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LIVESTOCK INTEGRATION

For generations, farming operations included both row crop and livestock production. Animals provided farmers with low cost means of controlling weeds, on farm nutrient cycling and diversified income streams. Over time, however, the agricultural industry favored specialization, separating livestock production from row crops and with it, removed the soil health benefits that livestock provide. Where weed species and plant residue may be seen as a nuisance for crop production, they can provide valuable feed for animals.

The benefits of livestock integration for crop production and soil health are many. Livestock manure contains both micro- and macro-nutrients, as well as bacterial and fungal microbes critical for nutrient cycling and breaking down organic matter. Integration of manure into soils can also reduce the need for fertilizer applications during the season. For row crop farmers, integrating livestock can provide additional revenue, either through animal production itself or additional rents when working with a local livestock producer.

WHERE TO START

Many row-crop farmers do not own livestock themselves, so a starting point would be to make arrangements with a local livestock producer. Type of livestock can vary from chickens, to small ruminants such as sheep or goats, to cattle.

Bringing livestock into crop fields will require temporary or even permanent infrastructure. Fencing is necessary in many instances to prevent animals from entering adjacent fields or streams. Pivots can be a challenge with temporary fencing if creating paddocks smaller than the full pivot. Some producers have attached electric wire to the pivot to use it to move livestock. PVC pipes can be attached in front and under pivot gearboxes to push fencing down so that pivots do not catch and drag wires. Watering of livestock also needs to be considered and may include hauling water or running a temporary waterline from an irrigation pump.

As with any grazing operation, appropriate stocking rates must be determined. Overgrazing can leave ground bare and susceptible to wind and water erosion, which eliminates the benefits of cover cropping and residue management. It can also mean stresses on the livestock.

Nutrient management is more dynamic when livestock are integrated into the system. Farmers will need to closely monitor soil nutrients and adjust applications accordingly the following season.

IN THE FIELD

Chris Unruh farms in Grandview, Idaho, where he grows many different crops including timothy, corn, alfalfa, sunflower for seed and small grains. For several years now, Chris has worked with Bob Howard, a Hammett-based rancher and co-founder of Desert Mountain Grass-Fed Beef, a cooperative of family ranches raising 100% grass-fed Akaushi cattle. Chris and Bob formed a partnership from their shared interest in soil health.

Not one to shy away from experimentation, Chris agreed to plant corn and peas directly into the residue of timothy after it was cut for hay. Later that fall, the timothy-corn-pea mix was grazed by Bob Howard's cows.

The timothy was again allowed to grow during the next growing season, but this time served as a cover crop. The corn limited the sun exposure and growth during the summer months, but once the corn leaves started to dry the timothy started to grow. Corn yielded as high or higher than average for the area at 280 to 300 bu/acre. Cows grazed the corn stover/timothy mix for several months that winter.

Figure 1. The inter-seeded timothy and pea mix provided a cover crop and grazing feed for livestock between rows of the corn cash crop.

Now Chris considers the livestock component in all of his cropping decisions. The planter or grain drill is always running on this farm, and as soon as a crop is harvested another is planted to maintain living roots in the soil. This also allows for grazing in the fall or winter months which has been a significant income generator for this farm. Grazing has also allowed for increased nutrient cycling in the soil. Instead of removing plant material that contains the nutrients, the livestock returns it back into the soil for the next growing season. Finally, Chris doesn't worry about weeds, a common misconception with adding livestock to cropping systems.

ADDITIONAL RESOURCES

Coffee, L. (2014). Integrating Livestock and Crops: Improving Soil, Solving Problems, Increasing Income. ATTRA Sustainable Agriculture. https://attra.ncat.org/publication/integrating-livestock-and-crops-improving-soil-solving-problems-increasing-income/

Hatfield, P., Goosey, H., Lenssen, A., Blodgett, S. (2006) Targeted Grazing: A natural approach to vegetation management and landscape enhancement. In Peischel, A. and Henry Jr., D.D. (Eds.), Incorporating Targeted Grazing into Farming Systems (pp. 129-140). American Sheep Industry Association. https://www.webpages.uidaho.edu/rx-grazing/handbook.htm

Foundation for Food and Agricultural Research – Integrated Cattle and Crop Production Product, University of Nebraska https://beef.unl.edu/ffar

Rodale Institute 10 Tips for Adding Livestock to Your Crop Rotation. Retrieved November 2023, from https://rodaleinstitute.org/science/crop-livestock-integration/

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