Efficacy and Crop Safety of Pyraziflumid for the Control of Southern Blight (*Sclerotinium rolfsii*) in Tomato

Project No. P13076
Date: 01/2022

PROJECT TITLE:

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PROJECT JUSTIFICATION AND OBJECTIVES:

IR-4 received a request for the use of pyraziflumid on tomato for control of southern blight. The purpose of this research is to collect efficacy and crop safety data to support registration of pyraziflumid on tomato for the control of southern blight.

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 Research Coordinator
Alice Axtell

1/14/2022
Date

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MATERIALS & METHODS:

Host plant: Tomato- Use a locally grown commercial variety that is susceptible to the test pathogen

Pathogen: Southern blight (*Sclerotinium rolfsii*)

Treatments:

Product	MFG	EPA Reg. #	AI	Application Method	Rate	Notes
Untreated	N/A	N/A	N/A	N/A	N/A	N/A
Fontelis[1,2]	Corteva	352-834	Penthiopyrad	Drench or Drip followed by a foliar application directed to the base of the plant	See Table below	Registered Standard; Make the first application at transplanting (no more than 1 day after planting). Apply as a drench or drip application, keeping the product concentrated near the root/stem zone. Make the second application 21 days later as a drip application or as a foliar application directed to the base of the plant.
Pyraziflumid 20 SC[1]	Nichino	N/A	Pyraziflumid	Drench or Drip	3.2 fl oz/A	Make the first drip or drench application at transplanting (no more than 1 day after planting). Then 21 days later, make the second drip or drench application.

[1] For all soil applications, do not proportionally reduce the application rate (the amount of active ingredient applied per acre). Direct the entire per acre rate onto the soil. If row widths in the research plots are greater than local commercial practices, then the application rate should be calculated using a local commercial row width. Note: the treated area for directed applications is calculated as row spacing x number of rows x plot length.
[2]Suggested application rates for pyraziflumid 20 SC:

Treatment 02 Fontelis Soil Application Rates for Tomatoes

Rate per 1000 row feet	Product per Acre (fl oz)[a]						
fl oz prod/ 1000 ft row	22" rows	30" rows	32" rows	34" rows	36" rows	38" rows	40" rows
1.2	28.6[b]	20.9	19.6	18.5	17.4	16.5	15.7
1.6	-	27.9[c]	26.1[d]	24.6[e]	23.0	22.0	21.1

[a] Consult the maximum rate per acre allowed for the crop, and do not exceed that rate when using this application method. [b] In 22 inch rows, the highest rate for crops with 24 fl oz/acre maximums is 1.0 fl oz/ I 000 ft row, and for crops with 30 fl oz/acre maximums is 1.26 fl oz/1000 ft row. [c] In 30 inch rows, the highest rate for tomatoes and bulb onions with 24 t1 o z/acre maximum is 1.38 fl oz/I 000 ft row. [d] In 32 inch rows, the highest rate for tomatoes and bulb onions with 24 t1 oz/acre maximum is 1.47 fl oz/1000 ft row. [e] In 34 inch rows, the highest rate for tomatoes and bulb onions with 24 fl o z/acre maximum is 1.56 fl oz/I000 ft row.

Soil Application Instructions:

Drench Application:

Apply the appropriate amount of test substance per plant in approximately 80 to 200 mL of water per plant. However, if soil/environmental conditions require it, lesser or greater amounts may be used. Apply drench solution around the base of the plants. Utilize typical plant spacing to determine the number of plants per acre and the proportion of the per acre rate that should be applied to an individual plant.

Drip Irrigation Applications:

Apply in a minimum of 0.50 acre inches of water. Apply irrigation water and test substance as follows: first approximately ¼ to ½ of the irrigation water with test substance and the final ½ to ¾ of irrigation water without test substance. The fractions are not exact requirements but rather guidance as how to apply.

For all application, calculate the amount of test substance solution needed for the entire plot (based on the entire plot area). Do not proportionally reduce the application rate. Direct the entire per acre rate onto the crop/area as specified above.

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.

<u>The IR-4 Research Coordinator will arrange for new test substance to be delivered. Contact the Research Coordinator if the test substance(s) has not been received prior to trial initiation.</u>

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: Each test site should conduct six replicates of each treatment listed in Section 9. Arrange 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 that will be used 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:

Efficacy: YES ☑ NO ☐ OPTIONAL ☐

If natural inoculum is not present in the field plot, inoculate 0.1 g of southern blight around the base of each plant within three days after planting. Disease incidence should be rated within approximately 4 weeks after the first application and then weekly until commercial maturity of fruit. An initial rating should be done before any applications are made to determine if southern blight is present in the plots before the applications begin. Evaluations should be conducted when conditions are most favorable for southern blight.

Crop Injury: YES ☑ NO ☐ OPTIONAL ☐

Crop health should be evaluated on all plots 1-2 days after each application and at the conclusion of the study. If injury occurs additional evaluations should be considered. Evaluate the impact on disease development. Assess four randomly selected areas within each treatment.

Use visual ratings on a 0 to 5 scale:

- For ratings on fruit: 0 = no adverse effect on fruit; 3 = moderate spotting; 5 = severe spotting
- For ratings on foliage: 0 = no adverse effect on foliage; 3 = moderate foliage damage; 5 = severe foliage damage including defoliation and numerous spotting

If injury is observed, describe the symptoms (i.e. stunting, stand loss, leaf burn, leaf cupping or twisting, chlorosis, etc.), record if any delay in maturity occurred and specify if the level of phytotoxicity would be acceptable in commercial production.

Yield: YES ☑ NO ☐ OPTIONAL ☐
Determine yield at the conclusion of the study

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.

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.

TRIAL SITE INFORMATION

Researcher	Field ID NO.	RFC
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RESEARCH FIELD COORDINATORS

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