



DETERMINING LEVELS OF BOT AND PHOMOPSIS IN THE ORCHARD; EFFECTS OF A BLOOM SPRAY ON BOT, PHOMOPSIS, AND MOLD; AND EFFECT OF A COMBINATION OF ETHEPHON WITH A FUNGICIDE AGAINST MOLD

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Project status in 2024: Year 2 of 2

PROJECT OBJECTIVES:

1. Developed procedures to determine pre-season the presence/absence and the levels of Bot and/or Phomopsis canker and blight in a walnut orchard.
2. To determine whether a bloom spray alone and/or in combination with a walnut blight spray helps reduce Botryosphaeria, Phomopsis, and/or mold of walnut, and compare it with a pre-hull-split and early-hull-split fungicide spray alone or in combination with Ethephon.
3. Understand in detail the infection process of walnut resulting in mold.

KEY FINDINGS

- In orchards where Botryosphaeria canker and blight disease is active yearly, the causes of mold will be Botryosphaeria, followed by Aspergillus niger, Alternaria spp., and Fusarium spp. and orchards where there is no Botryosphaeria and/or Phomopsis diseases, the dominant mold fungi will be Fusarium spp., Aspergillus niger, and Alternaria spp.
- The BUDMON and SPURMON techniques work well in determining presence/absence of Botryosphaeria and/or Phomopsis fungi and give the levels of these walnut pathogens in an orchard.
- Thus far, there has not been determined any correlation of BUDMON results with the levels of mold in an orchard.
- The triazole fungicide Cevya (FRAC #3) applied three times at calendar timing for control of Botryosphaeria was the most effective fungicide in reducing blighted nuts in a Chandler orchard.

- A bloom spray with Cevya or Luna Experience reduced blighted (moldy) nuts caused by Botryosphaeria and the mold fungi, Aspergillus niger, and Alternaria and Fusarium spp.
- A Luna Experience spray alone or combined with Ethephon, or an Ethephon spray alone applied one week before hull split or at 20-30% hull split reduced mold similarly.
- However, a Luna Experience+Ethephon spray at 20-30% hull split reduced mold (caused by Fusarium spp., A. niger, and Alternaria spp.) the most in a flood-irrigated orchard where high mold levels were recorded.
- Black nuts with intact (unsplit) or slightly cracked hulls or split black hulls had significantly higher levels of mycelia incidence on the kernel than the normal nuts with green split hulls.
- Results differed from those of 2023 in which the shriveled intact-hull blighted nuts had the highest incidence of fungal mycelia on kernels, perhaps due to extreme heat waves we had during August.

DISCUSSION

The “blight phase” of Botryosphaeria canker and blight disease is the one which causes most of the damage to the crop, resulting in yield losses from actual loss of blighted nuts and killing of spurs bearing the fruiting buds of the next growing season. In orchards with Botryosphaeria/ Phomopsis canker and blight disease, the Botryosphaeria and Phomopsis pathogens can also develop and cause mold of walnuts at harvest. Interestingly, in orchards where Bot/Phomopsis are absent, Aspergillus niger, Alternaria and Fusarium become the dominant molds. Although BUDMON and SPURMON assays have not shown any correlation with mold incidence, a qPCR sensitive method that detects latent infections by Botryosphaeria or Phomopsis should be investigated. A bloom spray with Cevya (FRAC 3) or Luna Experience (FRAC 3/7) reduced blighted moldy nuts. Also, a Luna Experience+Ethephon spray at 20-30% hull split stage reduced mold the most. Black nuts with intact, unsplit, and shriveled hulls need to be re-examined again to determine whether they represent nuts that are infected by mold fungi early in the season.