

More tomato fields undergo conversion to subsurface drip

By Kathy Coatney

Subsurface drip irrigation is the rule, not the exception, for processing tomatoes on the west side of the San Joaquin Valley. The majority of growers in western Fresno County use drip, according to Tim Hartz, University of California, Davis, extension specialist.

“I’m hard pressed to put an exact number, but I’m absolutely comfortable in saying the majority of those fields are drip,” Hartz said.

At one time tomato fields were sprinkled for pre-irrigation and to set transplants. Today, in many cases, it’s all drip, Hartz said.

“It is true that in the wintertime a lot of people will still be sprinkling to fill up the profile or to leach salts, but during the (growing) season it would be exclusively drip,” Hartz said.

The Sacramento Valley has also been converting to subsurface drip, and Hartz estimates as much as half of the acreage has changed over to drip. “Very clearly it’s how tomatoes will be done in the future,” he said.

Gene Miyao, UC Cooperative Extension farm advisor for Solano, Yolo and Sacramento counties, said the research on drip irrigation has shown that fruit quality can be improved and quality yields can be maintained by withholding water, particularly the last five to six weeks before harvest.

The soluble solids in tomatoes are very important. Processors who are primarily paste manufacturers want high soluble solids, and the paste market comprises the bulk of the California tomato sector, Miyao said.

“They want these high soluble solids in the manufactur-



ing because they’re making paste that is 25 to 34 percent concentrated,” Miyao said.

In years past, processing tomatoes grown on subsurface drip had problems with low soluble solids, so Hartz began a research project to increase solids.

“Our work was designed to develop a management practice with drip that would allow a reasonable tradeoff between solids high enough that the processors could deal with them and growers getting some yield advantage over furrow irrigation,” he said.

Hartz looked at ways to get the maximum soluble solids with the minimum tradeoff for fresh yield. To achieve this, he concentrated on the time when processing tomatoes are ripening in the field—approximately five to six weeks from the time the fruit first begins to color until harvest.

“What will happen is that if you hit the window correctly, the total amount of tomato solids that are produced doesn’t go down. What goes down is the amount of water that’s in the tomato fruits at harvest, so the solids concentration comes up,” Hartz said.

“If you have kept water out of the fruit, your fresh yields obviously are going down somewhat. That is a natural tradeoff. But what we were able to show is that you could reliably increase solids over what they would have been with full irrigation and not lose any production of solids,” Hartz said. “In general, the only way that drip irrigated growers can consistently meet those processor desires on the solids concentrations is to do some form of deficit during the fruit ripening phase. Many growers have already adopted some version of this as their normal practice.”

If growers did full irrigation until just before harvest, generally the soluble solids concentration would be undesirably low, Hartz said.

“Some manner of deficit irrigation while the fruits ripen are needed in most fields to really meet a reasonable solids standard,” he said.

Using deficit irrigation for really high soluble solids has drawbacks. The fruit would be very small, and there could be problems with blossom-end rot, Miyao said. Growers would also have to sacrifice yields, he added.

Deficit irrigation has the bonus of saving two to four inches of water.

“That’s not a huge amount, but every little bit helps,” Hartz said. “In the context though of water savings, the only period of time in which you can save water is during that fruit ripening.”

Hartz cautioned that any attempt to reduce or deficit irrigate during plant establishment through the fruit setting cycle would result in serious yield loss.

Woody Yerxa, owner of River Vista Farm in Colusa, started using subsurface drip about three years ago on some of his processing tomatoes.

“So far it hasn’t been as easy as advertised. We’ve had good crops. There’s a lot of advantages,” Yerxa said, adding he’s definitely seen an increase in yields, but he’s found it is harder to get high soluble solids with drip vs. furrow irrigation.

Yerxa starts deficit irrigating about three and a half weeks before harvest. He said he thinks deficit irrigating five to six weeks before harvest can be problematic, especially when there are long periods of 100-plus degree days.

Crop rotation with drip irrigation is also a concern for Yerxa.

“I’ve always been a proponent of good crop rotations,”



he said, adding he’s concerned about planting wheat because of problems with gophers destroying the drip tape when wheat is in the ground.

After Yerxa harvested a wheat field, he converted it to drip irrigation. He planted back-to-back crops of tomatoes. This year it was planted in cucumbers, and he will probably go back to tomatoes next year, he said.

“The problem is, I’m starting to get in a situation where I’m irrigating it all summer long. I think in the long run that’s detrimental to the ground because you don’t dry it up and destroy a lot of the soil-borne organisms,” Yerxa said, adding some of those pathogens love warm, moist soil during the summer.

The advantage of a grain crop like wheat is it’s not irrigated from the end of April until the winter rains start. This keeps the ground dry for a long period of time, Yerxa said.

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