

Tiny air bubbles boost berry yield

Irrigation Extra

By BRENDA CAROL

As much as plants need water and nutrients to grow, they also need air. That may sound like a no-brainer, but the air in question is down in the dirt, not up in the sky. Air availability to roots is integral to overall plant health and vitality, and even short periods of anaerobic conditions in the root zone can negatively impact plant performance.

Growers have found that delivering air to plant roots through irrigation in subsurface drip systems can improve yields. Injecting air along with irrigation water reverses the temporary anaerobic state created when irrigation water is applied, allowing plant roots to continue to function normally. Vegetable growers, in particular, have been experimenting with the concept.

Yield response

"It shows results most of the time," says John Dullam, a strawberry grower near Oxnard who has been evaluating this idea for the past five years. "It looks like it has the potential of a 5% to 10% in-

Key Points

- Injecting air into drip lines has shown up to a 10% increase in strawberry yields.
- Air-water mixture helps strawberry plants' shallow roots.
- John Dullam is testing drip tape placed 3 to 4 inches below the soil surface.

crease in yields. Strawberries are very shallow rooted with a poor root system. That's why they're susceptible to root diseases and why we have to fumigate. That's why it is a little difficult to get the correct air-water mixture to the roots. At least that's what we think."

Dullam uses a system manufactured by Mazzei Injector Co. LLC, Bakersfield. The company has developed a proprietary high-efficiency venturi-type system for injecting liquids or gas additives into water.

"We know that it can work," Dullam says. "We just need to figure out how to make it work more consistently."

The system is relatively simple. A high-efficiency injector is added to the drip line, which forces atmospheric air into the drip system along with the irrigation water. As water is added to the soil profile, it is accompanied by a corresponding ratio of air that optimizes



AIRING ROOTS: These strawberry beds have a Mazzei Injector air system hooked up to their drip lines. Producer John Dullam knows the system works but is trying to figure out how to make it perform more consistently.

the water-air mix. Instead of being temporarily drowned in excess water, plant roots have immediate access to critical air necessary for growth.

Depth check

Dullam is evaluating 2- to 4-acre plots next to control plots to chart results and look for ways to tweak the system. In the past he's used drip tape placed an inch below the surface. But he's beginning to experiment with drip tape placed 3 to 4 inches below.

"We don't know what depth is optimal," he says. "Also, if we have a wet winter, we're not irrigating and injecting air into the root zone, so that's probably a factor in consistency. We're also not sure at what point the extra air is most beneficial or if it's a benefit through the growing cycle. Some years we've seen very little yield increase, while in other years it's as much as 10%, which is significant."

Managing the variability in results is somewhat a function of good management. Maintaining adequate pressure and keeping the drip lines clean is important, according to Dullam.

"There is very little extra maintenance required with the air-injection system," he says. "It's mostly a matter of good management. You should be doing that regardless of whether or not you are injecting air into the drip lines."

Experimentation has long been a foundation to the success of Dullam's



MORE STRAWBERRIES:

Experimenting with air injection in subsurface drip lines has given strawberry grower John Dullam a 5% to 10% yield increase.

farming philosophy. "Whether it's with the university or on our own, I believe it's always very important to be on that cutting edge," he says. "If you go out of your way to invest in the time and resources to learn about new technologies or methods, you will reap benefits that aren't always that obvious in the beginning."

Firsthand benefits

Sometimes those benefits are nuances that might not be written up in university papers or presented in meetings because they are not "statistically" significant. However, in today's highly competitive ag world, nuances can make a huge difference, Dullam says.

"I like to know what's going on," he says. "I may not buy into it or adopt it, but at least I've seen it firsthand if the research was conducted on my farm."

With at least a 10% upside yield potential, Dullam's experimentation might just pay off as test yields have been reported higher for fresh-market tomatoes and broccoli.

For more information about the
Mazzei AirJection® Irrigation System,
please contact:



Mazzei®

www.mazzei.net

Mazzei Injector Company, LLC

500 Rooster Drive
Bakersfield, CA 93307
661-363-6500

California State University, Fresno and the Center for Irrigation Technology have conducted numerous trials on the Mazzei AirJection® technology since 2000. Data from these trials and from commercial installation has shown the Mazzei AirJection® Irrigation System achieves increases of 13% to 35% over water-only irrigation. Contact Mazzei for more information.