Efficacy and Crop Safety of Pyraziflumid for the Control of Lettuce Drop and Alternaria Leaf Spot in Greenhouse-Grown Lettuce

Project No. P12975
Date: 03/2024

PROJECT TITLE:

Efficacy and Crop Safety of Pyraziflumid for the Control of Sclerotinia and Alternaria Leaf Spot in Greenhouse-Grown Lettuce.

PROJECT JUSTIFICATION AND OBJECTIVES:

IR-4 received a request for the use of pyraziflumid on greenhouse-grown lettuce for the control of Sclerotinia and Alternaria Leaf Spot. The purpose of this research is to collect efficacy and crop safety data to support registration of the proposed use pattern for pyraziflumid on this specialty crop.

Adherence to Good Laboratory Practices (GLPs) is not required for trials conducted under this research plan.

IR-4 RESEARCH COORDINATOR:

Consult with the Research Coordinator listed below regarding desired changes in this research plan prior to occurrence.

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Signature of IR-4 Plant Pathologist
Jaimin Patel

03/26/2024
Date

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MATERIALS & METHODS:

Host plant: Lettuce (Butterhead varieties only) - Use a locally grown commercial variety that is susceptible to the test pathogen and is suitable for greenhouse production.

Disease / Pathogen: Lettuce Drop /*Sclerotinia* spp. - NY trial only

Alternaria leaf spot/ *Alternaria* spp. - CT trial only

Powdery mildew / *Golovinomyces* sp. (Optional but encouraged to collect data) – NY and CT trials

Site: Greenhouse

Inoculum: Use artificial inoculation technique 1 to 2 days after the first treatment application. The goal is to simulate preventative applications of the product.

Treatments:

Product	MFG	EPA Reg. #	AI	Appl. Type	Rate	Adjuvant	No. of Appl. & PHI	GPA
UTC	N/A							
Industry Standard	Read label	Read label	Read label	Read label	Read label	Read label	Read label	
Pyraziflumid 20SC **(For NY trial only)**	NAI	N/A	Pyraziflumid	Foliar Spray	4.6 fl oz/A 3.2 fl oz/A	Use a non-ionic surfactant at the labeled concentration	Make the first application at thinning; make the second application after 14 days PHI= 1 day	50-100 gal/A
Pyraziflumid 20SC **(For CT trial only)**	NAI	N/A	Pyraziflumid	Foliar Spray	4.6 fl oz/A 3.2 fl. oz/A	Use a non-ionic surfactant at the labeled concentration	Make the first application 1 day prior to inoculum; make the second application after 7 days PHI= 1 day	50-100 gal/A

Test Substances Manipulation & Application: Read product use directions prior to manipulation and application. Applicators and handlers must wear the personal protective equipment listed on the product label. Do not use old/expired products for trials conducted under this research plan.

The IR-4 Plant Pathologist will arrange for new test substance to be delivered. Upon receipt of the test substance(s), document the corresponding lot/batch number. Store the test substance in a secure, clean, dry area at temperature ranges noted in the product label. Use application equipment that will provide uniform application of the test substance and simulates the intended commercial application technique. To ensure accurate delivery, calibrate test application equipment prior to application of the test substance(s).

Experimental Design: Arrange treatment plots in a randomized complete block design or other appropriate statistical design. The individual plots should be large enough to permit accurate application of the test substance in a manner that represents the major application technique used in greenhouse commercially.

Supplemental Crop treatments: The integrity of the study should be protected by managing pests causing significant damage to the crop other than the test target pest. Only EPA-registered maintenance pesticides should be used at labeled rates and applied to all experimental units. Document all supplemental crop treatments.

DATA COLLECTION:

For NY TRIAL ONLY

Efficacy: Disease incidence should be rated for lettuce drop prior to the very first treatment application. Ratings should continue on a weekly to biweekly basis until harvest. For incidence, evaluate plants in each replicate and calculate the number of infected plants (% of infection).

Researcher may collect powdery mildew disease severity and incidence data (optional but encouraged to collect data). Powdery mildew data should be collected based on the observation on both upper and lower surfaces.

FOR CT TRIAL ONLY

Efficacy: Disease incidence and severity should be rated prior to the very first treatment application for both Alternaria leaf spot and powdery mildew (optional but encouraged to collect data). Ratings should continue on a weekly basis. For incidence, evaluate plants in each replicate and calculate the number of infected plants (% of infection). For alternaria severity, evaluate each plant for percent upper leaf surface infection (% of leaf area infected) and for powdery mildew severity, evaluate each plant for percent of both upper and lower leaf surface infection.

Crop Injury: Assess phytotoxicity in the experimental plants preferably 7-14 days after each application of the test substance, using the damage scale indicated below. The untreated plot should be assessed on each date that any treated plot is assessed. If the crop is to be harvested/sampled within 14 days of the last application, then make the assessment on the day

of harvest. If a rating of 1 or higher is given to a plot, a follow up rating is needed 7-14 days after that, even if there is no additional test substance application in the interim, unless this rating is given to the crop at harvest.
Scale:

- 0 = no damage seen in the plot
- 1 = damage in ≤10% of the plot
- 2 = damage in 11-25% of the plot
- 3 = damage in 26-50% of the plot
- 4 = damage in >50% of the plot

STATISTICAL ANALYSIS:

Conduct appropriate statistical analysis to determine if significant differences exist between treatments. Statistical analysis from commonly used agricultural data programs, such as but not limited to Agricultural Research Manager (ARM), SAS, Minitab, etc. is acceptable.

DATA REPORTING:

At trial completion, please submit a final report and the raw data in two separate files to the IR-4 Research Coordinator and the appropriate Regional Field Coordinator (RFC) listed below.

For the sake of consistency and to avoid missing information, IR-4 encourages collaborators to adopt and fill out the Final Report Research Template provided by the Research Coordinator prior to trial conclusion.

The final report and the raw data should be submitted to IR-4 within 60 days of last data collection.

DATA PUBLICATION:

For non-confidential test substances, IR-4 encourages researchers to publish the results obtained from the study. Any publications should acknowledge support by IR-4 and consider including our plant pathologist, Jaimin Patel, as one of the authors when you publish any article resulting from this protocol. IR-4 Plant Pathologist spends a considerable amount of time in preparing protocol and providing technical details in this protocol.

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TRIAL SITE INFORMATION

Researcher	Field ID NO.	RFC
Dr. Daniel Heck Mailing address: 3059 Sound Ave Long Island Horticultural Research and Extension Center Riverhead, NY 11901 Phone: (680) 241-8082 Email: dwh237@cornell.edu **Shipping address (if different from above)**	P12975.24-NYP07	NER
Dr. Srikanth Kodati Pesticide Safety Education & Crop Protection Extension Educator University of Connecticut Address: 24 Hyde Ave, Vernon, CT 06066 Phone: 860-870-6935 Email: srikanth.kodati@uconn.edu **Shipping address is same as above**	P12975.24-CTP01	NER

RESEARCH FIELD COORDINATORS (RFC)

NER: Marylee Ross, IR-4 North East Region Field Coordinator's Office, University of Maryland, LESREC, 27664 Nanticoke Rd., Salisbury, MD 21801. Tel: (410) 742-8788 x 310, FAX# 410-742-1922; e-mail: mross@umd.edu

AMENDMENTS (Total 5) MADE ON 03/25/2024:

1. **Added a new disease (underlined) in the title as follow: "**Efficacy and Crop Safety of Pyraziflumid for the Control of Lettuce Drop and Alternaria Leaf Spot in Greenhouse-Grown Lettuce"
2. **Updated DISEASE/PATHOGEN section by adding an additional disease (Lettuce drop)**
3. **Updated Treatment table and specified which use patterns to be used in a specific state**
4. **Updated instruction for collecting Efficacy data for a specific state (NY vs CT) under DATA COLLECTION section.**
5. **Added contact information of a new researcher (Dr. Daniel Heck) in the TRIAL SITE INFORMATION section.**