Efficacy and Crop Safety of Flutolanil for the Control of Black Root Rot in Strawberry

Project No. P09102
Date: 03/2023

PROJECT TITLE:

Efficacy and crop safety of flutolanil for the control of black root rot in strawberry

PROJECT JUSTIFICATION AND OBJECTIVES:

IR-4 received a request for the use of flutolanil for control of black root rot in strawberry. The purpose of this research is to collect efficacy and crop safety data to support registration of flutolanil for use 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.

Jaimin Patel, Ph.D.
Principal Plant Pathologist
IR-4 Project Headquarters
1730 Varsity Drive
Venture IV Suite 210
Raleigh, NC 27606
Office: (919) 515-4287
E-mail: jpatel38@ncsu.edu

Signature of IR-4 Research Coordinator
Jaimin Patel

03/07/2023
Date

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MATERIALS & METHODS:

Host plant: Strawberry - Use locally grown commercial varieties that is susceptible to the test pathogen. Keep a record of variety, source, lot number and date received.

Disease/ Pathogen: Black root rot / *Rhizoctonia* spp.

Test site: Field

Treatments: Product	MFG	EPA Reg. #	AI	Rate	No. of applications and other notes
Untreated	N/A	N/A	N/A	N/A	N/A
Standard control*	Depends on product	Depends on product	Depends on product	Read label	Read label
Convoy*	Nichino	71711-28	Flutolanil	32 fl oz/A	Drench/soil directed spray; 2 applications; 30-day RTI; 30-day PHI

*1st drench application = after harvest somewhere in July; 2nd drench application = 30 days later in August; Apply 1st application of both standard control and Convoy at the same day

Test Substances Manipulation: 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 Research Coordinator 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: Conduct a trial in the field with known history of black root rot in strawberry. If naturally infested field is not available for the trial, please inoculate plants with the pathogen. Each test site should include four blocks and each block should include all treatments. 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 target pest. Only EPA-registered

maintenance pesticides should be used at labeled rates and applied to all experimental units. Document all supplemental crop treatments.

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 COLLECTION
Efficacy: Rate plant cover using a scale from 1 to 4 as below before evaluating root health:
1 = ≤25% of plot area covered with many weak plants and no daughter plants from runners;
2 = 25 to 50% of plot area covered, few runners present;
3 = 50 to 74% plot area covered with more healthy vigorous plants than weak ones, at least half of the plant produced runners;
4 = >75% of plots covered with healthy vigorous plants all with rooted runners

Dig roots carefully and evaluate root health according to scale from 1 to 5, as below:
1 = mostly black, dark brown, no finely branched roots and single crown
2 = same as 1, except a 1 or 2 finely-branched roots present;
3 = Half of all roots are black/dark brown and unbranched, and 1 or 2 crown branches;
4 = More white, fine, branched roots present than black/brown unbranched roots, and >2 crown branches;
5 = White, fine and multiple branched roots and crown

Keep a record of number of plant roots evaluated per treatment in a block and submit it with the row data. Isolate pathogen(s) from randomly selected three diseased root samples per treatment per block to identify causal organisms.

Yield: Harvest fruits at peak ripeness and determine marketable strawberries.

Crop Injury: Crop health should be evaluated on all plots 5days after each application (foliage, flowers, and fruits). Record injury even if all assessments are zero. If injury is still present 14 days after the final application, then additional evaluations should be conducted. Assess four randomly selected areas within each treatment. Use visual ratings on a 0 to 100 scale:

- For foliage: 0 = no adverse effect on foliage; 100 = complete crop death
- For fruits: 0 = no adverse effect on fruits; 100 = complete necrosis of fruit

Specify the type of injury rated (leaf burn, leaf cupping or twisting, chlorosis, flower abortion, fruit drop, necrosis, etc.; multiple columns for injury may be used if more than one type is present). Record if any delay in maturity occurred and provide an overall assessment (if the level of phytotoxicity would be acceptable in commercial production).

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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
Dr. Timothy Miles Dept. of Plant, Soil & Microbial Sciences Michigan State University 578 Wilson Road, 105 CIPS East Lansing, MI, 48824-1311 Phone: 517-355-3964 Cell Phone: milesti2@msu.edu	P09102.23-MIP05	NCR
Dr. Mahfuz Rahman 1194 Evansdale Drive P.O. Box 6108 Morgantown, WV, 26506 Phone: 304-293-8838 mm.rahman@mail.wvu.edu	P09102.23-WVP01	NER

RESEARCH FIELD COORDINATORS (RFC)

NCR: Nicole Soldan, IR-4 North Central Region Research Center, 1066 Bogue St., Room A440 East Lansing, MI, 48824, Phone: 517-353-0416, Cell Phone: 517-712-8441, schroe65@msu.edu

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