



# Agronomic Spotlight

## Northeast Cover Crop Removal

- Cover crops can help improve soil quality and nutrient values, control soil erosion, and improve water and air quality.
- Proper timing and method of termination are required for cover crop removal.
- Timing for removal/termination of a spring growing cover crop is critical because the crop should not be allowed to become weedy and/or hinder crop production.

### Timing of Removal

Timing of removal is specific to each farming condition. Cover crop termination four to eight weeks prior to commercial crop planting can allow soil warming, soil water replenishment, and residue drying and decomposition.<sup>5</sup> Termination that occurs less than four weeks before commercial crop planting can help provide benefits of increased cover crop biomass, soil and water conservation, and possible nitrogen sources from legume cover crops.

Nitrogen release and commercial crop yields can be affected by timing of cover crop removal. Early termination of small grain cover crops can result in more rapid decomposition of the residue due to the narrow carbon to nitrogen ratio of young plant tissue. Carbon to nitrogen ratios of 30 to 1 and greater are reached at the flowering stage of small grains.<sup>1</sup> This wider ratio may be desirable for increasing above-ground biomass production and residue coverage. The following crop should be considered when terminating cover crops. For example, termination of winter-hardy cereals including cereal rye, triticale, and wheat should be timed to allow at least a two-week window prior to corn planting to avoid corn yield reduction.<sup>3</sup>

### Method of Termination

Cover crops may include grasses, broadleaves, legumes, or a mixture of all three. The four methods used to terminate cover crop are: winterkill, tilling, mowing, and applying herbicides. A survey of the Corn Production Area farmers in 2006 found that approximately 54 percent of cover crop growers applied herbicides, 33 percent used tillage, and 13 percent used both methods of cover crop termination.<sup>2</sup>



Figure 1. Annual ryegrass growth should be controlled in the spring as the first node is just starting to form.

Winterkill is a method in which the cover crop is left until it is terminated by a hard freeze. This method is only possible in certain climates and for certain cover crops that are susceptible to the first hard frost (temperatures below 25° F) such as turnip and radish.<sup>1</sup> Most of the farmers surveyed in 2006 preferred a cover crop that does not rely on winterkill. While tillage is a more common method of terminating cover crops than

relying on winterkill, the use of tillage to terminate a cover crop can be expensive and can negate the benefits of cover crops.

**Mechanical.** Aside from tillage, other mechanical methods of cover crop termination include use of a roller-crimper or mower. Roller-crimpers (mechanical rollers) can be used to kill tall-growing cover crops by breaking or crimping the stem. This method can be effective when used on cover crops at the flowering stage or later.<sup>1</sup> Mow-kill is a method of cover crop removal that is effective on some species. Cover crop regrowth and residue distribution should be evaluated when mowing is used for termination.

**Herbicide.** The herbicide burndown application is generally more successful when the cover crop is small and actively growing. Cover crops that are bolting or jointing can be more difficult to control with standard herbicide rates and higher, labeled rates may be warranted under these conditions. Herbicides should be applied after three to four days of daytime temperatures in the high 50° to low 60° F range with nighttime temperatures greater than 40° F. Spraying in early morning or late afternoon/evening should be avoided as plants are not optimally growing during these times in the spring. Always include ammonium sulfate (AMS) at 8.5-17 lbs per 100 gallons of spray solution with glyphosate applications.

Here are some tips for various cover crop species:

**Winter Kill (temperatures below 25° F).** Buckwheat, oats, radish, turnips.

**Cereal Rye.** Apply Roundup PowerMAX® (32 oz/acre) + AMS in 10-15 gallons of spray mix per acre. Spray before plants are 18 inches tall. In general, this cover crop is easier to kill than Annual ryegrass. Avoid the use of residual herbicides with Roundup PowerMAX as this tank mix may cause a reduction in control.

**Annual Ryegrass.** Apply Roundup PowerMAX (44 oz/acre) + AMS in 10-15 gallons of spray mix per acre. Target grass heights of 8-12 inches (prior to jointing), and spray mid-morning to early afternoon for best results. Avoid the use of residual herbicides with Roundup PowerMAX as this tank mix may cause a reduction in control. Scout fields after application to confirm complete death of the cover crop.

**Legumes (Crimson Clover, Red Clover, Hairy Vetch, Peas).** Apply Roundup PowerMAX (32-44 oz/acre) + 2,4-D LV4 (16 oz/acre) or Sharpen®

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(1 oz/acre) in 10-15 gallons of spray mix per acre. Consult 2,4-D LV4 and Sharpen labels for soybean replant intervals and recommended adjuvants. Target spray applications from mid-April to first of May time period for optimum plant activity and herbicide effectiveness.

**Winter Wheat.** Apply Roundup PowerMAX (32-44 oz/acre) + AMS in 10-15 gallons of spray mix per acre. Spray prior to joint stage, targeting application for a period of warm weather during early spring. Avoid the use of residual herbicides with Roundup PowerMAX as this tank mix may cause a reduction in control.

## Summary

- Growers should make decisions for timing and method of cover crop removal prior to seeding and be prepared to amend the plan according to weather.
- A proper application should be made the first time as the first herbicide application is the most important.
- Control methods should be evaluated for escapes a couple weeks after application and into the growing season.

## Sources

<sup>1</sup> Sustainable agriculture research and education. 2012. Managing cover crops profitably (3rd edition).

<sup>2</sup> Singer, J. 2008. Corn belt assessment of cover crop management and preferences. *Agronomy Journal*. Vol. 100:1670-1672.

<sup>3</sup> Singer, J. 2006. Cover crops in the Corn Belt: Survey finds underused potential as conservation tool. Leopold Center for Sustainable Agriculture. Iowa State University. <http://www.leopold.iastate.edu/>

<sup>4</sup> Loux, M. 2007. Burndown herbicide activity—Can we kill anything when it's this cold? C.O.R.N. Newsletter 2007-08. The Ohio State University. <http://corn.osu.edu/>

<sup>5</sup> Schomberg, H. and Balkcom, K. 2009. Cover crops. Soil quality for environmental health. <http://soilquality.org/>

<sup>6</sup> Legleiter, T., Johnson, B., Jordan, T., and Gibson, K. 2012. Successful cover crop termination with herbicides. Purdue University. WS-50-W. <http://www.extension.purdue.edu/>  
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**For additional agronomic information, please contact your local seed representative.**

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