Slip Plow Tillage Effects in Almonds

John P. Edstrom
UCCE Farm Advisor

Stan Cutter
Nickels Soils Lab

Background

Orchard expansion in California has exhausted the supply of prime orchard ground forcing new plantings onto poorer soils. These are often characterized by stratified layers of clay, hardpan or gravel and often include a shallow topsoil.

To overcome soil limitations, substantial new almond acreage has been established using deep tillage "slip plows" to mix soil layers and expand rooting. Generally this is done at considerable expense - $300-500/acre. At the same time, adoption of microirrigation has allowed growers to supply tree roots with a more optimal and continuous supply of moisture an nutrients. Soil physical characteristics have to some extent been overcome by the use of microirrigation, especially under close tree spacings. Tests done at Nickels in the 1970-80s evaluating the merits of backhoeing each tree site did not find yield or tree survival benefits under drip irrigated conditions .

A field trial was started at the Marine Nickels orchard to evaluate the effects of slip plow soil modification on three varieties of almonds: 'Nonpareil', 'Carmel' and 'Aldrich' planted in 1997 at either 16' X 22' on Lovell root or 22' x 24' on P/A hybrid rootstock . Prior to planting, replicated areas of this 20 acre block received a commercial slip operation on a 10 foot grid to a depth of 6 feet in a north/south direction including a diagonal pass (SE-NW) to a 5 ft. depth. The planting receives irrigation via microsprinklers.

Results

Tree performance for 'Nonpareil' between slipped and non-slipped areas was evaluated by measuring trunk size and by determining crop yield and kernel sizes. The 2001 data represents the second commercial harvest. Although a numerical difference is evident for yield, statistically, there was no difference between slip yield of @ 9.9 lbs/tree and non-slip, 8.6 lbs/tree. Kernels sizes were also equal and no differences were measured for either rootstock area. Trunk size measurements show an average of 49.6 cm for slip and 51.4 cm for non slip trees. This difference is not statistically valid, trees are of equal size in both areas. Now, after the 5th growing season,there are still no detectable differences between trees planted in slip plowed and non slip areas, regardless of rootstock. Tree survival rates are also the same, however no significant flooding has occurred to create harmful conditions.

Kernel - Lbs./Tree	***Mean***
Slip Plow	**8.56**
No Slip Plow	**9.95**

Weight - Lbs./Tree	
Slip Plow	**1.138**
No Slip Plow	**1.299**

Nic Rac SP rpt01