Control of Olive Fruit Fly on Olive Trees

Project No. IS00423
Year: 2022

PROJECT TITLE:

Control of Olive Fruit Fly on Olive Trees.

PROJECT JUSTIFICATION AND OBJECTIVES:

The olive fruit fly (*Bactrocera oleae*) (OLFF) is an economically important pest of commercial fruit-bearing olive plantings, where the maggots feed inside the fruit and allow the entry of secondary bacteria and fungi that cause fruit rot and degrade the quality of the oil.

The objectives of this study is to assess the performance of a variety of conventional (Delegate, & Danitol) and biological insecticides (Entrust SC Naturalyte Insect Control, MBI-306 and Venerate XC) for the control of OLFF in olive trees.

The goal of this study is collect efficacy and crop safety data to support registration of these pesticides 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.

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Signature of IR-4 Research Coordinator
Alice Axtell

3/17/2022
Date

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MATERIALS & METHODS:

Host plant: Any local commercial olive variety (*Olive europaea*).

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

Insect Pest: Olive fruit fly (*Bactrocera oleae* Gmelin) (OLFF).

Test Site: Any commercial olive tree plantation that is historically subjected to OLFF infestations.

Treatments:

Treatments	Rate Form/ac	No. Appl.	Timing
1) MBI-306*	10.0 fl. oz	1	Pit hardening ca. (Jul. 15)
		1	Pop. Increase ca. (Sep. 1)
		1	Sep. 15
		1	Oct. 1
2) MBI-306*	20.0 fl. oz	1	Pit hardening ca. (Jul. 15)
		1	Pop. Increase ca. (Sep. 1)
		1	Sep. 15
		1	Oct. 1
3) Venerate*	128.0 fl. oz	1	Pit hardening ca. (Jul. 15)
		1	Pop. Increase ca. (Sep. 1)
		1	Sep. 15
		1	Oct. 1
4) Danitol 2.4EC*	10.66 fl. oz	1	Pit hardening ca. (Jul. 15)
		1	Pop. Increase ca. (Sep. 1)
		1	Sep. 15
		1	Oct. 1)
5) Entrust 2SC*	2.25 fl. oz	1	Pit hardening ca. (Jul. 15)
		1	Pop. Increase ca. (Sep. 1)
		1	Sep. 15
		1	Oct. 1
6) Delegate*	7.0 oz	1	Pit hardening ca. (Jul. 15)
		1	Pop. Increase ca. (Sep. 1)
		1	Sep. 15
		1	Oct. 1
7) Treated check*			

*Treatments shall include a bait consisting of 100 g granulated sugar, 37.5 ml NuLure, and 25.0 ml Brandt Insect Bait/Acre

Treatment Information:

- **MBI 306 (*Bulkholderia* spp. strain A396):** Recent formulation developed by Marrone Bio Innovation and not yet registered for use on olive trees.
- **Venerate (*Bulkholderia* spp. strain A396):** Biopesticide marketed by Marrone Bio Innovation for use on specialty crops other than olive trees (EPA Reg. No. 84059-14).
- **Danitol 2.4 EC (A.I. fenpropathrin):** Conventional pesticide marketed by Valent and used in this trial as the commercial standard treatment (EPA Reg. No. 59639-35).
- **Entrust 2SC (A.I. spinosad):** OMRI registered pesticide for use on specialty crops other than olive trees and marketed by Corteva (EPA Reg. No. 62719-621).
- **Delegate WG (A.I. spinetoram):** Conventional pesticide marketed by Corteva and registered for use on specialty crops other than olive trees (EPA Reg. No. 62719-541).

Application Method: Treatments should be applied as a foliar directed spray. Apply with a hand-held sprayer operating with a finished spray volume of 150 GPA.

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 Research Coordinator will arrange for new test substance to be delivered. 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.

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: Treatments should be replicated at least 4 times in a completely randomized block design. Each replicate should be a single tree with a minimum of one untreated buffer tree between treatment trees.

Supplemental Crop treatments (Filed Trial): 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: OLFF population will be monitored weekly with two McPhail traps baited with Torula yeast lures and two yellow panel traps baited ammonia carbonate and spiroketal (pheromone) lures from mid-April though harvest. The traps will be placed in the untreated control trees. At commercial harvest, 250 fruit per replicate (1,000 fruit total) will be inspected for ovipositional scars, larvae present and exit holes.

Phytotoxicity: Assess phytotoxicity in the plot(s) preferably 7-14 days after each application of the test substance, using the damage scale indicated below. If an application interval is less

than 7 days, then the assessment may be done at the next application date. 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. The rating is an assessment of the damage throughout the entire plot. 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.

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

WSR: Dr. Michael Horak, Western Region IR-4 Project, 4218 Meyer Hall, University of California-Davis, Davis, CA 95616; Tel: (530) 752-7634, FAX# 530-752-2866; e-mail: mjhorak@ucdavis.edu