

Maintenance is vital for smooth-operating irrigation systems

By Dennis Pollock

Some spring cleaning was in order at California State University, Fresno, as workshop presenters checked out the pumping system that delivers irrigation water to a portion of the campus orchard.

“Something in the system is not working properly, and we have to resolve that to get proper flushing of the filter,” said Dean Best, district sales manager for the agriculture division of Netafim in Fresno.

The problems Best found as he checked the pump’s filter and gauges were multiple. Before the system could be used efficiently to send out water during the searing summer days, some maintenance would be needed.

Pinning down exact problems would take longer than the 45 minutes or so that was spent as part of a workshop on irrigation system spring cleaning and maintenance. But Best was able to point out variations in pressure levels coming into and going out of the system, pressure too low to enable flushing, a backwash valve that was not opening and an excess of debris in the sand filter.

“The sand media in the filter was being flushed out over time, and it probably would have been best to add another filter—a particle separator—in front of that,” Best said.

“This is where the coffee can idea could have helped,” he added, referring to earlier advice to save some of the sand initially placed into the sand filter for later comparison with sand taken from the filter after months and years of use.

And Inge Bisconer, technical marketing and sales manager with Toro Micro-Irrigation in San Diego, said she suspected that the system’s problems would also show themselves in drip lines through grapevines in the campus farm.



Sure enough, she was right. Bisconer opened lines to find water was murky at first, and pressure was not up to par. At least one line was even plugged with algae that had become trapped in a filter.

“The trajectory of the stream from this line should reach farther, about 8 inches or so, and it’s only a couple inches,” Bisconer said. Earlier, she had presented a chart that showed how far a flushing trajectory should travel.

Best used a pressure gauge that he shoved into the end of the line and came up with a reading that indicated pressure too low for flushing the system.

Bisconer said the lines should be cleared of algae and flushed, and then chlorine and acid should be added.

Before workshop participants visited the field, Bisconer and Best talked of steps that should be taken to maintain irrigation systems for greatest efficiency.

Among those who attended the workshop, presented by the Center for Irrigation Technology at Fresno State, were growers and others seeking to maximize the value of the water they deliver to plants.

They included Pat Ricchiuti, a Fresno County grower who said he was concerned about salinity on some of his fields and the dropping water table.

Anil Gupta, a Tulare County grower, had the same concern about the water table. Both he and Ricchiuti have had wells that were extended more than 60 feet, and, Gupta said, “We can’t go deeper.”

Gupta said he wants to convert his walnut orchards from flood irrigation to fan jets.

Both men have also moved to crops that require less labor. For Gupta, it was a switch from raisins to nut crops that include almonds, pistachios and walnuts. Ricchiuti has turned away from tree fruit and substituted more almonds.

Ruben Palacio, who does various farming practices for Joe Del Bosque on a farm west of Firebaugh in the Westlands Water District, said that farm is moving to more drip irrigation.

“It’s drip or it’s fallow,” he said, talking of low water deliveries to the district. “It’s a shame to see fields idle.”

Those who attended the seminar were given a checklist on maintenance steps.

Best opened with a discussion of various types of filters and emphasized the need to check for water leaks, which he said could be merely cosmetic or could cause failure of the operating system.

He said there are also safety issues that go beyond leaks that could result in slips and falls. There’s also the fact that breaches involving water that is under pressure can be dangerous.

Particle separators on wells use centrifugal force to separate solids, Best said, and should be operated at a consistent flow rate with periodic flushing of the sedimentation tank.

Screen filters—polymeric or metallic—should be checked regularly and the pressure maintained according to manufacturer specifications.

Sand media filters like the one at Fresno State can be flushed by reversing the flow across the media bed with the flow rate adjusted using a manual valve at the backwash line. A level of 25 pounds per square inch is recommended during the flushing.

Best also demonstrated disc filters used in some systems. He said they can be cleaned manually by lifting them out of the unit. Previously, the disc filters required 45 pounds per square inch for flushing, he said, but newer units require only 30 PSI.

In sand filters, Best said, the flushing process can wear grains down and result in contamination and displacement by particles of similar size. Both of those factors can reduce the filter’s efficiency. Some sand filters use gravel to create an interface between the sand in the lower part of the drain, which diffuses the spread of water.

Best said automatic flush systems require weekly maintenance of a filter on the inlet manifold. “If it clogs,” he said, “the filter will not flush automatically. The pressure differential switch on automatic filter systems lasts about two or three seasons. After that, replace it; it’s the heart of your system.”

He said automatic filters with organic contaminants require acid or chlorine shock treatment at least once a season and always at the end of a season. And those used with groundwater sources may need periodic treatment with a detergent to remove oil. Products like Simple Green, which are non-toxic and biodegradable, work well, he said.

All irrigation systems should be flushed and components drained during the offseason, he said.

Bisconer talked of maintenance of drip irrigation systems. She said chemicals should be used to prevent clogging, systems should be flushed periodically to keep lines clean and the system should be monitored for damage that can come from rodents, insects and other pests. Sometimes a solution is selecting a thicker mil drip tape.

Bisconer also recommended having water tested to determine its chemical constituents. She said most clogging problems can be treated with chlorine and/or acid. Organic growers can use non-synthetic products such as acetic acid, citric acid, chelates, vinegar, hydrogen peroxide, natural acids, peracetic acid or pH buffers.

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