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Objectives:

1. Determine the relation of pre- and postplant soil fumigation, backhoeing, and mycorrhizal fungus to tree vigor and susceptibility to canker; monitor nematode populations in the fumigated and nonfumigated soils.
2. In controlled tests, ascertain the effect of pin and ring nematodes on the susceptibility of French prune to bacterial canker and *Cytospora* canker.
3. Determine the correlation of bacterial canker to soil type, depth, pH, and the presence of plant parasitic nematodes.
4. Ascertain if low temperatures predispose French prune trees to bacterial canker.

Results, Conclusions, Work Planned:

Research on objectives one to three, outlined above, is in progress and some results worthy of note have been obtained. The soil fumigation and backhoe work is being done in 5 commercial orchards in 4 Sacramento Valley counties. In one of the Yuba County orchards, postplant fumigation with Fumazone (5 gal/A) significantly increased tree growth and resistance to bacterial canker. Canker severity in the trees on fumigated soil was reduced by approximately 72%. In a second orchard in this county, insufficient canker has developed to provide data, but tree growth was again increased with postplant fumigation treatments with Fumazone at both 2.5 and 5.0 gal/A. Canker has developed in only one of three orchards in which the backhoe \pm preplant soil fumigation has been done. In this orchard backhoeing plus fumigation with either Telone or methyl bromide significantly increased tree growth and reduced the severity of bacterial canker. Canker was 3-4 times as severe in the control trees as in those on treated sites. The backhoe treatment alone was ineffective. In the two orchards in which canker has not developed, backhoeing plus fumigation has resulted in a significant increase in tree growth over that in the controls. Backhoeing alone was effective in one of these orchards. The addition of a mycorrhizal fungus to the planting holes in two orchards has as yet had no effect on either tree growth or canker development. Bacterial canker appears to be worse in shallow than in deep soils.

The above research on backhoeing and fumigation is being expanded with the addition of a new test plot in Yuba County. This plot will compare type of fumigant, hole size, and peach vs. plum rootstock. Peach rootstock will also be tested in a Butte County orchard. The ring and pin nematode tests involving both bacterial canker and *Cytospora* canker are in progress and should yield results within the coming year. The effect of low temperature on canker development will be studied during the present winter.

Rept. to CPAB - Dec. 16, 1976