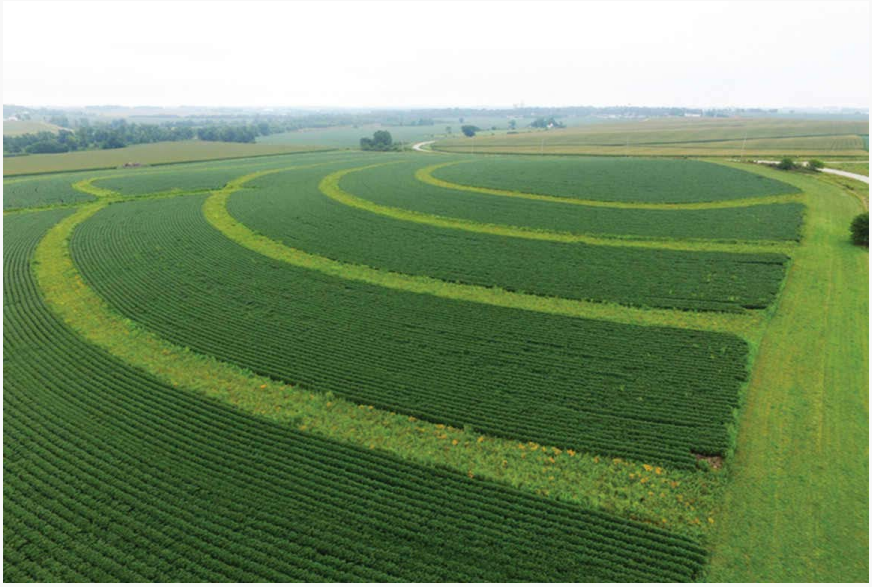
How planting prairie strips on Iowa farms could save soil, water, wildlife and money – in-state and beyond

POSTED ON JUN 18, 2019 BY PAUL BRENNAN



A field planted with prairie strips in Tama County. — Lynn Betts

A solution to some of the biggest problems facing farmers, and some of the biggest environmental challenges in the state, has deep roots in Iowa's past.

Roughly 85 percent of Iowa's 36 million acres were covered with prairie plants when the U.S. frontier pushed into what would become the state of Iowa in the 19th century. Now, less than one-10th of one percent of that 30 million acres of prairie exists.

Instead, 30 million of the state's acres are now devoted to agricultural production, with just two crops — corn and soybeans — covering more than 80 percent of those acres. Being so heavily invested in these crops has massive consequences for the land and water.

But researchers at Iowa State University have demonstrated that planting just 10 percent of a field of row crops, like corn or soybeans, with buffer strips of native prairie plants will reduce soil loss on that field by 95 percent. It also reduces runoff of phosphorus and nitrogen from fertilizer, a major source of water pollution, by almost as much. And it cuts the need for pesticides.

"Mother Nature is a pretty wonderful business partner," said Seth Watkins, the first farmer to plant prairie strips as part of ISU's "Science-Based Trials of Rowcrops Integrated with Prairie Strips" program, or STRIPS, as it is known.

The standard approach to growing corn and soybean crops involves large-scale planting in rows, which makes fields particularly vulnerable to soil loss (in the past 50 years, Iowa has lost 50 percent of its topsoil, according to the USDA), and depletes the nutrients in the soil that remain. To make up for the lack of nutrients, corn and soybean fields are heavily treated with fertilizer containing nitrogen and phosphorus.

"A lot of our modern farming practices unfortunately keep hinging on trying to beat nature," Watkins said.

Fertilizer runoff from the fields is one of the primary causes of nutrient pollution in the state's waterways. Nutrient pollution causes, among other things, spikes in the amount of water-borne bacteria as well as algae blooms, both of which can kill fish and cause illness in humans. Since 2006, the Iowa Department of Natural Resources (DNR) has issued almost 200 warnings for the lake beaches in Iowa due to high levels of a toxin produced by algae.

The problem may be more widespread, because the DNR only monitors 39 lakes, and only does that monitoring between Memorial Day and Labor Day.

Urban water supplies are also affected by the runoff, because cities that draw their water from the state's rivers must remove high levels of nutrients from their water supply to make it safe to drink.

The problem extends beyond the state's borders; Iowa rivers ultimately empty into the Mississippi River, which carries the pollution to the Gulf of Mexico. Once in the Gulf, it drives the creation of an annual algae bloom that depletes the oxygen in the water, killing marine life and causing a massive dead zone.

Researchers at Louisiana State University estimate this summer's dead zone in the Gulf will be just slightly smaller than the record-setting one, which covered 8,776 square miles. (By way of comparison, the state of New Jersey is 8,723 square miles.)

The typical approach to farming also puts financial stress on farmers, as Watkins explained to *Little Village*.

"Probably since the '50s, we really have built our farms to rely on those two finite resources — fuel and other chemicals like fertilizer and pesticide, and bigger and bigger equipment with new technology," he said. "But the cost of those resources have increased almost 6 percent per year since the '50s, and the price of the products we sell, even accounting for yield increase, has only increased 1.5 or 2 percent a year."

"And that's not even getting to the issue of diminished soil health or those other consequences like runoff, which have a big impact."

A 2017 STRIPS study found prairie strips, pictured here in Cass County, drastically reduced soil loss and pollution runoff from row-crop farms. — Lisa Schulte Moore

The idea behind planting prairie strips is simple, according to ISU Associate Professor of Entomology Matthew O'Neil, pollinator research lead for STRIPS.

"Why plant prairie species?" O'Neil said. "One, because they're native, so they are things that have co-evolved for this region, for this landscape and for wildlife that's here, and to some extent still is. They are also perennials — once they're in the ground, they are present all year round."

"They have deep roots that allow them to be very resilient in terms of drought stress. And they produce soil structure that absorbs moisture and nutrients, almost like a sponge. And the stiff, upright stems that are above ground act as a barrier to water moving down the hillside. Those features all make for a nice barrier, if you're trying to prevent soil, and the nutrients in that soil, from moving downhill and into a watershed."

STRIPS was launched in 2002, with funding from the Leopold Center for Sustainable Agriculture, also based at ISU. Five years later, the first experimental plots using prairie strips around row crops were planted in the Neal Smith National Wildlife Refuge in central Iowa. After encouraging early results, STRIPS began looking for a farmer willing to take a chance on the approach.

A peer-reviewed study of the effects of planting 10 percent of a row-crop field with prairie strips at the wildlife refuge was published in 2017. In addition to the 95 percent decrease in soil loss, there was a 44 percent reduction in water runoff on the fields, as well as runoff reductions of 90 percent in phosphorus and 84 percent in nitrogen. The study also found a reduction of emissions of heat-trapping gases.

What's more, the study found using 10 percent of a field for prairie strips didn't reduce the yield of corn and soybeans per acre.

Even with those results, when it came time to move from the experimental plot to introducing strips on a working farm, STRIPS had trouble finding a farmer open to planting prairie strips.

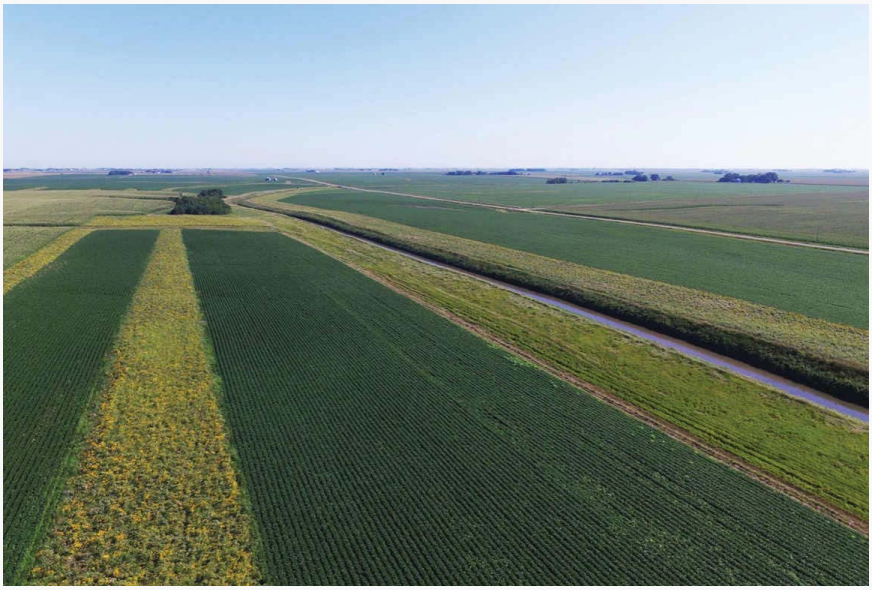
Watkins, whose southwestern Iowa farm has been in his family since 1846 (the same year Iowa became a state), was willing to take a chance.

For the first four years after Watkins took over his family's Page County heritage farm in 1994, he followed standard farming practices in an effort to maximize yield. But he quickly grew dissatisfied, feeling that what he was doing wasn't in the best interest of his farm, his animals or his bottom-line.

"I finally decided to trust some of those feelings, and try something different," Watkins said. "I guess my question came down to: Why am I working against Mother Nature, instead of with her?"

Watkins had been studying sustainable farming practices, and he started implementing them.

"My profitability and productivity actually increased," Watkins said. "Basically, in a nutshell, what I did was greatly reduce my reliance on fossil fuels and equipment, which are the two largest costs of any farming operation."



Prairie strips planted in Wright County. — Lynn Betts

In 2011, Watkins became aware of ISU's prairie strip research, and learned that STRIPS was looking for farmers to participate in the next stage of their research. The following year he met with STRIPS members and agreed to introduce prairie strips.

"Someone's got to try it first and at least take a chance for the idea to take off on the farm-level," Watkins said. "And it wasn't like it was a big cost or anything. I just had to take some land out of production. Land that I probably shouldn't have farmed anyway."

"I figured if it doesn't work, then three years from now, I'll do something else."

The three-year commitment was key.

"Prairie takes a while to establish," Matthew O'Neil explained. "There's a poem about this that goes something like: In the first year, the prairie sleeps/In the second year, the prairie creeps/In the third year, the prairie leaps."

But there wasn't much leaping on Watkins' farm in the third year.

"I planted my first stand in 2013," Watkins recalled. "I probably learned a little bit about the disconnect between academia and the realities of what we're doing on the farm."

The first year was very wet, with major rain events. The strips were washed out before they could take root. Watkins replanted the next year.

“The first stand was probably my worst planting. It really took almost five years to get established,” Watkins said. “But now I’m at the point where I can get a pretty solid stand in two years.”

“The thing that is impressive is that even in the first year, when you can’t see anything and it looks horrible, the roots are already doing their thing,” Watkins said. “Like a giant filter that catches the nutrients and some of the things that we can’t see. We’re seeing great results as far as, like, the wetland below us or the water runoff we measured last year. And it does a great job with sediment.”

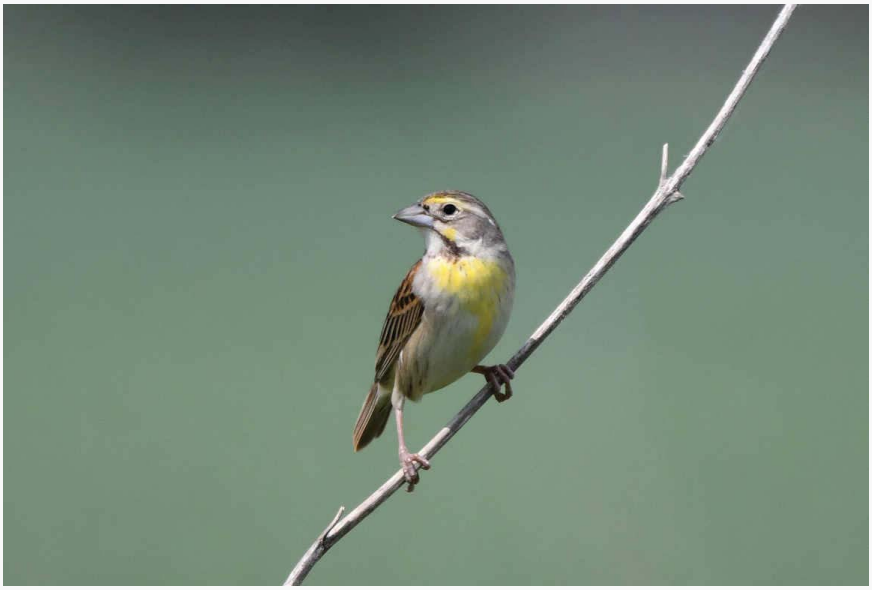
Iowa’s native fauna are also showing results. Two years ago, a STRIPS survey found “118 percent more bird species and 133 percent more total birds than those with 100 percent row-crops.”

On his land, Watkins has seen an increase in grassland birds — such as dickcissels, vesper sparrows and red-winged blackbirds — and pollinators, including a variety of butterflies and bees.

“All the birds and butterflies need is some landing spots,” he said. “They’ve got to have places to rest.”

Within the strips, there’s also an increase in beneficial insects that prey on the insects that damage crops, reducing the need for pesticides and the costs associated with spraying fields.

Despite the demonstrated benefits of prairie strips, it’s still challenging to get farmers to try the new approach. Most farmers are reluctant to take parts of their fields out of production. Some also balk at the initial cost of planting the strips, which runs between $24 and $35 an acre.



A female dickcissel perched at the Hawkeye Wildlife Management Area. Seth Watkins reported an increase in dickcissel on his farm after his prairie strips took root. — Norbert Sarsfield

Fewer than 50 farms in Iowa and the rest of the Midwest are currently collaborating with STRIPS.

“The farmers we’re working with are a special group,” O’Neil said. “They’re early adopters and committed to sustainable practices.” But they are also, he pointed out, “a drop in the bucket in terms of the total number of farms we need to be engaged for this practice to have a real impact on the environment problem associated with row-crop agriculture.”

Although farmers have been slow in adopting prairie strips, the scientific community has embraced them. Prairie strips are even mentioned in the latest National Climate Assessment as a potentially important tool in

improving water quality in the United States.

“Making sure the program is more widely adopted, in Iowa and throughout the Midwest, is going to take a lot more engagement,” O’Neil said. “And that takes money, resources and time. Right now, we’ve got some of that, but it will take more to get us [within distance] of this having the kind of public awareness and acceptance we need.”

Watkins is doing his part. He’s a leading voice among Iowa farmers, advocating sustainable practices, including prairie strips.

“Nature will do much of the work, if you just give her a little chance,” he said. “It’s like the old saying, ‘good things beget good things.’”

Paul Brennan grew up in Louisiana, where everyone knows the dead zone in the Gulf of Mexico starts on the farms of the Midwest. This article was originally published in Little Village issue 266.

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