

Epidemiology and Management of Almond Brown Rot, Jacket Rot, Shot Hole, Rust, and Hull Rot

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PROJECT SUMMARY

Objectives:

- Evaluate new fungicides and organic compounds based on spectrum of activity, systemic action, and persistence for brown rot, jacket rot, shot hole, gray mold, rust, and hull rot.
- Establish baseline sensitivities of fungal pathogens against new fungicides and determine shifts in fungicide sensitivity.
- Evaluate almond genotype susceptibility to foliar diseases that develop naturally in the almond variety trial at UC Davis under simulated rainfall.
- Identify cultural practices and fungicide treatments for reducing hull rot.

Background and Discussion:

In 2013-14, we evaluated new treatments for major foliar and fruit diseases of almond in California. New fungicides belong to new (i.e., BAS750) and existing classes (e.g., DMIs – FRAC 3, SDHIs – FRAC 7, anilinoimidazole – FRAC 9, QoIs – FRAC 11, polyoxins – FRAC 19, phosphonates – FRAC 33, isophthalonitriles – FRAC M5, guanidines – U12). Several pre-mixtures and rotation programs and a natural product were also evaluated. FRAC 7 fungicides (boscalid, isofetamid, fluopyram, fluxapyroxad, penthiopyrad) belong to three sub-groups that differ in their activity due to differences in the target binding site. This reduces cross-resistance among some of the sub-groups; however, cross-resistance is still possible because the target site (i.e., succinate dehydrogenase) is the same.

When applied in rotation and mixture programs, the arsenal of available fungicide treatments will help prevent the selection and build-up of resistance. In our research, highly effective single-fungicides and pre-mixtures were identified

for the management of brown rot blossom blight, gray mold, and shot hole.

Brown rot, shot hole, and gray mold incidence was generally very low in the spring of 2014. For management, several classes, and especially several pre-mixtures and rotation programs provided excellent disease control. A new variety block was established at UC Davis for evaluation of disease susceptibility in coming years. The genotypes planted correspond with those in new variety orchards established by UCCE in several counties.

Studies on the management of hull rot were conducted in orchards with *Rhizopus stolonifer*, *Monilinia fructicola*, or both pathogens as the causal agents. We confirmed previous studies, that hull rot caused by *R. stolonifer* can be managed with a single application during early hull split. For hull rot caused by *Monilinia* species, applications should be done earlier (e.g., early to mid-June). Because the pathogen population causing hull rot is generally not known for a particular orchard site and because both pathogens are usually present at varying frequencies among locations and years, a 2-spray program with one treatment in early/mid-June and another one at early hull split is recommended. The most effective treatments include fungicides in FG 3+7, 3+9, 7+11, 3+11, and 3+19. For the most effective integrated management of hull rot, fungicides should be used together with proper water management (i.e., deficit irrigation) and nitrogen fertilization.

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For More Details, Visit

- Poster location 28, Exhibit Hall A + B during the Almond Conference; or on the web (after January 2015) at Almonds.com/ResearchDatabase
- 2013-2014 Annual Reports CD (13-PATH4-Adaskaveg); or on the web (after January 2015) at Almonds.com/ResearchDatabase
- Related project: 13-HORT11A-Sanden