ORGANIC COVER CROP CASE STUDIES

Vic Madsen

Farm location	Audubon, IA
Certified organic acres	350
Total acres	350
Year of initial organic certification	2000 (State of Iowa)
Primary cash crops	Corn, soybeans, oats, winter wheat, alfalfa
Years planting cover crops	About 3 years, since 2017-2018
Frequently used cover crops	Oats, winter wheat, cowpeas
Livestock on farm	16 cow-calf pairs and beef cattle, poultry
Soil type	Marshall silt loam. Wind blown loess. Hilly, very well drained.

Brief Farm History

The gentle, rolling topography of Vic Madsen's farm made it ideal for corn and soybean, and sometimes continuous corn, production prior to the organic transition in 2000. The farm began incorporating cover crops into their rotation around 2017-2018. **As members of Practical Farmers of Iowa, they were exposed to a lot of information through the organization's cover crop group, and the practice of using cover crops "rubbed off" on them.** With their cow herd, the farm includes pasture subdivided into seven paddocks. In mid-November, after the crops are harvested, they utilize the whole farm for potential grazing acres.

Cover Crop Use & Goals

In western Iowa, due to variable rain patterns, fields often experience water stress. Madsen's primary goals for cover crops are to improve water holding capacity and the water infiltration rate. The roots of wheat and oats create pore channels and support soil aggregate formation, increasing water movement into the soil,

reducing the rate of runoff and erosion. Madsen knows erosion is a symptom of poor water infiltration and that his cover crops are treating the "root" infiltration problem as well as helping to slow runoff and soil movement that may be occurring in the meantime.

The two primary cover crops used in the rotation are winter wheat planted into corn stalks with a grain drill, and oats seeded after soybean harvest. He has found that wheat drilled into corn stalks has helped with weed control the following season. Madsen finds the soil to be more crumbly and mellow following the winter wheat, improving planting operations and stand establishment. The oats following soybeans winter kill and he plants directly into this residue the following spring. He is experimenting with interplanting cowpeas and late season soybeans during his last cultivation pass on corn.

Madsen has tried a few cover crop mixes, though his drier climate prevents reliable germination when rainfall isn't adequate. Instead of cover crop mixes with multiple species, which can often be expensive and don't provide benefits of all the species if they don't germinate, Madsen prefers to use two to three species proven to reliably work well in a blend for his soils and climate to meet his goals.

Madsen believes getting the timing right for successful cover crop establishment and termination is one of the biggest learning curves when starting to use cover crops. Knowing which species to plant can also be a challenge, as there are many cover crop species available. He questions the economic return to using some of the more expensive species, particularly when compared to planting more commonly available and less expensive options, like oats and winter wheat.

Crop Management

Winter wheat

TYPICAL ROTATION

Madsen runs the farm on a rotation with two years in row crops (corn or soybeans), followed by two years of small grain (oats or winter wheat) or hay. Example rotations include corn-soy-oats-alfalfa hay or corn-soy-oats-winter wheat. Fields never see row crops for more than two years in a row.

FIELD OPERATIONS

A driving goal of Madsen's rotation is to till as little as possible. Alfalfa is tilled four inches deep ahead of corn and the farm ridge tills their soybeans.

Madsen will also sometimes create ridges in the alfalfa and then plant corn into the ridges. He has access to multiple cultivation tools and normally makes one or two passes with the rotary hoe and one or two passes with a cultivator, depending on the crop, for weed control.

NUTRIENT INPUTS AND TIMING

Madsen's sole nutrient additions come from manure. He sources his manure from his own cows, his wife's poultry operation, and purchasing turkey compost. Manure is applied in the fall 90% of the time.

Advice to New Cover Croppers

Madsen has gained his cover crop knowledge from Practical Farmers of Iowa (PFI), Albert Lea Seed House, and YouTube videos. **He recommends anyone interested in cover crops should talk to people currently using the practice and who have similar goals to yours.** Also, the education provided by PFI webinars and field days are highly valuable. He says to "self educate and ask questions."

Looking to the Future

Madsen is excited to try winter oats, which have more cold hardiness - up to ten degrees more than regular oats. This allows for the oats to achieve more fall growth, but still winter kill. He is looking forward to the increased fall biomass to protect the soil from erosion and reduce fall and spring weed pressure.

Madsen's long-term goal is to have cover crops on every acre of his farm. His rotation allows the farm to be flexible to plant different crops at different times of the year. If he is able to work around his greatest challenge of finishing corn and soybean harvest early enough to allow for cover crop seeding, then Madsen believes he can achieve this goal. In addition to solving the timing of cover crop planting post harvest, more labor would help Madsen achieve his goals. Additional labor would allow Madsen to have someone running the drill, planting winter wheat immediately behind the combine harvesting corn.

PUBLISHED JANUARY 2022

AUTHORS
Anne Pfeiffer, Vic Madsen, Erin Silva, and Danielle Kusner

FOR MORE INFORMATION
Contact Erin Silva at emsilva@wisc.edu and 608-890-1503

OGRAIN

The Organic Grain Resource and Information Network (OGRAIN) offers an educational framework for developing organic grain production in the Upper Midwest. Whether you farm 10 acres or 10,000, are an experienced organic grower or just considering the transition to organic, OGRAIN provides learning opportunities to improve your organic row crop and small grain operation.
https://ograin.cals.wisc.edu/

UW Organic Collaborative
UNIVERSITY OF WISCONSIN–MADISON

The UW Organic Collaborative is a group of faculty, staff, and partners who are committed to increasing the health and resilience of the organic industry, from the farm to consumers' kitchen tables, in Wisconsin and throughout the country, through world-class research, academic opportunity, and impactful outreach.
https://uworganic.wisc.edu/