Plant Pathology Seminar Series

"Assessing saprophytic and pathogenic fitness in fungicide-resistant isolates of *Penicillium expansum*"

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Abstract:

Blue mold (BM), primarily caused by *Penicillium expansum*, is the most important postharvest disease of apple and pear worldwide and in the Pacific Northwest (PNW). Packinghouse surveys indicate that *P. expansum* has begun to exhibit resistance to thiabendazole (TBZ), pyrimethanil (PYR), and fludioxonil (FDL), the three most used postharvest fungicides in the PNW. To better understand if the evolution of fungicide resistance alters the ability of resistant populations to cause epidemics of BM*, P. expansum* isolates sensitive or resistant to TBZ, PYR, and FDL were evaluated using several fitness parameters. Spore germination, mycelial growth, sensitivity to reactive oxygen species, osmotic stress, and resistance stability were assessed *in vitro*, while virulence, sporulation, and resistance stability were assessed *in vivo*. In preliminary *in vitro* trials at 1.5°C, resistant isolates exhibited reduced conidial germination on nutrient restricted media and susceptibility to osmotic stress. Virulence of resistant isolates was similar to those of sensitive isolates on detached fruit after 3 months at 1.5°C. Our preliminary findings indicate that while some fungicide-resistant phenotypes of *P. expansum* may incur fitness costs, their ability to cause BM in cold storage may not be affected. The goal of this research is to help fruit packers effectively assess and mitigate the risk of fungicide resistant disease populations.

References:

Amiri, A., Ali, M.E., De Angelis, D.R., Mulvaney, K.A., Pandit, L.K. (2021). Prevalence and distribution of *Penicillium expansum* and *Botrytis cinerea* in apple packinghouses across Washington State and their sensitivity to the postharvest fungicide pyrimethanil. *Acta Hortic,* 1323. DOI 10.17660/ActaHortic.2021.1323.26

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