

ORCHARD REHABILITATION

Gerald E. Allen & Kevin D. Olsen

Abandoned or neglected orchards, regardless of their age, typically develop severe conditions which require broad treatment for rehabilitation. With no pruning, suckering, fertilization, or other horticultural inputs, trees are typically shrub-like, with weeds rising above tree height. Most likely, the orchards will have suffered water deficits, perhaps the result of an inadequate irrigation system. Ground squirrels or other vertebrate pests may have caused significant tree damage by girdling structural branches or significant portions of the root system. Successful bud take and insufficient numbers of male trees may be additional challenges requiring correction.

This chapter outlines an orchard rehabilitation program performed on a neglected eight-year-old Madera County orchard. This outline focuses primarily on the first three years and lists activities covered in greater depth within the other chapters of this publication.

FIRST YEAR

1. Disc and float the orchard to insure that all low spots are filled in as much as possible. Ponding water and lack of storm drainage can lead to anaerobic soil conditions and Phytophthora Root and Crown Rots.
2. Implement ground squirrel control measures through baiting and mechanical trapping.
3. Evaluate irrigation system. Filters, lines, hoses and emitters if present may require unplugging, maintenance, repair, and/or replacement. Obtain the "distribution uniformity %" for your system and ascertain where the problem lies if it is too low and implement mitigation measures.

4. Institute a comprehensive pest management program, which includes diligent monitoring.
5. Institute fertilization program. Nitrogen, zinc and boron are most commonly deficient. Copper and potassium may also be needed. Orchards on the west side of the San Joaquin Valley should not require boron. Take leaf and soil samples at the appropriate time to guide your fertilization program. If the irrigation water source is from a well, a current laboratory test for water quality is advised.
6. Male trees should occupy 4-6 % of the orchard. Plant males to achieve this objective if adequate numbers are not present. If excessive numbers of males are present, consider removal of some and replacement with female trees. If the orchard is isolated, it might be beneficial to exceed the 4 % level, especially on the upwind border of the orchard.
7. Topwork some trees to males using 'Peters' if appropriate. Consider adding some 02-16 and or 02-18 to the orchard in order to spread out pollen emission. The new patented "Randy" male selection from the University also deserves some consideration.
8. Re-bud rootstock seedlings if needed.
9. Replant missing tree sites. Budded replants accelerate productivity and minimize the expense of budding in the orchard.
10. During the first winter of rejuvenation, prune trees to remove approximately 35% of the tree mass. Remove all suckers and dead wood. If Botryosphaeria Panicle and Shoot Blight are present in the orchard, remove all infected nut clusters and twigs, and open the area in the tree center to facilitate air movement. Infected and pruned out plant materials should be

located in row middles and destroyed by either shredding or discing.

SECOND YEAR

1. If needed, institute an artificial pollination program. Continue until the planted males are ready. Same-year pollen is preferable. Ground application of pollen is advised.
2. Continue first-year programs outlined above.
3. In winter, prune to remove 25% of tree volume. Tip terminal shoot growth.

THIRD YEAR

1. Continue programs instituted during the first two years.
2. During dormancy, prune the trees to open up the center if not previously done.

11. Monitor for soft scales and treat during the dormant season if necessary.

SUBSEQUENT YEARS

1. Continue programs as applicable.
2. Survey orchard annually for *Verticillium* Wilt. Remove and replant affected trees with *Verticillium* resistant rootstocks.
3. Pruning by hedging, if needed, every other middle every other year may now be considered, as well as topping, if applicable.
4. Average production should continue to increase. In this case, average production has reached over 5,000 lbs/acre (12,350 lbs/hectare) in an on year, and as much as 800 lbs./acre (1,976 lbs./hectare) in the off year.