

# When should I spray my cereal rye cover crop before soybeans?

*Cereal rye is a versatile cover crop that can be seeded late into the fall in Ontario. Not to be confused with annual ryegrass – a grass that can be challenging to control – it is a winter cereal that overwinters reliably and grows rapidly in the spring. Delayed termination of rye by herbicide prior to soybean planting can enhance weed suppression and soil benefits. We have summarized the findings of on-farm and small plot research trials conducted with the Ontario Soil and Crop Improvement Association from 2017-2020 that evaluated the impacts of rye and its termination timing.*

## The simple answer

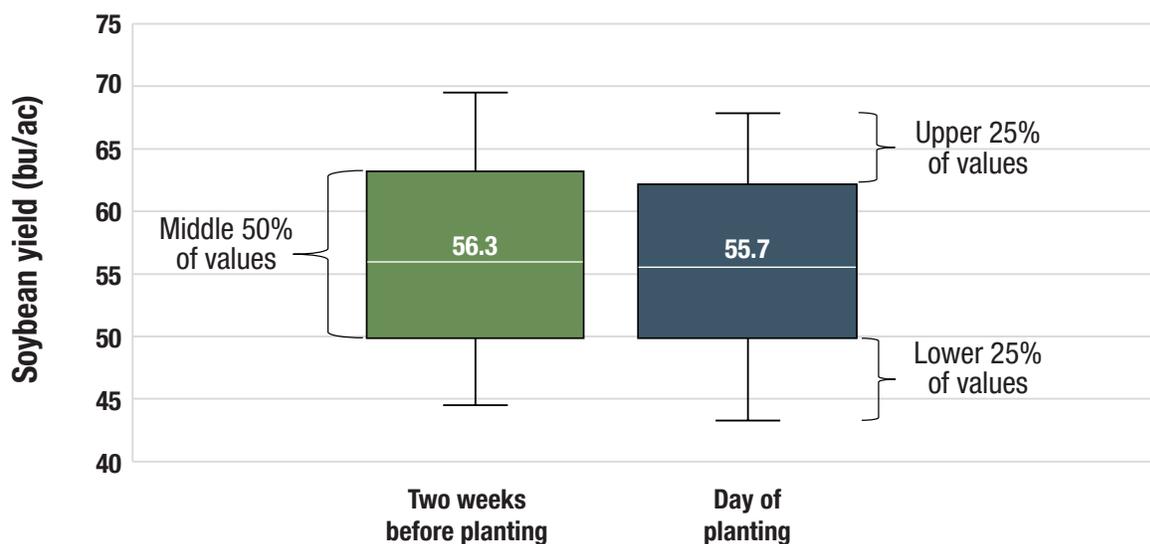
Spray the cereal rye cover crop just prior to planting soybeans “green” into it. Delaying termination until planting maximizes cover crop benefits and poses minimal risk to the soybean crop.



## A little more information

### Impact on soybean yield

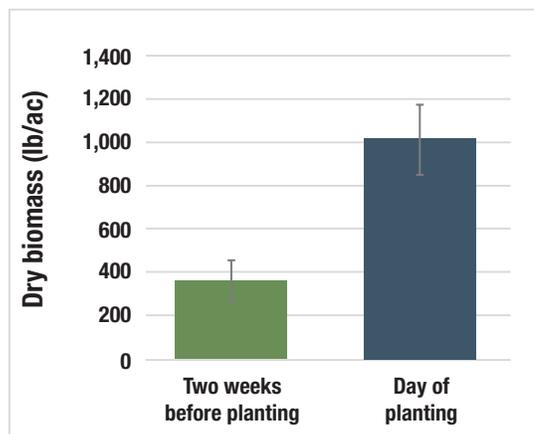
Delaying termination of rye and planting soybeans “green” (day of planting) does not negatively impact crop yield compared to spraying it off two weeks before planting, based on 13 site-years of replicated Ontario trials. Average yield was within 1 bu/ac (Figure 1).



**Figure 1.** Box and whisker plots of soybean yield data for two rye termination timings from 13 replicated trials conducted from 2017-2020. Horizontal line indicates median (middle) value and numbers in each box are average yield.

## Why plant green?

Delaying termination until planting greatly increases aboveground cover crop growth (Figure 2). Cover crop biomass is positively associated with soil benefits such as increased soil organic matter and improved infiltration and soil structure. It also enhances weed suppression (Figure 3).



**Figure 2.** Impact of termination timing on aboveground rye biomass based on 13 site-years (2017-2020).



**Figure 3.** Cereal rye has been shown to reduce weed abundance and size in Ontario, through competition and release of allelopathic chemicals. (Photo: Mike Cowbrough)

## The full story

Replicated, randomized on-farm strip-trials were conducted in Brant, Wellington, Huron, Lambton and Stormont, Dundas and Glengarry United Counties from 2017 to 2020 (Figure 4). Cereal rye was seeded at rates ranging from 20 to 100 lb/acre, as early as August and as late as November 9. Existing farmer cooperator equipment was used to seed and terminate rye and to plant soybeans.

### Effects of planting soybeans green vs. early termination

- Reduced final plant stand by ~10,000 plants/acre
- Delayed soybean growth and maturity when rye stand was thick (Figure 5)
- Lowered soil moisture in seed zone during dry spring conditions
- Reduced weed abundance during soybean critical weed free period, but not enough to reduce herbicide use

### Take aways for planting green

- Less is more – aim for a modest cover crop stand
- Plant green or spray rye early (10-14 days before planting). Avoid planting into yellow, dying plant material.
- Ensure seeder can cut through plant material, place seed to depth and close slot – a well-maintained no-till drill is adequate in most cases
- Use a minimum seeding rate of 160,000 seeds/acre to ensure an adequate stand
- Don't delay termination beyond date of soybean planting; under dry spring conditions, termination 1-2 weeks post-planting can lower soybean yields



**Figure 4.** On-farm termination timing trial. May 24, 2017, Brant County.



**Figure 5.** Soybeans in early (left) vs. late (right) terminated cereal rye. June 26, 2017, Brant County.

### For more detailed information:

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For more information on cover crop establishment and management, visit the Midwest Cover Crop Council's Decision Tool and Cover Crop Recipes

[mccc.msu.edu/covercroptool/](https://mccc.msu.edu/covercroptool/)

