Plant Pathology Seminar Series

Phenotypic and molecular Characterization of fungicide sensitivity in various *Penicillium* species causing blue mold of pome fruit in Pacific Northwest

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Abstract:

Blue mold disease poses a significant threat to apples and pears in storage, causing economic losses estimated to make up to 50% of total decays. *Penicillium expansum* is believed to be the primary causal species of blue mold, however several other *Penicillium* species have been identified and reported to make up to 25% of PNW *Penicillium* population. Postharvest fungicides, i.e., thiabendazole (TBZ), pyrimethanil (PYR), and fludioxonil (FDL) have been used to manage blue mold and other postharvest diseases for decades, whereas difenoconazole (DIF) has been registered in 2017. Frequent applications of these fungicides have selected for strains of *P. expansum* . that are resistant to TBZ, FDL and PYR. .However, *Penicillium* species that were phenotypically different from *P. exapansum* showed unusual higher levels of tolerance when tested *in vitro* on a single discriminatory dose of each of the 3 fungicides. The reasons behind the elevated *in vitro* tolerance of these "non-*expansum*" isolates are unknown. The ability of the label rates of the four postharvest fungicides to control these *Penicillium* spp. populations on fruits is also unknown. Therefore, a research study that combines both *in vitro* and *in vivo* fungicide sensitivity assays among various *Penicillium* isolates, along with molecular characterization of the *Penicillium* populations will help understand the resistance mechanisms and the development of effective control measures. Our preliminary findings indicate a high level of tolerance to FDL among various *Penicillium* species, whereas the test for sensitivity to PYR, TBZ and DIF is currently being done. The research goal is to determine if the level of *in vitro* tolerance translates into *in vivo* resistance, hence control failure. Furthermore, the research is also aimed towards identifying the possible molecular mechanism(s) that may be causing this high level of resistance in comparison with known mechanisms in *P. expansum*.

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Zoom Link: https://wsu.zoom.us/j/95501196325?pwd=aGdCeTZGM0pQaXZoY05qT3M0SFVHQT09

Meeting ID: 955 0119 6325 **Passcode:** 5498

Call in number: 1 253 215 8782

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References:

Amiri A., and Pandit LK. 2019. Fungicide resistance in *Penicillium expansum* from pome fruit in the U.S. Pacific Northwest. Phytopathology 109-10: S2.75.