Selecting Cover Crop Species

COVER CROP

TRAINING MODULE


There are dozens of
cover crop species and
varieties available

Crimson Clover

Factors to consider in selecting a cover crop

- What time of year is the cover crop needed?
- What are the goals for the cover crop use?
- What planting method will be used?
- How easy is the cover crop to establish?
- What kind of soils are present?
- What are the cash crops in the rotation?
- How much does the seed cost and how available is it?

Radishes

Biology of the cover crop plant

- Annuals – fastest plants at getting established
  - Winter annuals start growth in fall and generally require a cold period to flower
  - Summer annuals will flower in a single growing season
  - Cool season annuals do best in spring or fall
  - Warm season annuals thrive in the heat of mid-summer
- Biennials
  - Two-year growth cycle, normally start growth in the spring or summer of one year and don't flower and produce seed until the following year, e.g., sweet clover
- Perennials
  - Plants that will live multiple years and can flower every year
  - "Weak" perennials tend to die out after a few years
  - Perennials are generally much slower at early above ground growth than annuals, as they are putting energy into roots

Cover Crops *(examples)*

- Fall planted
  - Cereal (winter) rye
  - Oats
  - Oilseed radishes
  - Annual ryegrass
  - Hairy vetch

Crimson clover in a Missouri field.

- Spring planted
  - Spring triticale
  - Oats
  - Austrian peas
  - Dwarf rapeseed
  - Clovers

- Summer planted
  - Sorghum sudan grass
  - Foxtail millet
  - Buckwheat

What are the goals for the cover crop?

- Soil erosion – need fast cover, good rooting, persistent growth – cereal rye, triticale
- Soil compaction – deep rooting or taproots – annual ryegrass, oilseed radishes, sunflowers
- Nitrogen fixation – legumes – Austrian winter peas, crimson clover, red clover, hairy vetch, sunnhemp, cowpeas
- Nitrogen sequestration – cereal rye, other winter cereals, radishes
- Disease/nematode suppression – Brassicas (eg. radish), or just good rotation practices – don't use a grass cover crop before or after a grass cash crop (corn), avoid a legume cover crop before soybeans
- Weed control – cereal rye is allelopathic to small-seed broadleaf weeds, Brassicas good at smothering winter annual weeds
- Pollinator habitat – buckwheat, sunflowers, diverse mixes


Oilseed Radishes

What planting method will be used?

- Traditionally, most cover crop seed has been drilled or broadcast seeded. When broadcasting:
  - the larger the seed, the harder it is to get good seed-soil contact, so more important to rough up the soil surface, and possibly roll or press the seed into the soil after broadcasting
  - aerial seeding works best with small seeded cover crops like radishes; don't use with large seeds like Austrian winter peas
- Precision planters (like a corn planter) can work well for one or two species but not as well for multi-way blends of cover crop seed
- Planting method will often be tied to planting date, and some species are more important to plant early in fall (like radishes) than others (like cereal rye)

Photo credit Joel Gruver, Western Illinois University

How easy is the cover crop to establish?

- Ease of establishment based on type of seed, method of seeding, time of seeding, soil conditions, and especially moisture conditions and rainfall.
- In general:
  - Easier to establish – crimson clover, cereal rye, oats, wheat, triticale, radishes, other Brassicas (radishes, rapeseed, etc.)
  - Using mixes of cover crops can improve odds of success, especially if just broadcasting or “disking it in” – something is likely to grow!
  - Buying clean high-quality seed and good varieties can make a big difference – find out the tested germination – should be 85% or above.


Hairy vetch and oats

How hard is it to terminate the cover crop?

- Possible methods of control – herbicide, tilling, mowing, rolling, roller-crimper, grazing or easiest of all – winter!
- With most mechanical methods, best success comes after cover crop reaches reproductive (flowering) phase
- If using herbicides, cover crop needs to be actively growing to translocate the herbicide
- Clovers not especially easy to kill with glyphosate alone
- Really thick matts of covers (rye or mixes) can be tough to completely kill with a roller crimper
- For beginning cover crop users, sometimes easiest thing is a cover crop that winter kills – oats, radishes
- Crimson clover easy with everything except glyphosate, winter rye pretty easy to kill with glyphosate


Crimson clover

What kind of soils are present?

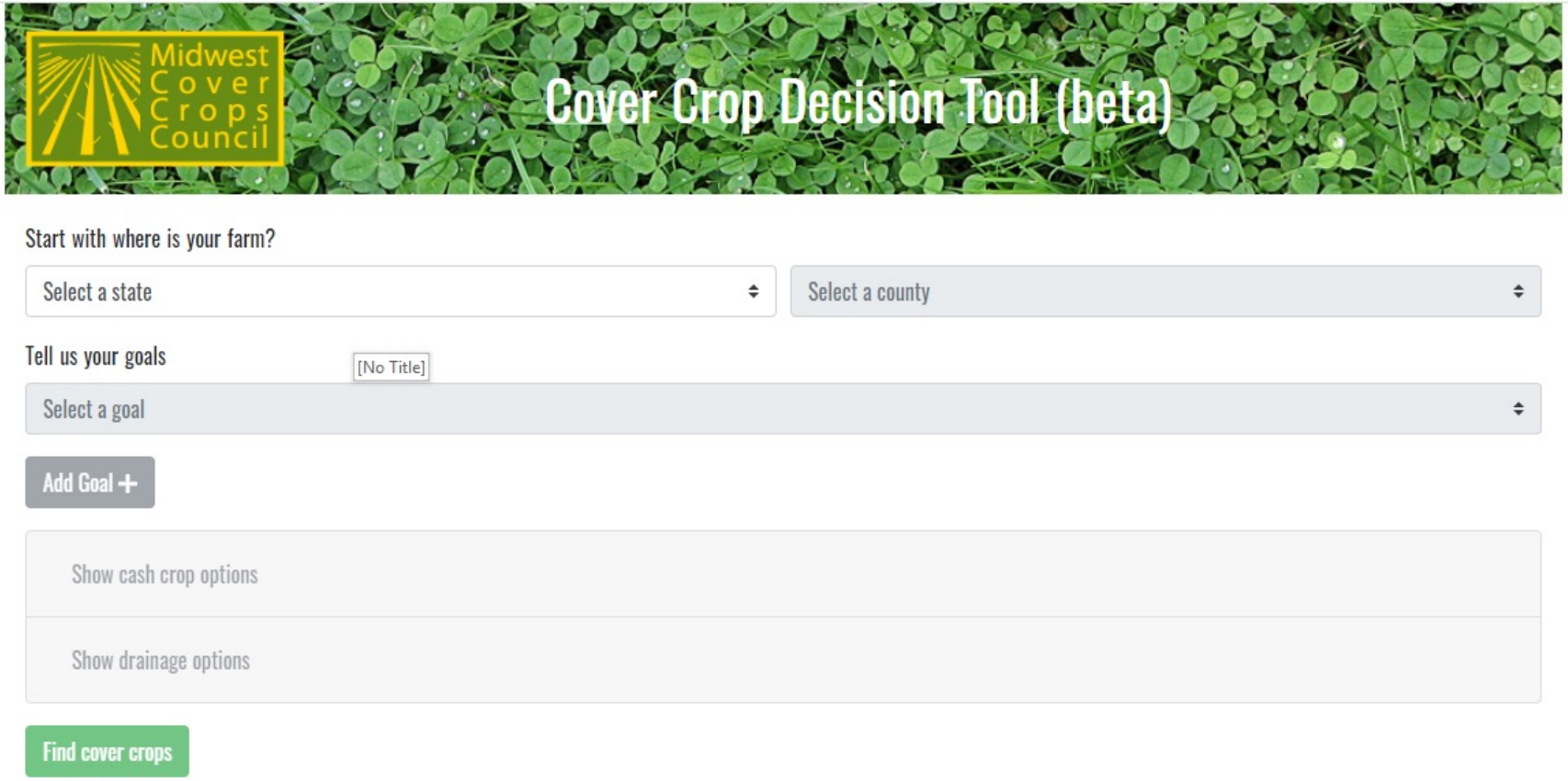
- Good drainage important for some overwintering cover crops like crimson clover
- Sandy soils may need a cover crop good at building organic matter and helping hold the soil from blowing
- Claypan soils may need a strong rooting cover crop like annual ryegrass, sunflowers, or possibly radishes
- Low fertility soils may benefit from a legume, but watch out if pH is really low (grasses can tolerate acid soils better than clovers and other legumes)
- Sloping fields that are erosive need a fast-growing, persistent cover crop like cereal rye
- Saline soils are challenging, barley is recommended

Photo credit Joel Gruver, Western Illinois University

What are the cash crops in the rotation?

- Try to have a diverse rotation in terms of plant families and plant types
- Can really help to add wheat to a corn-soy rotation in combination with cover crops, especially more northern areas
- May want to adjust cash crop planting dates, herbicides
- Mixes of covers adds biodiversity
- If grazing can be done with covers, that influences choices

Midwest Cover Crop Council Cover Crop Decision Tool

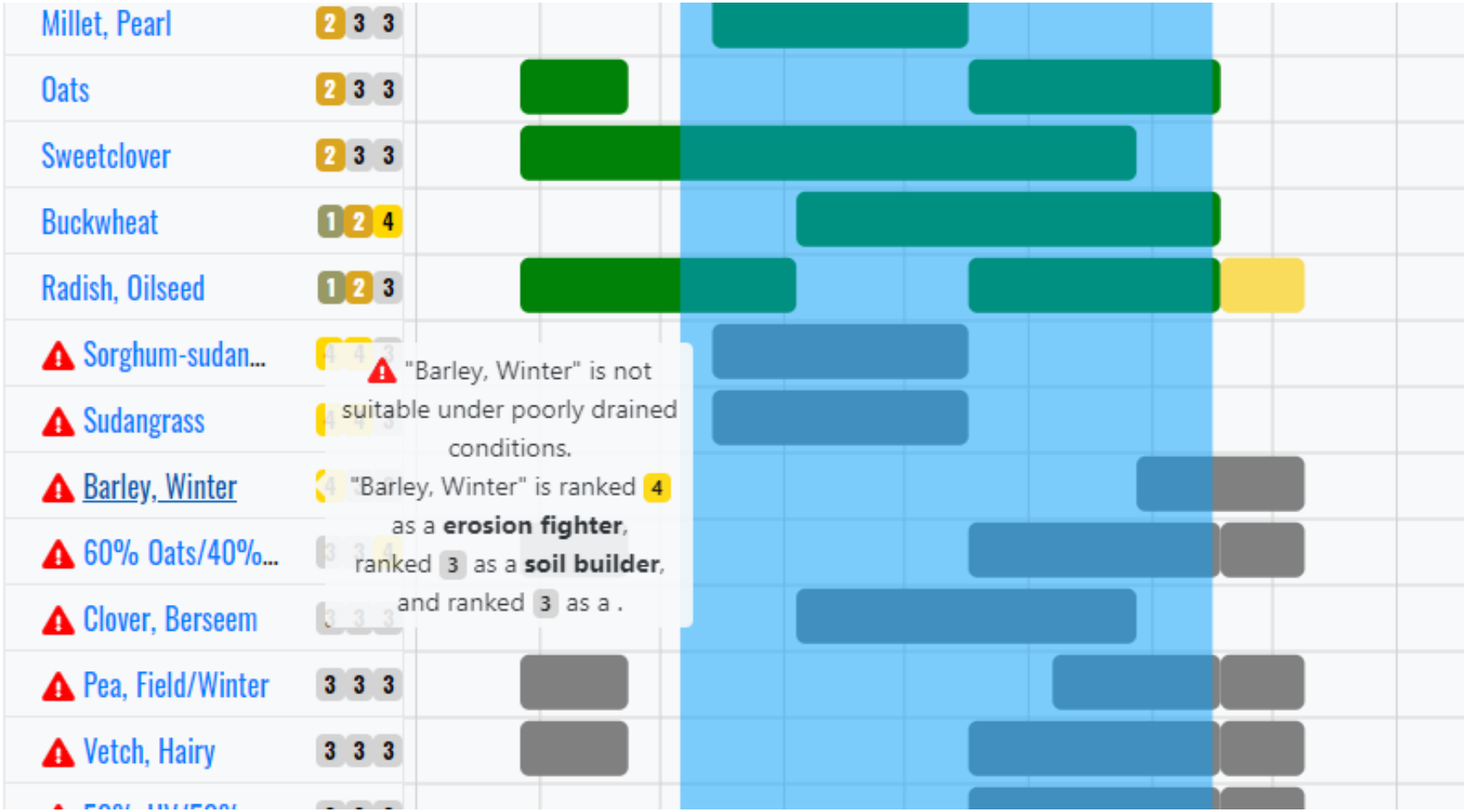


Available Cover Crops

Revise your requirements

Planting periods: Reliable Establishment | Freeze/Moisture Risk to Establishment | Frost Seeding

Goal fulfillment: 4=Excellent, 3=Very good, 2=Good, 1=Fair, 0=Poor


Millet, Pearl 2 3 3
Oats 2 3 3
Sweetclover 2 3 3
Buckwheat 1 2 4
Radish, Oilseed 1 2 3
Sorghum-sudan...
Sudangrass
Barley, Winter
60% Oats/40%...
Clover, Berseem
Pea, Field/Winter 3 3 3
Vetch, Hairy 3 3 3
"Barley, Winter" is not suitable under poorly drained conditions.
"Barley, Winter" is ranked 4 as a erosion fighter, ranked 3 as a soil builder, and ranked 3 as a .

MCCC Cover Crop Selector Tool

Click the cover crop name for additional information, including seeding depth.

MCCC Cover Crop Recipes for Midwestern States

WISCONSIN COVER CROP RECIPE MCCC-119

Post Corn Silage, Going to Soybean: Use Cereal Rye

This publication is intended to provide a starting point for farmers who are new to growing cover crops. With experience, farmers may fine-tune the use of cover crops for their systems.

Introduction

The following recipe provides an introductory approach to integrating a cover crop into a corn silage–soybean rotation.

Planning and Preparation

- *Planning*—Read about cover crops. Go to field days. Start small. Be timely. Prioritize management based on purpose and objectives.
- *Corn hybrid and planting*—If possible, plant the preceding corn silage crop early and use a hybrid within the adapted maturity range for your location.
- *Residual corn herbicides*—Cereal rye can be planted in the fall and produce a successful stand following most spring-applied residual corn herbicides. If cereal rye is to be grazed or harvested for forage, there are some time-interval restrictions. (See Resources.)
- *Seed purchase*—Order cereal rye seed early, usually by early summer. Named rye varieties can produce substantially more growth and have predictable development, but they are usually more expensive than VNS (variety not stated) seed. Use good quality seed from a reputable seed dealer.

Fall Work

- *Corn silage harvest*—Harvest fields where cereal rye is to be planted as early as possible.
- *Fall manure*—Manure applications supplying high rates of nitrogen are not recommended when soybean is the next crop. Small amounts may be permitted. If you need to apply manure, apply it as soon after corn silage harvest as possible and drill-seed cover crops after manure is applied.
- *Tillage or no-tillage*—Generally, it is easier to integrate cover crops into no-till or strip-till systems. If tillage is necessary to incorporate manure or smooth the seedbed after corn silage harvest, it should take place prior to rye seeding.
- *Timing of planting*—Plant cereal rye as soon as possible after corn harvest and at least two weeks before the average hard frost date (28°F). If planting later than mid-October, consider increasing the seeding rate.
- *Seeding rate*—Seed at a rate of 40–60 lb./acre (assuming a germination rate of 85% or greater). Seeding rates should be increased by 20% if broadcasting and increased by 10% if broadcasting and incorporating. Also increase the rate if the rye will be harvested as a silage crop in the spring.
- *Planting method*—Drill to a depth of 0.75–1.50 inches or broadcast with shallow incorporation to less than 1.50 inches. Aerial or other broadcast seeding is an option for earlier establishment into standing corn with some risk. Harvest should be planned within two weeks of seeding. Overly wet or dry conditions after aerial seeding or presence of slugs will limit success.

Spring Work

- *Termination timing*—Terminate the cereal rye in spring when the plants are 6 to 12 inches tall and actively growing or at least 10 days before planting soybean—whichever comes first. In a wet or windy spring, be ready to take advantage of any break in the weather and/or use low axle weight sprayers. Be familiar with the rules related to termination timing and crop insurance. (See *NRCS Cover Crop Termination Guidelines* in Resources.)
- *Termination herbicide*—Cereal rye can easily be terminated with a full rate of glyphosate (1 lb. acid equivalent/acre) after the rye begins growing in the spring. Effectiveness and rapidity of termination improves if rye is rapidly growing and air temperatures are warmer (> 60°F). Larger rye, rye past the boot stage, or rye sprayed during cooler weather can be more

What does the seed cost and how available is it?

- Cheap and readily available ≠ good
- Buy quality seed of known varieties and appropriate varieties – really important for annual ryegrass
- Order early, seed often in short supply late in season
- Inoculate legumes (keep inoculum cool)
- Mixes of species have pluses but can be more expensive
- Consider applying for government cost-share programs
- Invest in your cover crop like you would your cash crop!
  - Buy good seed, don't plant too thinly, and plant correctly at the right time

Sources of Cover Crop Seed

- Companies specializing in cover crop seed sales
- Forage seed companies
- Local seed warehouses/retail sellers
- Ag retailers, such as fertilizer dealers
- Other farmers*

* When buying from other farmers

- ✓Be sure seed has been recently tested for germination percent
- ✓Ask for a seed tag showing percent foreign material, weed seed, noxious weeds, and percent germ
- ✓Be aware of transport restrictions across state lines from some sellers

- Best to buy named varieties instead of variety not stated (VNS)

Buying Cover Crop Mixes

Sources – Some companies sell only pre-packaged sets of cover crop mixes or may sell only individual species, others will custom blend

Tips

- Seeding rate should be cut back to reflect total number of species
- Ask about inoculation on legumes – best to order inoculum separately, keep it cool such as refrigerator after received, and then stir in the inoculum shortly before planting; may work to have seed company do it as long as its done in cool weather shortly before shipping, and seed will be stored in cool, dry conditions.
- Seed segregation is worst when only two species and seeds are round and similar size. If using three or more species and some difference sizes and types of seed are used, segregation is usually less. Still, check the seed and make sure it doesn't need to be remixed.


Many different cover crops are available today
and more are coming on the market.
It pays to match the cover crop selected to the
specific needs in the field.