

IRRIGATION NEWS

Managing Water In No-Till Farming

How water is managed in reduced or no-till operations is quite different than in conventional tillage operations. The reduction in soil disturbance changes how the soil reacts to applied water, usually by increasing the infiltration rate and holding capacities. This is attributed to the increased root activity within such systems and the subtle changes in soil chemistry and composition that occur.

Mike Naylor owns a modest tree fruit operation near Dinuba. He has traded the clean look of weed free fields for orchard floors covered with winter grasses and other annuals as part of his organic production system. "I saw the unfortunate consequences of a chemical application one winter and decided that I did not want to repeat the experience," says Mike. While organic production and reduced/no-till systems are highly complimentary, going organic is not required to benefit from the changes in tillage practices.

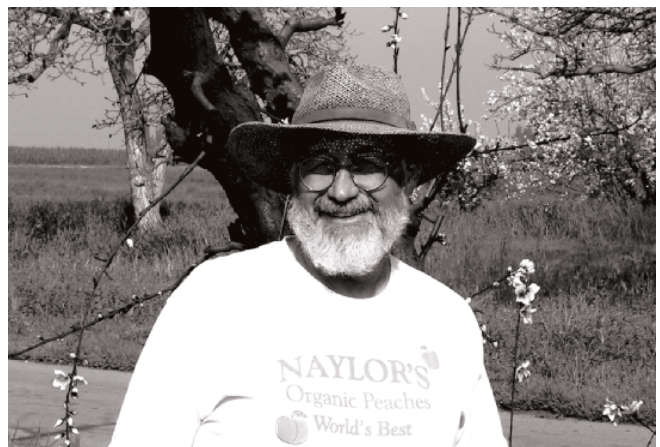
"I saw conservation tillage as a means of controlling some of my production costs, mainly through less tractor work within the orchards. Where I used to pull four furrows per row, I now pull just two," Mike says. "So far, the results are inconclusive. I have found that while I save money in one area, I have spent more in others. It really depends on what your approach to farming is."

Under conservation tillage systems, work required to be done in a field occurs every couple of years, to promote development of natural vegetation. Such vegetation frequently increases a soil's biological activity, as well as changing its surface characteristics. "I have found that I can get back into my fields more quickly after an irrigation or rainstorm now than before, mainly because the water penetrates the soil so well."

This increase in water penetration does have its drawbacks. Mike has had to pull his plow through the orchard to reseal some of the larger pores in the

soil. "I increased the slope of the orchard to encourage water movement through the furrows, thus keeping my set times the same but the soil is so open that I need to recreate the sealing effect we saw when the furrows were kept clean."

Mike feels that the trend in conservation tillage systems is toward microsprayer or drip systems. A key challenge he has is making it work with organic practices. "How do you deal with the vegetative



Mike Naylor has found that conservation tillage brings it's own set of problems.

growth without causing damage to the system itself?" Mike says. "You can't mow close enough to clear the weeds from around the emitters but you must keep the area clear for the microsprinklers to do their job. So what you saved in not running a tractor you just lost in labor to clear the area around each sprinkler."

Water use is also a consideration. "I know that I use a little more water now than before, just to maintain the vegetative growth. But the benefits in dust reduction and mite suppression seem to balance that out. The thick vegetation does make harvest a little more miserable, since the picking crews spend most of the morning with wet feet." ♠

Preliminary Signup for Water Quality Coalition

The Agricultural Discharge Waiver requires that growers choose between filing for individual regulatory compliance or "knowingly elect" to join a water quality coalition. KRCD is the lead agency for the Kings River interests and encourages growers to enroll with the coalition. You can either return this portion of the newsletter or call (559) 237-5567 and select extension 117 or ext 126 and leave your information there.

Name:

Address:

City, State, Zip:

Phone Number(s):

This information is being collected by KRCD as a lead agency for the Kings River Sub-Watershed Coalition. After completion, please mail this blue section to KRCD, 4886 E. Jensen Ave, Fresno, CA 93725. If you have previously signed up, there is no need to sign up again. ♠

Compost May Ease Air, Water Quality Mandates

Recent changes to environmental regulations have growers wondering about their options. Air regulations are taking away the burning of ag waste and water regulations are compelling growers to be more responsible for the water that may leave their property. The unfortunate aspect to both sets of requirements is that remedies are not cheap. On the other hand, one potential solution exists that can help with both dilemmas: compost. This article will look at how this material can help growers on both accounts.

Compost is the residue formed from the controlled decomposition of organic materials. The complex structures found in the original debris have been reduced to simpler forms that are readily incorporated into the soil.

Several factors are involved in compost formation. First, the parent material must be sufficiently ground up so as to maximize its surface area. Second, a proper mix of materials must be blended together (the carbon to nitrogen ratio). The waste materials must provide sufficient nutrients and moisture to initiate and sustain the composting cycle. The compost pile must then be managed to ensure that all the organic debris is consumed in an efficient manner. The final result is a material that is rich in stabilized yet readily available nutrients but also has a considerable population of beneficial microbes.

How will compost help growers? First, with new burning restrictions, composting presents an opportunity to dispose of ag wastes in a beneficial manner. The application of compost to agricultural soils improves the soil structure and increases populations of beneficial organisms within the soil while possibly improving yields.

The second benefit will help growers with the runoff issues raised by the ag discharge waiver. Soils rich in organic matter can trap agricultural chemicals within their structure, thus reducing the risk that they would be present in any runoff.

Conventional methods for controlling tail-water and storm runoff have included construction of sumps and pump-back systems, and selective land leveling. Sumps and pump-back systems collect accumulated water that has not infiltrated the soil at the lowest point of the field where it can either sit and percolate into the

ground or be pumped back to the head end of the field for reuse, or to another field altogether. Sumps are also good for collecting sediments. These will require removal at a later date.

Land leveling can reduce the risk of runoff by slowing the velocity of the water at the surface, thus increasing the time available for it to infiltrate into the soil. The cost of this option varies with the amount of material to be moved.

According to papers published by the U.S. Environmental Protection Agency (www.epa.gov), the application of compost has been shown to actually increase the natural degradation rates of certain pesticides in the soil, in some cases from 180 days in untreated soil to less than 60 in composted soils. Earthworm activity increases greatly in soils where compost has been applied, leaving larger pores for the water to penetrate into the root zone. Compost also works well in crops that require clean middles, where cover crops are not desirable.

In regularly composted soils, the increased number of binding sites within the soil profile reduces the risk of leaching. Fertilizers and pesticides are electrically attracted to the soil and remain available to the plant roots for uptake or soil microbes for digestion.

Another potential use of compost is as a biofilter for storm water runoff. Under this concept, runoff enters into a ponding structure that removes sediments and then is allowed to pass through a bed of specially blended composts. This bed filters out many harmful constituents, allowing relatively clean water to drain out the bottom. Trapped chemicals are broken down via microbial action. Any metals remain fixed to the compost. The compost is removed periodically and spread upon the land.

Compost use can also have an intangible benefit of creating a positive image of agriculture's commitment to environmental stewardship. This act of recycling normal agricultural wastes into a productive product can potentially yield considerable image benefits.

Questions regarding this or any other irrigation related issue should be directed to KRCD's Eric Athorp at 237-5567, ext. 117. Pump evaluations and irrigation performance testing services are also available. ♠

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