

Brussels sprouts join field of drip irrigation candidates

By Bob Johnson

Brussels sprouts may be one more Central Coast crop that could benefit from the use of drip irrigation.

Virtually all of the region's strawberries and winegrapes and a substantial share of the green leafy vegetables are grown on drip because of the advantages in efficiency, control and disease management. The first study on brussels sprouts indicates that crop, too, is a good candidate for drip irrigation.

"Drip irrigation may offer several advantages over sprinklers for brussels sprouts production," said Michael Cahn, University of California Cooperative Extension irrigation farm advisor in Monterey County.

Cahn teamed up with agronomist Mark Buchanan of Buchanan and Associates to compare drip and sprinkler irrigation systems in a side-by-side trial on an 8-acre commercial brussels sprouts field near Año Nuevo in Santa Cruz County.

The grower's sprinkler irrigation system in this field achieved 96 percent efficiency. Drip systems generally have higher efficiency scores, and 96 percent is unusually high for any kind of system. But the researchers still found enough small differences in the use of drip irrigation to potentially add up to a fairly big difference in the bottom line.

By season's end just 12.3 inches of irrigation water were used to establish and grow the crop with drip irrigation, compared to 12.7 inches with the standard sprinkler irrigation. But the drip system also made it possible to achieve far greater control and efficiency in the application of fertilizer.

On the sprinkler side of the trial, 189 pounds of nitrogen were applied in preplant and sidedress applications.

An additional 58 pounds of nitrogen was applied late in the season after the canopy grew too dense to use a tractor.

There was a significant savings of 19 pounds of nitrogen per acre on the drip side, where the fertilizer was applied through the drip tape that was buried three or four inches below the surface. But probably even more important than the savings in fertilizer was the more precise control of the fertilizer applications made possible by the drip system.

Because the fertilizer could be injected into the drip lines, it could be applied every week at the rates the crop needed. By applying between 7 and 24 pounds of nitrogen a week, depending on the stage of crop growth, it was possible to keep more of the nitrogen in the root zone and available to the crop when the crop needed it.

Because the fertilizer was targeted more precisely, the smaller amount of nitrogen applied on the drip side produced slightly higher yields.

"Drip irrigation provided a more uniform moisture and nitrate level in the soil during the season than hand-moved sprinklers and increased yields using less nitrogen fertilizer than sidedressing," Cahn said.

The crop appeared more uniform in height and taller in the drip-irrigated zone compared with the grower's standard zone.

The drip side produced 10.7 tons of marketable yield per acre, while the sprinkler side produced 8.8 tons of marketable yield per acre. Most of this yield increase came because there were fewer culled sprouts on the drip side of the field.

"This was a preliminary trial that was not replicated," Cahn said. "But it shows that drip may offer some sig-

nificant benefits for brussels sprouts production on the Central Coast while also addressing regulations to improve water quality by minimizing run-off and nitrate leaching.”

Pacific Gas & Electric Co. provides additional help in covering the initial cost of installing a drip system. The utility offers, among its agricultural incentive programs, rebates for switching to drip irrigation.

“Hopefully it will help to make it more financially feasible for growers to invest in drip,” said Josaphine Tuchel, Pacific Gas & Electric senior program manager.

The rebate for converting vegetable crops to drip irrigation is \$44 an acre, according to Tuchel. The grower needs to supply the meter number, a statement of the work already accomplished and invoices showing the cost of the drip system. After the paperwork has been submitted it takes four to six weeks for the rebate check to arrive.

A description of Pacific Gas & Electric’s numerous agricultural rebate programs is available on the Internet at www.pge.com/agfood.

Not only do drip systems generally require less energy for pumping, they can be more flexible in how much they pump.

“For situations where pumping capacity is limited, drip systems can be designed to apply water at low rates so that they can irrigate more acreage during a single irrigation than sprinklers,” Cahn said.

In some situations this flexibility can make the difference in whether an entire field can be irrigated at the same time.

Drip also gives greater flexibility in irrigating when the winds come up.

“Windy conditions that are common adjacent to the coast can greatly reduce the uniformity of sprinklers, but do not affect the uniformity of drip systems,” Cahn said.

This shelter from the effects of the wind can be helpful almost anywhere on the Central Coast, and can be particularly helpful in brussels sprouts growing areas, which are very close to the coast.

There can also be environmental advantages in keeping nitrates in the root zone, and out of surface and underground water, with drip.

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