



Machine helps with cover crops for runoff control

Issue Date: [October 21, 2015](#)

By Bob Johnson



Eric Brennan, USDA research horticulturist, right, and Jim Leap, USDA agricultural science research technician, stand with their new Salinas planter-cultivator that can cultivate the furrow, plant a row of cover crop seeds and lay the drip line to germinate the seeds in a single pass.

Photo/Bob Johnson



By planting a cover crop in the furrow between rows of strawberries, a grower can reduce sediment loss during rainstorms and

also cut down on the emergence of weeds.

Photo/Bob Johnson

A machine that cultivates furrows, plants a line of cover crop seeds at a customizable width and lays a line of drip tape in a single pass has been developed by U.S. Department of Agriculture researchers in Salinas.

The machine performs three tasks at once, to minimize runoff of sediment and chemicals during storms, and also reduce winter weeds.

"It can cultivate in the furrow in front of the planter, and after that it puts down the drip tape," said Eric Brennan, USDA research horticulturist. "We put the drip on for just one hour and that was enough to germinate. You just want to get the area with the mustard seeds wet, without germinating the weeds further out."

While the system can work for vegetable growers who want a minimal cover crop, it is particularly well suited for strawberries because, with the beds covered by plastic during the winter, storms can send large amounts of water rushing down the bare furrows.

"It's a tougher challenge in strawberries, because with the plastic you have a lot more water coming down the furrow," Brennan said. "Even if you can't infiltrate that water in the furrow, at least it comes off clean and gives you a chance for recharge through a pond."

A University of California Cooperative Extension trial showed that even a small storm of less than a fifth of an inch of rain can carry off more than 500 pounds of soil an acre from a strawberry field, but a cover crop in the furrows can reduce that by more than 80 percent.

"It's such a simple thing, but it does a lot," said Mark Bolda, UCCE farm advisor specializing in berries. "It reduces sediment runoff incredibly."

That could matter a lot, particularly for the many growers with strawberries on sloping ground, because water quality regulators are taking a closer look at runoff from Salinas Valley fields.

"We get storms early in the season and the soil is saturated. Then we get a one-inch storm, then another, and we have flooding," said Michael Cahn, UCCE irrigation farm advisor. "The Regional Water Quality Control Board is taking a look not just at sediments, but also pesticides. They're not just looking at chlorpyrifos, but also at pyrethroids."

Growing some kind of cover in the furrows during the winter also helps with weed control.

"If we do it like we are now and get the cover crop germinating early, we can easily reduce the weed problem in the furrow," said Roy Fuentes, who grows strawberries in cooperation with the USDA. "If you don't try, you're not going to learn."

At a generously estimated hour an acre, the system costs around \$200 an acre in materials and labor, but most of that was for the drip tape, which could be pulled out and used again year after year.

The USDA is lending use of the planter to growers through the Salinas USDA office, and there is also enough Ida Gold mustard seed for growers to try.

"You can borrow it from us; that's why we made it," Brennan said, as growers looked over the machine during the cover crop field day in late September.

Mustard is particularly well-suited for early termination as a cover crop because it stops growing if you cut off the tops with a weed whacker, but the straw still holds water up to six weeks after termination, Brennan added.

Mustard seed sprouts easily and grows quickly, but it can also be smothered in mud and fail to germinate if there is an early season heavy rain, as happened in the Salinas Valley early last December, he said.

"Last year we got an incredible amount of rain on Dec. 8, and we had almost no mustard in the furrow," Brennan said. "We want to get the seeds to germinate before the heavy rains. We hardly had to apply any water through the drip tape to germinate the seeds and grow the mustard before the rains. If you use overhead, it's too much water and you have to worry about weeds."

The demonstration mustard in the furrows was planted in early September, germinated in three days, and less than four weeks later, grew a low but lush canopy with very little applied water.

USDA agricultural science research technician Jim Leap did the work of modifying a vegetable seeder to make it more suitable for planting cover crops down the furrow.

"It would easily hold 10 pounds of seed. We use three to five pounds an acre," Leap said.

At the advice of Bob Sutton, who owns a Salinas agricultural supply shop specializing in planters, Leap did the custom machine work on a precision vegetable seeder to make it possible to vary the width of the band of cover crop seeds.

Researchers pointed out that the width matters because it is easier to cultivate the edges with a single line of mustard seeds, but you crowd out more weeds with a dense, broader line of cover crop.

It also is necessary to make sure the cover crop is not competing with the strawberries already growing close by.

"If the cover crop goes over the shoulder of the bed and starts to shade the plants, that's not good," Bolda said. "Those first few months for strawberries are critical, and if you shade them, then it will have an effect all season."

Growers should also monitor to guard against creating habitat for pests that could later infest the cash crop.

"Watch out for bagrada bugs; it's a problem in warmer areas like Hollister or farther south in the Salinas Valley," Brennan said.

An advantage of mustard, for strawberry growers in particular, is that it can be planted without damaging the cover crop.

"You can walk right on top of it to transplant and it will look hurt for a couple days, but it will get over it," Brennan said. "You don't have to worry about it."

The advantage of planting just in the furrow, even if the bed is available, is a dramatic reduction in the biomass that has to be managed, researchers said.

"If you grow a mustard cover crop from October to March over the entire field, you get two to three tons an acre," Brennan said. "If you have it just in the furrow, you only get 10 percent of that."

Chemical mowing is an option for conventional growers, but the UC researchers cautioned not to use glyphosate near strawberry plants.

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