

Conservation Tillage Forage Production in California's San Joaquin Valley

Jeff Mitchell (Professional + Producer Grant Program)

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Title: Conservation Tillage Forage Production in California's San Joaquin Valley

Principal Investigator:

Jeff Mitchell
Department of Plant Sciences
University of California
Kearny Agricultural Center
9240 St. Riverbend Avenue
Parlier, CA 93648
559.303.9689
Mitchell@uckac.edu

Producers Advisors:

Larry and Daniel Soares
Kings Dairy Supply
5835 13th Avenue
Hanford, CA 93230
559.582.7801
kingsiba@lemoorenet.com

Ryan Camara
Camara Dairy
10482 14th Avenue
Lemoore, CA 93245
559.381.2206
camararyan@hotmail.com

Dino Giacomazzi
Giacomazzi Dairy
9550 6th Avenue
Hanford, CA 93230
559.381.8125
dino@giacomazzi.us

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Situation:

California dairies require year-round availability of inexpensive and locally produced forages. During the year, producers typically plant and harvest a series of forage crops – small grains, corn for silage, milo, sorghum sudan – requiring considerable tillage and seedbed preparation ahead of each successive crop

These production systems lend themselves to a variety of conservation tillage (CT) approaches developed in other production regions. Adoption of conservation tillage practices in dairy forage systems could:

- Reduce the time between the harvest of one crop and the planting of the next
- Lower costs
- Lessen dust by as much as two-thirds



Objectives:

- Evaluate and refine strip-till and no-till planting systems for corn forage production and no-till drill winter forage planting at the San Joaquin Valley dairy of Larry and Daniel Soares in Hanford in terms of crop establishment, weed control, and profitability
- Determine whether the conservation tillage production practices enhance the quality of life of dairy producers in the region as measured by the net profitability and the extent to which the alternative management systems ease time and labor constraints at the dairy
- Disseminate information, experience, and knowledge resulting from these evaluations to other Central Valley dairy farmers

Actions:

The project team evaluated strip-till silage corn production following wheat forage on a 600-cow dairy in Hanford.

In 2006, the trials evaluated conventional, no-till, and strip-tillage in replicated strips, each 10 acres in an 80-acre field used to produce forage. After the 2005-06 winter wheat forage crop was chopped in April 2006, a 6-row 30-inch Case DMI Ecolo-Till strip-tiller was used to subsoil to 12 inches and clear soil for planting. The traditional tillage strips were disked and listed before planting.

In 2007, because of irrigation pump challenges, the demonstration was moved to two fields. An 8-row 30-inch Schlagel strip-tiller was used for the strip-till comparison.



Strip-till silage corn planted following wheat forage.

Results:

In 2006, because an irrigation pump failed, the first irrigation was delayed, and all stands suffered, especially the no-till strips, and were taken over by weeds. Adequate stands were achieved initially, but the late irrigation, coupled with weed pressure, made the no-till planting unsuccessful.

In the 2007 demonstration, corn plant populations were higher in the strip-tilled fields. Weed populations and yields were roughly equal in both fields.

On the whole, results from the strip-tilled corn production were positive and encouraging. Because the producer does some of his own planting, converting to strip-till will be difficult until a new implement can be acquired. But because he contracts some of his farm acreage to custom planters, it may be feasible to move toward strip-till gradually.

From the time the project started in 2005, interest in conservation tillage has increased markedly in the San Joaquin Valley.

Potential Benefits:

Strip-tillage involves less intercrop tillage normally employed following winter wheat chopping in preparation for spring corn silage planting. A typical dairy producer could eliminate 4-5 tractor passes by converting to strip tillage.

It has also been shown that strip-tillage and no-tillage for forage production can reduce particulate matter emissions by 50-90% compared with traditional tillage.

We estimate a reduction in costs of \$50 an acre by using strip-tillage instead of traditional tillage. However, it is important to understand that strip-tillage may not work in all soil types; heavier soils may be more difficult than coarser soils.

With high fuel costs, fewer passes across the field are better not only for the field but also for the dairy producer.



Recommendations:

- When strip-tilling, having some moisture in the soil precludes bringing up large clods
- Timely weed management is needed – time herbicide applications close to planting (within a week)
- Using the same GPS system for both the strip-tilling and planting operations will keep the planter on the strip-tilled area

Improved strip-tilling could enable legitimate triple-cropping – the sequential growing of three crops in a year – which could provide a means for San Joaquin dairy producers to efficiently manage manure nitrogen with minimal risk of losses. (A subsequent Western SARE funded project, SW08-060, *Triple-Cropping Dairy Forage Production Systems Through Conservation Tillage in California's San Joaquin Valley*, is exploring the efficacy of triple cropping.)



Participants listen to a presentation during one of several field days conducted for the project.



Field day participants inspect one of the project demonstration fields.