

Maximizing Integrated Crop & Livestock Systems Value

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As livestock and forage farmers, we have a leg-up on crop farmers when it comes to tools in the soil health and environmental stewardship toolbox. Cover crops and no-till are a good start, but without livestock, they can take us only so far. Incorporating livestock and forage crops expands the options for keeping the soil covered, reducing soil disturbance and runoff, diversifying crop rotations, and keeping living roots in the ground. And in today's unpredictable economy, diversified farms have some significant financial advantages over single enterprise farms. Against the backdrop of an increasingly specialized Midwestern agriculture system, diversified farms are enjoying a comeback. While single enterprise farms excel at capturing economies of scale, there is a growing body of scientific and economic evidence that diversified farming systems do a better job of capturing a range of production, ecological, and economic synergies. Reintegrating livestock and crops means working at the right scale and using today's tools and technologies to reach the economic, environmental, and quality of life goals of the farm family. The Match Made in Heaven (MMIH) project is teaming up with innovative crop and livestock farmers to modernize and scale up diversified systems for the agriculture of the future.

What is MMIH? It is about starting conversations, building partnerships, and sharing knowledge on reintegrating livestock and annual cropping systems, for the benefit of both! The three-year, SARE-funded project is facilitated by Green Lands Blue Waters and seeks to engage new and existing partners throughout the Upper Midwest. Like the Midwest Forage Association, the MMIH project is a space for information sharing. Just as we've seen a trend toward specialization in farming systems, many organizations farmers belong to have also specialized. Corn Growers, Soybean Growers, Cattlemen's Associations and similar groups, by definition, focus on a single commodity rather than the system within which it's produced. This project brings these groups together to explore common interests between specializations, for the benefit of the farmers. Other planned activities include economic case studies and field days highlighting innovative integrated farms and assembling resources, like the new MMIH infographic (see below) depicting a range of options for integration of crops and livestock.

Maximizing integration benefits at the farm level. Fundamentally, the benefits of livestock integration flow from the capacity of ruminants to consume inedible (by humans) plant material, such as grasses, legumes, crop residue or cover crops, and turn it into meat, milk, fiber,



and fertilizer. The more we shape our system to take advantage of that ability, the more efficient our system can be. Many farmers have livestock and crops side-by-side as part of their operations, but aren't taking full advantage of that integration, either production-wise or economically. So, what does a fully integrated system look like?

Don't be afraid of fencing. A key element of an efficient integrated system is maximizing use of the cheapest harvesting and manure spreading equipment we have – our grazing livestock! Getting livestock to where the forage is can be a barrier. Arguably, one of the best investments an integrated farmer can make is in perimeter fencing. It doesn't have to be the major maintenance burden it used to be. There are many relatively low cost, flexible options available. Perimeter fencing allows you to send animals out anywhere there is available feed, saving time and money. Using temporary interior fencing to manage grazing takes a little more time but increases forage harvesting efficiency and improves manure and urine nutrient distribution. A variety of integration practices can yield economic and soil health benefits. The following are just a few possibilities across a spectrum of annual and perennial cropping systems.

- **Grazing crop aftermath, with or without cover crops:** Crop aftermath is one of the cheapest feeds we have; it can replace the need for stalk chopping and reduce synthetic fertilizer inputs. It

extends the grazing season and reduces feed and manure handling chores. Adding a cover crop increases forage quality; select mixes that are nutritionally appropriate for growing or lactating animals.

- **Raising small grains:** Winter small grains serve a dual purpose as a grazing crop in fall and spring (extending the grazing season) and a grain crop for feeding or for sale. Small grains help spread out the workload across the season and can diversify income streams. Small grain straw serves as a cash crop, a source of bedding, or a feed additive. Additionally, interseeding clover into small grains in the spring can provide late season grazing after the grain is harvested.
- **Including annual forages in the crop rotation:** Summer annual forages such as sorghum sudangrass and millet can be incorporated as a double crop after winter small grains, soybeans, or plowed down alfalfa. They can be grazed or harvested as baleage for winter feeding. Diversifying the crop rotation and planting times creates additional opportunities during the year to spread stored manure, with manure nutrients taken up by the forage crop.
- **Incorporating pasture into crop rotations:** As alfalfa fields go into their third or fourth year, they can start getting grassy. Instead of plowing them down, these fields can be grazed for a few years to reduce costs, lengthen the crop rotation, and give other pastures on the farm a rest.

Grazing continued on page 6 ►




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- **Raising perennial grasses for pasturing or high quality haylage:** Some large Wisconsin dairies are experimenting with replacing alfalfa with perennial grass. Taking frequent cuttings for haylage yields similar tonnage and quality. Unlike alfalfa, perennial grass fields can absorb manure nutrients after each cutting, providing another opportunity for spreading stored manure. There may also be establishment cost savings with perennial grasses.
- **Raising dairy heifers on pasture (yours or a neighbor's):** It's significantly less expensive to raise heifers on perennial or annual pasture and they will have strong legs and feet and better health outcomes.
- **Partnerships between grain and livestock farmers:** Although it may take some time to find the right partner, multiple benefits can derive from complementary operations working together. The grain farmer benefits from having access to manure nutrients and opportunities for a more diverse crop rotation. The livestock farmer benefits from an increase in grazable acres, places to go with excess manure, and a more predictable purchased feed source. Both may benefit from reduced costs of sharing equipment and labor, stable marketing opportunities, and reduced costs of synthetic inputs.

From these examples, we start to see a scenario where two themes are prominent: keeping the land covered with green, growing plants as much of the year as possible and maximizing the value of the grazing animal

to harvest and cycle nutrients. Fundamentally, the most important "crop" farmers harvest is the sun's energy and a bare field is a missed opportunity. Keeping the soil covered with a growing crop keeps that solar generator running at capacity: storing carbon in the soil, reducing soil erosion, protecting water quality, and producing crops that can be grazed or harvested. Good permanent and portable temporary electric fencing makes it possible to get the animals where they need to be when you need them there. Virtual fencing options are becoming available as well.

Economics. Just like the production side of agriculture, farm business management has long taken a siloed approach, and encourages farmers to view the finances of their operations in discrete enterprises. It's human nature to simplify in order to make sense of a farm's finances, but we do it at the risk of missing some of the key features of synergistic systems. For example, grazing crop aftermath and cover crops in the fall provides several opportunities for cost-savings that may not be captured by traditional accounting practices. Manure and cover crop biomass have fertilizer value for the following crop. Keeping the cows grazing and out of winter quarters reduces stored feed costs as well as labor for feeding and manure handling. On the flip side, there are labor costs associated with managing the grazing herd and the cost of fencing and watering facilities for which to account. Farmers who focus on optimizing their integrated systems believe the benefits

outweigh the costs. The MMIH project is developing simple tools farmers can use to explore possibilities and capture the economic costs and benefits of integrated systems. The project is working with innovative farmers to test these tools and gather financial data to be summarized and shared through field days and case studies in 2024.

Challenges of integration on a regional level. To capture the water quality and soil health benefits of livestock and forages, this and other projects are strategizing about integration on a landscape scale. Reintegrating livestock and crops is complicated enough on the farm level, and a lot has changed since diversified farmers were the norm. Many farmers who raise livestock have the skills and the infrastructure for both annual cropping systems and livestock production, but there are whole communities that have lost the tools and the knowledge to raise livestock. In large parts of the Midwest, you'd be hard pressed to find a large animal veterinarian or a farm store that carries fencing supplies or the people who can install them and provide advice on how to use them. Even a simple step like adding winter wheat to a crop rotation is a challenge where there are no livestock farms to buy the straw (which can generate as much or more income than the grain). Addressing these challenges seems like a monumental undertaking, but there are some innovative farmers demonstrating fresh new approaches. Match Made in Heaven will capture their stories and share them. ☘



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