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Drip requires planning and more maintenance

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Contributing Writer*

As water supplies tighten on the West Side of the San Joaquin Valley, many row crop growers are turning to drip irrigation to maximize the efficiency of their applied irrigation.

UC Statewide Cotton Specialist Bob Hutmacher told a group of growers at a recent field day at the UC West Side Research and Extension Center (WREC) that flood and drip irrigation each carry their own issues and growers will have to weigh the costs and benefits to determine whether drip is right for their individual operation.

He noted that good irrigation management decisions are becoming more complicated as researchers and producers learn more about managing crops, such as cotton and canning tomatoes, under drip.

"Something described as a best management at one time may need to be looked at again because it's really a moving target with all that's going on," he said.

Hutmacher and others are re-examining old data about subsurface drip irrigation in cotton and other crops in the hopes of developing updated recommendations for growers.

In general, Hutmacher said subsurface drip irrigation can provide growers significant benefits in crop yield and water savings. Applying water and other inputs directly to the root zone increases uniformity and plant response. Buried drip also can help improve irrigation efficiency on sloping terrain.

But he said a number of issues must still be considered before a grower makes the switch to subsurface drip. Growers must first weigh the cost to install the system against the expected rate of return on that investment through water savings, reduced inputs and increased production.

"Experience has shown us that there can actually be a very large range in actual water savings," Hutmacher said.

Growers should factor in capital and fixed costs to install the system, increased yields, decreased costs for fertilizer, herbicides and other chemical inputs, reduced seed costs and other items that will impact the bottom line return on an installed subsurface drip system.

Also consider the annual cost to operate and maintain the system, compatibility with crop rotation patterns, and willingness to change management practices.

"You have to think about compatibility with the crops you will be growing," Hutmacher said. "The crop rotations of what we are growing here in California are changing so fast it's hard to say what you will be planting five years down the line."

Hutmacher suggests working with a qualified designer to determine if he has the water and energy to support a pressurized system. Water quality can also be an issue to consider, particularly on the West Side where salts and minerals can require extra filtration and water treatment costs. West Side producers may also have to create a plan to deal with accumulated salts that will no longer be flushed out by furrow irrigation. In many cases a grower will have to apply sprinkler sets every three to four years to leach salts and other accumulated solids out of the root zone.

Maintenance is another important consideration in deciding whether to install a subsurface drip system.

Larry Schwankl, irrigation specialist stationed at the UC Kearney Ag Center in Parlier said there are several universal considerations when it comes to maintaining a drip irrigation system.

"Clogging is the greatest enemy to drip irrigation," Schwankl said.

He said growers should consider water quality when choosing a filtration system, and select one that will eliminate particles before they can physically clog emitters.

"A good thing to remember is they all work to the same degree, but you have to think about how clean your water is. With dirty water you

should go to a filter with greater capacity so you don't have to clear it as often."

Biological clogging is always a problem and systems must be flushed with a biocide to prevent buildup. Chemical clogging such as calcium carbonate buildup can also be a problem when pH rises above 7.5. "If we drop the pH, lime will re-dissolve and keep it from precipitating," Schwankl said.

In addition to addressing the clogging issue, growers should also be prepared to conduct a number of other maintenance tasks to keep systems in peak working order to maximize irrigation efficiency.

Systems should be flushed periodically regardless of how good the filtration system to move silts and clay particulates through the system that might have escaped the filtration system. In general, Schwankl said the flush should only take about a minute or two; if it takes longer, growers should be flushing more frequently.

Pressure gauges should be checked and adjusted regularly and replaced after a year.

Filter media also needs to be replaced regularly. Sand media, in particular, should be replaced every few years when sand granules lose their coarseness and begin to get smooth.

"This is something growers often forget," Schwankl said.

Growers also often forget to follow a chemigation or injection of any type through the drip system with a flush of clear water.

"Running clear water through the drip system after an injection is very important, I can't stress that enough. Take enough additional time so the material gets through the whole system, then flush it with water for at least an hour," he said.

Hutmacher noted that maintaining the drip system is just as important as selecting and installing the right one and taking the extra steps will help return the investment in a new drip system.

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