Many Ag producers have discovered the economic benefits of incorporating cover crops into their operation.

A cover crop is a crop generally grown at times of the year when cash crops are not actively growing. Covers are planted primarily to improve soil fertility and soil health, control weeds, improve water infiltration, break up pest and disease cycles, and reduce soil erosion. Cover crops are also used to manage excess water, improve water quality, provide wildlife habitat, and extend the grazing season. The range of cover crop species available and array of characteristics those species possess, allows farmers to target a broad spectrum of resource concerns.

**Cronin Farm, Potter County**
Our cattle grazed a 12-way full season cover crop with brassica production, at 3,000 lbs, and 35 kg of white clover. We grazed 32 acres in January of 2017 and the results were promising. We grazed 21 acres of cover crop and 34 inches of snow on the ground. Our concern was that the snow cover wouldn’t allow us to turn the cattle. We were able to do this. This field was set up with 5 paddocks, grazing for 40 days, consuming 3.5 tons per day. Grazing the entire 30 days kept the feed cost per day for 450 days. If we were to have a normal amount of snow, this would have been our cattle’s full feed.

**Smith Farm, Davison County**
This cover crop mix included forage, diversify grass type, soybeans, flax, and clover. It was a 12-way blend that was seeded into cover crops on 7/23/18 and 10/18/18. The cover crop was doing well and growing vigorously on the field. Growth is growing well. Grass growth is growing and the rest is growing. After grazing, the remaining 3 tons of residue helped with the salinity issue.

**Arnoldy Farm, Lyman County**
Mike Arnoldy planted flax, Indiana red, corn, and rye. Rye and flax are especially important. This year, we harvested with a stripper head. The goal of the cover crop was to provide a mix of tillage to reduce the majority of the winter wheat residue for better water quality and increasing soil organic matter.

**Rausch Farm, Potter County**
Rausch farms use cover crops to eliminate pokey soil structure in their all-loam dominated soils. Fibrous root cover crops such as oats address the adverse affects of plattsiness. Plattsiness isn't necessarily compactness, but the soil may have similar symptoms such as reduced root growth.

**Stebly Farm, Davison County**
This field had winter rye flown on 8/3/18 for the purpose of efficiently using the next spring’s moisture while managing salinity, spodic building OM, structure, infiltration, and tillth; and cycling nutrients. An added bonus is better management of next years weed growth.

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**What is the Primary Purpose of the Cover Crop?**

- Reduce soil erosion
- Improve water infiltration
- Improve soil structure
- Build organic matter
- Reduce water runoff
- Improve wildlife habitat

**Crop Types and Varieties**

- Common cover crops:
  - Winter wheat
  - Winter rye
  - Barley
  - Oats

- Summer cover crops:
  - Corn
  - Sorghum
  - Sorghum-sudangrass
  - Millet
  - Sunflowers

**Seedling Dates and Ratings**

- Seedling dates: November 1 through May 15
- Ratings:
  - L = Low
  - M = Medium
  - H = High
  - Y = Yes
  - N = No
  - Note: Not Available

**Backhoe contamination**

- To reduce chances of backhoe contamination in wheat, do not rotate to wheat for grain for 2 years.

**Considerations when using cover crops:**

- What is the primary purpose of the cover crop?
- Selecting the right cover crop for your region and soil type is crucial.

- What crop type will be the following cash crop?
- The majority of the cover crop mix is a winter bare crop type.

- Do you include warm season species or no?
- Planning to plant later than August 10, do not include warm season species.

- Review the “half half” of previously applied herbicides.

- For cutworms, refer to NRCS Cover Crop Terminology Guide for definitions and details.

- Seeding Timing Options:
  - Drill after small grain/soybean/creeping red clover; interseeding or full season.

- Source: USDA Natural Resources Conservation Service South Dakota, Field Office Technical Guide, Agriculture, Cover Crops, Table 1.

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**Source:** USDA Natural Resources Conservation Service (SD) - Field Office Technical Guide, Agriculture, Cover Crops, Table 1.
South Dakota Cover Crop Common Species and Benefits

**Dwarf Essex Rapeseed**  
*Brassica campestris/Brassica napus*  
Cool Season, broadleaf  
- Good for grazing  
- Good cold tolerance for late season grazing  
- Large taproot  
- pH tolerance 5.5–8.3  
- Occasionally overwinter with mild winter conditions  
- Flood tolerance Low, especially during establishment  
- High Drought tolerance  
- The minimum soil temperature for planting is 45°F  
- Fits well into rotations with non-brassica crops

**Common Vetch**  
*Vicia sativa*  
Cool Season, broadleaf  
- Annual or biennial  
- Good for grazing  
- Legume (N fixation)  
- Prostrate plant architecture (vines)  
- Common Vetch is different than Hairy Vetch or Chickling Vetch  
- Poor salinity tolerance  
- Seeding depth: 1½ – 2½ inches  
- Crude protein: 13–20%  
- Low C:N ratio  
- Forms arbuscular mycorrhizal associations  
- Attracts pollinators

**Cereal Rye**  
*Secale cereale*  
Cool Season, grass  
- Winter annual  
- Very good at increasing Organic Matter  
- High water use  
- Good salinity tolerance  
- Seeding depth: ½ – 2 inches  
- Crude protein: straw 4%, grain 14%  
- Medium C:N ratio  
- Forms arbuscular mycorrhizal associations  
- Assists in weed control for subsequent crops  
- Rated ‘very good’ at scavenging nitrogen from the soil

**Flax**  
*Linum usitatissimum*  
Cool Season, broadleaf  
- Annual  
- High C:N ratio  
- Medium water use  
- Fair salinity tolerance  
- Seeding depth: ½ – 1½ inch  
- Benefits from arbuscular mycorrhizal associations  
- Flowers attract pollinators

**Cowpea**  
*Vigna unguiculata*  
Warm Season, broadleaf  
- Annual  
- Legume (N fixation)  
- Resembles or looks like soybean  
- Good for grazing  
- Low water use/shallow rooted  
- Fair salinity tolerance  
- Seeding depth: ½ – 1 inch  
- Crude protein: grain and leaves 19-30% – stems 13-17%  
- Low C:N ratio  
- Forms arbuscular mycorrhizal associations  
- Attracts pollinators

**Oats**  
*Avena sativa*  
Cool Season, grass  
- Annual  
- Good at Increasing Organic Matter  
- Fair salinity tolerance  
- Seeding depth: ½ – 1½ inches  
- Crude protein: hay 9-15%, grain 13-18%  
- Forms arbuscular mycorrhizal associations  
- Self pollinator (wind)  
- Rated ‘very good’ at scavenging nitrogen from the soil

**Radish**  
*Raphanus sativus*  
Cool Season, broadleaf  
- Annual  
- Good for grazing  
- High water use  
- Poor salinity tolerance  
- Seeding depth: ½ – 1½ inch  
- Crude protein: 23-30%  
- C:N ratio: Low 19 – 20  
- Does not form arbuscular mycorrhizal associations  
- Rated ‘good’ at scavenging nitrogen from the soil  
- Flowers attract pollinators

**Field Pea**  
*Pisum sativum arvense*  
Cool Season, broadleaf  
- Annual  
- Legume (N fixation)  
- Good for grazing  
- Low water use  
- Poor salinity tolerance  
- Seeding depth: 1 – 3 inches  
- Crude protein hay 14%, grain 24%, silage 15%  
- Low C:N ratio  
- Forms arbuscular mycorrhizal associations  
- Flowers attract pollinators

**Pearl Millet**  
*Pennisetum glaucum*  
Warm Season, grass  
- Annual  
- Excellent for increasing Organic Matter  
- Good for grazing  
- Poor salinity tolerance  
- Seeding depth: ½ – 1 inch  
- Crude protein: hay 13%  
- Forms arbuscular mycorrhizal associations  
- Potential for accumulating toxic levels of nitrate, especially on the lower 6” of the stalks

**Turnip**  
*Brassica rapa L. var. rapa*  
Cool Season, broadleaf  
- Good Cold Tolerance  
- Good for grazing  
- Poor salinity tolerance  
- Seeding depth: ½ – 1½ inch  
- Crude protein: tops 16%, root 12-14%  
- Low C:N ratio  
- Does not form arbuscular mycorrhizal associations  
- Rated ‘good’ at scavenging nitrogen from the soil  
- Flowers attract pollinators

**Annual Ryegrass**  
*Lolium multiflorum*  
Cool Season, grass  
- Good at Increasing Organic Matter  
- Seeding rate is much less than cereal rye  
- Deep rooted  
- Good at scavenging nutrients from the soil profile  
- Desirable for grazing but often less biomass than other grasses  
- Has been used in aerial seeding into a standing crop  
- Can overwinter with spring control difficult  
- Cross pollinate freely, and many different types have developed  
- It does not withstand hot, dry weather or severe winter

**Sorghum-Sudangrass**  
*Sorghum bicolor*  
Warm Season, grass  
- Annual  
- Good for silage, grazing or hayed  
- Excellent for increasing Organic Matter  
- High tonnage potential  
- Fair salinity tolerance  
- Seeding depth: 1 inch  
- Crude protein: hay 7-11%, silage 6-17%  
- Medium C:N ratio  
- Forms arbuscular mycorrhizal associations  
- Rated ‘Excellent’ at nutrient scavenging  
- Stress conditions that limit growth (e.g., drought, frost) can contribute to prussic acid accumulation in leaves