

Cover Crop Termination



COVER CROP TRAINING MODULE

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All photos are by Rob Myers, University of Missouri, unless otherwise noted.



Cover Crop Termination Approaches

Options:

- Winter kill
- Herbicide
- Roller-crimper
- Mowing
- Grazing
- Tilling



Terminating with Cold Weather (Winter Kill)

Warm season cover crops typically killed at 28-32 F., depending on the species

- Buckwheat
- Sunhemp
- Cowpeas
- Millets
- Sunflowers



Some cool season cover crops will winter kill – those that are not very winter hardy – temperature that kills these depends on the species and how abrupt a temperature drop to freezing is in the fall

- Spring oats – killed at about 18 F.
- Winter oats – killed at about 14 F.
- Radishes – killed at about 20 F.
- Turnips
- Kale
- Ethiopian cabbage
- Other Brassicas
- Some clovers and legumes

Terminating with Herbicides

- Some cover crops terminated easily with glyphosate, others will require a tank mix of two or more herbicides, such as adding 2,4-D to glyphosate to terminate legumes
- Cover crop should be actively growing
- Consider soil moisture conditions when deciding on termination timing
- If working with cover crop mixes, timing may be particularly important to kill all species at once

Species Specific Herbicide Tips for Termination*

Cereal rye - glyphosate plus Sharpen or plus Select (clethodim)
very effective

Winter wheat - glyphosate plus Select very effective

Annual ryegrass – combo of glyphosate and Select is “hands down best way to kill it”

Hairy vetch – Liberty or Gramoxone, or use glyphosate with a broadleaf product

Austrian winter pea – glyphosate plus Sharpen works well

**Suggestions from Dr. Kevin Bradley, University of Missouri Weed Extension Specialist*

Terminating the Cover Crop Mechanically

Main options are roller crimper or mowing, tillage as a last option

For mowing or using a roller crimper, generally need to terminate during reproductive (flowering) growth of the cover crop



Photo credit – Buffett Foundation

Terminating by Crimping Cover Crop Stems

Some plain rollers can terminate a cover crop by breaking stems, but most often it works better to “crimp” the stems using a roller modified by edged steel vanes that can crush or break the vascular tissue (xylem and phloem) in the plant stems

- Usually work best if the cover crop has already reached the flowering (reproductive) stage
- Often better to roll after planting
- If rolling before planting, roll in same direction as planter is traveling



Photo credit: Edwin Remsburg (SARE image library)

Roller Crimper Equipment Options

There are now a dozen or more manufacturers selling roller crimpers, some mount in front of the tractor and some in rear, some are single rollers 10-15 feet wide, some are wider folding units with multiple offset and overlapping rollers. There are now even smaller roller-crimpers that can be added to the tool bar of a planter.



Photo credit: Advance Cover Crops (Dahmer roller)

Roller crimpers attached to a planter



Photo credit: Steve Groff

Terminating with a Mower

- Successful termination with a mower is dependent on timing – for most cover crops, needs to be done after flowering has started; plants that are still in vegetative stage (pre-flowering) will often regrow
- Also helps to mow as close to the ground as feasible
- Type of mower can make a difference, for example, flail mowers cut residue more finely but take more power



Photo credit: Johnny's Selected Seeds

Comparing Mowing vs. Crimping



Sorghum-sudangrass rolled on the left, and mowed on the right

Terminating through Grazing

- Basic idea is to simulate mowing by using grazing livestock
- As with mechanical mowing, works best if cover crop is already flowering
- Plants need to be grazed hard, removing high percentage of biomass
- Good rotational strategy with high density stock is critical
- Need to avoid just trampling plants, or they may regrow



Terminating through Tillage

- Terminating cover crops with tillage should generally be avoided, especially for farmers who are already in a no-till or strip-till system
- If tilling, be sure to dislodge the roots of the cover crop to ensure complete termination
- If voles or slugs are an issue, light tillage may be warranted in affected areas
- Tillage termination is most common for organic farmers and some types of horticultural operations



Photo credit: Edwin Remsburg (SARE image library)

A field of red clover cover crop plants. The plants are in various stages of growth, with some showing bright red flower heads and others showing green foliage. A semi-transparent green rectangular box is overlaid in the center of the image, containing the text "Cover Crop Termination Timing" in white, bold, sans-serif font.

Cover Crop Termination Timing

Terminating the Cover Crop Early

Advantages

- Minimizes amount of cover crop residue to deal with in planting the cash crop
- May reduce the chance of some pest problems
- Can prevent the soil from being dried out by the cover crop
- Often a more comfortable approach for first time cover crop users

Caution

- Avoid terminating a high biomass cover crop 10-14 days before cash crop planting; may end up making a wet mat that prevents soil from drying out



Photo credit - Rob Myers

Terminating Cover Crops Late, Including “Planting Green”

Advantages

- Allowing the cover crop to grow longer maximizes cover crop benefits for soil organic matter, erosion reduction, weed control, soil health, etc.
- Longer period of cover crop growth can help draw down moisture in a wet spring and enable earlier cash crop planting
- Sometimes planting into a still standing and living cover crop (planting green) is easier than into a thick mat of dead cover crop residue

Caution

- If spring conditions are trending dry, best to go ahead and terminate the cover crop earlier to avoid drying out soil



Photo credit – Dave Robinson

Summary

- If using herbicides to terminate a cover crop, match the herbicide choice to the species of cover crops being sprayed
- For farmers seeking to minimize or eliminate herbicides, mechanical termination options are available, just have to pay more attention to the growth stage of the cover crop
- For first time cover crop users, sometimes cover crops that winter kill are a more comfortable way of trying out cover crops
- Likewise, for an overwinter cover crop, early termination may be an easier strategy for a cover crop novice
- For more experienced cover crop users, there can be advantages to delayed cover crop termination, including using a “planting green” approach