA	0.0055	NA	NA	361	NA
16	0.029	0.029	NA	0.0050	NA	NA	401	NA
17	0.026	0.026	NA	0.0045	NA	NA	445	NA
18	0.024	0.024	NA	0.0040	NA	NA	495	NA
19	0.021	0.021	NA	0.0036	NA	NA	550	NA
20	0.019	0.019	NA	0.0033	NA	NA	611	NA
21	0.017	0.017	NA	0.0029	NA	NA	679	NA
22	0.015	0.015	NA	0.0027	NA	NA	754	NA
23	0.014	0.014	NA	0.0024	NA	NA	838	NA
24	0.013	0.013	NA	0.0021	NA	NA	931	NA
25	0.011	0.011	NA	0.0019	NA	NA	1035	NA
26	0.010	0.010	NA	0.0017	NA	NA	1150	NA
27	0.009	0.009	NA	0.0016	NA	NA	1277	NA
28	0.008	0.008	NA	0.0014	NA	NA	1419	NA
29	0.007	0.007	NA	0.0013	NA	NA	1577	NA
30	0.007	0.007	NA	0.0011	NA	NA	1752	NA

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Appendix B/Table 4 Flusilazole (Punch 3.3EC) Occupational Postapplication Cancer Risk Assessment For Low/Medium Row Crop Group

Occupational Post-Application Risk Assessment Calculator Version 1 (8/9/00)

Chemical	Flusilazole
Reason	Section 18 For Soybean Rust
Date:	10/24/05
Transfer Coefficient Group	Field/row crop low/medium
Specific Crop(s) Considered	Soybeans
Application Rate of Crop (lb ai/A)	0.1

DFR Data Summary

Data Source (enter 1 if data available 0 if defaults)	0
Source	No data
Slope of Semilog Regression	No data
[Initial] (ug/cm2)	No data
Study Application Rate (lb ai/A)	0.1
Limit of Quantification (ug/cm2)	No data

[Note Enter application rate of crop if no data available in study rate cell.]

Exposure Inputs Summary

Exposure Potential	Transfer Coefficients (cm2/hour) Used For RA	Range	Activities
Very Low	N/A	N/A	N/A
Low	N/A	N/A	N/A
Medium	1500	486 to 2760	Scouting
High	N/A	N/A	N/A
Very High	N/A	N/A	N/A

DAT	DFR LEVELS (ug/cm2)		AVERAGE DAILY DOSE (ADD) (mg/kg/day)			RISKS FOR PRIVATE GROWERS						RISKS FOR PROFESSIONAL FARMWORKERS					
						Low Exposure		Medium Exposure		High Exposure		Low Exposure		Medium Exposure		High Exposure	
	Not Adjusted	Adjusted For Rate	Low Exposure	Medium Exposure	High Exposure	LADD	Cancer Risk	LADD	Cancer Risk	LADD	Cancer Risk	LADD	Cancer Risk	LADD	Cancer Risk	LADD	Cancer Risk
0	0.224	0.224	NA	0.011539	NA	NA	NA	1.6E-004	4.5E-007	NA	NA	NA	NA	4.7E-004	1.3E-006	NA	NA
1	0.202	0.202	NA	0.010386	NA	NA	NA	1.4E-004	4.0E-007	NA	NA	NA	NA	4.3E-004	1.2E-006	NA	NA
2	0.182	0.182	NA	0.009347	NA	NA	NA	1.3E-004	3.6E-007	NA	NA	NA	NA	3.8E-004	1.1E-006	NA	NA
3	0.164	0.164	NA	0.008412	NA	NA	NA	1.2E-004	3.3E-007	NA	NA	NA	NA	3.5E-004	9.8E-007	NA	NA
4	0.147	0.147	NA	0.007571	NA	NA	NA	1.0E-004	2.9E-007	NA	NA	NA	NA	3.1E-004	8.8E-007	NA	NA
5	0.132	0.132	NA	0.006814	NA	NA	NA	9.3E-005	2.7E-007	NA	NA	NA	NA	2.8E-004	8.0E-007	NA	NA
6	0.119	0.119	NA	0.006133	NA	NA	NA	8.4E-005	2.4E-007	NA	NA	NA	NA	2.5E-004	7.2E-007	NA	NA
7	0.107	0.107	NA	0.005519	NA	NA	NA	7.6E-005	2.1E-007	NA	NA	NA	NA	2.3E-004	6.4E-007	NA	NA
8	0.097	0.097	NA	0.004967	NA	NA	NA	6.8E-005	1.9E-007	NA	NA	NA	NA	2.0E-004	5.8E-007	NA	NA
9	0.087	0.087	NA	0.004471	NA	NA	NA	6.1E-005	1.7E-007	NA	NA	NA	NA	1.8E-004	5.2E-007	NA	NA
10	0.078	0.078	NA	0.004024	NA	NA	NA	5.5E-005	1.6E-007	NA	NA	NA	NA	1.7E-004	4.7E-007	NA	NA
11	0.070	0.070	NA	0.003621	NA	NA	NA	5.0E-005	1.4E-007	NA	NA	NA	NA	1.5E-004	4.2E-007	NA	NA
12	0.063	0.063	NA	0.003259	NA	NA	NA	4.5E-005	1.3E-007	NA	NA	NA	NA	1.3E-004	3.8E-007	NA	NA
13	0.057	0.057	NA	0.002933	NA	NA	NA	4.0E-005	1.1E-007	NA	NA	NA	NA	1.2E-004	3.4E-007	NA	NA
14	0.051	0.051	NA	0.002640	NA	NA	NA	3.6E-005	1.0E-007	NA	NA	NA	NA	1.1E-004	3.1E-007	NA	NA
15	0.046	0.046	NA	0.002376	NA	NA	NA	3.3E-005	9.2E-008	NA	NA	NA	NA	9.8E-005	2.8E-007	NA	NA
16	0.042	0.042	NA	0.002138	NA	NA	NA	2.9E-005	8.3E-008	NA	NA	NA	NA	8.8E-005	2.5E-007	NA	NA
17	0.037	0.037	NA	0.001924	NA	NA	NA	2.6E-005	7.5E-008	NA	NA	NA	NA	7.9E-005	2.2E-007	NA	NA
18	0.034	0.034	NA	0.001732	NA	NA	NA	2.4E-005	6.7E-008	NA	NA	NA	NA	7.1E-005	2.0E-007	NA	NA
19	0.030	0.030	NA	0.001559	NA	NA	NA	2.1E-005	6.1E-008	NA	NA	NA	NA	6.4E-005	1.8E-007	NA	NA
20	0.027	0.027	NA	0.001403	NA	NA	NA	1.9E-005	5.5E-008	NA	NA	NA	NA	5.8E-005	1.6E-007	NA	NA
21	0.025	0.025	NA	0.001263	NA	NA	NA	1.7E-005	4.9E-008	NA	NA	NA	NA	5.2E-005	1.5E-007	NA	NA
22	0.022	0.022	NA	0.001136	NA	NA	NA	1.6E-005	4.4E-008	NA	NA	NA	NA	4.7E-005	1.3E-007	NA	NA
23	0.020	0.020	NA	0.001023	NA	NA	NA	1.4E-005	4.0E-008	NA	NA	NA	NA	4.2E-005	1.2E-007	NA	NA
24	0.018	0.018	NA	0.000920	NA	NA	NA	1.3E-005	3.6E-008	NA	NA	NA	NA	3.8E-005	1.1E-007	NA	NA
25	0.016	0.016	NA	0.000828	NA	NA	NA	1.1E-005	3.2E-008	NA	NA	NA	NA	3.4E-005	9.7E-008	NA	NA
26	0.014	0.014	NA	0.000746	NA	NA	NA	1.0E-005	2.9E-008	NA	NA	NA	NA	3.1E-005	8.7E-008	NA	NA
27	0.013	0.013	NA	0.000671	NA	NA	NA	9.2E-006	2.6E-008	NA	NA	NA	NA	2.8E-005	7.8E-008	NA	NA
28	0.012	0.012	NA	0.000604	NA	NA	NA	8.3E-006	2.3E-008	NA	NA	NA	NA	2.5E-005	7.0E-008	NA	NA
29	0.011	0.011	NA	0.000544	NA	NA	NA	7.4E-006	2.1E-008	NA	NA	NA	NA	2.2E-005	6.3E-008	NA	NA
30	0.010	0.010	NA	0.000489	NA	NA	NA	6.7E-006	1.9E-008	NA	NA	NA	NA	2.0E-005	5.7E-008	NA	NA
							Average	4.9E-005	1.4E-007	NA	NA	NA	NA	1.5E-004	4.2E-007	NA	NA

D319403

Appendix B/Table 5: Flusilazole (Charisma 0.9EC) Occupational Postapplication Cancer Risk Assessment For Low/Medium Row Crop Group

Occupational Post-Application Risk Assessment Calculator Version 1 (8/9/00)

Chemical:	Flusilazole
Reason:	Section 18 For Soybean Rust
Date:	10/24/05
Transfer Coefficient Group:	Field/row crop, low/medium
Specific Crop(s) Considered:	Soybeans
Application Rate of Crop (lb ai/A):	0.07

DFR Data Summary

Data Source (enter 1 if data available, 0 if defaults):	0
Source:	No data
Slope of Semilog Regression	No data
[Initial] (ug/cm2):	No data
Study Application Rate (lb ai/A):	0.07
Limit of Quantification (ug/cm2):	No data

[Note: Enter application rate of crop if no data available in study rate cell.]

Exposure Inputs Summary

Exposure Potential	Transfer Coefficients (cm2/hour) Used For RA	Range	Activities
Very Low	N/A	N/A	N/A
Low	N/A	N/A	N/A
Medium	1500	486 to 2760	Scouting
High	N/A	N/A	N/A
Very High	N/A	N/A	N/A

DAT	DFR LEVELS (ug/cm2)		AVERAGE DAILY DOSE (ADD) (mg/kg/day)			RISKS FOR PRIVATE GROWERS						RISKS FOR PROFESSIONAL FARMWORKERS					
						Low Exposure		Medium Exposure		High Exposure		Low Exposure		Medium Exposure		High Exposure	
	Not Adjusted	Adjusted For Rate	Low Exposure	Medium Exposure	High Exposure	LADD	Cancer Risk	LADD	Cancer Risk	LADD	Cancer Risk	LADD	Cancer Risk	LADD	Cancer Risk	LADD	Cancer Risk
0	0.157	0.157	NA	0.008078	NA	NA	NA	1.1E-004	3.1E-007	NA	NA	NA	NA	3.3E-004	9.4E-007	NA	NA
1	0.141	0.141	NA	0.007270	NA	NA	NA	1.0E-004	2.8E-007	NA	NA	NA	NA	3.0E-004	8.5E-007	NA	NA
2	0.127	0.127	NA	0.006543	NA	NA	NA	9.0E-005	2.5E-007	NA	NA	NA	NA	2.7E-004	7.6E-007	NA	NA
3	0.115	0.115	NA	0.005889	NA	NA	NA	8.1E-005	2.3E-007	NA	NA	NA	NA	2.4E-004	6.9E-007	NA	NA
4	0.103	0.103	NA	0.005300	NA	NA	NA	7.3E-005	2.1E-007	NA	NA	NA	NA	2.2E-004	6.2E-007	NA	NA
5	0.093	0.093	NA	0.004770	NA	NA	NA	6.5E-005	1.9E-007	NA	NA	NA	NA	2.0E-004	5.6E-007	NA	NA
6	0.083	0.083	NA	0.004293	NA	NA	NA	5.9E-005	1.7E-007	NA	NA	NA	NA	1.8E-004	5.0E-007	NA	NA
7	0.075	0.075	NA	0.003864	NA	NA	NA	5.3E-005	1.5E-007	NA	NA	NA	NA	1.6E-004	4.5E-007	NA	NA
8	0.068	0.068	NA	0.003477	NA	NA	NA	4.8E-005	1.4E-007	NA	NA	NA	NA	1.4E-004	4.1E-007	NA	NA
9	0.061	0.061	NA	0.003129	NA	NA	NA	4.3E-005	1.2E-007	NA	NA	NA	NA	1.3E-004	3.7E-007	NA	NA
10	0.055	0.055	NA	0.002817	NA	NA	NA	3.9E-005	1.1E-007	NA	NA	NA	NA	1.2E-004	3.3E-007	NA	NA
11	0.049	0.049	NA	0.002535	NA	NA	NA	3.5E-005	9.9E-008	NA	NA	NA	NA	1.0E-004	3.0E-007	NA	NA
12	0.044	0.044	NA	0.002281	NA	NA	NA	3.1E-005	8.9E-008	NA	NA	NA	NA	9.4E-005	2.7E-007	NA	NA
13	0.040	0.040	NA	0.002053	NA	NA	NA	2.8E-005	8.0E-008	NA	NA	NA	NA	8.4E-005	2.4E-007	NA	NA
14	0.036	0.036	NA	0.001848	NA	NA	NA	2.5E-005	7.2E-008	NA	NA	NA	NA	7.6E-005	2.2E-007	NA	NA
15	0.032	0.032	NA	0.001663	NA	NA	NA	2.3E-005	6.5E-008	NA	NA	NA	NA	6.8E-005	1.9E-007	NA	NA
16	0.029	0.029	NA	0.001497	NA	NA	NA	2.1E-005	5.8E-008	NA	NA	NA	NA	6.2E-005	1.7E-007	NA	NA
17	0.026	0.026	NA	0.001347	NA	NA	NA	1.8E-005	5.2E-008	NA	NA	NA	NA	5.5E-005	1.6E-007	NA	NA
18	0.024	0.024	NA	0.001212	NA	NA	NA	1.7E-005	4.7E-008	NA	NA	NA	NA	5.0E-005	1.4E-007	NA	NA
19	0.021	0.021	NA	0.001091	NA	NA	NA	1.5E-005	4.2E-008	NA	NA	NA	NA	4.5E-005	1.3E-007	NA	NA
20	0.019	0.019	NA	0.000982	NA	NA	NA	1.3E-005	3.8E-008	NA	NA	NA	NA	4.0E-005	1.1E-007	NA	NA
21	0.017	0.017	NA	0.000884	NA	NA	NA	1.2E-005	3.4E-008	NA	NA	NA	NA	3.6E-005	1.0E-007	NA	NA
22	0.015	0.015	NA	0.000795	NA	NA	NA	1.1E-005	3.1E-008	NA	NA	NA	NA	3.3E-005	9.3E-008	NA	NA
23	0.014	0.014	NA	0.000716	NA	NA	NA	9.8E-006	2.8E-008	NA	NA	NA	NA	2.9E-005	8.4E-008	NA	NA
24	0.013	0.013	NA	0.000644	NA	NA	NA	8.8E-006	2.5E-008	NA	NA	NA	NA	2.6E-005	7.5E-008	NA	NA
25	0.011	0.011	NA	0.000580	NA	NA	NA	7.9E-006	2.3E-008	NA	NA	NA	NA	2.4E-005	6.8E-008	NA	NA
26	0.010	0.010	NA	0.000522	NA	NA	NA	7.1E-006	2.0E-008	NA	NA	NA	NA	2.1E-005	6.1E-008	NA	NA
27	0.009	0.009	NA	0.000470	NA	NA	NA	6.4E-006	1.8E-008	NA	NA	NA	NA	1.9E-005	5.5E-008	NA	NA
28	0.008	0.008	NA	0.000423	NA	NA	NA	5.8E-006	1.6E-008	NA	NA	NA	NA	1.7E-005	4.9E-008	NA	NA
29	0.007	0.007	NA	0.000380	NA	NA	NA	5.2E-006	1.5E-008	NA	NA	NA	NA	1.6E-005	4.4E-008	NA	NA
30	0.007	0.007	NA	0.000342	NA	NA	NA	4.7E-006	1.3E-008	NA	NA	NA	NA	1.4E-005	4.0E-008	NA	NA
							Average	3.4E-005	9.8E-008	NA	NA	NA	NA	1.0E-004	2.9E-007	NA	NA

R117111

Chemical:	Flusilazole
PC Code:	128835
HED File Code	14000 Risk Reviews
Memo Date:	10/26/2005
File ID:	DPD319403
Accession Number:	412-06-0008