

# Cover Crops for Southwest Ohio

Second Edition 2016 - 2017



Annual Ryegrass



Cereal Rye



Sorghum- Sudangrass



Oats



Oilseed Radish



Barley



Buckwheat



Winter Wheat & Clover



Austrian Winter Pea



Crimson Clover



Red Clover



Berseem Clover

Clermont Soil & Water Conservation District  
Natural Resources Conservation Service

**Cover Crop:** A crop planted primarily to manage soil fertility, soil quality, water, weeds, pests, diseases, biodiversity and wildlife in an agroecosystem.

## What's Holding You Back?

*I have farmed this way successfully for years.. Why change?*

*Cover crops are one of many Best Management Practice that can help you address common farming challenges and find the road to success...*

◆ **Top soil is disappearing rapidly**

- ◆ *Cover crops help prevent this from happening. Cover crops hold the soil with their extensive root system along with residue protecting the soil surface. They also slow down water runoff and improve infiltration, reducing the overall rate of both sheet and rill erosion and gully erosion.*

◆ **Fertilizer costs are high**

- ◆ *Cover crops tie up nutrients over winter and release them to the next crop planted. Leguminous cover crops produce nitrogen for use by the subsequent crop, and can be credited toward the nitrogen needs for the cash crop. Cover crops also add organic matter to the soil. Over time, less fertilizer may be needed due to the improved ability of the soil to make nutrients available to the growing crop. Cover crops helps hold the fertilizer you purchased on your field, making more available to the cash crop.*

◆ **Hydric soils and soil compaction are challenging**

- ◆ *Soils in the southwest Ohio region were formed by a different glacier than the rest of Ohio. The soil has a very high silt content, which is packed tightly with little structure, allowing very little water infiltration. These soils are problematic, particularly in flatter areas. Without good infiltration, water moves off the fields, picks up speed over long distances and causes problems with gully erosion. Management of these soils is critical to successful farming.*
  - ◆ *Cover crops slow water runoff, reduce erosion and improve infiltration. Improved infiltration will allow water into the soil subsurface so it's available to the next growing crop in the summer months.*
  - ◆ *Cover crops are not only for Highly Erodible Land (HEL), but can benefit land with any soil type/condition.*

◆ **Water quality is in decline**

- ◆ *Cover crops help to reduce the amount of pesticides and nutrients leaving the fields attached to soil particles. Cover crops serve as a filter for sediment, nutrients, and pesticides to prevent losses from surface runoff. Soil conservation and water quality protection will benefit generations to come.*

***“Set a good example for others to follow.... plant cover crops in your area.”***

*Ernie Hatfield, Local Farmer*

## The Benefits of Cover Crops

- ◆ Helps prevent soil erosion
- ◆ Reduces surface water runoff
- ◆ Improves water quality
- ◆ Adds organic matter to the soil
  - ◆ Increases earthworm populations
    - ◆ Increases soil tilth, aeration, and provides 'routes' for crop's roots for greater nutrient recycling
- ◆ Increase in beneficial microorganisms
- ◆ Increases water infiltration
- ◆ Reduces soil compaction
- ◆ Provides weed control
- ◆ Helps control nematodes
- ◆ Reduces fertilizer application—Save Money!



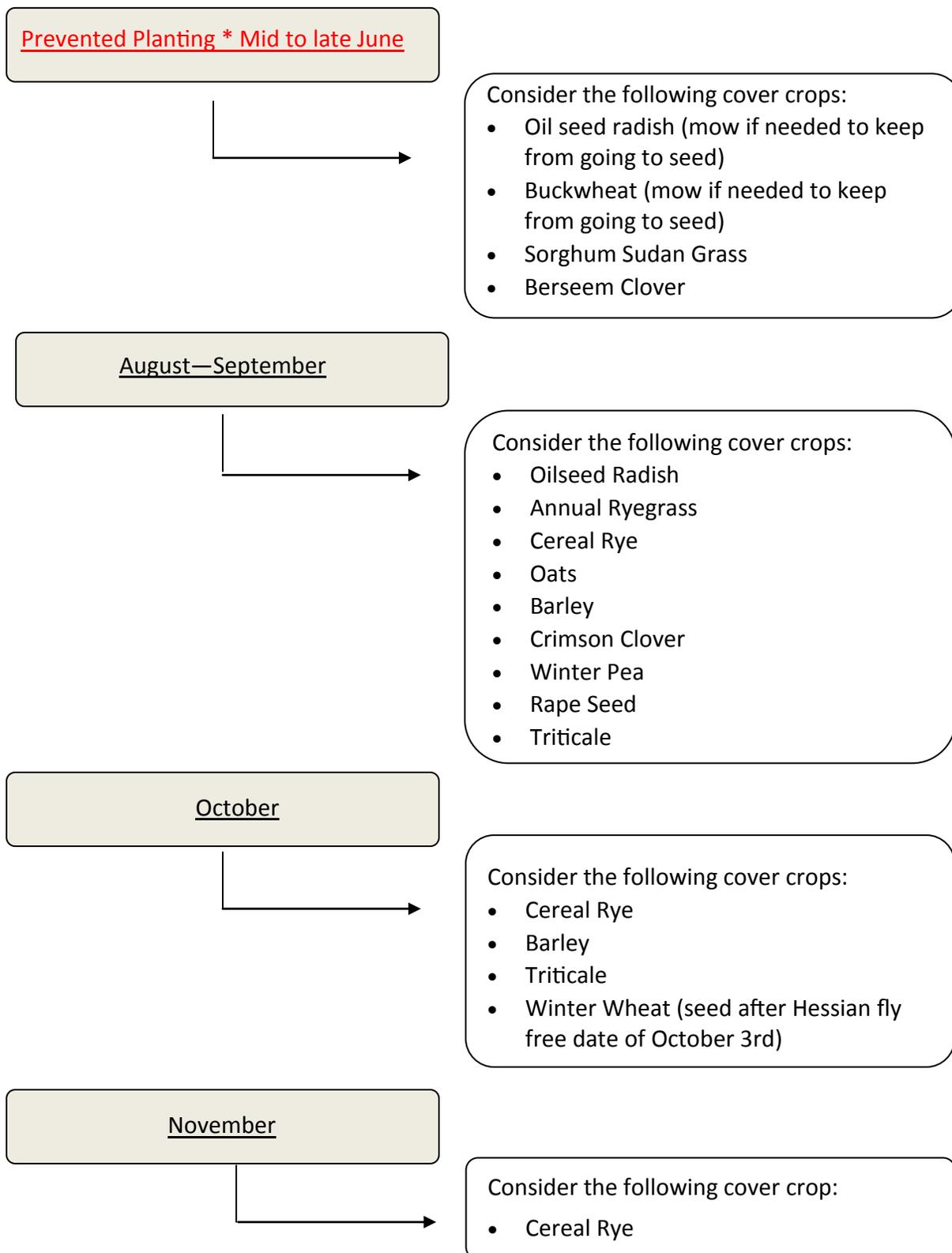
### ***Improve Your Chances for Success...***

*Planting cover crops does require additional planning; however, the benefits far outweigh the time and resources required. Select the cover crop that fits your needs (e.g. soil erosion, compaction) and learn the best management practices that will increase your chances of success. In addition to the benefits mentioned earlier, cover crops can also increase your planting window after a few growing seasons.*



# CHOOSING THE RIGHT COVER CROP AND MANAGEMENT STRATEGIES

The following chart includes recommendations on cover crop type based on when cover crops can be planted.



\* Prevented Planting - Failure to plant the insured crop with the proper equipment by the final planting date



**Cover Crop mixes can offer many benefits, depending on the goals for your fields. Below are suggestions to address specific challenges:**

- **Increase organic matter:** Sorghum Sudan grass, cereal rye, annual ryegrass, triticale, oats, wheat, spelt and barley
- **For nitrogen:** cowpea, winter pea, red clover, sweet clover, crimson clover, berseem clover, hairy vetch, alfalfa, soybeans and mung beans.
- **Require no herbicide to kill:** oats, cowpea, winter pea (if planted early), crotalaria, sorghum sudan-grass, and oilseed or tillage radishes.
- **Reduce compaction:** annual ryegrass, oilseed or tillage radish, sweet clover (deep taproot)
- **Start up or enhance no-till:** oilseed or tillage radish, turnips, Sorghum Sudan grass.
- **Prevent soil erosion:** cereal rye, annual ryegrass, oats, wheat, barley, hairy vetch and winter pea.
- **Recapture excess nutrients:** oilseed or tillage radish, (if planted in a mix), turnips, annual ryegrass, cereal rye, oats, wheat, Sorghum Sudan grass, buckwheat, sweet clover, winter pea, cowpea, red clover, hairy vetch.
- **Weed suppression:** cereal rye, annual ryegrass, oilseed or tillage radish, mustard, oats, barley, buckwheat, Sorghum Sudan grass.
- **Tolerate heat and drought:** cowpea, hairy vetch, mung beans, sweet clover, Sorghum Sudan grass, buckwheat, barley, teff.
- **Livestock Feed:** cereal rye, wheat, oats, barley, triticale, teff.

# COVER CROP SEEDING GUIDELINES

## Seeding Rates - (#/Acre) / Depth

Seed Type	Drill*	Broadcast Or Aerial	Seeding Dates	Dry Biomass (Tons/Acre)	N Produced (#/Acre)	N Scavenger	Innoculants?
Annual Rye Grass	12# / .5"	15#	Aug. 1 - Sept. 25	1 to 4.5	N/A	Very Good	N/A
Cereal Rye	45# / 1"	54#	Aug. 15- Nov. 15	1.5 to 5	N/A	Excellent	N/A
Oats	35# / 1"	42#	Aug. 1 - Sept. 30	1 to 5	N/A	Very Good	N/A
Sorghum Sudan Grass	20# / .25"	24#	May 1 - June 15.	4 to 5	N/A	Excellent	N/A
Winter Wheat	55# / 1"	66#	Sept. 30 - Nov. 1	1.5 to 4	N/A	Very Good	N/A
Winter Barley	50# / 1"	60#	Aug. 25- Oct. 20	1 to 5	N/A	Very Good	N/A
Buckwheat	30# / .5"	36#	June 1 - Aug 1	1 to 2	N/A	Poor	N/A
Oilseed Radish	5# / .25"	6#	Aug. 15- Sept. 15	2 to 3.5	N/A	Excellent	N/A
Rapeseed	4# / .25"	5#	Aug. 15- Sept. 15	1 to 2.5	N/A	Very Good	N/A
Crimson Clover	10# / .25"	12	June 1- Sept 15	1.75 to 2.75	70-130	Good	Rlbv**
Medium Red Clover	8# / .25"	10	Aug. 1- Sept. 15	1 to 2.5	70-150	Good	Rlbv**

PLEASE NOTE - THE SEEDING RATES HAVE BEEN CHANGED PER NRCS GUIDELINES FROM THE FIRST EDITION OF THIS BOOKLET

\* Seeding rates are based on Natural Resources Conservation Service recommendations for Clermont County based on pure live seed; make adjustments for purity & germination rate.

\*\* Rhizobium leguminosarum biovar trifoli



Winter Kill?	Management					Comments
No	1		3	4		Fibrous root system can grow to 2 feet, breaking up compaction. Excellent for erosion control, excellent for green chop or forage. If aerially seeded in early September, may be ready for grazing just after corn harvest.
No	1		3	4		Easy to establish and very winter hardy. Provides structural support for an additional legume cover crop such as hairy vetch. Can provide up to 5 tons of organic material. Provides weed control (allelopathic). Germinates at 45°.
Yes	1		3		5	Excellent Forage, allelopathic weed control, good N scavenger.
Yes						Great choice for renovating over-farmed soils, adds large amount of organic matter. By mowing once, root mass increases 5 to 8 times adding organic matter to topsoil. Excellent Summer livestock forage. Soil temps above 60° before planting.
No	1	2	3			Good for erosion control and topsoil builder due to fine root mass. Can be harvested as cash crop. Plant past Hessian fly free date of Oct. 3. Kill 10 to 14 days prior to planting corn.
No		2	3			Good biomass producer, as thick root system improves soil structure and infiltration. Good at weed suppression. Does NOT do well in wet soils.
Yes					5	Great choice for renovating farmed soils, providing rapid growth, abundant fine root mass and high performance in low fertility fields. Good P (phosphorous) scavenger.
Yes			3		5	Large tap roots break up soil compaction. Nutrient scavenger - OSU study showed 182# N per acre! Winter kills at about 22° F.
Yes					5	Aids in pest suppression, captures nutrients, weed control, great for erosion control, tap root helps reduce compaction. Some varieties winter kill at 10° F. Ensure adequate N and S supply - 7:1 N/S ratio is optimal.
No	1	2			5	Good biomass producer. Mow kill after early bud stage, wait 2-3 weeks after kill down to plant crop. <i>Secondary host to corn earworm.</i>
No	1	2	3			Not recommended for early Fall seeding due to poor establishment during hot weather. Great option for high tunnels due to winter production and harvest, or planting between crop rows.

Management Key:	
1	Tolerates wet soils
2	Susceptible or attracts pests or disease
3	Low cost to establish
4	Requires high management - Kill at right time; See termination guide, pages 12-15
5	Easy to manage

## COVER CROP SEED MIXES

Cover crop mixes provide multiple benefits over single species plantings. They have been found to have a synergistic effect on each other. For example, when oilseed radish and Austrian winter pea are planted together, the radish growth is much improved by the added nitrogen provided by the pea. The radish provides a support system for the pea to grow on. The pea will also produce more nitrogen when planted with the radish than if grown alone, due to the radish taking up the nitrogen. It is generally recommended to plant three species in combination and include a brassica, such as radish or turnip, a legume for added nitrogen, and a grass, such as cereal rye or annual ryegrass. If you are just starting out with cover crops, it may be in your best interest to begin with a single species, or plant a cover crop mix that winter kills for easier management. The list of mixes is almost endless, but we have included some of the more popular mixes that are cost effective and overall easier to manage.



*Cover Crop Mix*

<b>Seed Mixes for Corn, Soybeans, etc</b>	<b>Seeding Rates (#/acre) Drill</b>	<b>Depth</b>	<b>Seeding Rates (#/acre) Broadcast/Aerial</b>
Oil Seed Radish / Australian Winter Pea	3# / 17.5#	.25"	4# / 22#
Oil Seed Radish / Crimson or Berseem Clover	3# / 5#	.25"	4# / 9#
Annual Rye Grass / Crimson Clover / Radish or Rapeseed	5# / 4# / 1.5#	.25"	8# / 7.5# / 2.5#
Cereal Rye / Crimson Clover / Radish	15# / 4# / 1.5#	.25"	27# / 7.5# / 2.5#
Oats / Austrian Winter Pea / Radish	12# / 12# / 1.5#	.25"	28# / 20# / 3#
Annual Rye Grass / Crimson Clover	7.5# / 5#	.25"	13# / 9#
<b>Seed Mixes - Forages*</b>			
Oats / Cereal Rye / Turnips	25# / 15# / 1#	1"	27# / 27# / 1.5#
Triticale OR Cereal Rye OR Winter Wheat AND: Crimson Clover OR Winter pea AND: Turnips (2-3#/acre) OR Kale OR Rape	80-100# /acre 25-30# /acre 3.5-4# /acre	.5	Use higher rates from drill column

# OPTIONS FOR APPLYING COVER CROP MIXES WITH MODIFIED EQUIPMENT



**Combine with cover crop broadcast seeder attachment: Low cost to build, no need to make extra passes on your field, save time, and only added expense is cover crop seed.**

## Modified Highboy Pros:

- ◆ Availability at the right time - farmers own or can rent a highboy
- ◆ Farmers can operate the machinery themselves
- ◆ If outfitted with drop tubes, can drop seed where needed



**Modified High Boy**

## Cons:

- ◆ Modifying highboys to act as seeders can be costly
- ◆ These vehicles are slower than aerial seeding
- ◆ Wet soils can prevent the highboy from getting onto fields



**Broadcast seed with fertilizer**



**Valmar Cover Crop Seeder**

Seeding Dates	Good For:
Aug. 7 - Sept. 21	Compaction, provides N, easy to manage, winter kills. Inoculate Winter Pea with <i>Rhizobium leguminosarum</i> biovar <i>vicia</i> . Use soybean plate to plant pea and sugar beet plate to plant radish in alternative rows
Aug. 7 - Sept. 21	Compaction, provides N
Aug. 7 - Sept. 21	Erosion control, compaction, provides N
Aug. 7 - Sept. 21	Weed control, erosion control, compaction, provides N
Aug. 7 - Sept. 21	Easy to manage - winter kills. Occasionally winter peas may overwinter
Aug. 7 - Sept. 21	Erosion control, compaction, provides N
Aug. 7 - Sept. 21	Seed in August to do well for Fall grazing. Rye will overwinter for Spring grazing
Aug. 7 - Sept. 21	Use for Fall planting that can winter over <b>*Please consult a grazing specialist before grazing, as toxicity can potentially occur during certain periods of the year.</b>

## THE CHARTS BELOW INCLUDE RECOMMENDATIONS ON MANAGEMENT STRATEGIES

### SPRING - Corn Planting

#### Following Cereal Rye Cover Crop

- Cereal rye may harbor pests such as armyworms and grubs for corn.
- Reduces weed seed germination (allelopathic effect), suppresses weed growth, including mares tail.
- Supplies nutrients to corn throughout the growing season by scavenging nitrogen and other nutrients. Also reduces nitrate leaching over the winter.
- Cereal rye ties up N when it decomposes, and is directly related to maturity of the rye. There's much less N tie up if you burn down cereal rye while it is still succulent.
- Kill cereal rye 2-3 weeks before planting a grain crop to avoid N unavailability and allelopathic effect. Mineralization of N can be slow, and is not available quickly. Consider planting with a legume to offset N tie up, or add 40 lb N/ac at corn planting.
- Cereal rye can absorb excess soil moisture in the spring (esp. on wet, heavy soils). It can also have opposite effect if planting is delayed after cover crop termination, coupled with heavy rains.
- Terminate the cereal rye early if you're new to planting rye. It will be easier to kill and plant through.
- Cereal rye residue increases soil water conservation in summer when needed.
- See termination guidelines, page 12-13.

#### Following Annual Ryegrass Cover Crop

- Annual ryegrass may harbor pests such as armyworms and grubs for corn.
- Excellent soil compaction buster; the longer it grows, the more soil benefits.
- Recommended to kill between 4 and 8 inches, and before first node appears to prevent annual ryegrass from becoming a weed.
- Soil builder; dense, deep root system improves water infiltration and enhances soil tilth.
- Suppresses weed growth, especially mares tail
- Supplies nutrients to following crops; good scavenger of surplus nitrogen (N) and other nutrients. Reduces nitrate leaching by tying up nitrate in ryegrass. It's also a heavy user of moisture and N. Wait at least two weeks before planting corn to minimize N tie up. May add 40 lb N/ac at corn planting to offset tie up. Soaking up excess moisture in spring is normally a benefit in Clermont soils.
- Not allelopathic to corn.
- Annual ryegrass residue increases soil water conservation in summer when needed most.
- See termination guidelines, page 14.



**SPRING - Soybean Planting**

Following Cereal Rye Cover Crop

- Cereal rye before soybeans is a good combination for farmers just starting out with cover crops.
- Reduces weed seed germination (allelopathic effect).
- Provides up to 3-5 tons of organic matter per acre. This organic matter becomes a long lasting residue to hold moisture and suppress weeds for soybeans.
- The best option is to kill cereal rye after planting beans. Kill within five days of planting for crop insurance purposes.
- Another option: Kill once it is about knee high. The longer you wait to plant after killing cereal rye, the more chance it will hold excess moisture in the ground. Cereal rye has no negative effect on planting soybeans, so there's no need to wait two weeks to plant from allelopathic effect of rye.
- Cereal rye can absorb excess soil moisture in the spring, especially on wet, heavy soils if not killed too early.
- Cereal rye residue increases soil water conservation in summer when needed.
- Consider using a roller crimper to roll down your cereal rye. This rolls down the rye in one direction, and makes planting through much easier. Rye needs to be crimped close to maturity at full height or early pollen shed. Otherwise, it will be too green and not stay down.

Following Annual Ryegrass Cover Crop

- Reduces soil erosion in fall and spring; extensive, soil-holding root system
- Provides significant organic material
- Annual ryegrass can absorb excess soil moisture in the spring, especially on wet, heavy soils. Excellent soil compaction buster; the longer it grows, the more soil benefits.
- Recommended to kill between 4 and 8 inches, and before first node appears to prevent annual ryegrass from becoming a weed.
- Annual ryegrass residue increases soil water conservation in summer when needed most.

**“If you use no-till, then cover crops should be your next step to improve your soil.” — Brad Barber, local farmer**

## COVER CROP TERMINATION:



**Roller crimper**



It is important to have a termination plan in place to maximize the benefits cover crops can provide. Cover crops should be given time during the spring to actively grow and provide the soil quality benefits needed to help improve the success of the subsequent cash crop.

### **Helpful Tips for Terminating Cover Crops:**

- Herbicide rate—most glyphosate labels recommend increasing the rate of product as the cereal grain and weeds mature. This is just as important under cool-cloudy conditions. With Gramoxone, use the 3 pt rate and remember that it is better on smaller cereals or after they have reached the boot stage—during the period of rapid culm elongation it is less effective.
- Include appropriate adjuvants in the spray tank—include 1 to 2 qt/100 gal nonionic surfactant (unless fully loaded formulation) plus 8.5 to 17 lb/100 gal AMS or equivalent with glyphosate. The AMS helps alleviate hard water problems and also can reduce antagonism if tank-mixing with other herbicides such as 2, 4D. Be sure to add the AMS first to the spray tank and agitate before adding the glyphosate.
- Use a clean water source that does not contain soil or other sediment that can reduce glyphosate or Gramoxone activity.
- Use flat fan nozzle tips that produce a uniform spray pattern and thorough coverage.
- Spray in sufficient carrier to achieve good coverage (usually between 10 and 30 GPA).
- Make sure the sprayer is accurately calibrated (output, pressure, pattern, speed, etc.) to deliver the appropriate rate uniformly.
- Air temperature before, during, and after application can influence control. Cold nights (<40°F) will reduce activity, particularly for glyphosate, and especially when followed by cool (<55°F) cloudy days.
- The more time between application and rainfall the better, especially with difficult to control perennials.

## GENERAL MANAGEMENT STRATEGIES TO CONSIDER

### Helpful Tips for Terminating Cereal Rye:

Cereal rye is a great choice for a fall cover crop. While it provides many benefits, the following management strategies should be considered:

- If cereal rye gets taller than 24 inches in the spring, there may be a need to add starter nitrogen due to the rye tying up the nitrogen, if planting corn.
- Some growers choose to allow cereal rye to grow as long as possible, others insist on killing it early. If you are just beginning to plant cereal rye, an early kill is recommended for easier management and reducing residue. Try killing rye between 8 and 12 inches if this is your first experience.
- Regrowth may occur if not completely controlled (mature cereal rye is difficult to manage).
- The best time to kill cereal rye is 2-3 weeks before planting corn. No effect on soybeans for late kill.
- The worst time to spray and kill cereal rye is 5-10 days before planting corn, assuming glyphosate will be used. Cereal rye contains an allelopathic chemical that suppresses weed growth, which can be helpful to growers. Because cereal rye is allelopathic, the residue can also suppress the growth of grasses such as corn, while the residue is decomposing. If there is limited time to kill the cereal rye before planting, it is recommended that growers use another herbicide that reacts faster than glyphosate to kill the rye and break it down. This will reduce the risk of the allelopathic effect.

Cereal Rye reference: [http://msue.anr.msu.edu/news/reasons\\_to\\_consider\\_rye\\_for\\_fall\\_cover](http://msue.anr.msu.edu/news/reasons_to_consider_rye_for_fall_cover)



**“If you’re using cover crops for the first time, try using cereal rye. It’s easy to start and easy to kill.”— Brad Barber, local farmer**

## COVER CROP TERMINATION:

### Helpful Tips for Terminating Annual Ryegrass

Historically, annual ryegrass can be somewhat difficult to control with herbicides in the spring. Some general recommendations for control of annual ryegrass are provided by a team of agronomists from Illinois, Indiana, and Oregon State who have much experience with this species. For control, some general recommendations include:

- Annual ryegrass doesn't truly go dormant in the winter; however, top growth basically stops around 37°F. Root growth can be substantial in the winter depending on the weather and soil type. Annual ryegrass roots can grow to 2 feet in southwest Ohio.
- Control is best done when the plants are small, 4-8 inches in height and before the first node has developed.
- While one burn down application may provide control of annual ryegrass, growers should plan for two.
- If annual ryegrass is allowed to reach the flowering stage, the control of the plant is easier, but some viable seed may develop and may create additional weed management problems in the future.
- For glyphosate, successful control depends on timing, application rate, and weather conditions. Apply glyphosate at 1.25 to 1.5 lb ae\*/acre (48 to 64 fl oz of a 3 lb ae gal product) with AMS\*\* and surfactant. Some folks add an acidifier (e.g. citric acid) to improve glyphosate. Adding other herbicide to glyphosate and especially triazines or clay-based materials can antagonize glyphosate activity. Generally, including 2,4 DLVE in the mixture doesn't appreciably reduce activity and it can help broaden the weed control spectrum.
- The use of air induction spray tips that produce coarse droplets should be avoided and for glyphosate, reduce spray application volume to 10 GPA\*\*\* (others recommend a bit higher carrier volume if the stand is thick and coverage is a concern).
- Spray during daylight hours at temperatures about 60° F and when annual ryegrass is actively growing.
- If night temperatures drop below 38° F, wait three days before spraying and soil temperatures should be above 45° F.
- Spray at least 4 hours prior to sunset to allow for maximum translocation.

\* ae - acid equivalent

\*\* AMS - ammonium sulfate

\*\*\* GPA - gallons per acre

***“The key to successful termination of annual ryegrass is burning it down early in the Spring. I choose annual ryegrass because the root system does a good job of holding the soil in areas that are prone to erosion.”***

*Charles Stahl, Local Farmer*



Annual Rye reference: <http://www.agprofessional.com/news/Killing-cover-crop->



*Photo shows annual ryegrass after 1 burn down—green leaf indicates plant is not entirely terminated; growers should plan to burn down twice.*

Source: <http://plantcovercrops.com/killing-cover-crop-annual-ryegrass-how-are-we-doing/>

## PROS, CONS & TIPS ON AERIAL SEEDING:

### PROS:

- ◆ More acres planted in less time - SAVE TIME
- ◆ Gets seed down when unable to get on fields, even before crop harvest - NO RUTS
- ◆ Some species winter kill, which means you won't need to make a single extra pass on your field
- ◆ Aerial seeding is comparable cost wise to drilling at \$12-\$16 \ per acre (cost for flying on seed in 2016).

### CONS:

- ◆ Aerial seeding requires everything to line up perfectly; stage of crop maturity, soil moisture, weather conditions. Its better to plant cereal rye via drill or broadcast after harvest up to November 15th then to gamble with cover crop seed mixes applied aerially.
- ◆ Increased seeding rates (25% more than with drilling) depending on weather conditions and if getting close to the last seeding date.
- ◆ May not be as uniform as ground application practices
- ◆ Weather dependent - Bad weather, no flying

### TIPS:

- ◆ Be SURE to wait until field is ready before aerial seeding - See next page "When do I Plant the Cover Crop?"
- ◆ Adequate soil moisture and a friable soil surface for good seed to soil contact must be present for seed germination and establishment. Need adequate moisture in the top 1/2"-1" of soil. This moisture needs to be present at the time of seeding or should be expected to occur within 10 days of seeding.
- ◆ Aerial Seed cover crops at least 7-10 days earlier than when drilling them in, as they are slower to establish.

## Which Cover Crops Are Suitable for Aerial Broadcast Seeding?

*A general grouping of cover crop seed, with Group 1 being the most suitable and Group 5 being the least*

**Group 1** - Small grains (rye, wheat, barley, oats, triticale). Seed sources are plentiful and relatively inexpensive. Seeds germinate readily on the soil surface when soil moisture is present.

**Group 2** - Ryegrass (annual, perennial) benefits by having rain shortly after broadcasting. Aerial seeding requires an additional 2-3 pounds of seed per acre over drilling or incorporating. Grasses are more adapted to germinate on the soil surface. Their young roots are smaller than those of legumes, so they can penetrate the surface crust easier. Grass roots multiply quickly once they enter the soil, creating a root mass that can absorb the water and nutrients the young plant needs.

**Group 3a** - Small seeded brassicas (mustards, rape, canola, turnips, radishes) must be established early, about 4 weeks before the average date of a 28° F freeze. Soil temperatures needs to be greater than 45° F. Small seed size allows for good soil contact.

**Group 3b** - Sorghum-sudan and millet. Requires warm, moist soil conditions with soil temperature > 65° F).

**Group 4** - Small seed legumes (clovers, medics, trefoils, alfalfa) best success if drilled 1/4 to 1/2 inch deep into the seedbed. Will establish in late winter/early spring as "frost seeding" when the soil surface is moist and conditions allow freezing and thawing to provide good seed-to-soil contact. Best success with sweet and red clovers.

**Group 5** - Large seeded legumes (beans, vetch, peas, lupine, cowpeas) and buckwheat. Best success if drilled or broadcast and incorporated. Large seeds are not recommended for aerial seeding. When these seeds germinate, their young roots don't have the ability to penetrate the soil surface as well as other species. Legumes, like most dicots, germinate and establish better when they are in direct contact with the soil.

## AERIAL SEEDING: AN OPTION FOR SOUTHWEST OHIO

Aerial seeding can be a beneficial means of getting cover crops established. Drilling or broadcast seeding generally are the preferred methods IF crops are harvested early enough to plant the cover crop during the recommended seeding dates.

Germination rates may be less than other seeding methods due to shading and risk of insect damage or rodents & birds eating the seed, if there's not enough moisture for the seed to germinate rather quickly.

### When Do I Plant the Cover Crop?



#### ***Aerial Seed into Standing Soybeans :***

- ◆ When the soybean leaves have yellowed more than 50%, but less than 50% of the leaves have dropped.
- ◆ If seeding into 7" rows, wait to seed until soybeans are more mature, closer to the 50% leaf drop.



#### ***Aerial Seed into Standing Corn:***

- ◆ When corn plant is dried roughly to the ear
- ◆ Daylight is reaching 50% of the ground between rows
- ◆ DO NOT plant when corn is still green, as there won't be enough sunlight on the ground for the seedlings to grow properly.

# NOTES

# RESOURCES

Cover Crop Decision Tool Cornell University

<http://covercrops.cals.cornell.edu/decision-tool.php>

OSU Cover Crop Fact Sheets Ohio State University

<http://ohioline.osu.edu/sag-fact/index/html>

Midwest Cover Crop Council: Cover crop decision making tool

<http://www.mccc.msu.edu/selectorINTRO.html>

Midwest Cover Crops Field Guide

<https://ag.purdue.edu/agry/dtc/Pages/CCFG.aspx>

Managing Cover Crops Profitably SARE

<http://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition>

Building Soils for Better Crops SARE

<http://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-Edition>

Cover Crop Plants Database USDA

<http://plants.usda.gov/java/coverCrops>

## FOR MORE INFORMATION CONTACT:

Clermont Soil and Water Conservation District

1000 Locust St., PO Box 549

Owensville, OH 45160

513-732-7075

<http://clermontswcd.org/>



Natural Resources Conservation Service (NRCS)

1000 Locust St., PO Box 549

Owensville, OH 45160

513-732-2181 x 102

<http://www.oh.nrcs.usda.gov/>

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Please contact NRCS if you are enrolled in a Farm Bill Program to plant cover crops, to confirm any specifications listed in this booklet are sufficient for meeting program requirements. Seeding rates, dates, and other specifications do change from time to time and may be different based on geographic area.

Cost share assistance may be available for establishing cover crops and other Best Management Practices through NRCS.

Looking for a place to find seed? Call Clermont SWCD for a list of local seed vendors. Providing this list is a courtesy only; these are not recommendations or endorsements by Clermont SWCD or NRCS .

**“I plant cover crops because I feel that it’s the right thing to do.”**

**— Charles Stahl, local farmer**

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