Not an Either-Or Choice

How One Farm is Integrating Crops & Livestock

By Brian DeVore

Deleting the disconnect between livestock and crops on Midwestern farms (*see page 12*) can be the key to a more regenerative form of agriculture, but what does it look like in the flesh? On a cool morning in late summer, it's in the form of an acre of seemingly undifferentiated sorghum-sudangrass standing over seven-feet high in the northeastern Iowa sun. At first glance, a pretty mundane scene. Then, for a moment, the dark back of a single Black Angus bovine breaches the sea of sorghum before disappearing again.

"The only thing I don't like about this is you have 150 or 160 cattle in there, and I can only see one calf," says Rick Matt with a laugh as he drives away from the 23-acre field containing the paddock. He has just moved a line of polywire to create new grazing for the cow-calf herd. It's noon, and by supper time, all that forage will be either in the rumens of those animals, or stomped into the ground as soil enrichment, leaving exposed the cattle, as well as the diverse "salad mix" of cover crop summer annuals growing close to the ground. As the 58-year-old farmer concedes, integrating crops and livestock requires a changed relationship with the land, animals, and biology, and a willingness to sometimes just let go.

"Everything seems to be in more control," he says. And yet, he adds, "It's such a new paradigm of not realizing where my control is."

Yes, linking animals and the land requires loosening the reins and letting nature call more of the shots. But as Rick's son, Damien, explains, farmers can play a key role in such a system by consciously creating a foundational base from which those natural processes can do their work. And that foundation starts with a strategic focus on plant diversity.

"When we start to have an emphasis on soil health, I think that's where all the puzzle pieces of livestock integration fall into place," says Damien.

For the Matts, this integrated approach is yielding economic and ecological dividends, as well as setting the stage for a new generation to continue their farm's legacy.

"I love what we're doing; it brought fun back," says Rick Matt, shown with his son, Damien. (*LSP Photo*)

A Flat-on-the-Back Epiphany

Livestock production is not a new enterprise on the Matt farm. Rick grew up on the home place here in northern Fayette County, and beef cattle always played a role. However, they traditionally focused on raising the animals in a feedlot system where the feed was hauled in and the manure hauled out. Up until 2020, the family custom finished hogs in a confinement system as well. Rick's father, Art, always used good conservation practices on the extremely hilly land, and in 1993, their operation, which they call Varykino, adopted no-till crop production. Over the years, they utilized simple cover crop mixes consisting of mostly rye and one or two other species to build and protect soil.

When Rick had knee surgery in 2019 he vowed to make good use of his recovery time by learning to play a musical instrument. That turned out to be pretty tough going while lying on one's back, so instead he read *Dirt to Soil*, which describes North Dakota farmer Gabe Brown's use of multiple species of cover crops, combined with diverse rotations, no-till and managed rotational grazing, to build soil profitably.

Rick was struck by the idea that various species of plants in a field can often play off of each other in a way that builds long-term fertility and resilience. Native prairies are based on this premise, and recent agricultural research in Kansas and Minnesota has backed up this concept. Such resilience has become even more critical as climate change generates extreme, oftentimes unprecedented, weather events with increasing frequency. This focus on diversity and greater interaction with the land and natural biological processes runs counter to the conventional agriculture paradigm, which is based on monocropping and removing livestock from the land so they can be raised in specialized confinement facilities.

"And that just connected the dots," recalls Rick of the points Brown made about integrating crops, livestock, and diversity.

Before that tall stand of sorghum-sudangrass was mowed down by the cattle on this summer day, the father and son walked amongst the seeming monoculture and took a closer look at the undergrowth. Rick, a student of history, recalls the story of how early European settlers described riding through prairies so tall it engulfed horses. But he points out that such a description of a "sea of grass" is misleading, since it overlooks all the forbs and other kinds of plants growing close to the ground, contributing to an incredibly diverse, healthy ecosystem.

"You're saying, 'Oh my gosh, this grass is tall — I can tie it in a knot over the saddle.' You wouldn't have even mentioned the stuff down here," says the farmer as he points at the diverse mix of summer annuals growing below the sudangrass: sunn hemp, three varieties of clover, radish, rapeseed, peas, Japanese millet, and fava beans, among others.

After Rick's on-the-back epiphany, the Matts utilized funding from the USDA's Natural Resources Conservation Service (NRCS) to increase their plantings of cover crops and to put in place a wide-ranging rotation involving row crops, summer annual salad mixes, and permanent pasture.

The farmers are still adjusting the system,

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but after six years a consistent pattern has emerged. For example, once a cornfield is harvested — either as chopped, high moisture corn or grain — they may plant a winter annual cover crop mix consisting of rye and triticale. In the spring, the Matts graze, bale, or chop off that winter cover crop. That land is then planted to a 12-way summer annual salad mix and the farmers utilize portable polywire fencing to break the fields up into roughly one-acre paddocks, allowing the cattle to rotate through a couple of times during the summer and fall as they graze.

Damien jokes it's hard to keep track of what makes up a typical mix, given that his dad is constantly tweaking it, but there is a method to the madness. Rick owns three books on weeds, and he picks the seed mixes based on what plant pests are trying to dominate. For example, foxtail is a major problem on Varykino, so Rick makes sure he includes millet in the mix, which is a similar species.

"They say grow what your problem is, and that's what grew, the millet," Rick says, pointing to a low-lying spot in a field that was under water during the early part of 2024, a situation that would have typically created perfect conditions for foxtail.

The mix also includes legumes to help fix nitrogen for the following corn crop and radishes to help scavenge sulfur.

Corn Suitability Waiting

Character begets nicknames, and the 1,500 acres of owned and rented land the Matts farm on the edge of the Driftless Region has plenty of character. One valley they farm is called "Watercress" for the bright green member of the mustard family that flourishes in a stream flowing amongst steep hillsides. "It's good on a salad – it's a little bitter, but it's good," says Rick as he guides his pickup truck along the snaking stream. One sidehill is called the "Hanging Gardens" by the farmers because of the way individual parcels of oddly shaped land seem to cling to the slope. Another parcel that's suffered from compacted soil was termed "Mojave Desert" by local NRCS staffers. "Every drop of rain that landed just raced off the edge of the field," explains Rick.

It would make sense for the Matts to focus on grazing some of their more marginal acres rather than placing them in an intense row-cropping rotation year-after-year. Indeed, around two-thirds of the land they farm is planted to perennial forages.

But under their system, even land with a relatively high corn suitability rating is exposed to grazing cattle. For example, the 23-acre parcel is made up of prime bottomland soil that, before the Matts first started grazing summer annuals on it a few years ago, had been in continuous corn since 1965. Once the cattle had grazed it a couple times in 2024, it was planted to corn this past spring in soil reinvigorated by a diversity of living roots and biological activity spawned by manure and animal disturbance.

Such a rotation has paid off elsewhere. Later in the day, Rick and Damien checked out row-cropped fields that had already gone through cycles of cattle grazing off summer annuals in previous growing seasons. The stands were thriving, and the Matts are getting over 200 bushels-per-acre in corn yields on some of those acres, despite the fact that the farmers have been cutting back on applications of nitrogen fertilizer — one cornfield had received around 120 pounds of nitrogen per acre. On average, Iowa State University recommends 125 pounds of nitrogen in corn planted after soybeans, and 175 pounds on corn planted after corn.

The Matts are rotating grazing of summer annuals with the planting of row crops. "Everything seems to be in more control," says Rick. (*LSP Photo*)

Rick concedes it's been a trial-and-error process to figure out how much of a nitrogen credit to take when switching between grazing summer annuals and planting corn. Because of years of hog manure applications, the soil still has plenty of other sources of fertility to draw on as well.

"I haven't put phosphorus on for I bet close to 30 years," says the farmer. "And we haven't put potash on for maybe 12 or 15."

When setting up and experimenting with this system, there were some misses. Hairy vetch is difficult to establish, and it can be hard to stay ahead of rye in the spring when trying to graze it off, for example. But during the drought of 2023, the Matts saw signs that they were hitting their stride, and that the soil was responding to the intermingling of crops and livestock.

On Mother's Day that year, they received 2.5 inches of rain, and no more precipitation fell until mid-September, creating dry conditions that were particularly tough on the permanent pastures the Matts were grazing. But they invested in more polywire so they could adjust their grazing system in such a way that they were able to increase the frequency of the cattle movements from every three- to five-days to roughly every one-and-half days. This gave the paddocks more time to recover, reducing overgrazing. In addition, having the summer annuals in the mix took pressure off those pastures.

"We had deep, green grass growing," recalls Rick. "It's almost embarrassing to admit that we had grass left over in the fall."

This, despite the fact that they had let go 200 acres of pasture they were renting that year in order to reduce travel time and simplify logistics. In a way, the Matts see their moveable grazing infrastructure as a kind of crop insurance policy — cattle can always be turned out into a cornfield decimated by severe weather.

The Payoff

As Rick drives his pickup on a field road past a mix of permanent pasture and new plantings of summer annuals, Damien is in the backseat going over some calculations he's done on the economics of integrating crops and livestock. Based on the farm's historical average corn yield, the cost of infrastructure such as grazing paddocks and watering systems, and other expenses, he was able to determine what price corn would need to be before it wasn't worth grazing summer annuals on crop fields. He figures if corn is below $4.17 a bushel, it makes more sense to be grazing. If corn's above that, then their return on a per-year basis is going to be better by growing the row crop.

Damien cites a six-year study done by the American Forage and Grassland Council that compared the profitability of a strictly corn-soybean farm with one that had a more

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diverse crop rotation, along with livestock.

"In the end what they found is there's not really a statistical difference between having livestock on the farm profitability wise, and not having livestock," he says.

But the Matts see building economic resilience on this farm as a long-term investment in their soil; responding to short-term cyclical spikes in corn prices threatens to undermine that investment. Damien recalls seeing fellow Iowa farmer Jerome Fulsaas present at a Land Stewardship Project workshop about how building soil health is like sticking money in an individual retirement account and allowing interest to accumulate.

"It's a multi-year, even a generational, return on investment by building your soils," says Damien. In fact, he concedes that they are so committed to building long-term resiliency in their fields that they've often ignored the $4.17 per-bushel corn profitability cutoff. "We were grazing two-three years ago when corn was $6.50 to $7 a bushel. To me, it seems like a no-brainer."

And as they learned during the 2023 drought, that kind of investment pays dividends when extreme weather strikes. It paid off again in early 2024 when the weather picture flipped and heavy rains threatened to waterlog low-lying fields for an extended period of time. Instead, because of the good aggregate structure the Matts have been able to build, the soil soaked up and stored that moisture.

Financially, one factor that helps the father-son duo is that they are raising their beef cattle for a European hormone-free market, which pays a premium; they finish the cattle out on grain 120 days prior to slaughter, which takes place in Omaha, Neb. Having a reliable market that pays a livestock producer for adopting regenerative practices is important. Many farmers who are utilizing grazing, for example, are attempting to market their animals direct to consumers or via specialty markets, but inadequate local processing infrastructure is a major barrier.

Match Made In Heaven is a six-state collaboration involving 50-plus groups — including LSP — that's working to show ways crops and livestock can be integrated in a profitable and sustainable manner. A recent survey conducted by the initiative of over 550 farmers primarily in Iowa, Minnesota, Wisconsin, Illinois, Indiana, and Missouri found that lack of adequate local processing and the inability to get a premium price for a product were among the top challenges to integrating livestock into cropping operations. It's hard to compete with a corn-soybean system that simply allows a grower to haul the harvest to town and, when disaster strikes, to receive an insurance payout.

80-20 Rule

Successfully integrating crops and livestock also requires tossing out some traditional paradigms about even perennially-based agriculture. For example, hay production has long been considered a way of providing forage to livestock that's good for the soil and an efficient use of land, since multiple cuttings can be taken during the growing season. But the Matts are reconsidering the role this crop plays on their farm.

The Matts select their grazing mix based not only on forage quality, but what each particular species contributes to rejuvenating the soil. "When we start to have an emphasis on soil health, I think that's where all the puzzle pieces of livestock integration fall into place," says Damien. (*LSP Photo*)

By analyzing how haying as an individual enterprise fits into their overall system, they've found it to be the least profitable sector, given all the labor and equipment it requires. Damien says they've applied the "80-20" rule to it. Are you spending 80% of your time bringing in 20% of your profit, or 20% of your time generating 80% of your profit? On Varykino, haying seems to fit in the former category, Damien has concluded. And besides consuming a lot of time and labor, this form of forage production removes plant cover and nutrients from their farm with each cutting. So maybe it makes more sense to purchase hay than to raise it.

"When you're purchasing hay and bringing it in, you're not only bringing in that feedstock, but you're also bringing in everybody else's nutrients that they cut and removed," says Damien, adding that raising less of their own hay gives them the incentive to rely more on grazing. "I'll let the cattle do all that work themselves."

But relying less on harvested forage and more on grazing takes a new mindset. For example, the farmers could have grazed some of their winter cover crops earlier in 2024, but they had haylage they needed to burn through to make room for first crop hay. "It's scary not to make that hay," concedes Rick.

Healing the Land

To the Matts, economic and ecological resiliency go-hand-in-hand. This is particularly true when they recall the impacts decades of row cropping and moldboard plowing have had.

"There were gullies in the middle of this field where I could stand up and it was still a foot over my head," says Damien, pointing at a now smooth stretch of land rising out of a creek bottom. "It looked more like the surface of the moon than what a field should look like."

The Matts are proud of how the combination of no-till, diverse rotations, and managed rotational grazing is starting to heal these acres, both above and below ground. Organic matter levels are rising, aggregate structure is being built, water is infiltrating even on the "Mojave Desert" land, and a cold-water stream flowing through one section of the farm is running clear and fast, unclouded by eroded sediment. As the pickup crosses the creek on a small field bridge, Damien talks excitedly about a neighbor's plan to reintroduce trout to the waterway.

"You can't have a legacy with depleted soil," says Rick from the driver's seat. "No one will want to be around that."

The Toys & Joys of Farming

And family legacy is important. Damien, 33, served in the National Guard and got an agriculture degree from Iowa State University before returning to the farm. He says that fully integrating livestock into the operation

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via grazing has helped provide room for him without expanding acres. As they proved when they dropped those 200 acres in 2023, they feel they are getting more value out of each existing square foot. Another Matt son, Jesse, works for the NRCS and has shown interest in coming back to the operation as well. The Matts recently added a flock of ewes to their operation, and the younger farmer sees this new species as a way to expand opportunities on the farm via grazing.

"I never really knew what I wanted to do growing up," says Damien. "But I always played with farm toys, so I guess my 5-year-old self would be pretty impressed with me."

Rick and Damien seem to have a good give-and-take relationship, something that's important when a farm is trying out innovations to the point where, "I'm willing to swing and miss," says Rick.

Damien knows of situations where children come back to the farm wanting to try out new practices and strategies, but they're hampered by an older generation resistant to change. In fact, at times the opposite dynamic is at work at Varykino.

"Boy, I feel a lot of the time I have to say, 'Dad we gotta slow down a little bit, we've got to see if this will work first,' " Damien says.

Such a strategy built on innovating and experimenting can be attractive to a new generation from a quality of life standpoint.

"I'm blessed to have a family that wants to learn," says Rick. "I love what we're doing; it brought fun back."

Power of Community

The Matts are the first to admit that an integrated system that uses nature as a model would not be possible without the use of managed rotational grazing, which allows them to move their cattle in response to the growth of summer annuals and permanent pasture. And they've added their own twists to this system. For example, in summer annual paddocks dominated by tall stands of sorghum-sudangrass, they use a tire drug behind a four-wheeler to create alleyways where the polywire can be strung. It can be a challenge in vegetation that's sometimes eight-feet-tall, but it's worth it, given what can happen if there isn't such a demarcation.

"We've had instances where the cattle just sort of walk through that wire," says Damien. "And it turns your intensive grazing system into a continuous grazing system really quick."

The Matts have also used "swath grazing" — a system where they cut forage in the late fall and leave it in windrows for the cattle to browse during the winter. This makes it easier for the animals to access the forage through the snow. Rotational grazing in the winter is also possible with the help of a clever system involving highly moveable "tumble wheels" — rolling devices that allow the farmers to create temporary paddocks without planting fenceposts in the frozen ground.

A stream flowing through the Matts' land. "You can't have a legacy with depleted soil," says Rick. (*LSP Photo*)

Such innovations aren't conjured out of thin air — the Matts say they've benefited greatly from taking part in learning opportunities as much as possible. Studies show that farmers who are part of peer learning networks are much more likely to succeed in adapting and maintaining regenerative practices. The six-state Match Made in Heaven survey found that crops-only farmers emphasized the need for more information — particularly from other farmers — on setting up grazing systems and the economics associated with them before they would consider integrating livestock.

The Matts attended LSP's Driftless Grazing School in June 2024, where they saw firsthand how to transition land out of row crops on widely varying landforms. Before that, Damien went to Missouri to learn more about integrating sheep into their grazing system. Rick is a member of LSP's Soil Health Steering Committee, which develops strategies around how farmers can share information on various regenerative practices.

He also meets regularly with an informal group of about 40 farmers from northeastern Iowa and southeastern Minnesota that call themselves the SCABS: "Soil Health, Cards, and Bullshit."

"But we never get to the cards," jokes Rick. "It's a different subject every month. There's no one judging anybody."

One August evening, the Matts put that community aspect of sharing knowledge into action by hosting a Match Made In Heaven field day. As farmers, NRCS staffers, and commodity group leaders, along with forage, soil, and livestock experts from Iowa State, sit at long picnic tables across the road from the 23-acre field of summer annuals, the cow herd bawls incessantly, begging to be moved to a new paddock.

The father-son team takes turns describing the operation's big picture rotation involving summer annuals, permanent pasture, and row crops. They also explain how this system helps them adhere to the five principles of soil health: armor the soil, minimize soil disturbance, increase plant diversity, keep living roots in the soil, and integrate livestock. There are questions about seeding rates, what species of summer annuals they use, weed control, paddock sizes, and frequency with which animals are rotated. At one point, Damien goes off script to reiterate the interconnected nature of their enterprise.

"I know the schedule says we'll talk about the economics of crops versus livestock," he says. "But I don't like the word 'versus' too much, because crops and livestock can and should be complementary of one another."

To prove his point, he leads the field day participants across the road and takes down the strand of polywire separating the complaining herd from a strapping stand of summer annuals. Almost immediately, the bawling is replaced by the thrum of bovines chomping and stomping a field of forage. It almost sounds like corn flowing out of a wagon. ❐

Give it a Listen

Episode 345 of LSP's *Ear to the Ground* podcast features a discussion with Rick and Damien Matt about how they are building an intergenerational farming operation based on soil health, diversity, and grazing: landstewardshipproject.org/podcast/ear-to-the-ground-345-grazings-generational-jump.