

Novel Seed Treatments – Sweet Corn and Seed Corn Maggot – Year 4



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Year 3 Project



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Biological Evaluations (June 2022)



The screenshot shows the EPA website's 'Pesticides' section. The main headline is 'EPA Finalizes Biological Evaluations Assessing Potential Effects of Three Neonicotinoid Pesticides on Endangered Species', released on June 16, 2022. The article text states that EPA has released its final biological evaluations (BEs) for clothianidin, imidacloprid, and thiamethoxam, which are part of a group of insecticides known as neonicotinoids. These evaluations assess the potential effects of these pesticides on over 1,700 listed species and over 800 designated critical habitats. The article also mentions that these pesticides are used on a variety of crops, turf, and ornamentals, and for other residential and commercial indoor and outdoor uses.

- Long-term availability of neonics in question
- BEs required as part of re-registration decisions
- Fish & Wildlife Service
- Determine impacts on federally-listed species
 - 1700 species
 - 800 habitats
- Use of BEs part of EPA's efforts to meet its obligations under the Endangered Species Act

US EPA - Endangered Species Act (1973)

Protecting Endangered Species from Pesticides



About

- [About the endangered species program](#)
- [Assessing pesticides under the ESA](#)
- [Litigation and associated pesticide limitations](#)
- [Implementing NAS Report Recommendations on Ecological Risk Assessment for Endangered and Threatened Species](#)
- [Conventional Pesticide Registration](#)

Endangered Species Act Workplan

- [EPA's workplan and progress toward better protections for endangered species](#)
- [Implementing EPA's Workplan to Protect Endangered and Threatened Species from Pesticides: Pilot Projects](#)
- [Assessing effects of new pesticides on listed species](#)

Biological Evaluations (BEs)

- Final BE Chapters for [Chlorpyrifos](#), [Malathion](#), [Diazinon](#), [Carbaryl](#), [Methomyl](#), [Atrazine](#), [Simazine](#), [Glyphosate](#), [Clothianidin](#), [Imidacloprid](#), [Thiamethoxam](#)
- Draft BE Chapters for [Propazine](#), [Sulfoxaflor](#), [Inpyrfluxam](#)
- [Provisional Models and Tools Used in EPA's Pesticide Endangered Species Biological Evaluations](#)
- [Models and Tools for National Level Listed Species Biological Evaluations of Neonicotinoid Insecticides](#)

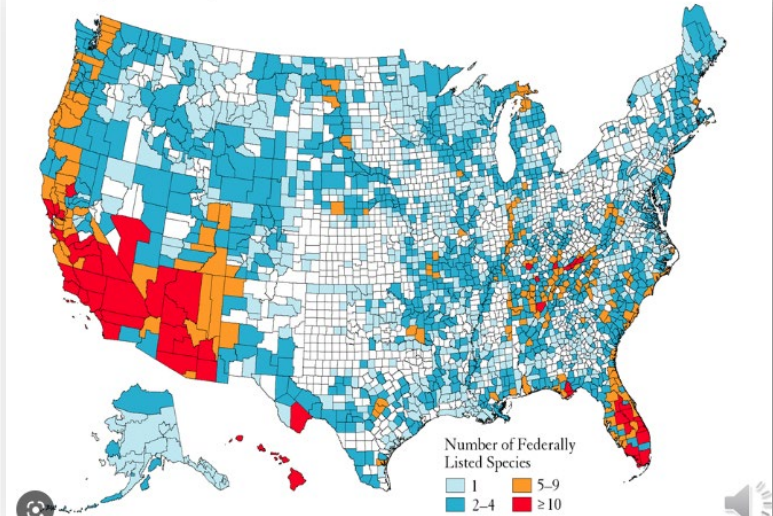
Protections for Endangered Species

- [Effects determinations](#)
- [Pesticide restrictions](#)
- [Bulletins Live! Two](#)
- [Information for pesticide users](#)

Recent Highlights

- [EPA's workplan and progress toward better protections for endangered species](#)
- [Reports to Congress on Improving Consultation Process Under Endangered Species Act Section 7 for Pesticide Registration & Registration Review](#)

Endangered species clustered in subset of counties



<https://www.epa.gov/endangered-species>

- ESA originally had authority for reviewing pesticide registrations
 - But held up in court until 2016
- Neonics now up for re-registration
 - Pending BEs will inform reg.
- Many headwinds for neonics

Insecticide Seed Treatments for Vegetable Crops in the U.S.

Crop Group	Major Pests	Products
Carrot	aster leafhopper	Sepresto 75WS, Cruiser 70WS, FarMore FI400
Bulb crops	onion maggot, seedcorn maggot	Sepresto 75WS, Trigard OMC FarMore FI500, Lumiverd, Regard SC, Cruiser 5FS
Legumes	seedcorn maggot, potato leafhopper, aphids, etc.	Cruiser 5FS, Lumivia
Cucurbits	seedcorn maggot, cucumber beetles, aphids. etc.	FarMore FI400
Sweet corn	seedcorn maggot, corn flea beetle, corn rootworms, etc.	Poncho 600, Poncho VOTiVo, Cruiser 5FS, Fortenza, Lumivia, Lumiverd, Reatis

Experimental Approach(es)



Seedcorn maggot

- Locations: MN, WI (2024)
- Two planting dates (1st and 2nd generation SCM)
- Sweet corn
 - 2021: Seminis SV1339SK / Syngenta GS 1453
 - 2022-23: Seminis only
 - 2024: Seminis only
- Snap bean: Syngenta (cv. Huntington) ('22-23 only)
- Design:
 - Manure + bone/blood meal attractants
 - 5-6 experimental replicates / treatment
 - 6-12 seed treatment active ingredients



Onion maggot

- Onion seed trt updates - Lumiverd (spinosad) & Plinazolin

Experimental Treatments (MWFPFA - sweet corn WI, MN, NY, DE – 2021-24)

Sweet Corn - Treatment rates				
Product	AI	Rate		
		2021	2022	2023
Poncho 600	clothianidin	0.5	0.5	0.5
Cruiser 5FS	thiamethoxam	0.25	0.25	0.25
Reatis	tetraniliprole	0.25	0.25	0.25
Fortenza	cyantraniliprole	0.25	0.25	0.25
Lumiderm	cyantraniliprole	-	0.25	-
Lumivia	chlorantraniliprole	-	0.25	0.5
Entrust 2 SC	spinosad	0.25	0.25, 0.5	0.25, 0.5
Entrust 80WP	spinosad	-	0.25, 0.5	-
Lumiverd 80WP	spinosad	-	-	0.25, 0.5

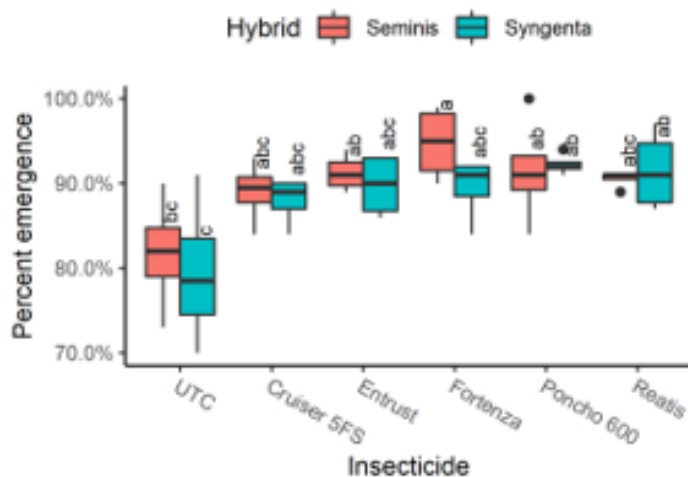
Fungicide package		
Product	Rate	Unit
42-S Thiram	5	fl oz/cwt
Apron XL	0.32	fl oz/cwt
Dividend Extreme	5	fl oz/cwt
Maxim 4FS	0.08	fl oz/cwt
Vitavax 34	3.6	fl oz/cwt



Experimental Results (MWFPFA - sweet corn – MN 2021)

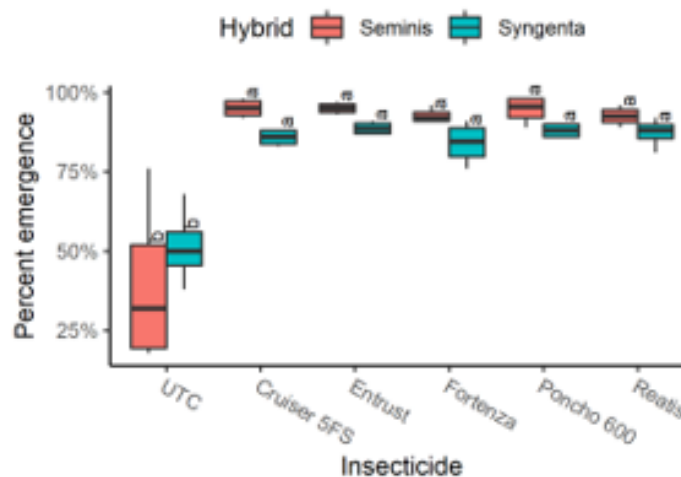
Stand count, first planting

May 24 (24 DAP), crop stage VE-V2



Stand count, second planting

May 26 (12 DAP), crop stage VE-V1


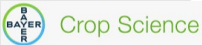







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Experimental Treatments (Syngenta - sweet corn - 2022)

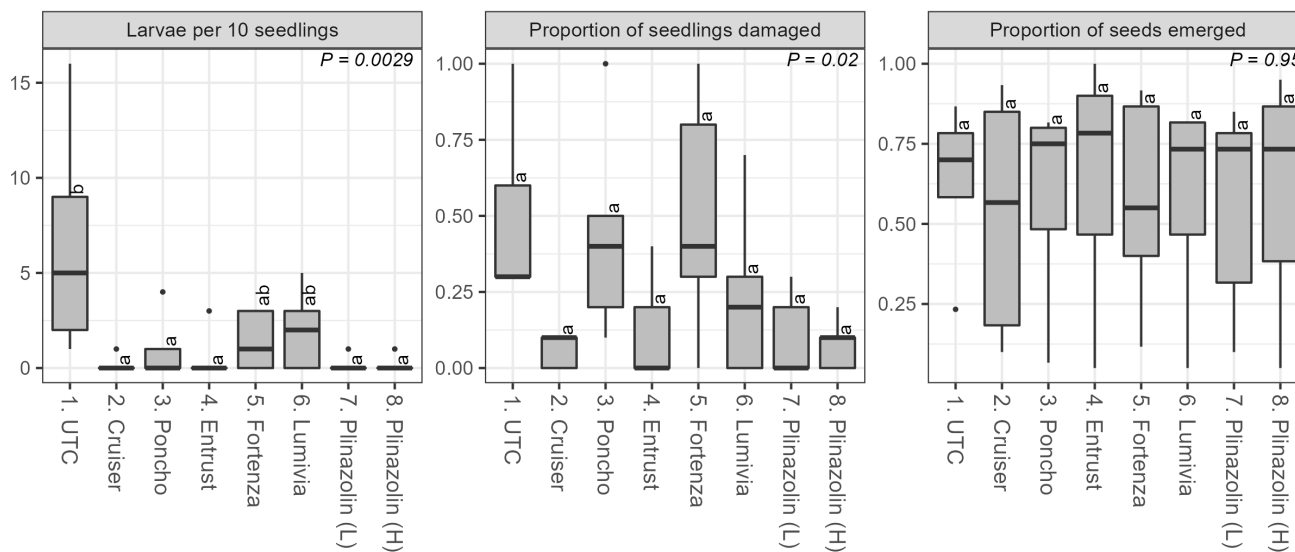
Table 1. Treatment details

Trt No	Trt Description	Rate Amt	Rate Unit	
1	No insecticide (UTC)			
2	Cruiser 5FS	0.5	mg ai/seed	
3	Poncho 600 (clothianidin)	0.5	mg ai/seed	
4	Entrust (spinosad)	0.2	mg ai/seed	
5	Fortenza 5FS (cyantraniliprole)	0.5	mg ai/seed	
6	Lumivia (chlorantraniliprole)	0.5	mg ai/seed	
7	PLINAZOLIN technology (isocycloseram)	25	g ai/100kg seed	
8	PLINAZOLIN technology (isocycloseram)	50	g ai/100kg seed	

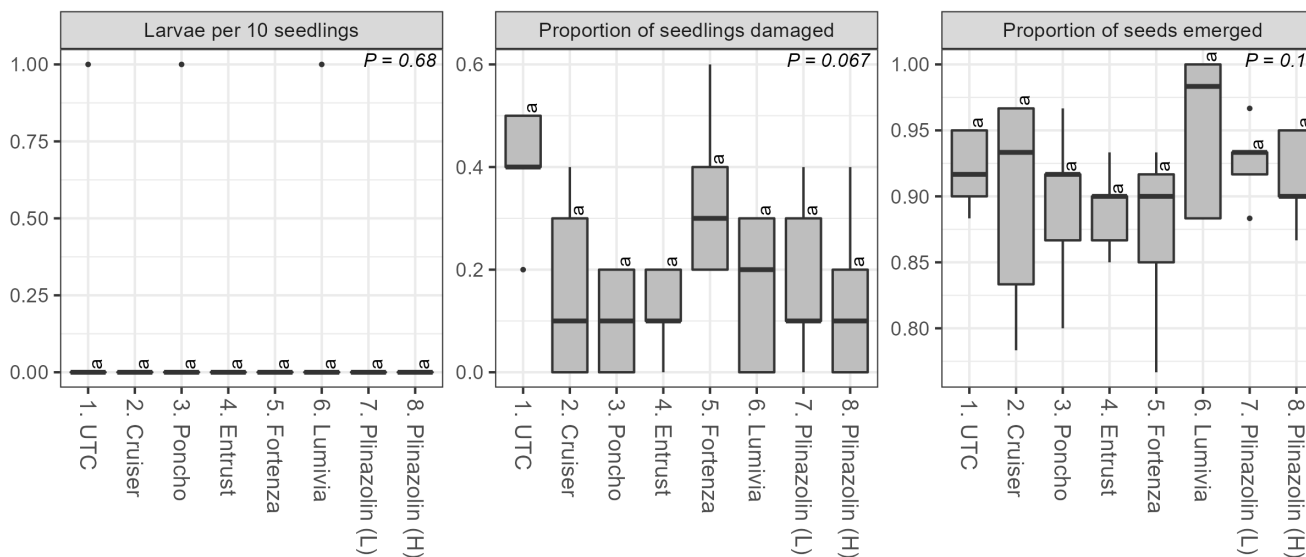
All seed including the UTC also received Vibrance Cinco and Vayantis fungicides.

Experimental Treatments (Syngenta - sweet corn - 2022)

AARS Syngenta Sweet Corn SCM Trial (1st planting)



AARS Syngenta Sweet Corn SCM Trial (2nd planting)



New active ingredients! (Onion)

- **Lumiverd[®]** (spinosad) IRAC 5

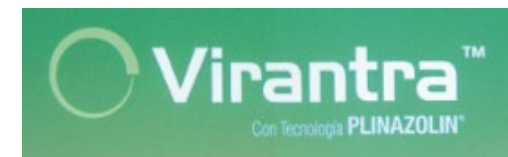
- Entrust 80WP

- availability increasing in 2023



- **Plinazolin[®]** technology (isocycloseram) IRAC Class 30

- current registration (2021) – Argentina (soybean)

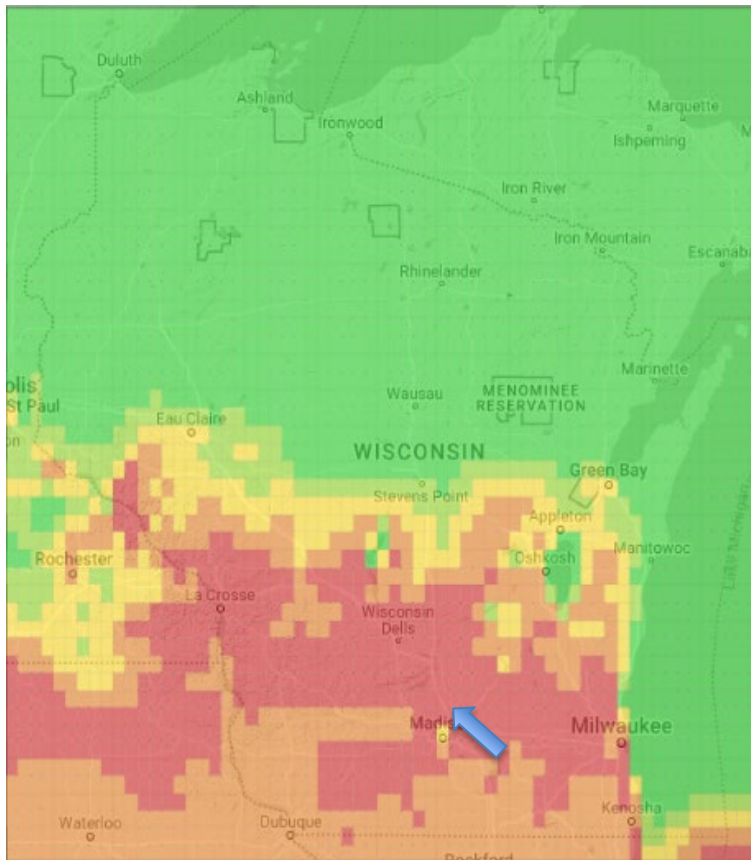


Best (worst) time to plant - 2023

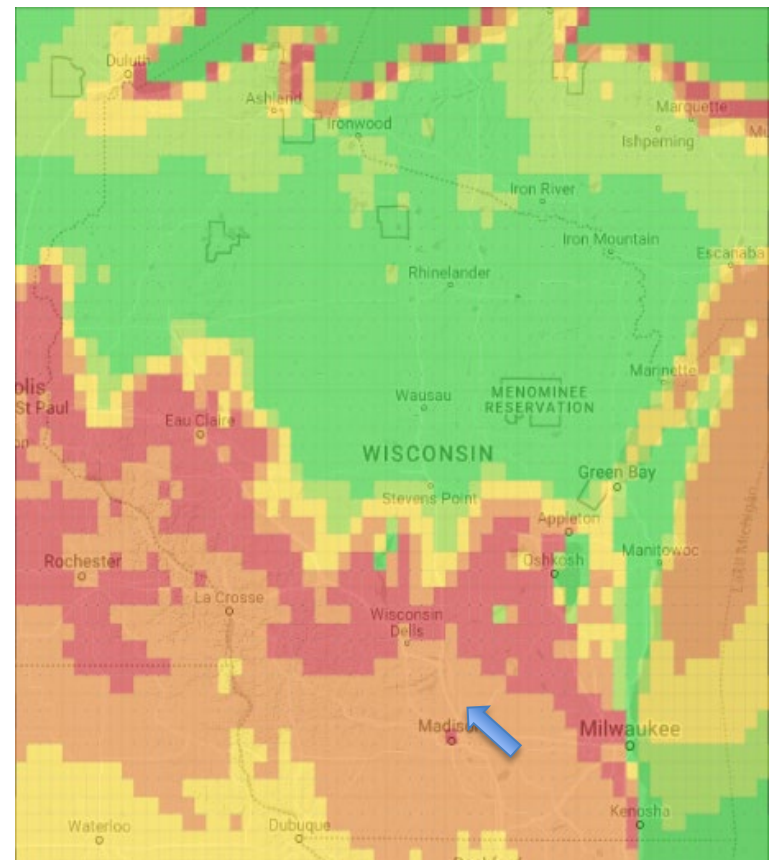
<https://agweather.cals.wisc.edu/vdifn>

Base 39.2F degree day model

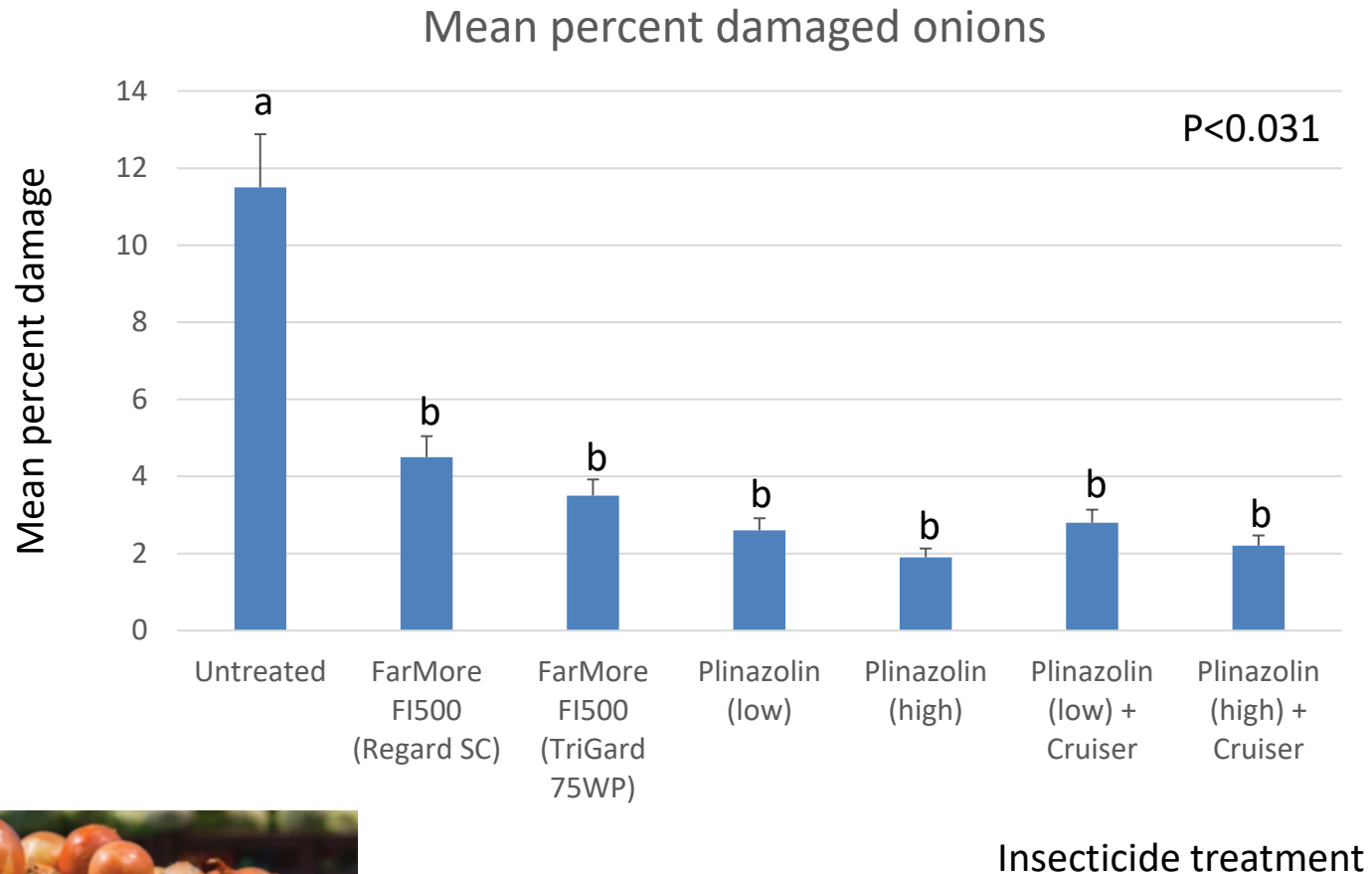
First planting date, May 4



Second planting date, June 5



Insecticide seed treatment performance (2022, Endeavor, WI)



- Regulatory challenges could affect continued viability of Group 4A, neonicotinoid insecticides
- Non-neonic seed treatments provide similar protection against seedcorn maggot
- Cyantraniliprole (Fortenza) offers systemic protection from sucking insects
- Plinazolin offers a novel modes of action for continued testing (not systemic – no leafhopper control?)
- Prediction of (timing of) seedcorn maggot damage remains an ongoing challenge!

IR-4 PCR submissions (simple search: corn (sweet))

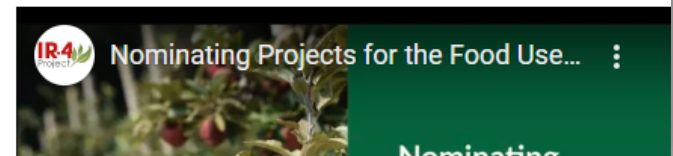
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NEW VIDEO:

[Nominating Projects for the Food Use Workshop](#)

Additional Search Options

PR#	CHEMICAL(MFG)	COMMODITY (CROP GROUP)	Crop Group	PROJECT STATUS	Reasons for need	PCR Use Pattern	Efficacy/Crop Safety (E/CS)	E/CS Research Comments	Comments	PERFORMANCE RESULTS & COMMENTS
08942	SPINOSAD (CORTEVA)	CORN (FIELD & SWEET) (15-16=CEREAL GRAINS AND CEREAL GRAINS FORAGE/FODDER/STRAW GROUPS)	15-16	USE REGISTERED	CORN EARWORM, EUROPEAN CORN BORER	0.075 LBS/A; 3 DAY PHI			(SEED) CURRENTLY THE FODDER RESTRICTION IS 28 DAYS, THIS IS TO LOWER THE PHI TO 3 DAYS. EPA OK TO USE GRASS HAY DATA:08/03.	
11708 C	SPINOSAD (CORTEVA)	CORN (SWEET) (SEED TRT) (15-16=CEREAL GRAINS AND CEREAL GRAINS FORAGE/FODDER/STRAW GROUPS)	15-16	MFG WILL NOT SUPPORT	SEED CORN MAGGOT (IN ORGANICALLY-GROWN SWEET CORN, USING ENTRUST PRODUCT)	ONE SEED TREATMENT APPLIC OF ENTRUST FORMULATION AT PLANTING; RATE NOT SPECIFIED			A 0.02 PPM TOLERANCE IS ESTABLISHED FOR SWEET CORN, AND COULD POSSIBLY COVER THIS SEED TREATMENT USE:07/15; MFG (DAS) DOES NOT SUPPORT:09/15	SEED TREATMENT WITH ENTRUST AT 0.25, 0.5 AND 0.75 MG AI/SEED; HIGHLY EFFECTIVE CONTROL OF SEEDCORN MAGGOT; EQUAL TO PONCHO SEED
11708 C	SPINOSAD (CORTEVA)	CORN (SWEET) (SEED TRT) (15-16=CEREAL GRAINS AND CEREAL GRAINS FORAGE/FODDER/STRAW GROUPS)	15-16	MFG WILL NOT SUPPORT	SEED CORN MAGGOT (IN ORGANICALLY-GROWN SWEET CORN, USING ENTRUST PRODUCT)	ONE SEED TREATMENT APPLIC OF ENTRUST FORMULATION AT PLANTING; RATE NOT SPECIFIED			A 0.02 PPM TOLERANCE IS ESTABLISHED FOR SWEET CORN, AND COULD POSSIBLY COVER THIS SEED TREATMENT USE:07/15; MFG (DAS) DOES NOT SUPPORT:09/15	SEED TREATMENT WITH ENTRUST AT 0.10, 0.25 AND 0.5 MG AI/SEED + MAXIM QUATRO FUNGICIDE IN 1ST TRIAL, OR 0.5 MG AI/SEED ALONE IN 2ND TRIAL;
13104 A	SPINOSAD (CORTEVA)	CORN (SWEET) (SEED TRT) (15-16=CEREAL GRAINS AND CEREAL GRAINS FORAGE/FODDER/STRAW GROUPS)	15-16	TOLERANCE/USE TO BE PURSUED WITH NO DATA PROPOSAL/PETITION	SEEDCORN MAGGOT (SCM), DELIA PLATURA (MEIGEN); SCM IS A MAJOR PEST OF MANY AGRICULTURAL CROPS BECAUSE IT ATTACKS GERMINATING	USE THE REGARD SC PRODUCT; MAKE ONE SEED TREATMENT APPLIC OF 0.5 MG AI/SEED; SEED MUST BE TREATED BY A COMMERCIAL SEED TREATMENT	MFG REQUIRES E/CS DATA:09/20	IN THE 2021 PERFORMANCE PROTOCOL: TESTING THE ENTRUST 2EC PRODUCT (2 LB AI/GAL OF SPINOSAD ACTIVE INGREDIENT); SEEDS ARE TO BE TREATED	KEY EXPORT MARKETS NOTED AS EUROPE, ASIA, OTHERS:07/20; SYNG SUPPORTS, RESIDUE AND E/CS DATA NEEDED:09/20; HQ SUGGESTS IR-4	

<https://ir4app.cals.ncsu.edu/Ir4FoodPub/simpleSch>

Acknowledgements and Thanks



<https://vegento.russell.wisc.edu/>

