



Scientist favors synthetic fertilizers on organic crops

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By Bob Johnson



U.S. Department of Agriculture organic researcher Eric Brennan says he supports judicious use of synthetic fertilizers in organic farming, combining it with cover crops.

Photo/Bob Johnson



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Photo/Christine Souza

After more than 15 years of looking at the ability of cover crops and compost to build the soil for vegetable production in a 170-acre piece of ground outside Salinas, U.S. Department of Agriculture organic researcher

Eric Brennan has come to the belief that judicious use of synthetic fertilizer should be permitted in organic agriculture.



Brennan discussed what he has learned about fertility over the last 15 years of studying changes in the organic ground at the USDA field outside Salinas with 100 organic farmers from around the country before the 37th Annual Ecological Farming Conference in Pacific Grove.

He told the assembled farmers about his conclusion that organic farmers should rethink the ban on synthetic fertilizer as a source of nitrogen fertility.

"All the fertilizers we use in organic farming come from conventional agriculture; why not just let me use the pure stuff?" Brennan said. "We've got this thought that synthetics are bad, but synthetics can be useful."

He has posted in a YouTube video his conclusion that organic fertilizers already start as synthetic fertilizer that is used to grow corn and other feed crops, that are fed to animals whose manure and byproducts are then processed into fertilizers that can be called "organic." (www.youtube.com/watch?v=3GjbnchPhl8).

Brennan's suggestion is that it would be more economical, energy efficient and sustainable to allow organic farmers to use limited amounts of synthetic fertilizer if they also use cover crops.

He has tried to grow vegetables using only accepted organic sources of nitrogen, and came to the conclusion that yields cannot be maximized without fertilizers from manures, bone meals, blood meals and feather meals from animals that are raised using the materials of conventional agriculture.

"We don't have enough land in the world to produce all the nitrogen we need to feed 7 billion people," Brennan said. "I've calculated we can produce 30 percent of the nitrogen we need for two vegetable crops with a good legume cover crop. Where is the other 70 percent supposed to come from? Who's not supposed to eat?"

One of the pioneers in organic farming in California supported Brennan in his conclusion that organic standards should be amended to allow the application of synthetic fertilizers like calcium nitrate.

"We need to rethink this problem," said Amigo Cantisano, the organic farm advisor who has led the pre-conference farm tour since it began 30 years ago. "We're taking all this stuff from conventional agriculture after we've declared our organics holy."

Cantisano was in a minority when he suggested that synthetic fertilizer be allowed when California adopted the first state standards for organic production, and again later when the USDA adopted national organic certification standards.

He also advised, however, that the organic sector needs and deserves far more from the agencies that allocate agricultural research resources.

"In 2001, Eric Brennan was the sole employee of the U.S. Department of Agriculture with the term 'organic' in his title," Cantisano said. "In 2017, Eric Brennan is still the sole employee of the USDA with the term 'organic' in his title."

Brennan pointed out that many among the 2,000 USDA researchers include organics in their studies, but agreed that far more attention should be paid to the science of organic production.

"You could have 10 researchers like me out here, and we would just be scratching the surface," he said. "Our goal is to help farmers solve their problems. Weed management is a need area. Soil health is another area we don't really understand well enough."

His major focus at the research field outside Salinas continues to be the use of winter cover crops and compost to improve soil health, fertility and weed management for vegetable production the following year.

His studies have already shown that, while composting is an essential tool in organic farming, cover cropping does more to build healthy, fertile soil and improve vegetable yields.

"Cover cropping adds to the yields of the crop the next year, but when I add the same amount of carbon through compost, I have to do it for five years before I see that change," Brennan said. "Cover cropping is essential, but it's got to be done right."

He has also concluded that the issue of weed control makes it pennywise but pound foolish to save money by using a reduced cover crop seeding rate.

"A hand-weeding crew took five times as long at a 125-pound rate of a legume-cereal mix than at a 375-pound rate," Brennan said. "Don't try to save on seeds. Weed management in organic systems is pretty easy if you focus on not letting them set seed; the most expensive seed an organic farmer can come across is weed seed."

Superior weed management has also led Brennan to favor cover crop mixes that quickly grow to cover the entire area.

"Cereal rye grows fast and shades out weeds; it's a great cover crop," Brennan said. "Seeding rate is extremely important with a cover crop. With weeds, you want a cover crop that grows fast and shades the entire area in 30 days."

The details of using cover crops to build fertility, both for the next season and for the long term, needs more scientific attention.

"The big challenge of organic farming is that organic matter is only useful when it is changing, but how can you hold onto it when it is changing?" Brennan said. "We're not talking about organic matter that stays on the surface. We're talking about organic matter that goes three feet deep and stays there. To sequester means 'to hold.'"

While the challenge of building organic matter and fertility continues to hold mysteries, Brennan said he is more convinced than ever of the need to keep putting organic material into the ground.

"What I'm finding is that adding fresh organic matter to the soil," he said, "no matter the type, is very important."

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