Efficacy of Cyflumetofen against Mites in Caneberry

Project No. P11808
Date: 02/2024

0PROJECT TITLE:

Efficacy of Cyflumetofen against Mites in Caneberry

PROJECT JUSTIFICATION AND OBJECTIVES:

The two-spotted spider mite is a key mite pest affecting caneberry production worldwide, as it feeds on the underside of leaves, extracts chlorophyll, and reduces crop yield.

Due to the lack of effective control tools against this pest, caneberry growers may benefit from the addition of cyflumetofen to their toolbox, which is an active ingredient registered for the control of spider mites on a variety of crops other than caneberry.

The goal of this study is to generate efficacy and phytotoxicity data to support the registration of cyflumetofen to control mite infestations in caneberry.

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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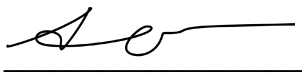

_ Signature of IR-4 Research Coordinator

2/2/2024
Date

MATERIALS & METHODS:

Host plant: Caneberry

Host Plant Management: Follow local agricultural practices for the production of caneberry including fertilization, irrigation, weed and fungal disease management that ensure good crop production.

Insect Pest: Two-spotted spider mite (*Tetranychus urticae*) or Southern red mite (*Olygonichus ilicis*).

Artificial Pest Infestation: Not required unless the pest does not typically occur at the location where the trial will be conducted. High nitrogen fertilization may help promote pest outbreaks.

Test Site: Conduct a trial under field or hoop house conditions.

Treatments: View Table 1 for the full list of treatments. Read product label and follow use directions prior to applying any insecticide. The IR-4 Research Coordinator will request and arrange the shipment of the test substances (all treatments except the adjuvant) prior to trial initiation. Upon receipt, document the lot/batch number. Store the test substance in a secure, clean, dry area at temperature ranges noted in the product label. Avoid treating plants under unusually extreme environmental conditions.

Table 1: List or treatments

Treatment	EPA Reg. #	Active Ingredient	MFG	Application Method	Product Rate	Adjuvant	No. of Applications & Timeline	GPA
Nealta® Miticide	7969-336	Cyflumetofen	BASF	Foliar Spray	13.7 fl oz/A	Yes	2 applications at an interval of 14 days starting at first pest sight (approx. 10 mites /leaf)	50-100 gal/A
					27.4 fl oz/A	**No**		
Portal® Miticide/ Insecticide [Commercial Standard]	71711-19	Fenpyroximate	Nichino		2 pts/A	Yes		
Untreated check	N/A							

Adjuvants: Use a non-ionic adjuvant containing at least 75% surfactant in combination with each treatment. Do NOT use a dormant oil or binder or sticker-type adjuvant. Follow product use directions for mixing instructions, appropriate rates and restrictions.

Application Equipment: Use application equipment that will provide uniform application of the treatments and simulates the intended commercial application technique. Using a CO_2 backpack sprayer with single nozzle is an adequate option for this trial. To ensure accurate delivery, calibrate the equipment prior to application of the test substance(s).

Experimental Design: Each treatment should be replicated at least **4** times. Each replicate should consist of at least 4-5 established plants. All plants within each replicate should receive the spray but samples should only be collected from the 2-3 inner plants. The number of plants per treatment should be increased if the plants are not fully established or do not have enough leaves to be sampled. Treatments should be arranged in an appropriate experimental design that minimizes the bias deriving from environmental differences across the testing site. A completely randomized block design is usually recommended for field and large scale greenhouse trials.

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 replicates. Document all supplemental crop treatments.

DATA COLLECTION:

Efficacy: Collect at least 10 leaves per replicate from the inner 2-3 plants of each replicate and count the number of motiles (adults and juveniles) and eggs. Typically, medium-age leaves are more prone to have greater pest pressure. A mite brushing machine may be used to remove mites and eggs from the leaf samples to facilitate counting. One pre-count should be conducted 1-2 days prior to the first treatment application. Samples should be collected 7 and 14 days after each treatment application. One additional count should be conducted 21 days after the very last spray.

Crop Injury: Use the rating scale below to conduct 4-5 weekly assessments of potential insecticide-induced damage to plants. Assessments should be conducted on the untreated control plants at the same time when assessments are conducted on treated plants. If phytotoxicity is observed in treated plants, provide a description of the symptoms observed and take pictures comparing treated and untreated plant material.

- 0 = no damage seen in the experimental plot
- 1 = damage seen in ≤10% of the experimental plot
- 2 = damage seen in 11-25% of the experimental plot
- 3 = damage seen in 26-50% of the experimental plot
- 4 = damage seen in >50% of the experimental 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 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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Dr. Mark Bolda University of California Cooperative Extension Santa Cruz County, 1430 Freedom Blvd, Watsonville, CA 95076 Phone: 831-254-8040 E-mail: mpbolda@ucanr.edu	P11808.23-CAP03[1] P11808.24-CAP07	WSR

RESEARCH FIELD COORDINATORS (RFC):

SOR: Dr. Janine Spies, IR-4 Southern Region Field Coordinator's Office, University of Florida, 1642 SW 23rd Drive, Bldg 685, PO Box 110720, Gainesville, FL 32611-0720; Tel: (352) 294-3991, FAX# 352-392-1988; e-mail: jrazze@ufl.edu

WSR: Dr. Kari Arnold, IR-4 Western Region Field Coordinator's Office, University of California-Davis, 4218 Meyer Hall, Davis, CA 95616; Tel: (530) 752-7634, FAX# 530-752-2866; e-mail: klarnold@ucdavis.edu

PROTOCOL AMENDMENT(s):

[1]P11808.23-ARP03 & P11808.23-CAP03 replaced P11808.24-ARP02 and P11808.24-ARCAP08 respectively, as trials were funded in 2023 but will be conducted in 2024. No impact on the study.