



Cereal Rye vs. Winter Wheat

Kate Brown
ANR Agent, RCE-Somerset County

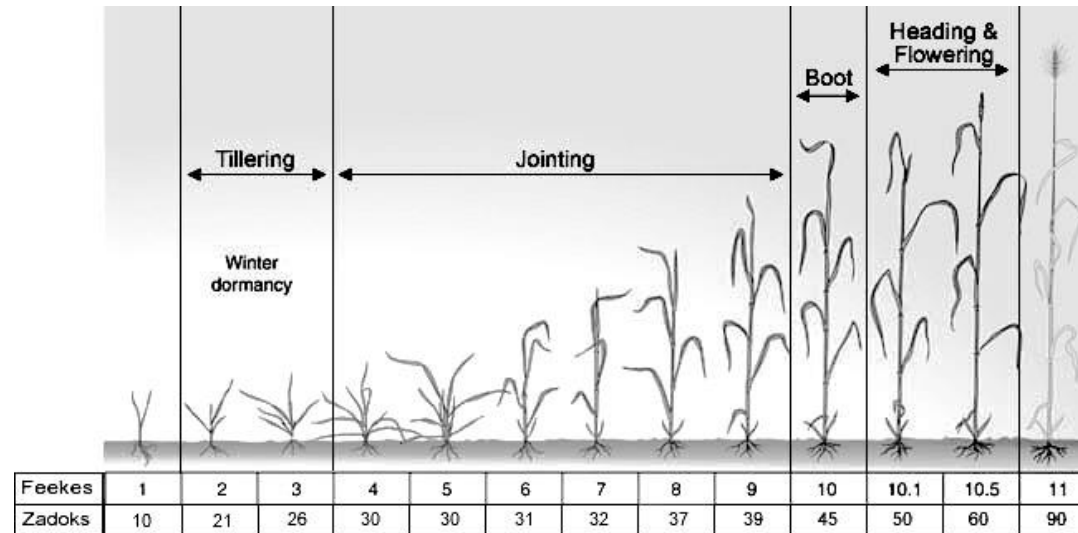


Today's Agenda

- Introduce species
- Explain species selection criteria
- Explore divergence, from planting through termination
- Discuss special considerations
- Summarize

Cereal Rye vs. Winter Wheat

- Cereal rye (*Secale cereale*)
- Winter wheat (*Triticum aestivum*)
- Winter annual grasses with similar seed size and growth habit



We R Extension

Considerations for Species Selection

Site Conditions

- Soil characteristics – soil type, pH, fertility, drought/flooding frequency
- Frost dates
- Precipitation timing, amount

Site Conditions

This information is based on your location. Crops that do not meet these site conditions will be grayed out. Update only as needed.

Soil Composition

Urban land

Frost Dates

First Frost Date	October 15
Last Frost Date	May 1
Frost Free Days	199

Precipitation

September	2.74 inches
Annual	44.04 inches

Drainage Class



Very poorly drained | Poorly drained | Somewhat poorly drained | Moderately well drained | Well drained
Somewhat excessively drained | Excessively drained

Flooding Frequency

None | Very rare | Rare | Occasional | Frequent | Very frequent

From NECCC Cover Crop Selector Tool

Cash crop growing window

Crop Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
 <u>WINTER WHEAT</u>	Light Green	Dark Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Dark Green	Yellow	Light Green
 <u>WINTER CEREAL RYE</u>	Light Green	Dark Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Dark Green	Yellow	Light Green

From NECCC Cover Crop Selector Tool



Field corn for silage or grain?



Late season crop like pumpkin?



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Goals

The screenshot shows a mobile application interface for selecting cover crop goals. At the top, the word "Goals" is centered in a large, black font. Below it, the instruction "Select 1 to 3 goals in order of importance." is displayed. A sub-instruction "Tap and hold for more information" is centered below the instruction. The main area contains 18 goal options, each in a light green rounded rectangle, arranged in a staggered grid pattern. The goals are: Forage Harvest Value, Good Grazing, Growing Window, Improves Soil Organic Matter, Increase Soil Aggregation, Lasting Residue, Nitrogen Fixation, Nitrogen Scavenging, Outcompetes Summer Annual Weeds, Penetrates Plow Pan, Pollinator Food, Prevent Fall Soil Erosion, Prevent Spring Soil Erosion, Reduces Surface Compaction, Residue Suppresses Summer Annual Weeds, and Suppresses Winter Annual Weeds.

Goals

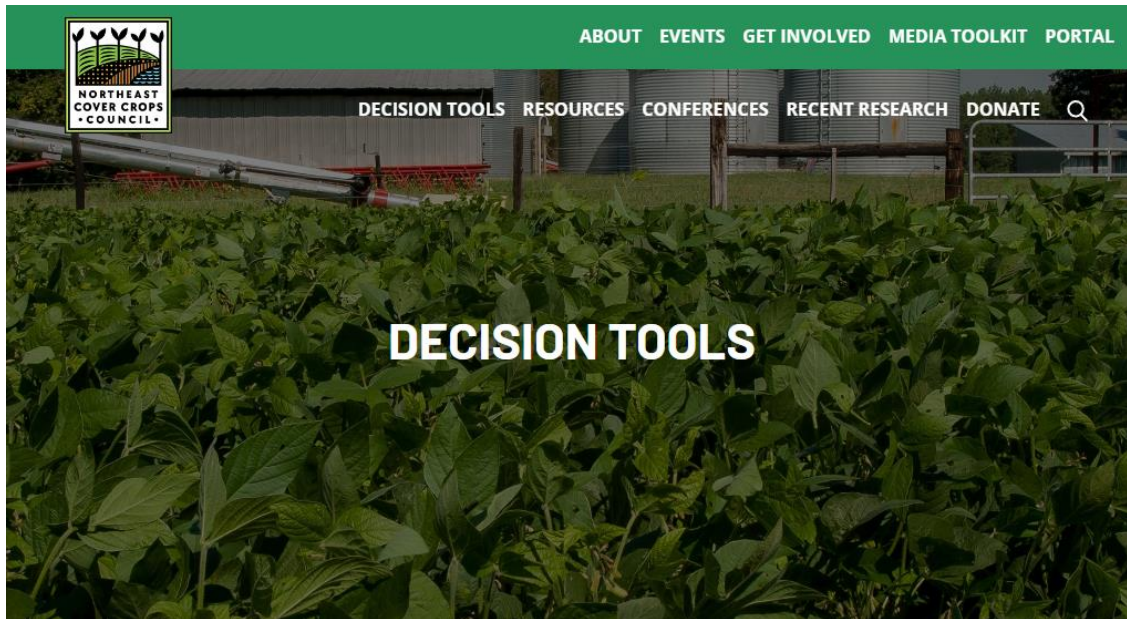
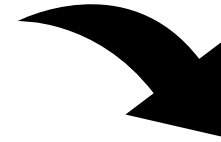
Select 1 to 3 goals in order of importance.

Tap and hold for more information

- Forage Harvest Value
- Good Grazing
- Growing Window
- Improves Soil Organic Matter
- Increase Soil Aggregation
- Lasting Residue
- Nitrogen Fixation
- Nitrogen Scavenging
- Outcompetes Summer Annual Weeds
- Penetrates Plow Pan
- Pollinator Food
- Prevent Fall Soil Erosion
- Prevent Spring Soil Erosion
- Reduces Surface Compaction
- Residue Suppresses Summer Annual Weeds
- Suppresses Winter Annual Weeds

From NECCC Cover Crop Selector Tool

NECCC Decision Tools





Seeding

Cereal Rye

- Germinates at 34 degrees → longer planting window
- Tolerates low fertility and acidic soils (pH range: 4.5 to 8.2)
- Wide range of seeding rate recommendation (30 to 120 lb./A)

Winter Wheat

- pH range: 5.5 to 8.0
- Base seeding rate: 50 to 90 lb./A
- Germinates at 38 degrees





Establishment and Overwintering

Cereal Rye

- Most cold hardy
- Growth continues with minimum temperature of 38 degrees
- Lower base growing temperature, produces biomass longer into the winter



Figure 1. Ground cover produced from 100 lbs of drilled cereal rye (left) and 100 lbs of drilled wheat (right). Cereal rye produced more ground cover than wheat in this year, and more than wheat after the cold snap in early 2018 as well. Photos from 2/13/17.



Spring Growth

Cereal Rye

- Earlier to mature with rapid growth in spring
 - May be desirable for planting early – more biomass, less time
- Significant moisture use – plus or minus
- Can reach 6 feet tall

Winter Wheat

- Later to mature
- Mature height, 2-4 feet





Termination

Cereal Rye

- Up to 10,000 lb./A dry matter production

Winter Wheat

- Less overall biomass production, 2,000 to 8,000 lb./A dry matter

Termination strategies are similar

- Terminate prior to elongation with herbicide
- Terminate at flowering with herbicide, mowing, or roller-crimper





Post-Termination

- Cereal rye and winter wheat have similar benefits for soil health, but rye bests wheat
- Cereal rye residue is more persistent
- Wheat is *less likely* to become weedy through reseeding



Photo credit: Jack Rabin, Rutgers NJAES (emeritus)



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Special Considerations

- How does the cover crop fit into your crop rotation? When and how will you terminate it?
- Do you intend to use the cover crop as a single species, or part of a mix?

Termination strategy, crop rotation

- Biomass production for spring and summer weed control is major benefit of rye over wheat
 - Early termination diminishes this benefit
- Delayed termination of cover crop produces residue with high C:N, resulting in N tie-up
 - Wheat has longer window for termination
- Consider allelopathic effects of cereal rye

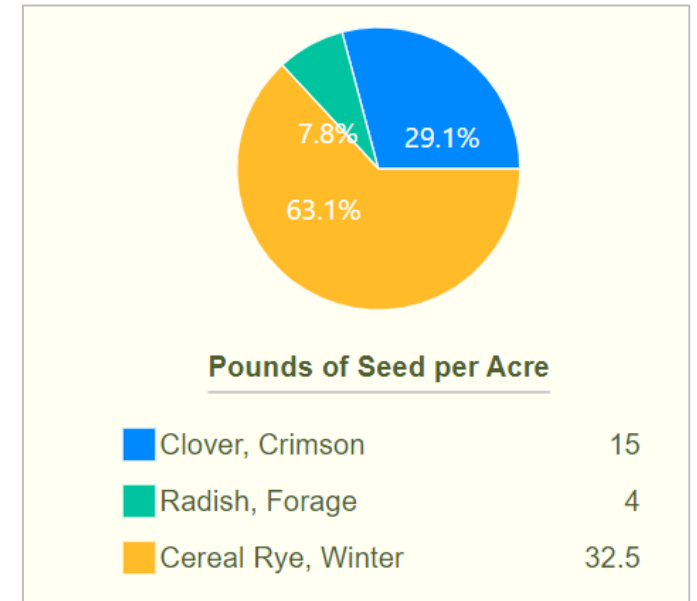
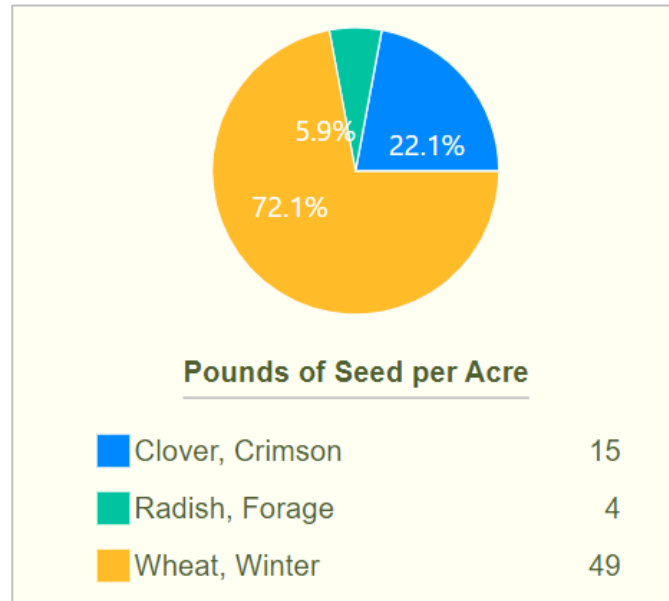
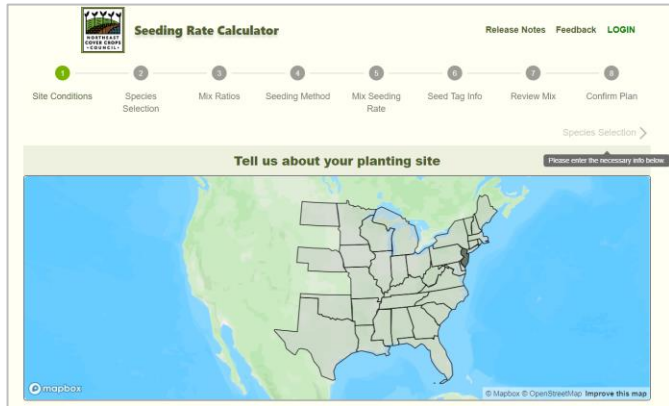


Will you terminate before, at, or after planting?



Performance in a Mix

- Seeding Rate Calculator, Precision Sustainable Ag





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Cover Crop Superlatives



**Most likely to
succeed**



Best team player



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In Summary

- Cereal rye is a workhorse, with greater adaptability and biomass production than winter wheat
 - Best where focus is primarily on nutrient scavenging, erosion prevention, weed suppression, and building soil organic matter
- Winter wheat is less competitive in a mix, has a longer spring management window, and produces less biomass
 - Good choice when concerned about termination timing and managing biomass



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Thank you!

Kate Brown

Agriculture and Natural Resource Agent

RCE - Somerset County

kbrown@njaes.rutgers.edu

908-526-6293