Advanced Fungicide Resistance and Its Management

FRAME Training Module 3 – Curriculum Guidelines For Module Delivery

Target Audience

Extension professionals, crop consultants, vineyard managers

Delivery and Learning Objectives

Content is designed to be delivered in a workshop format—either online or in person.

The activity consists of a presentation/seminar that provides an overview of pesticide (and fungicide) resistance, how it develops, and how to mitigate it.

Following the presentation, participants will participate in a group activity, where they are given a spray program, and then given a fungicide test results that coincide with different time points in the growing season. They will then be tasked with modifying their management approach for the remainder of the season based on the test results. This activity will evaluate their ability to apply the concepts learned in the presentation against what they might see in their professional activities. The evaluation will be done in groups using a guided discussion.

Workshop Materials

Workshop Contents

- Pre-recorded FRAME presentation. The presentation is provided in .mp4 format.
- Pre-developed in-meeting slide deck including introduction slides, areas to input your own program logistics, QR code and link for pesticide label databases, and prompt questions for the interactive group work.
- FRAME Module 3 Scenarios Answer Key (For Instructor Only)

Handouts for Participants

- FRAME Factsheet: *Fungicide Resistance Management in Vineyards*
- FRAME Factsheet: *Vineyard Disease Management – A Checklist*
- FRAME Factsheet: *Collecting Pathogen Samples for Fungicide Resistance Monitoring*
- FRAME Factsheet: *Interpreting FRAC 11 Fungicide Resistance Tests – Vineyards*
- FRAME Factsheet: *Dispersion: A Spore's Journey in Vineyards*
- CAPCA article: *Fungicide Resistance Monitoring and Management in US Vineyards*
- AJEV article: *Evolution of Fungicide Resistant Pathogens in Grapes: Erysiphe necator, Plasmopara viticola, and Botrytis cinerea*
- Handout on *Accessing Fungicide Label Databases* (i.e., QR Code)
- FRAME Module 3: Breakout Room / Group Work Handout
- *All handouts are also available online at the FRAME Educator's webpage under Module 3:* https://framenetworks.wsu.edu/educator-information/.

Advertising the Workshop

When advertising this workshop, please use the following language in your advertising campaigns / webposts:

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The contents of this workshop were developed as a part of the Specialty Crop Research Initiative Award No. 2024-51181-43184 titled “Pathogen Monitoring and Disease Management Within a Vineyard FRAMEwork,' from the U.S. Department of Agriculture's National Institute of Food and Agriculture. Please visit https://framenetworks.wsu.edu/ for more information.

Workshop Flow and Tips

Pre-workshop Recommendations

Prior to setting up the workshop, determine whether you will be offering regional pesticide applicator recertification credits (or equivalent training credits). Check with your local agencies to determine their requirements regarding activity duration, attendance verification, and workshop learning validation.

You may also wish to establish a pre-meeting survey (completed at the time of registration) and a post-meeting survey to assist in collecting baseline information for your region. Potential survey questions are provided at the end of this document.

Workshop Agenda

- (5 minutes) Use the pre-developed slide deck to introduce yourself and the activity to the audience. This is also where you can add specific logistical information regarding regional licensing/credit requirements.
- (46 minutes) **Play the FRAME pre-recorded video**.
- (5 minutes) Open the floor for any audience questions.
- (35 minutes – 60 minutes – Option dependent). **Begin the interactive session**. Groups will be given a spray scenario, as well as a fungicide resistance test result (or multiple results). See “Options” below on how you might assign different levels or work, based on audience size, base knowledge, and amount of workshop time you have. They are tasked with determining how they might modify their management approaches for the remainder of the season based on what their spray program was, and what the test results showed. Participants can use the *Accessing Fungicide Label Databases* handout to look up product information.
    - *Webinar*
        - Pre-assign attendees to breakout rooms at the start of the meeting to help maintain flow.
        - If using a moderator for each breakout room, pre-select individuals before the webinar to confirm their willingness and attendance.
        - The moderator is an individual that will help the groups stay on task and answer any logical questions they might have.
    - *In-person*
        - We recommend pre-assigning individuals to working tables or providing group numbers (if not seated at tables) to facilitate quick group formation.
        - A designated group moderator may not be necessary, as meeting hosts can circulate to stimulate discussion.
    - *General Session Logistics*
        - Have each group take some time to read through the spray program, and the test result scenario(s) they were assigned.

        - Using the handouts provided, and what they learned from the lecture, have them discuss how they might adjust their spray program given their fungicide resistance test results.
        - Have them complete the workshop handout with their responses.
    - *Session Options*
        - #1 – Have all of the groups select the same Test Result Option. Provide all of the groups the same scenario and same test result – This will allow open discussion that highlights how different approaches are taken to the same problem.
        - #2 – Assign the groups different Test Results timing options (Test Results #1 and #2, or #3 and #4). This will allow discussions highlighting how a response to a fungicide test result might alter your approach depending on the time of the season.
        - #3 – Assign the groups different Test Results Options but across all of the options. This will allow discussions highlighting how a response to a fungicide test result might alter your approach depending on the time of the season and what you are testing for..
        - If you would like a longer group activity, you can assign Teams Multiple Test Result Options, so they can have internal discussions on how their approaches might change (may require longer Wrap-up time).
- (40 minutes) **Wrap – up / Discussion.**
    - Bring everyone back together. Go around the room and have each group quickly share their scenario, and their response. Use the *Scenario Answer Key* provided to ensure all intended points are made.
    - Open the floor for final questions and answers.
    - Display or provide any necessary logistical information regarding regional pesticide applicator recertification credit requirements.
    - Provide post-meeting survey.

Supplemental Information / Details

Optional Pre-Meeting Survey

Provide a survey questionnaire and require attendees to complete the information as a prerequisite for joining the meeting (if a webinar), or that they complete prior to starting the workshop (in-person). Survey questions / information could include:

- Do you currently use spore trapping in your vineyards for pathogen monitoring?
    - Yes
    - No
    - No, but I am interested in learning more about this!
- Are you aware of any local plant disease diagnostic labs that are offering fungicide testing for grape pathogens?
    - Yes
    - No
- Do you feel fungicide resistance test results would be helpful in helping you design your spray program?

- Yes – I would use the results to alter spray program design
- No – I don't think an individual farm test is needed – if I know resistance is common in my area, I will automatically adjust my spray program accordingly
- No – I don't think I will need to make any adjustments until I see a problem in the vineyard.

Post-Meeting Survey

Provide a post-webinar survey to determine short-term impact. It might also be helpful to require participants to complete this survey before they can access a link or other information related to getting their pesticide applicator recertification credits. Potential questions include:

- Please list 3 things you have learned from this webinar. (open text question)
- Please list 2 things you might change for the upcoming growing season, whether it's on-farm practices or changes in consulting approaches. (open text question)
- Did you have any questions regarding the topics covered in this webinar that remain unanswered? (open text question)
- How likely are you to recommend this webinar, or future potential FRAME webinars to colleagues or clients? (select 1)
  - Very likely
  - Potentially, with reservation
  - Not likely
- Any suggestions for improving this specific-topic webinar? (open text question)