Healthy Soils, Happy Cows Grower Showcase

March 2026

Three farms in Wisconsin's Sheboygan and Ozaukee counties are interseeding cover crops early into their corn silage crop to maximize soil cover while minimizing yield decline. Sand County Foundation (SCF) is partnering with these farmers to demonstrate how interseeding cover crops may improve silage feed quality, and consequently improve milk production. Special management is being trialed throughout the two year timeframe to create a resilient system that could be implemented among Midwest dairy farmers. While cover crop use in Wisconsin has slowly increased, use by dairy farmers on silage corn acreage is not often considered as an opportunity to increase silage biomass, improve livestock health, or offset costs. When successfully established, cover crops can decrease erosion and nutrient runoff, improve trafficability for machinery, and increase water storage capacity during periods of drought. Grazing cover crops can decrease veterinary bills, and increase milk quality and quantity due to the added plant diversity introduced into the diet.

Farm Trial Approach

Cover crops are interseeded into approximately 20 acres of established corn silage fields. The objective is to increase biomass without negatively impacting yield beyond an acceptable threshold. Each farm will implement a herbicide management plan and tailor the cover crop blend to what will grow best on their farm. The comparison field will be planted to corn silage without cover crops.

General Rotation

Corn silage planted with interseeded cover crop ▸ Silage harvest ▸ Small grain planted in fall ▸ Spring small grain cover taken for forage ▸ Next crop

Analysis Approach

At silage harvest, the chopped silage is collected and packed into mini silos designed to simulate the farm fermentation process. The mini silos are four inch PVC pipe cut to 14 inch lengths and covered with rubber caps and hose clamps to seal. One cap has a piece of tubing and rubber valve that allows gas release.

Each farm has five samples taken annually; two are control samples without cover crops, and three samples are from the interseeding trial. The silage sample ferments for 60 days in the silo, separate from the farm's primary silage storage.

SCF is working closely with Agri-King to analyze fermented silage, both with and without the cover crop biomass, to understand how the cover crop biomass impacts feed quality. In 2023, results indicated that the mini silos did allow the silage samples to properly ferment; the lactic acid, pH, and mold counts were all within normal testing range. Feed analysis results will be compiled and shared after the second crop season of the project wraps up.

Loehr Dairy

Farm Profile

With 500 milking cows and 1,300 acres of cropland, the Loehrs stay busy with their farm management throughout the year. Since 2015, they have planted corn and soybeans for silage, interseeding the soybeans within corn. They rotate into wheat, alfalfa, or an annual mix the following year. By keeping the soil covered, the Loehrs have seen improved trafficability following extreme precipitation events and increased feed diversity for their livestock. For the trial, they interseeded cover crops into the corn rows in the same field pass (using the planter setup shown on the next page). After silage harvest, they planted small grain with winter peas and crimson clover, and then broadcast spread the manure. The small grain overwinters and is chopped for feed. Additionally, they planted fields of diverse annual species mix that were chopped and fermented separately. The annual mix was sampled instead of a control without interseeding, because corn-only fields were not available.

Implementation: Prior to engaging with SCF in this demonstration, the Loehrs broadcasted cover crop seed into the corn without success. Silage corn is typically planted on 30-inch rows with one pass, and soybeans are drilled separately on 7.5-inch rows. In 2023, interseeding was done with a new drill that follows the corn planter to drill the cover crop seed and soybeans between the corn rows. This increases the seed to soil contact to improve the establishment success while decreasing competition with the corn and soybean. Heavy weeds grew in the cover crop field in 2023 and a rescue herbicide treatment was applied leaving only soybeans interseeded in the corn silage field. Only soybeans were interseeded in 2024 corn silage and fields of annual mix interseeded in sorghum silage. The annual mix is planted with a drill, sorghum in one box planted on 45 inch twin rows and the mix of cover crops planted in the others on 7.5 inch rows and is harvested considerably later than corn silage fields.

Lessons learned: As they continue interseeding, they will retrofit a planter to make sure cover crops and soybeans stay between rows of corn. When using cover crops for diversity in corn silage, they should be planted in fields where the small grain can remain or where manure has not been applied to reduce weed pressure. Long term on the farm, the annual mix appears to be a more appealing option to bring diversity to the feed coupled with corn soybean silage fields that allow for better weed management since they have room to house two silage piles.

The Loehrs are continually learning about species selection. When sorghum was planted too deep, it did not emerge. If buckwheat was planted too close to the corn and soybeans, it created competition. When rye was used as the small grain forage rather than triticale, the soybean emergence was negatively impacted.

2023 Management Details

Days planted after corn: 0

Herbicide plan: Glyphosate applied three days preplant, Liberty® used as a rescue treatment.

Harvest notes: The annual mix field was difficult to harvest as it got tangled around the ends of the head. During corn chopping, there was little problem with the extra biomass. Overall, the yield of the corn soybean system was around 18 ton/acre of feed with the harvested small grain providing an additional 5.25 ton/acre.

Agronomic impacts: Weed pressure set in mid-season with problematic pigweeds during the dry year. The canopy cover from the cash crop and the covers was minimal until late in the season and left a chance for fast growing weeds to move in. ◆

Species and seeding rate (lb/acre):

Interseeding Corn/Soybeans	Annual Mix
Corn - 30,000 seeds	**BMR Sorghum** - 2-4 lb
Soybean - 45,000 seed	**Spring Forage Pea** - 18 lb
Spring Forage Pea - 18 lb	**Laredo Forage Soybeans -** 10.5 lb
Laredo Forage Soybeans - 10.5 lb	**Buckwheat** - 2 lb
Crimson Clover - 3 lb	**Sunflower** - 2 lb
Buckwheat - 2 lb	
Sunflower - 2 lb	
BMR Sorghum - 1 lb	

Double Dutch Dairy

Farm Profile

This family-run farm manages over 900 acres. They have 260 dairy cows, beef cattle, honey bees, and sell products directly to consumers. Throughout their dairy and cash crop operation, they have transitioned to a diverse crop rotation with high field residue that improves the land and the feed used to produce milk. Diversifying their corn silage provides an additional benefit of being visually appealing to the community. They plan to open an on-farm creamery where the public can be inspired by the sunflowers that have been integrated into the silage mix, and learn how farmers are adopting innovative management to improve biodiversity.

Within the last five years, the farm has transitioned from a conventional tillage system to a minimum to no-tillage approach. Keeping a diverse rotation improves the soil aggregation and aeration in the no-till system. Planting a cover crop after silage harvest was a challenge for the farm, and due to the late planting date, often resulted in low biomass. It was also not a convenient time to be planting, since staff would often be preoccupied with finishing the harvest. An ideal rotation would be corn silage interseeded, followed by a cereal rye harvested for feed in the spring, with an annual mix to follow and planting of cereal rye cover crop to overwinter, then back to corn. This could lead to far less corn-on-corn years than a typical dairy rotation of corn and alfalfa.

Implementation: Initially Double Dutch Dairy incorporated more crops into the rotation like rye, sorghum-sudan, and soybeans, but then they began to consider how to simplify the planting while expanding the concept. For the 2023 and 2024 trials, the farm interseeded a cover crop into corn silage. This was followed by cereal rye harvested in the spring. The cereal rye is chemically terminated before corn and covers are planted. For 2024, Double Dutch Dairy reduced the number of cover crop species in their mix and explored other herbicide options. They were focusing on cover crop species with broadleaves to allow for the use of a herbicide that targets grass only. They continued to use sunflowers, forage soybeans, and clovers. The wet weather in 2024 made it hard to get the cover crops planted. The corn was planted in mid-June and cover crops in mid-July. This led to more sporadic and limited growth of the covers.

Some additional volunteer species came through from the prior year's cover crop mix, including vetch and clover.

2023 Management Details

Days planted after corn: Planted around V2 on 6/28, about 30 days after corn was planted

Herbicide plan: Apply glyphosate and crop oil to terminate the small grain after corn planting preemergence. Spray glyphosate and Cadet® after interseeded cover crops but before cover crop emergence.

How they planted: Use a drill with rows removed every 30" for the corn row. This means they do not plant cover crops directly over the corn plant row. They have experimented with different pieces of machinery to learn that certain coulters move too much soil.

Harvest notes: No challenges in 2023. The custom chopper moved through the fields without any complaints or slowdowns. Yield came in at approximately 19 tons per acre which was lower compared to their control of 22 ton per acre. The diverse rotation gives an additional 5 tons per acre in small grain forage harvested from the overwintering cover corp.

Agronomic impacts: In a previous year, the extra ground cover was an attractant to armyworms, which is a problem in the conventional corn. There were more weeds, especially pigweeds, than ideal in 2023, but not enough to terminate the cover. In a dry year like 2023, it is important to get the corn planted right after rye termination. Where planting was delayed, the ground became hard and depth to plant was shallow.

Economics: The additional high quality feed that comes from rye forage makes the decreased corn silage yield acceptable. In addition, the cost of interseeding is expected to reduce herbicide costs, however this benefit has not yet been realized due to weed pressure. Cover crops do add cost to the mix. However, there are federal and private financial incentives available for planting cover crops and improving crop management. Veterinary bills have decreased since diversifying feed approximately seven years ago, when alfalfa was removed from the rotation and overall vet visits are less frequent. While this system appears to increase expenses, the hard to measure benefits outweigh the additional costs to the farm. By improving the milk quality, they can receive a higher price for the milk components. Cover crop benefits were estimated by considering the NRCS EQIP rate for a diverse cover crop.

Cost:

Silage value $85/ton * 3 ton decreased by interseeding = $255/ac

Cover crop cost $18 + $10 planting = $28/ac

Rye seed $25 + $10 planting = $35/ac

Total cost = $318/acre

Benefit:

Rye forage value $40/ton * 5 ton provided/ac = $200/ac

Cover Crop Conservation Incentives estimated based on NRCS rate = $58/ac

Total financial benefit = $258/acre

Unaccounted = decreased vet bills, increased milk components, improved soil trafficability

Balance = $60 initial cost without unaccounted benefits ◆

Species and seeding rate (lb/acre):

Corn - 27,000 seeds
Interseeded:
Forage Soybean - 12.1 lb
Medium Red Clover - 0.5 lb
Sunflower - 4.4 lb
Sorghum Sudan - 0.9 lb
Italian Ryegrass - 0.5 lb
Lablab Bean - 1.5 lb
Kale - 0.075 lb
Cereal Rye - 180 lb in the Fall

Photo credit: Dan Jacque

Dan Jacque

Farm Profile

Dan farms approximately 450 acres with 160 milking cows. His focus is on continual improvement through covering the soil, enhancing livestock feed, and managing manure storage while increasing conservation across the whole operation by focusing on the full system. He has been utilizing early seeded cover crops in his silage crop longer than SCF's other project collaborators, and is very committed to making sure the management needed to be successful happens. He strives for continual cover of the soil, moving from alfalfa or annual forage to seeding in a small grain that overwinters, harvesting that growing forage in spring, planting the corn and then cover crops. Manure is used in spring or fall.

Implementation: For the 2023 and 2024 trials, small grains present were harvested in spring and a vertical tillage or cultivator was used where manure was applied. Dan then planted the corn crop and interseeded cover crops. His fields had a mix of crops prior to corn silage and interseeding.

In 2024, the cover crop species were altered to increase or add those that have emerged most consistently over multiple years of farm trials interseeding in silage corn. Networking through the project with the other two farms has encouraged Dan to add forage soybeans, as they were one of the main species to emerge and get considerable growth in the other farms trials. They also provide a good feed source.

After harvest good ground cover is established by the rapeseed, vetch, ryegrass, and clovers.

2023 Management Details

Days planted after corn: 19 days

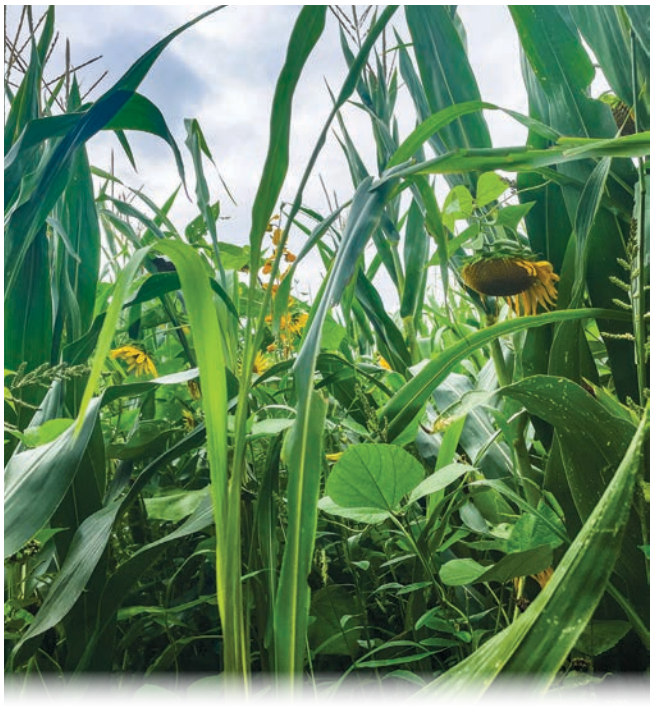
Herbicide plan: Verdict® applied preplant with light incorporation, glyphosate and Aim® applied one week prior to interseeding.

How they planted: Starter was applied at corn planting. Cover crops were planted after corn emergence utilizing two different pieces of equipment: a no-till drill and an Interseeder. The interseeder allowed bigger seed to pass through the openings as the foam meters provide better species distribution across the field. They planted at a 45 degree angle with the no-till drill, which provides better depth consistency due to less bounce and more pressure on the single seed disk opener. The 45 degree angle helps where consistent straight lines are not always present to stay off any single row.

Harvest notes: Yield appeared to be consistent between the fields that had interseeding and those that did not. Generally throughout his history he has not noted a decline in yield from interseeding.

Agronomic impacts: There were some weeds that came up, mostly ragweeds, pigweeds, and grasses. Being an abnormally dry year, there was concern about how the cover crops would emerge and grow, but the covers emerged well. Some of the brassicas were fed upon by insects toward the end of the season so we question whether they are useful in the mix of species. However, they were one of the primary things that continued to provide a lot of ground cover and growth after harvest, before frost.

Economics: While the cover crop seed costs approximately $58/acre, it is offset with NRCS multispecies cover crop incentives. The only additional cost is planting. There are also unaccounted benefits including reduced erosion, less soil deposited on roads during harvest, and improved milk components. Since implementing cover cropping into corn silage Dan has seen an improvement in butterfat, protein, and quantity. Butterfat improved by about 0.35 % and protein near 0.1 %. With quantity increases, this has yielded $13,900 annually compared to pre-management changes. The milk metrics have largely been attributed to diversifying crops, but milk production has many variables. That is why silage quality testing is important to the farm to correctly attribute improvements. ◆



Species and seeding rate (lb/acre):

Corn - Planted 32,000 seeds
Medium Red Clover - 5 lb
Lablab Bean - 4 lb
Buckwheat - 2 lb
Dwarf Essex Rapeseed - 2 lb
Sunflower - 2 lb
Sorghum Sudangrass - 2 lb
Sunhemp - 2 lb
Ryegrass - 2 lb
Kale - 2 lb

Silage Quality Preliminary Results

In 2025, a feed analysis was compiled from the two-year trial of planting cover crops between rows of corn or sorghum silage. The results from the two years showed differing trends, which may be attributed to varying weather patterns and their impact on the main crop's health and the cover crop's emergence.

In the spring of 2023, a dry spell led to a quick and vigorous emergence of weeds. This required an herbicide application in one trial, which left only interseeded soybeans and no other cover crops in corn silage. In the other two trials, pigweed species were present throughout the interseeded silage crops.

The spring of 2024 was wet, causing a delay in planting the cover crops. However, the warm weather that followed increased the presence of sorghum in the cover crop mixes. The wet spring also appeared to tie up some nitrogen in the interseeded corn silage compared to the control. Notably, the interseeding successfully filled in wet areas where corn failed to grow, still providing feed tonnage and preventing undesirable species from taking root.

The feed analysis revealed that the average starch content was lower in the interseeded crop averages in both years. However, the starch digestibility of the interseeded corn silage increased compared to the control. The crude protein was also slightly higher in the interseeded corn silage. Proteins and starch can interact, with proteins in some grains potentially inhibiting starch digestion. Starch in dairy feed provides energy, increasing milk yield by fueling microbial growth in the rumen and providing glucose after small intestine digestion, while protein is essential for synthesizing microbial protein and meeting the cow's amino acid needs.[1,2]

This preliminary analysis is promising, but Sand County Foundation, Agri-King, and the participating farmers agree that additional trials and years are necessary to definitively evaluate how interseeding effects on-farm feed analysis. The potential benefits of increased feed diversity on farm profitability, soil health, and herd health are significant drivers for further investigation.

[1] Reynolds, C.K. 2006. Production and metabolic effects of site of starch digestion in dairy cattle. Animal Feed Science & Technology 130(1-2): 78-94.
https://doi.org/10.1016/j.anifeedsci.2006.01.019

[2] Sánchez-Duarte, J.I., K.F. Kalscheur, D.P. Casper, & A.D. García. 2019. Performance of dairy cows fed diets formulated at 2 starch concentrations with either canola meal or soybean meal as the protein supplement. J. Dairy Science 102: 7970-7979.
https://doi.org/10.3168/jds.2018-15760

For more information or to sign up, contact:

Tricia Verville
Agricultural Systems Director
tverville@sandcountyfoundation.org
(920) 980-1971

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