

Managing Pecan Orchards under Water Quality Constraint

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In cooperation with participating area growers

Support provided by: USDA-NIFA, Rio Grande Basin Initiative, Texas Water Resources Institute and Texas A&M AgriLife Research

BACKGROUND

The water supply from the Rio Grande Project is curtailed from time to time due to drought. Shortages are supplemented through pumping of groundwater by the irrigation districts as well as by individual growers. Unfortunately, groundwater in this area usually has elevated levels of salts, especially in the El Paso Valley. Pecan trees are sensitive to salts, and are among the first to be affected. There is a need to develop orchard management practices to minimize salinity impact.

APPROACH

The primary cause of salt accumulation in soils is inadequate permeability of clayey (low permeability) soils which occupy 75% of the El Paso Valley. The basic processes which cause slow permeability are reasonably well understood, and include high clay content, soil compaction, and poor soil aggregation. The key to improve permeability is to deal with these processes in an economical and sustainable fashion. Scientists at the El Paso Research Center have been experimenting with a minimum-till soil management system involving subsoiling, sanding, minimum-till surface chiseling, sodding, and supplemental uses of chemical amendment only if needed. Subsoiling (plough below the normal depth to break up the subsoil) is to improve subsurface drainage, sanding is to provide pore spaces for improving permeability, minimum-till chiseling and sodding are to alleviate soil compaction and improve soil aggregation.

RESULTS AND BENEFITS

Preliminary results show that orchard soils can be maintained with minimal of salinization with this system at a cost lower than the conventional systems. The primary benefit of these management techniques are to help sustain pecan production under water quality constraints. Pecans are the number one cash crop in the El Paso Valley and far west Texas, and are becoming a significant crop in other irrigated areas.



Soil management practices at a pecan orchard using the minimum-till surface chisel (left) and minimum-till subsoiler (right).