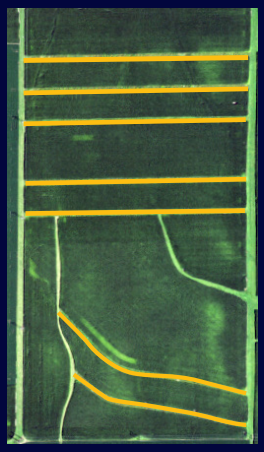
PRAIRIE STRIPS: THE LUZE FARM

Case Study 01 • The Tallgrass Prairie Center



Tallgrass Prairie CENTER

UNI University of Northern Iowa

THE LUZE FAMILY

Randy Luze and his daughter, Mollie Aronowitz, share a goal: Seeing the use of reliable, cost-effective conservation practices scaled up across Iowa's agricultural landscape. Both are certified land managers with the People's Company, and in that role have seen farmland management values evolve. Owners of Iowa farmland - especially absentee owners - are increasingly interested in sustainable agriculture, and this provides Randy and Mollie opportunities to talk about farming practices that improve water quality, soil health, and climate resilience.

Randy and Mollie's work helping clients assess sustainability options is enhanced by their own practical experience farming 1700 acres near Dysart. About 80% of their fifth-generation farm – located on some of the best soil in the state – is in seed corn and seed bean production; the remainder is conventional corn and beans. Four hundred of the acres farmed by the Luzes are owned by the Purdy family, absentee landowners whose neighboring farm is managed by Hertz. Like the Luze family, the Purdys have owned their land for generations and are committed to soil health.

Assistance for Prairie Strips

Most installation costs are eligible for up to 50% cost share through the USDA's Conservation Reserve Program. CRP annual rental payments can be 85-90% of cash rental rates. The average CRP payment for Tama County in 2023 was $265/acre. (USDA, Farm Service Agency, "Public CRP 2023 County Average SRRs.") See your County Office for details.

FARM STEWARDSHIP

Erosion reduction and management of nutrients frame the Luze's farmland stewardship decisions. Randy has experimented with a variety of tillage and cover crop practices, and paid close attention to how each impacts farm efficiencies and economics. He's also carefully considered management challenges.

"All conservation practices have challenges," Randy and Mollie point out, and that's especially true when trying to implement something like cover crops across 1,700 acres.

"You can have fantastic success with cover crops," Mollie says, "Especially after you've done them for multiple years and built up the soil structure." But the struggle is being able to consistently do the practice over hundreds of acres in the few days Mother Nature provides the right field conditions.

As an alternative, Randy considered installing contour terraces (and tile inlets) for erosion and nutrient reduction. But around the same time, he learned about Iowa State's prairie strips research. The prairie strips' success at reducing nutrient loss in crop fields impressed Randy. So did the fact that the strips were easier and less expensive than terraces.

PRAIRIE STRIPS

Partnering with UNI's Tallgrass Prairie Center (TPC), Randy installed 10 acres of prairie strips in 2015. Together, they planted seven prairie strips in an 80-acre, conventional corn/bean field on the Luze farm. They also installed three strips through a 40-acre seed corn/bean field on the Purdy's ground. The TPC seeded the strips as a research and demonstratioan project using three mixes: economy, diversity and pollinator – each with an increasing forb:grass ratio (1:3, 1:1, 3:1, respectively).

Enrolled in continuous-CRP CP-15A (grass contour strips) which allows seed-mix flexibility, the prairie strips were laid out on the contour. (Across the Luze's long slopes, that means some of the strips are nearly straight.)

To place strips on the Purdy farm, Randy took the idea to their farm manager, Lewain Beirmann. Beirmann describes the Purdys – who live in various places around the country – as "big-picture thinkers."

"They ask a lot of questions … and want verification that a practice will make sense on their land."

After doing research, the Purdys agreed to place the strips on a slope with existing terraces. Runoff had been overtopping the terraces during big storms, so the strips were placed in line with and over the structures, to stabilize them and extend slope protection in both directions.

The Purdy strips, like the Luze strips, are also enrolled in a 10-year, CP-15A contract. The per-acre payment for both farms is over $300, a return that makes it easier to idle acres – especially through seed corn.

OUTCOMES and CONSIDERATIONS

In 2021, Randy and Mollie continue to monitor the mature prairie strips, assessing outcomes not only for their own operation, but so they can knowledgeably answer their clients' questions. "There's a lot of talk about prairie strips," Mollie says. "Trying it out on our own farmland has given us an opportunity to see if it's doable."

Randy thinks the strips have helped to reduce erosion and nutrient loss, and is confident soil structure is improving under the strips. He's considered moving them at the end of his CRP contract to expand the soil health benefits in his field. Across the road on the Purdy farm, the strips have stopped storm water from running over the terraces.

Randy notes his Pioneer contacts have been supportive of the strips through the seed production field. "They recognize these fields are more intensively tilled, so they want good erosion-control measures in place."

Purdy family members have been pleased to see monarchs and other pollinators in the strips, and appreciate the "return of some diversity" to the farm. Pheasants have made a comeback too, a benefit to neighboring hunters.

Because the initial strips layout was designed with Luze equipment in mind, farming around the strips has proven largely trouble-free. Randy notes a couple spraying considerations: Overspray is more likely to occur where the contours curve, because of the way the sprayer swings around. On occasion Randy purposefully sprays the edge of the straighter strips. "We've got things spaced for our equipment, so when we see the strips creeping into the field, we just spray them back."

While the bulk of prairie strips management happens during the first couple years, Randy notes that weed and tree control is an ongoing effort. "You'll have trees," he states, and recommends a skid loader attachment to pull the seedlings.

Weeds, Randy says, will also be an issue. Because his strips were seeded with three different mixes, he's had the opportunity to observe differences in weed pressure. "It's highest on the pollinator mixes," probably because they lack the dense, vegetative cover provided by grasses. He notes other possible drawbacks to less grass: reduced erosion control on slopes and spottier mid-contract burns.

While the diversity and economy mixes have both worked well for the Luzes, Randy sees potential for a grass-only option, depending on owner/operator goals. The native grass mix would allow chemical broadleaf control during stand establishment, one of several ideas Randy and Mollie have considered when thinking of ways to scale up prairie strips acres. Simplifying the process, they feel, is key.

That includes seeding. Its likely more acres would be planted if operators could seed their own strips, the Luzes think. But conventional grain drills don't work with prairie seed, nor do most other types of typical farm equipment. Could existing equipment be modified? Are better seed carriers available? Is there a more efficient way to deliver large quantities of seed to the farm? These are all areas of critical need for adding strips acres, Randy says.

Mid-contract burns are another consideration. Burn contractors can be hard to find and tenants may be reluctant to make the effort.

"We need to help absentee owners get involved," Mollie says. "They need to be able to tell their renter 'I'm taking the acres out of production, so it's not yours to worry about anymore."

A final consideration: NRCS cooperation. Randy praises the Benton County NRCS staff for laying out his strips to maximize equipment efficiency and for ensuring they qualified for CRP payments. Not all offices may be as knowledgeable and accommodating, a barrier Randy hopes will recede as more strips are planted and their benefits become more widely known.

FARM FACTS

Location – Benton County, Iowa
Owners – Luze Farm Corporation, Purdy Family
Farm Operator – Randy Luze
Professional Farm Manager – Lewain Biermann, Hertz Farm Management
Total Acres – 1,700
Crops – Corn, soybeans, seed corn, seed beans
Acres in Conservation – 10
Conservation Practices – Prairie strips, grass waterways

Strips Establishment and Maintenance Timeline - Luze Farm

Established project goals are to intercept surface runoff, improve water quality, reduce soil erosion, and to provide wildlife and pollinator habitat and serve as a demonstration site

Preparation

Prairie Seeding (economy mix 3:1 grass to forb ratio, pollinator mix 1:3 grass to forb ratio, diversity mix 1:1 grass to forb ratio)

Management

Winter – CRP enrollment – Application for CP-15 enrollment and acceptance
Winter – Seed mix design and seed purchase
May – NRCS designs layout of strips, Randy leaves gap in corn planting to mark location, ground tilled prior to corn planting
June 9 – Drill seed seven prairie strips in south field
June 30 – Drill and seed three prairie strips in north field
July – First establishment mowing when weeds are knee-high
August – Second establishment mowing
September – Third establishment mowing (half of demo strip not mowed for comparison)

Summer **–** Mowed to 12 inches in height

Prescribed burn via contractor

Yearly mowing

"The whole key to farming in Iowa is to be able to consistently do the same practice over 2,000 acres in the couple of days mother nature gives you the field conditions you need . . . Managing that risk is huge and prairie strips is something one could control. You do it, it's there, and you don't have that ongoing seasonal risk as you do with cover crops."

Mollie Aronowitz

COSTS OF ESTABLISHING PRAIRIE STRIPS — *Luze Farm Financials*

The table uses actual costs from the case study as well as estimated costs using Iowa State's "2021 Iowa Farm Custom Rate Survey." Costs can vary considerably due to contractor and machinery availability, site conditions (size, shape, crops) and timing. The cost of seed is largely influenced by species composition and availability. A pollinator mix, in general, will be more expensive than a seed mix that is a 50:50 grass to forb ratio.

At the Luze Farm, the TPC drill seeded the prairie strips at no cost to the Luzes in exchange for using the strips as a research and demonstration site. The cost of prescribed burns is especially variable for strips. While burning is a be st management practice, mowing and haying prairie are legitimate alternatives.

Practice	Actual Costs for Case Study	Estimated Range of Costs
Tillage	Done by Luze prior to planting field to corn	$9.00-$20.00/acre[4]
Herbicide	None required	$16.00-$45.00/acre[4]
Nurse Crop Seed	$15.00/acre	$10.00-$50.00/acre[1]
Nurse Crop Seeding	Done by Luze	$10.00-$30.00/acre[4]
Native Seed	$130.00 (economy) $290.00 (diversity) $368.00 (pollinator)	$150+/acre[2]
Native Seed Drilling	TPC drilled strips	$43.00-42.00/acre[5]
Establishment Mowings (2x)	Done by Luze	$10.00-50.00/acre[4]
Spot Mowings (2x)	Done by Luze	$50.00-140.00/hr[4]
Prescribed Burn	Done by contractor	$50.00-$94.00/acre[5]

[1]USDA SARE, "Creating a Baseline for Cover Crop Costs and Returns," 2019.
[2]Tallgrass Prairie Seed Calculator, University of Northern Iowa.
[3] "Cash Rental Rates for Iowa 2023 Survey," Iowa State University.
[4]"2023 Custom Rate Survey," Iowa State University.
[5]"2022 Prairie Services Custom Rate Survey", Tallgrass Prairie Center.

A NOTE ON SEED MIXES

The cost of native seed is largely influenced by species composition and availability. In particular, abundance of forb seeds in the mix is typically responsible for most of the price. The pollinator mix used (due to enrollment in CP-42) was relatively expensive because it required approximately 50% more forb seeds than a typical 50:50 grass to forb seed mix that is common for prairie strips. There are many seed mixes marketed for CRP practices at the time of this publication that are significantly lower in price than the listed range of costs. The range of costs provided are based on field tested seed mix designs that result in multifunctional, diverse stands of tallgrass prairie.

Use of low-cost seed mixes may not result in outcomes similar to this case study, though more research is needed on cost-minimizing rather than ecosystem service maximizing seed mix designs. For more TPC research regarding the importance of seed mix design, see Meissen et al. 2020[5].

[6]Meissen JC, Glidden AJ, Sherrard ME, Elgersma KJ, Jackson LL. 2020. Seed mix design and first year management influence multifunctionality and cost-effectiveness in prairie reconstruction. Restoration Ecology. 28:807–816. doi:https://doi.org/10.1111/rec.13013.

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