

Field Evaluation of Almond Rootstocks

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PROJECT SUMMARY

Objectives:

This project evaluates the field performance of several alternative rootstocks. It encompasses six different trials planted in different almond growing locations in California. These locations present different production challenges and include the following:

- Evaluate alternative rootstocks irrigated with low quality (saline) irrigation water in low pH sandy soil (Merced County) and in high pH, loamy clay soil (west side, Stanislaus County).
- Evaluate alternative rootstocks under high boron conditions (Yolo County).
- Continue evaluation of alternative rootstocks for tolerance to Armillaria root and crown rot (Butte & Stanislaus Counties).
- Continue evaluation of variety compatibility with rootstocks for almond, particularly compatibility with Nonpareil.
- Continue evaluation of alternative rootstocks in a sandy, unfumigated replant location (Stanislaus).

Background and Discussion:

Selecting the appropriate rootstock for specific soil conditions is critically important for the long-term success of an almond orchard. Rootstocks influence the vigor of a tree, nutrient uptake, bloom timing and date of crop maturity. More importantly, rootstocks can guard against chemical soil challenges like high pH or dangerous levels of sodium, chloride or boron. They can also protect against soil-borne pathogens like nematodes, crown gall, Phytophthora, Verticillium and oak root fungus.

For the past several decades, most almond orchards have been grown on the peach rootstocks, Nemaguard and Lovell. These rootstocks have some very positive attributes but also have some significant weaknesses. Both perform poorly in heavy, alkaline soils and are susceptible to Phytophthora, oak root fungus, crown gall and other diseases. Nemaguard is also susceptible to ring nematode and bacterial canker while Lovell is highly susceptible to rootknot nematode and crown gall. This project involves a number of separate rootstock trials evaluating over 25 different rootstocks from around the globe.

Highlights documented in these field trials include:

- High vigor of peach x almond hybrids and Empyrean 1.
- High sodium and chloride tolerance of most peach x almond hybrids, Empyrean 1 and Empyrean 101.
- Sodium and chloride sensitivity of Atlas, Krymsk 86 and Empyrean 2.
- High tolerances of Verticillium wilt disease by Atlas and high susceptibility of Lovell and Hansen.
- Superior anchorage of Krymsk 86 compared to Lovell & Ishtara.
- Greater water stress experienced in sandy soil by Krymsk 86 and RootPac R.
- Superior ring nematode tolerance by Viking, Lovell and Guardian compared to Nemaguard

Project Cooperators and Personnel: Joseph H. Connell, UCCE - Butte County; David Doll, UCCE - Merced County; Brent Holtz, UCCE - San Joaquin County; Katherine Pope, UCCE – Yolo & Solano Counties

For More Details, Visit

- Poster location 51, 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-HORT4-Duncan); or on the web (after January 2015) at Almonds.com/ResearchDatabase
- Related projects: 14-HORT10-Gradziel; 12-HORT16-Aradhya/Ledbetter; 12-PATH7-Baumgartner; 14-PATH1-Browne