

# Northeast Cover Crops Council Short-Form Webinar Series

**Cover crop planting date vs. seeding rate considerations**

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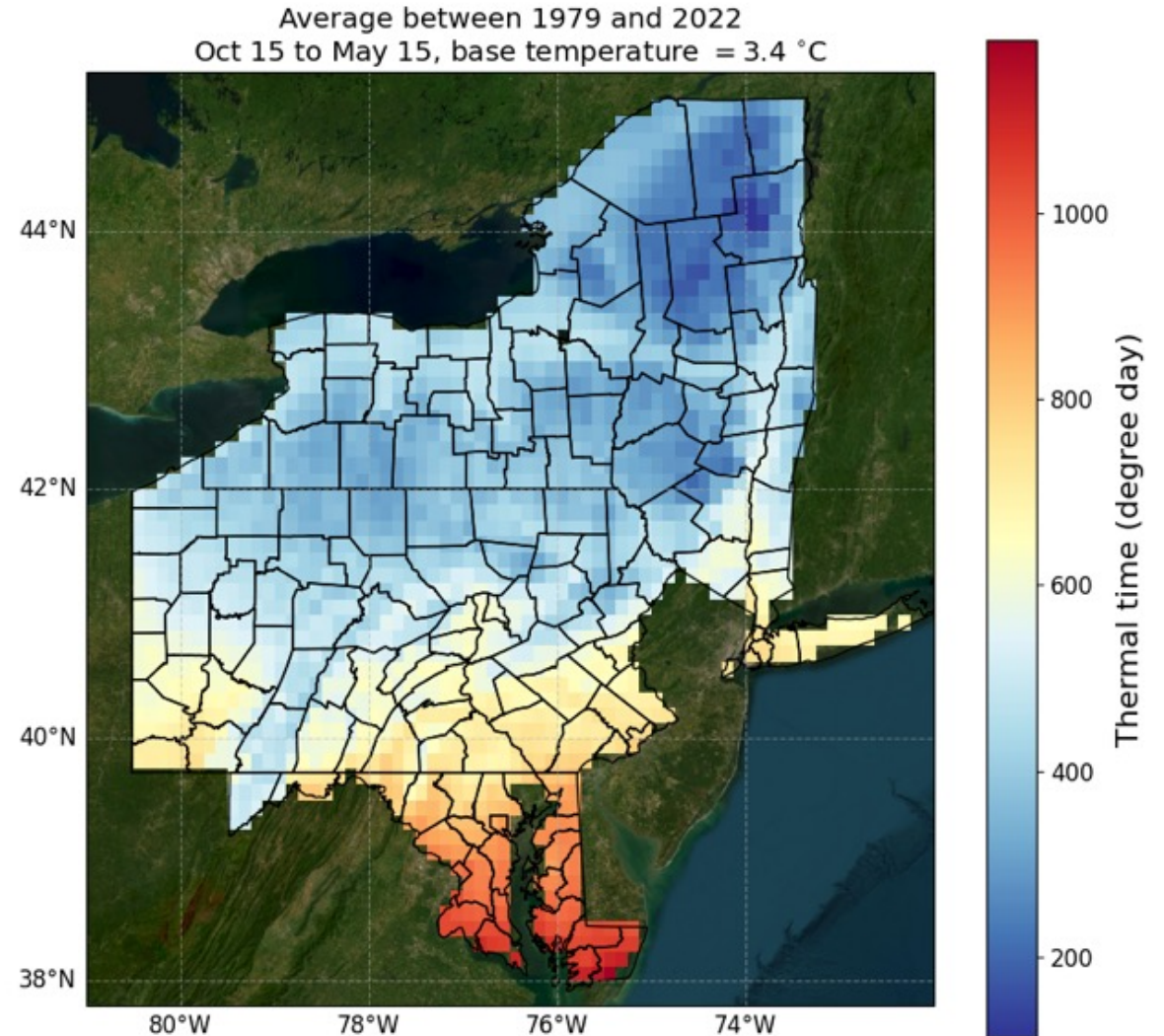
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# Planting date:

## Management challenges

- ✓ Cash crop harvest delays sowing
- ✓ Labor shortages
- ✓ Field conditions

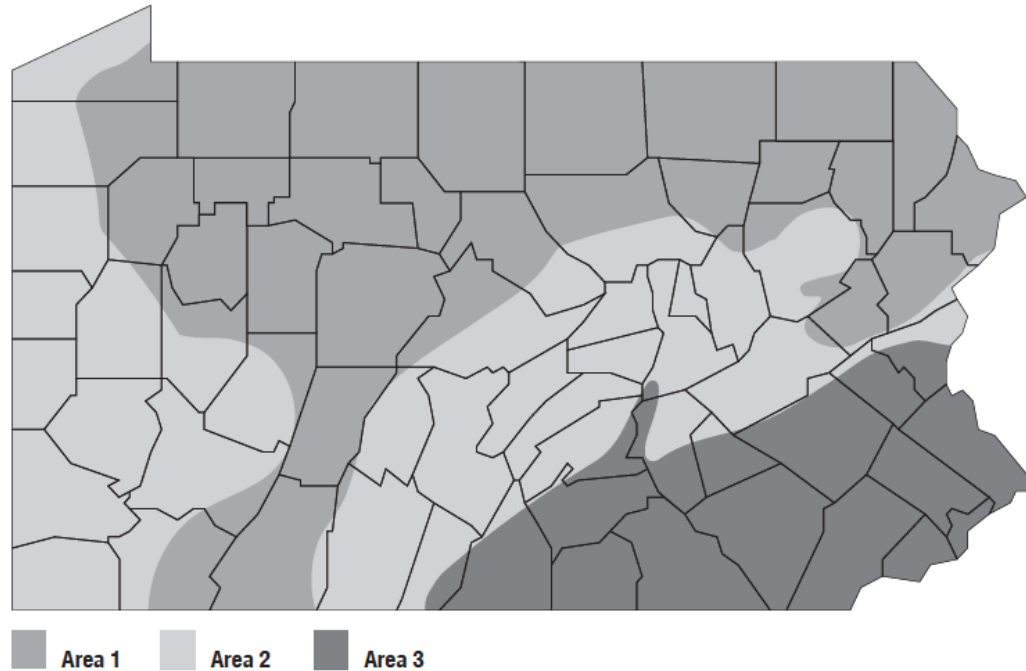
~300 GDDs for rye establishment



# Planting date:

## Management challenges

**Figure 1.7-1.** Small grain management areas in Pennsylvania.



**Table 1.10-6.** Recommended latest fall seeding dates for cool-season annual cover crops by small grain management zones in Pennsylvania.

Species	Zone 1	Zone 2	Zone 3
Winter rye	Oct. 10	Oct. 15	Oct. 25
Winter wheat	Oct. 1	Oct. 5	Oct. 15
Winter barley	n/a	Sept. 25	Oct. 1
Spring oats	Sept. 1	Sept. 10	Sept. 15
Annual ryegrass	Aug. 15	Sept. 1	Sept. 15
Crimson clover	n/a	Sept. 1	Sept. 15
Austrian winter pea	n/a	Aug. 25	Aug. 30
Hairy vetch	Aug. 15	Sept. 1	Sept. 15
Forage radish	Sept. 1	Sept. 7	Sept. 15
Rapeseed/canola	Sept. 1	Sept. 7	Sept. 15
Turnip	Sept. 1	Sept. 7	Sept. 15

See Figure 1.7-1 in Part I, Section 7 for small grain management zones.

# Planting date: Cover crop services

Erosion control, nutrient management, soil health, weed control

Indicators:

- ✓ Groundcover
- ✓ Biomass



## Seeding rate: Adjust for your management challenges & goals?

- ✓ **ROI:** services provided = extra seed cost?
- ✓ **Monoculture vs. mixtures:** tailoring rates to the species in the ground



# Seeding rate rules of thumb

- ✓ **Increase** seeding rate when broadcasting
- ✓ **Decrease** seeding rate when soil fertility is high



# Seeding rate knowledge gaps

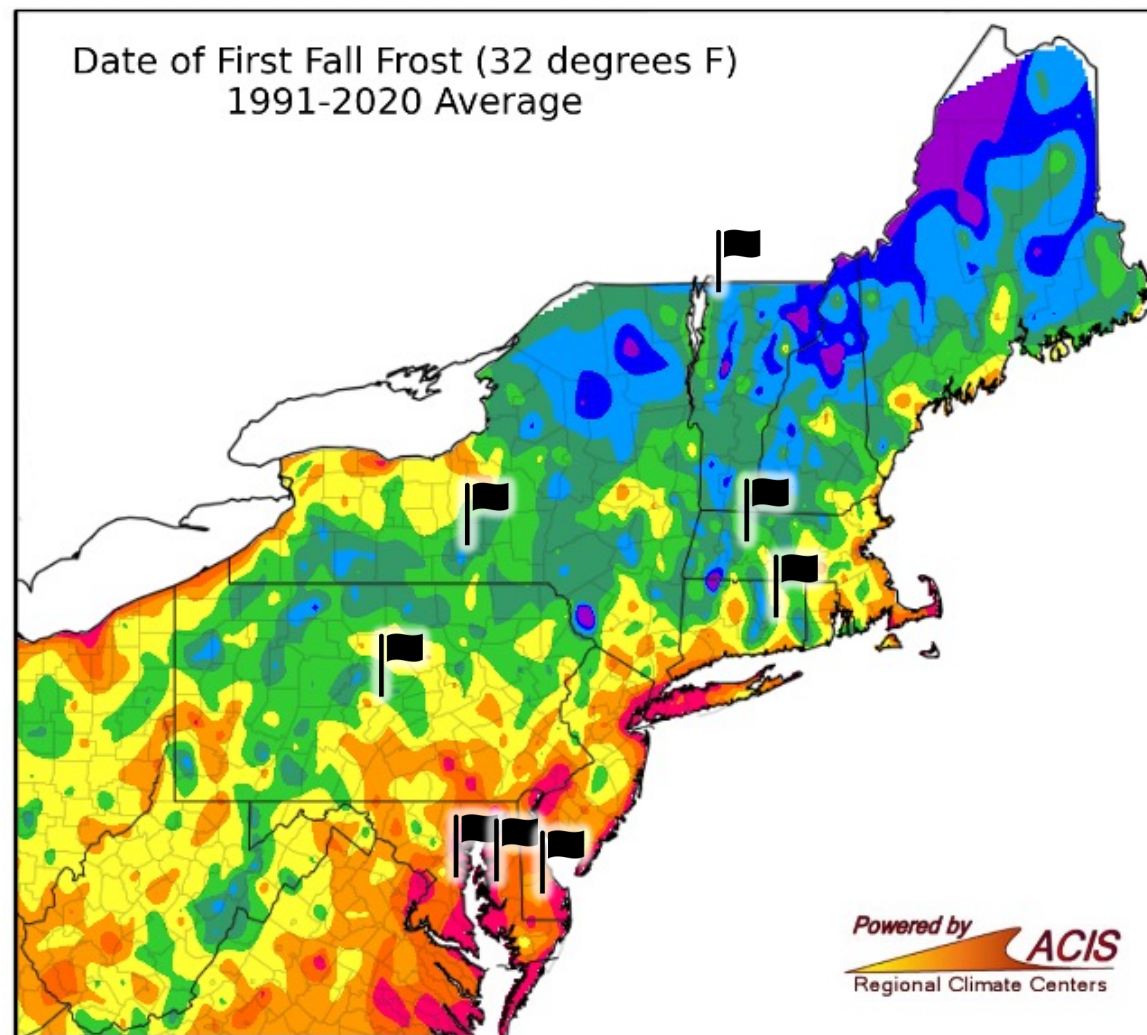
- ✓ **Sowing date?** Increase rates when seeding late?
- ✓ **Termination timing?** Decrease rates when planting green?



# Optimizing rye seeding rates across sowing date windows in the NE region



Dave Votypka



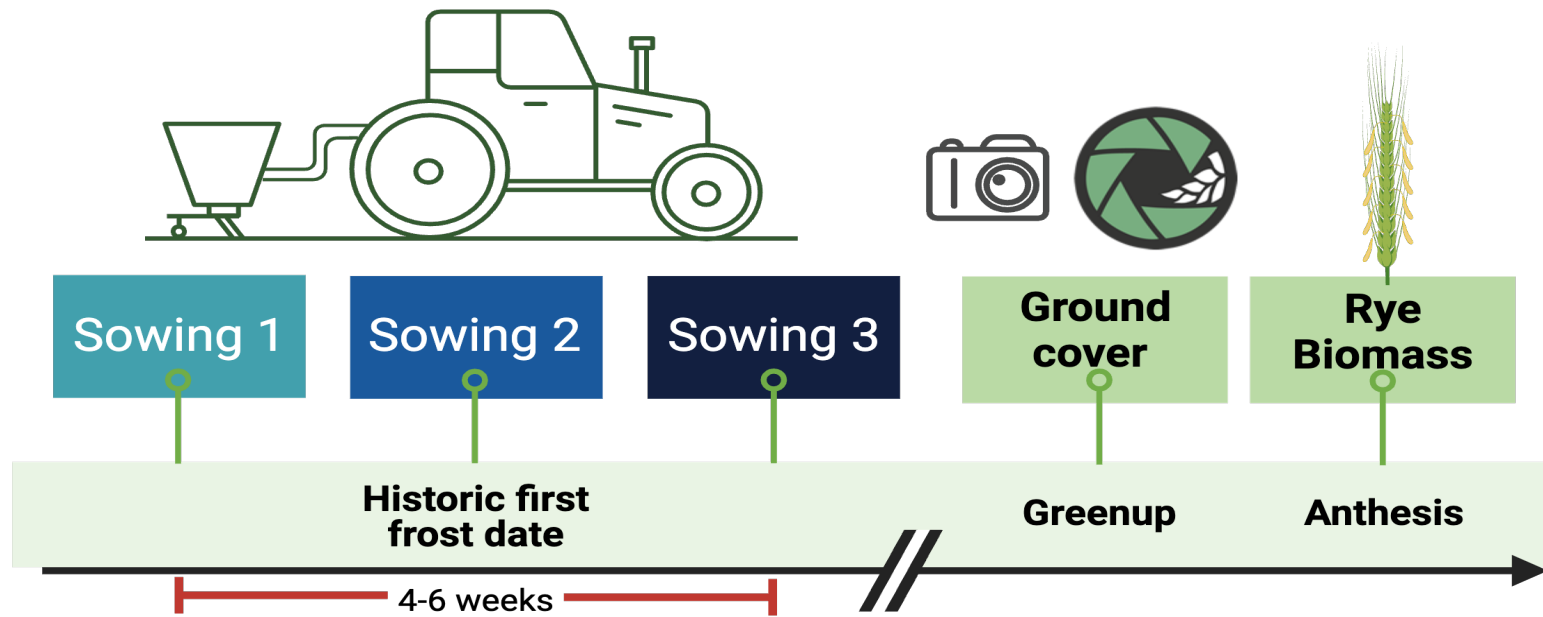
Sept 15 Sept 22 Sept 29 Oct 6 Oct 13 Oct 20 Oct 27 Nov 3

[extension.psu.edu](http://extension.psu.edu)



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Location	Historic first frost date
Alburgh, VT	October 6
South Deerfield, MA	September 30
Freeville, NY	October 13
Rock Springs, PA	October 16
Storrs, CT	October 15
Georgetown, DE	October 24
Beltsville, MD	October 21
Queenstown, MD	November 1

	Early	1st Frost	Late
Seeding rate (lbs/ac)	0	0	0
	15	15	15
	30	30	30
	60	60	60
	90	90	90
	120	120	120

## Seeding rate (lbs/ac) required to reach 30% groundcover in April

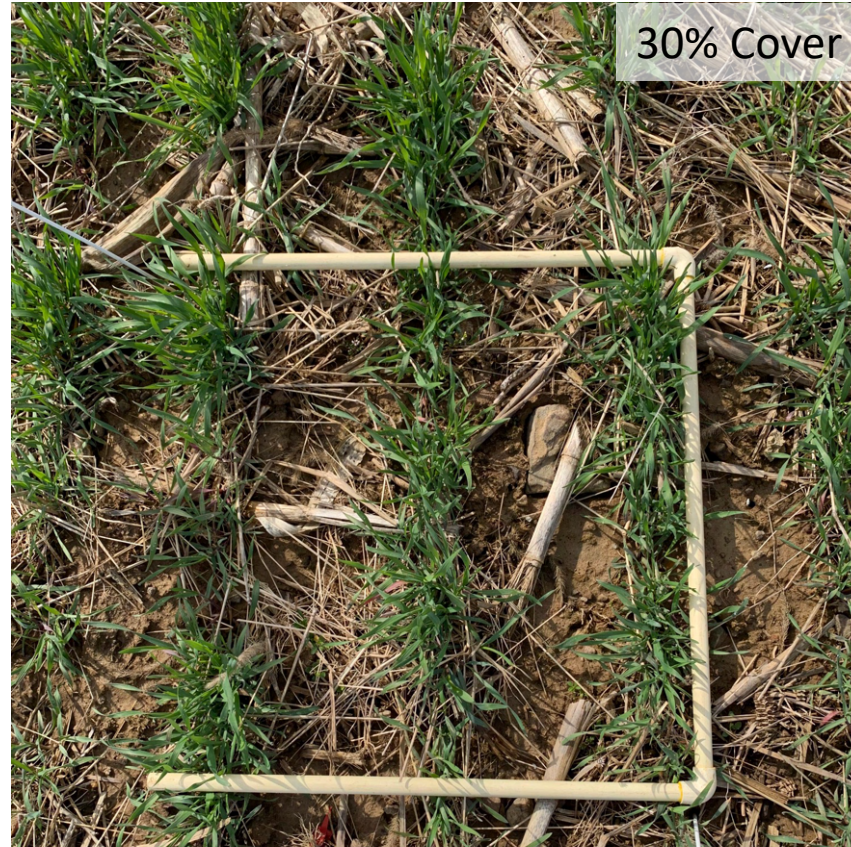
Take homes:

- ✓ High seeding rates beneficial at moderate sowing dates
- ✓ Late sown rye never reached 30% cover at greenup

Site	Early	1st Frost	Late
VT	30	90	---
NY	15	90	---
PA	60	120	---
DE	30	---	---

### Legend

- 2-3 weeks before 1<sup>st</sup> frost
- Historical 1<sup>st</sup> frost date
- 2-3 weeks after 1<sup>st</sup> frost



# Seeding rate (lbs/ac) required to reach maximum biomass at anthesis

Site	Early	1st Frost	Late
VT	45	60	120
MA	45	30	105
NY	60	45	45
PA	90	45	45
DE	30	<30	30
MD-BARC	45	<30	60

Take homes:

- ✓ Biomass maximized at ~1 bu/ac
- ✓ Greater benefit to higher SR at northern locations

## Legend

- 2-3 weeks before 1<sup>st</sup> frost
- Historical 1<sup>st</sup> frost date
- 2-3 weeks after 1<sup>st</sup> frost



# Maximum rye biomass (lbs/ac)

by sowing date



Site	Early	1st Frost	Late
VT	7000	5600	4500
MA	7500	5600	3900
NY	6000	4100	2600
PA	6200	5000	3300
DE	3800	2600	2200
MD	8200	8500	5500

Take homes:

- ✓ Maximum biomass achieved with early sowing
- ✓ 1600-3600 lbs/ac lost when sowing late
- ✓ Soil conditions matter

## Legend

- 2-3 weeks before 1<sup>st</sup> frost
- Historical 1<sup>st</sup> frost date
- 2-3 weeks after 1<sup>st</sup> frost



# Choose a seeding rate that fits your goals:

Seeding rate to reach **30% cover**

Site	Early	1st Frost	Late
VT	30	90	---
MA			
NY	15	90	---
PA	60	120	---
DE	30	---	---
MD			

lbs/ac

Seeding rate to reach **maximum biomass**

Early	1st Frost	Late
45	60	120
45	30	105
60	45	45
90	45	45
30	<30	30
45	<30	60

lbs/ac

**Maximum biomass** at Anthesis

Early	1st Frost	Late
7000	5600	4500
7500	5600	3900
6000	4100	2600
6200	5000	3300
3800	2600	2200
8200	8500	5500

lbs/ac



# Choose a seeding rate that fits your goals:

Seeding rate to reach **30% cover**

Site	Early	1st Frost	Late
VT	30	90	---
MA			
NY	15	90	---
PA	60	120	---
DE	30	---	---
MD			

lbs/ac

Seeding rate to reach **maximum biomass**

Early	1st Frost	Late
45	60	120
45	30	105
60	45	45
90	45	45
30	<30	30
45	<30	60

lbs/ac

**Maximum biomass** at Anthesis

Early	1st Frost	Late
7000	5600	4500
7500	5600	3900
6000	4100	2600
6200	5000	3300
3800	2600	2200
8200	8500	5500

lbs/ac



# Choose a seeding rate that fits your goals:

Seeding rate to reach **30% cover**

Site	Early	1st Frost	Late
VT	30	90	---
MA			
NY	15	90	---
PA	60	120	---
DE	30	---	---
MD			

lbs/ac

Seeding rate to reach **maximum biomass**

Early	1st Frost	Late
45	60	120
45	30	105
60	45	45
90	45	45
30	<30	30
45	<30	60

lbs/ac

**Maximum biomass** at Anthesis

Early	1st Frost	Late
7000	5600	4500
7500	5600	3900
6000	4100	2600
6200	5000	3300
3800	2600	2200
8200	8500	5500

lbs/ac



# Should you increase your rye seeding rate?

- ✓ High seeding rates at late dates could not reach biomass levels achieved when sowing early
- ✓ 1 bu/ac was sufficient for biomass production in most scenarios
- ✓ Consider increasing seeding rates when seeding late for improved groundcover (erosion, winter weeds)



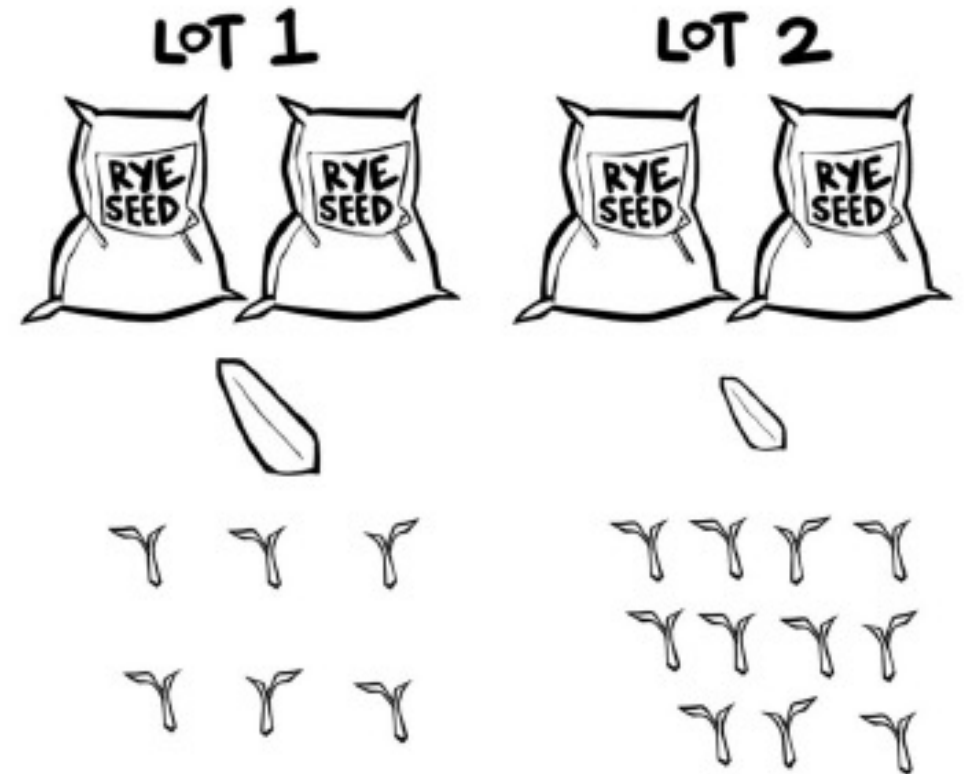


## Cereal rye seeding rate: Live seeds per acre

### **Summary (Lounsbury et al. 2022)**

Cereal rye seed/lb varies widely (13,000 – 23,000 seeds/lb) across varieties & seed lots

- ✓ Track seed counts for your records



Lounsbury et al. 2022

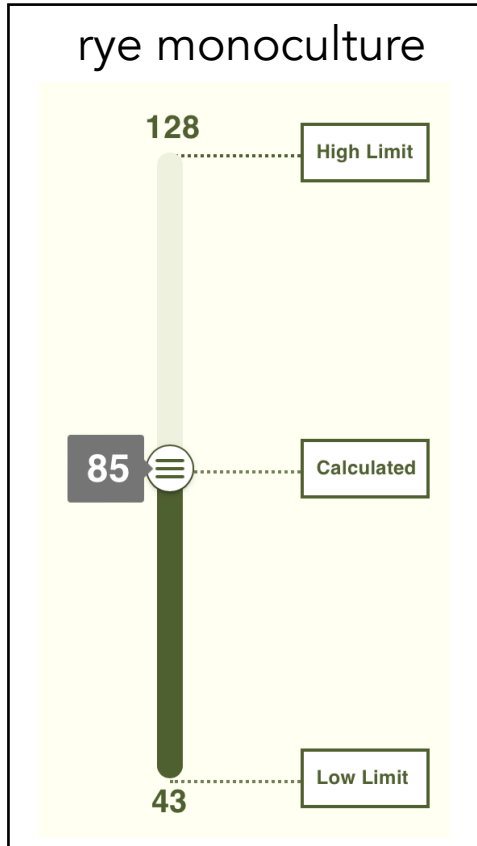


# Mixtures: rules of thumb

- ✓ Use half to one quarter of the typical grass rate
- ✓ Adjust brassica seeding rates based on expected winter survival
- ✓ Keep legumes close to the monoculture rate



# Mixture decision support tools





## Seeding Rate Calculator

[Release Notes](#) [Feedback](#) [LOGIN](#)

1 — 2 — **3** — 4 — 5 — 6 — 7 — 8

Site Conditions    Species Selection    **Mix Ratios**    Seeding Method    Mix Seeding Rate    Seed Tag Info    Review Mix    Confirm Plan

< BACK
Seeding Method >

 Cereal Rye, Winter  
 Vetch, Hairy  
 Rapeseed, Forage

### Review Proportions



**Pounds of Seed per Acre**

Rapeseed, Forage	7
Vetch, Hairy	20
Cereal Rye, Winter	42.5



**Seeds per SqFt**

Rapeseed, Forage	25.23
Vetch, Hairy	7.48
Cereal Rye, Winter	17.76

**Rapeseed, Forage** [Show Details](#) ⌵

**Vetch, Hairy** [Show Details](#) ⌵

**Cereal Rye, Winter** [Show Details](#) ⌵

# Seeding rate and planting date take-home messages

- ✓ Cover crops are still beneficial outside the optimum sowing window
- ✓ Before selecting a seeding rate, identify your:
  - ✓ Goals
  - ✓ Establishment & termination timing



# Questions

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