

BEEF

INSIDER

By Raylene Nickel



Darrell Oswald (with daughter Audrey, 7) grows cover crops to build soil organic matter, to fix nitrogen, and to break up the old tillage layer.

COVER CROPS RENOVATE GRASSLAND

DIVERSIFYING PLANT COMMUNITIES RESTORES SOIL HEALTH.

Cover crops are rejuvenating lackluster hayfields on Darrell Oswald's cow-calf operation near Wing, North Dakota. The alfalfa in the fields had gradually died out, leaving monocultures of domestic perennial grasses. With decreasing plant diversity, the grasses and soils lost vigor, and production dropped.

"Some of my hay ground and fields that were once in the CRP had become monocultures of perennial grass over time," says Oswald. "The soil biology was limited. By no-till planting cover crops, I'm giving these fields the benefit of plant diversity. The diversity mimics the natural plant diversity of native range. The cover crops build soil organic matter, fix nitrogen, and break up the old tillage layer in fields that once were farmed."

COVER CROP MANAGEMENT

Since 2006, when Oswald grew his first cover crop on hay ground, he has managed the former hayfields in several ways. He has grown forages for hay by no-till planting some fields to oats and peas, or forage barley.

In one field in 2010, he grew a full-season cover crop followed by a no-till corn crop in 2011.

His more typical practice in these former hayfields is to grow a no-till full-season cover crop for grazing. "Animal impact gives additional diversity," says Oswald. "There's a beneficial synergism between grazing animals, plants, and soil. The animals' hoof action, urine, and manure play important roles. Animal impact promotes diversity and feeds soil biology."

To prepare fields for an initial cover crop planting, Oswald

applies chemical to burn down the existing perennial grass. In subsequent years, he aims to no-till plant a full-season cover in April or early May. The early planting into moist soil gives the multi-species cover crop a chance to compete with any persisting grass plants and possible weed growth.

Plant species in the cover crop mix vary with seed availability, but they often include cowpeas, soybeans, pearl millet, sunflowers, sweet clover, radishes, turnips, oats, peas, kale, and Italian ryegrass.

"These plants grow all kinds of different roots that have a variety of structures, and they grow to various depths," says Oswald. "The diverse roots help break up soil compaction and improve water infiltration."

He seeds the cover crop at a rate of about 45 pounds

per acre using a John Deere 1690 no-till drill. The cost of the seed is \$35 to \$40 an acre.

By the end of the growing season last fall, the cover crop stood 2 to 3 feet in height. Oswald started grazing the crop at the end of November.

"Though there had been hard freezes, the kale was still thick and lush," he says.

He turned 175 pairs into a 90-acre field on November 27. "I weaned the calves on December 7, but I turned the cows back out on the cover crop," Oswald explains. "In total, I grazed it for 10 days with 175 pairs and then 21 days with 175 cows without calves."

In previous years, Oswald has included taller plants like sorghum, Sudan grass, and sunflowers in the cover crop planting. These strong-structured plants generally stand above snow levels and, thus, potentially provide grazing longer into the winter.

The forage produced by the cover crop for late-season grazing is typically more than the late-season forage standing on Oswald's pastures of tame grass stockpiled for late grazing.

GRAZING WITH CARE

Despite grazing during the dormant season, Oswald is careful not to overgraze the cover crop. He leaves sufficient residue to keep the ground well covered.

"After I took the cattle off last fall, the ground was



Kale is one of several plant species North Dakota farmer Darrell Oswald grows. Cover crop mixes vary with seed availability.

still completely covered with residue; much of it was still standing,” he says. “I want to leave enough residue to feed the soil biology as it works to break down the residue and cycle the nutrients.”

GRAZING SEASON EXTENSION

The extension of the grazing season provided by the cover crops is a real boon to Oswald’s annual production system of grazing native and tame grass pastures (see sidebar). “In 2012, because of the cover crops and stock-piled grasses, I was able to graze 268 days out of the year,” he says.

Since planting his first cover crop on grassland in 2006, Oswald has planted cover crops on additional grass fields with the intent of rejuvenating biodiversity in plants and soil life.

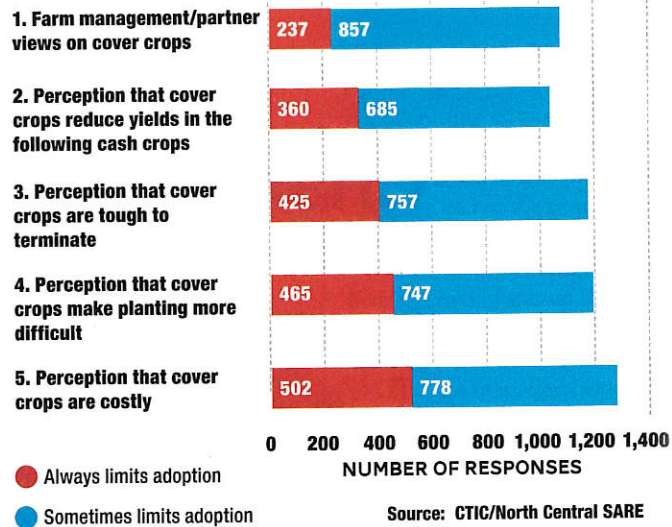
The renovation is a slow process, and results are just now becoming evident. Improved soil health in fields renovated the earliest is resulting in greater production. “These fields will be the first planted back to perennials,” says Oswald.

Soil processes are also evolving. “Because I leave a lot of litter on the surface, the soil is cooler and the water infiltration rate is better,” he says. “The color and texture of the soil are changing, as well, suggesting greater health. The soil is full of earthworms, and, in summer, the full-season cover crop is alive with pollinating insects.”

To measure the extent to which natural soil fertility is being restored, Oswald experimented with fertilization rates while growing a corn crop in 2011. He grew the corn in a field that had grown a full-season cover crop the year before. The cover crop had been lightly grazed.

“On part of the field, I ap-

5 FACTORS THAT INFLUENCE COVER CROP ADOPTION



plied no fertilizer. On another part, I applied 45 pounds to the acre of dry equivalent nitrogen. On a third part, I applied 90 pounds to the acre of dry equivalent nitrogen,” he says. “When I combined the corn, I saw little difference between the three treatments. This suggests that the cover crop supplies the fertility needed by the subsequent crop.

“Cover crops give me a way to speed up biological time and improve soil health quickly in old grass stands,” he says. “They help me keep the ground covered, and they’re a tool I can use to hold cattle out on the land as long as possible.” **SF**

LEARN MORE

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A ROTATIONAL SYSTEM

Growing cover crops as a means of renovating hayfields adds diversity to Darrell Oswald’s production system and helps him lengthen the grazing season.

Besides cover crops, his herd rotationally grazes brome-alfalfa pastures and native range. The tame grass fields comprise 10 pastures, and the native range is cross-fenced into 24 paddocks. Paddock sizes range from 13 to 40 acres.

“I run about 175 cows, and this number of cattle will graze my smaller paddocks for three days and my largest paddocks for 12 days, depending on forage availability,” he says. “I use a once-over rotation, so paddocks generally are grazed only once.”

Because Oswald alternates paddocks where cattle begin grazing each spring, some paddocks may rest for as long as a year or more before being grazed. **SF**