AN INTEGRATED SOIL MANAGEMENT APPROACH TO IMPROVING WATER PENETRATION, ROOT GROWTH, QUALITY, AND YIELD OF PRUNES

William E. Wildman, Dennis E. Rolston, Herbert Schulbach

The purpose of this experiment is (1) to loosen subsurface soil compaction that interferes with water penetration and root growth, (2) to improve and stabilize the structure at the soil surface so that it does not seal and thereby limit water penetration, and (3) to control the pattern of vehicle traffic so that part of the orchard floor remains permanently uncompacted.

Two orchards, one in Yuba County and one in Tulare County were selected. The first operation, subsoil loosening, was performed in both orchards in the fall of 1978. Thorough subsoiling of about half of the width in one direction between tree rows was done to a depth of 20 inches in Tulare County and 24-30 inches in Yuba County.

The second operation, improvement and stabilization of the surface soil structure, was completed in Tulare County in November 1978. A horizontal rotary tiller was used to create a granular soil surface structure, and then the surface was sprayed with a chemical polymer to stabilize the granular structure. Annual ryegrass seed was planted to provide protection for the soil surface.

Due to problems in obtaining a second type of chemical polymer, the surface of the Yuba County orchard has not yet been treated. The polymer is now on hand and treatment will be made as soon as the soil is dry enough to cultivate.

Orchard operations will be monitored during the 1979 season and wheel traffic will be controlled as nearly as possible to two tracks in each orchard middle. Penetrometer, infiltration, and soil moisture depth measurements will be made periodically and fruit size and hopefully yield will be measured at harvest.