

Cover Cropping for Soil Nitrogen Recycling

Managing Winter Cereal Cover Crops for Residual Nitrogen Recovery

Getting Started

This protocol can help you manage a grass cover crop like **Merced Rye** and **Pacheco Triticale**, and provides guidance around best management practices for planting and terminating a cover crop to maximize nitrogen recovery and prevent water contamination.

1 Planting Date and Seeding Rate

The cover crop should be planted between October and November to ensure establishment before winter rains and to recover as much residual nitrogen as possible. Plant before the first rain, or use sprinkler irrigation to supplement before rains come. Make sure seeds get covered, incorporated, and have good contact with the soil.

For weed suppression and nitrogen recovery, we recommend a seeding rate of:

Merced Rye: 150lbs/acre · **Pacheco Triticale: 200-250lbs/acre**

2 Use Shoot Length to Estimate Biomass

Calculating your cover crop's biomass is a good indicator of how much residual nitrogen the cover crop has recovered and will be available for your next crop in spring.

To calculate biomass, pull 10 random cover crop plants on a diagonal line across the plot and use the main stem to sample the stem/shoot height. Measure from the crown of the roots to the top/head of the main stem. Average the 10 stem heights. Reference Fig. 1 on the next page to find the chart relating averaged height to biomass.

3 Terminate Cover Crop After 100 Days

After 100 days, the cover crop will have maximized its capacity for N uptake. Terminating the cover crop after 100 days will delay the timing of when the scavenged nitrogen becomes available to the following crop. See Figures 2 and 3 on the next page for more detail.

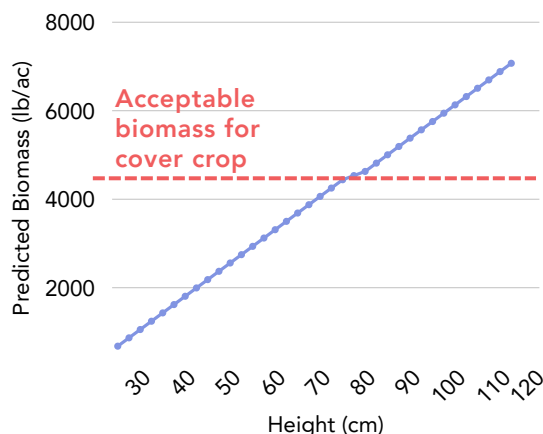
If you plan to plant short-cycle vegetables right after terminating the cover crop, we recommend terminating it before 100 days (while it's still green) to avoid tying up the nitrogen for too long.

4 Input Values to Calculate N Uptake

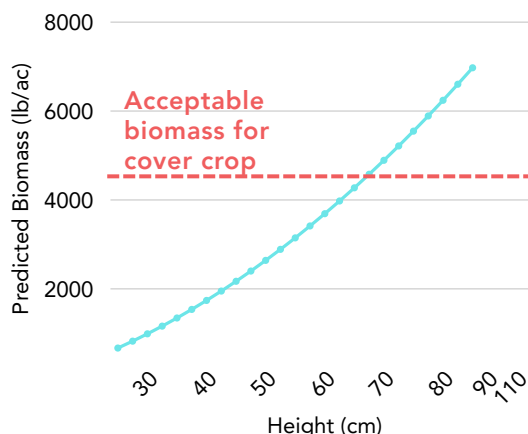
Scan this code to access a tool for calculating cover crop nitrogen uptake!



Figure 1.
Height to Biomass Correlation
Merced Rye

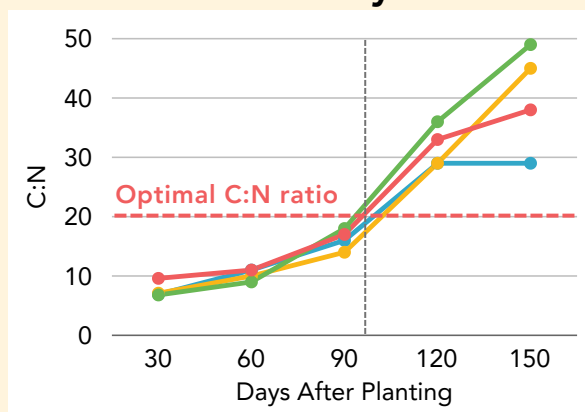


Pacheco Triticale

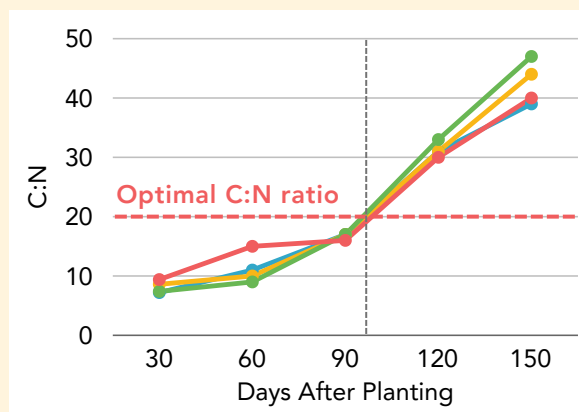


Source: Brennan, E. B., & Smith, R. F. (2023). Predicting cereal cover crop biomass using shoot length in California Vegetable Systems. *Agricultural & Environmental Letters*, 8(1). <https://doi.org/10.1002/ael2.20099>

Figure 2.
Carbon:Nitrogen Ratio (C:N) of Cover Crops After Planting
Merced Rye



Pacheco Triticale



Key:

Planting date

Oct. 01 - ●

Oct. 15 - ●

Nov. 01 - ●

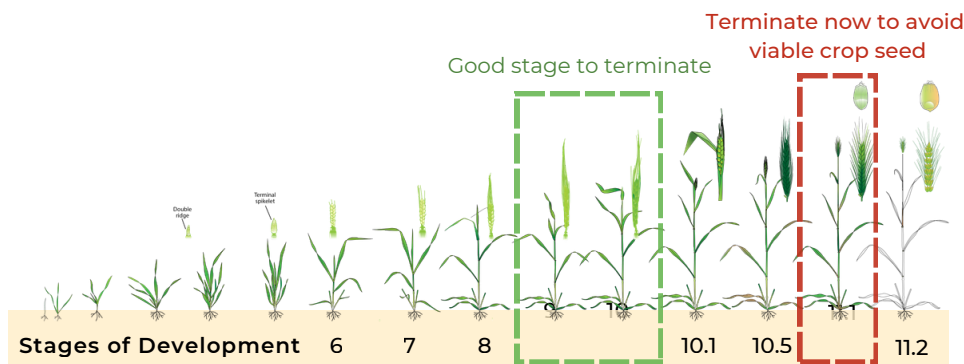
Nov. 30 - ●

At around 100 days, the cover crop has maximized its nitrogen uptake. Past 100 days the ratio of C:N continues to increase as the crop takes up more Carbon. Higher ratios of C:N correlate to a slower release of scavenged nitrogen after termination and incorporation.

Source: Brennan, E. et al. (2025). Can simple metrics predict Carbon to Nitrogen ratio changes in Rye and Triticale cover crops? (In Review)

Figure 3.
Feeke's Scale
of Development

Source: Romulo Lollato, Wheat and Forage Specialist, Department of Agronomy, Kansas State University



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Scan this code to
access our Cover
Crop N Uptake
Calculator!

