COOL BEAN

University of Wisconsin-Madison | UW Extension

WWW.COOLBEAN.INFO

Planting Soybeans into Rye
WI Cover Crop Termination Timing and Insect Study

John Gaska and Shawn Conley
Senior Research Agronomist
Soybean and Wheat Extension Specialist
College of Agricultural and Life Sciences, UW-Madison

UW Extension
University of Wisconsin-Extension

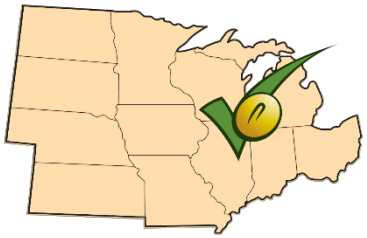
WISCONSIN SOYBEAN MARKETING BOARD

WISCONSIN
UNIVERSITY OF WISCONSIN–MADISON

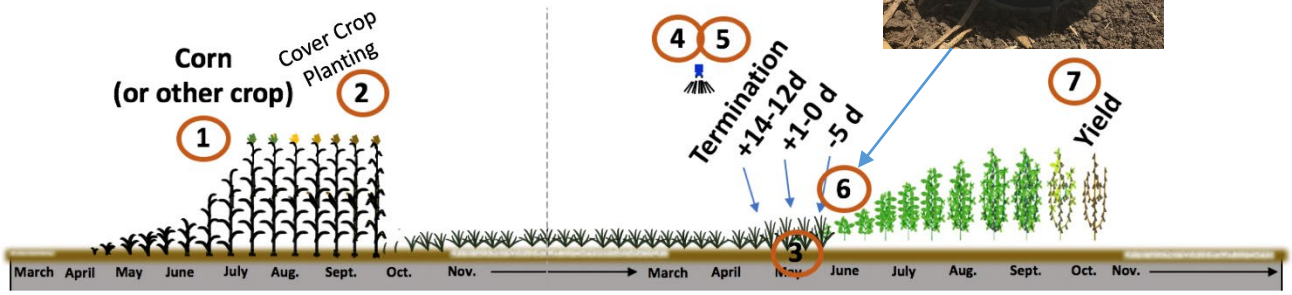
Cover Crops and Arthropods

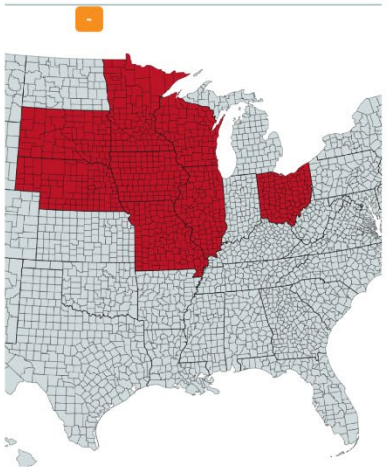
Rye to Soybean

NCSRP NORTH CENTRAL SOYBEAN RESEARCH PROGRAM



WISCONSIN SOYBEAN MARKETING BOARD





Cover Crop

2 Rye following corn

3 Termination: Glyphosate

Measurements

4 Cover crop biomass

5 Extended leaf height

6 Plant damage assessment
Pitfall traps

7 Soybean yield

Insects

myriapods (including centipedes and millipedes)
arachnids (including spiders, mites and scorpions)
crustaceans (including slaters, prawn and crabs)

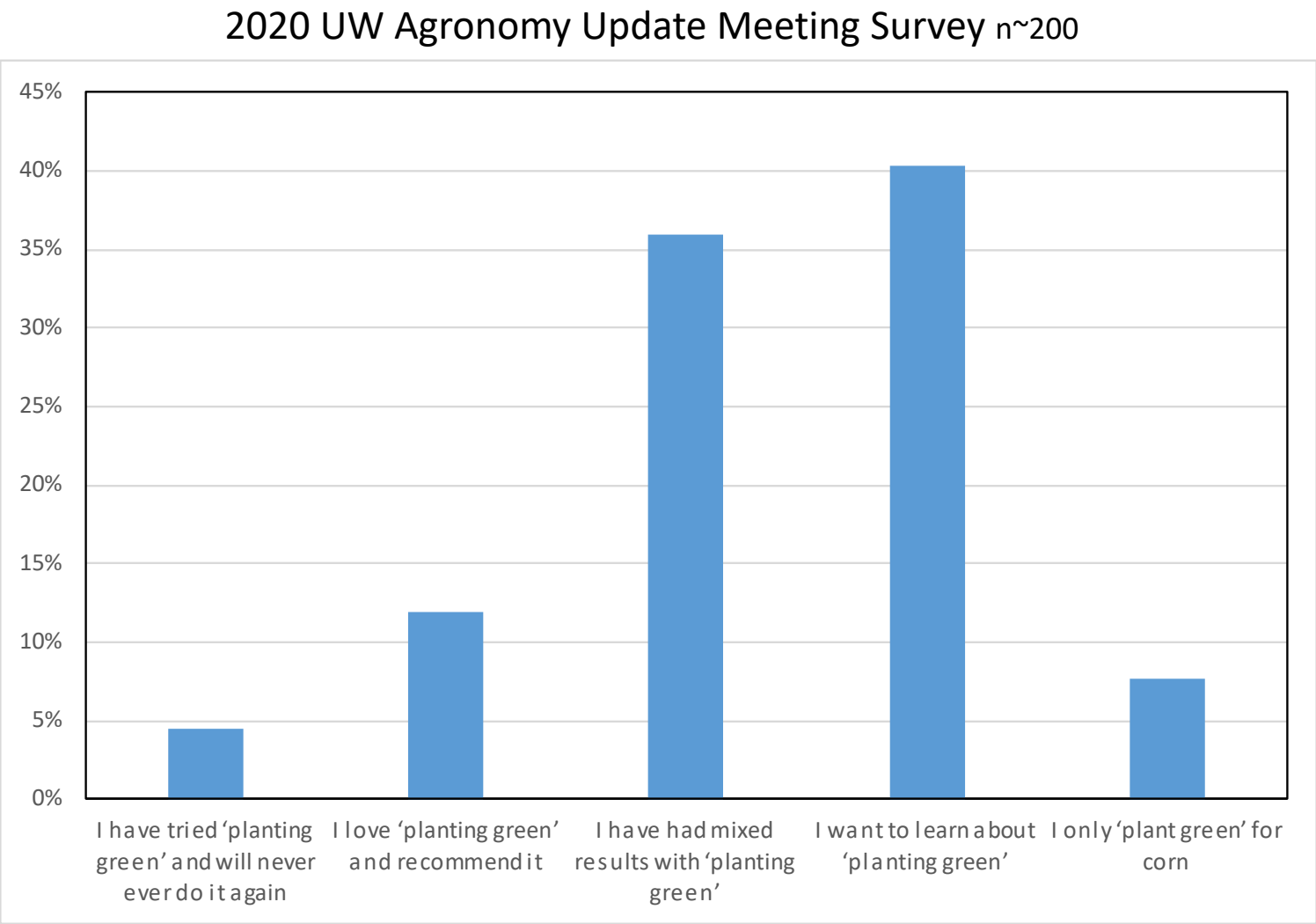
COOL BEAN
University of Wisconsin-Madison | UW Extension
WWW.COOLBEAN.INFO

Benefits of Rye as a Companion Crop for Soybeans

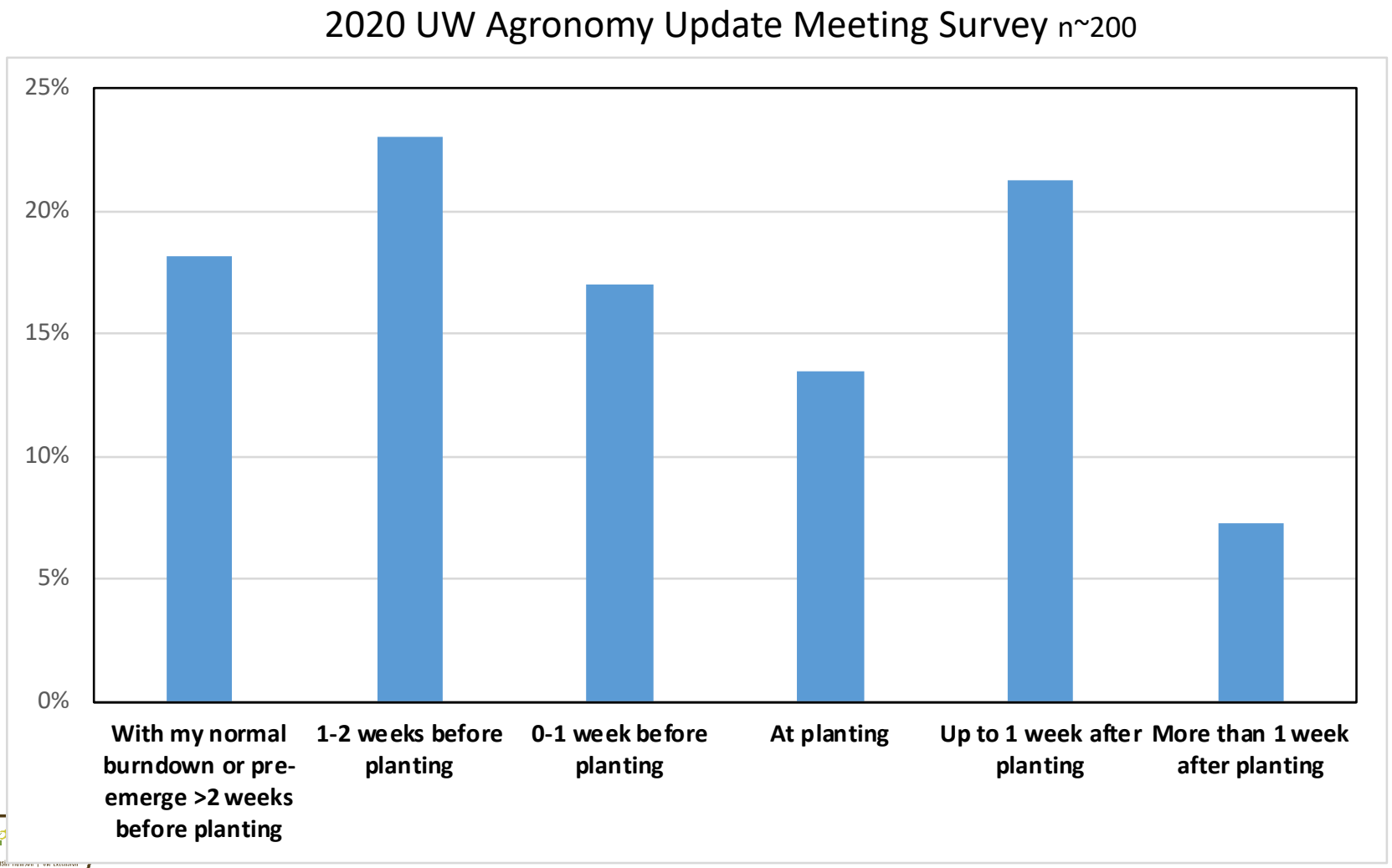
- Weed suppression
- Rye's fibrous root structure provides firm footing for equipment
- Reduction in soil erosion
- Forage crop potential
- Soil health benefits

COOL BEAN
University of Wisconsin-Madison | UW Extension
WWW.COOLBEAN.INFO

Cover crops and soybean



If you plant green, when do you terminate?



Rye Cover Crop Treatments

State	Location	Rye Cover Crop Planting Date 60 lbs/a	Early Termination (T1)	At Plant Termination (T2)	Late Termination (T3)
Wisconsin	Arlington	Sept. 25th	April 24th	May 14th	May 20th

Planted May 14, 2019, all termination with glyphosate
Variety: Renk RS204NX, untreated, 140,000 seeds/acre
Previous crop: Corn silage

Cover Crop Characteristics by Location

State	Location	Cover Crop Planting Date	Early Termination (T1)	At Plant Termination (T2)	Late Termination (T3)
Nebraska	Ithaca	Sept. 24th	April 19th	May 2nd	May 6th
	Pilger	Nov. 19th	May 1st	May 17th	May 23rd
	Plymouth	Nov. 21st	April 23rd	May 14th	May 20th
	Sargent	Nov. 20th	May 16th	June 7th	June 12th
	Waverly	Nov. 16th	April 23rd	May 14th	May 22nd
Wisconsin	Arlington	Sept. 25th	April 24th	May 14th	May 20th

COOL BEAN
University of Wisconsin-Madison | UW Extension
WWW.COOLBEAN.INFO

Precision Tillage Technology
Sabre Tooth Planter Disc Opener

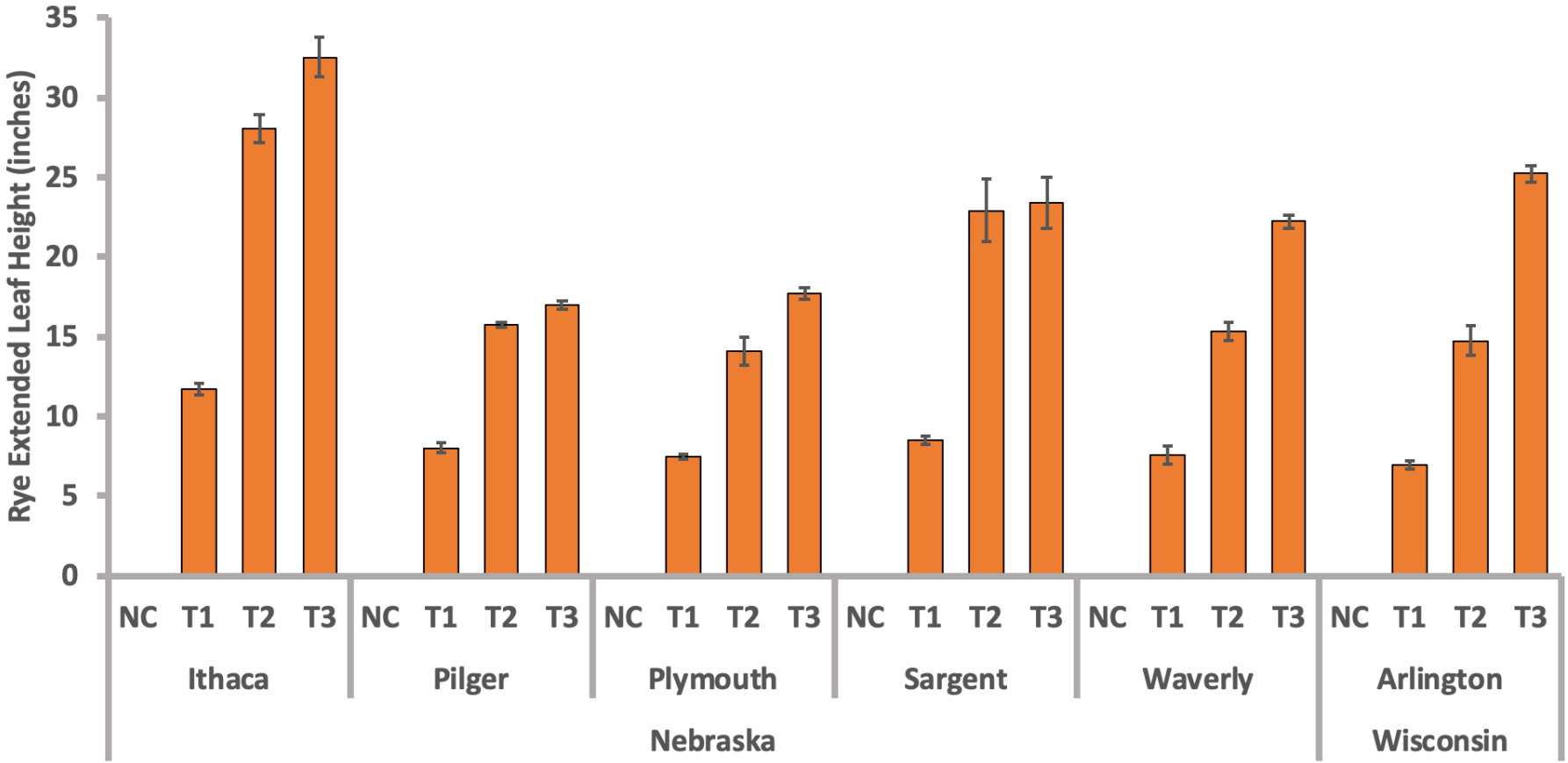
COOL BEAN
University of Wisconsin-Madison | UW Extension
WWW.COOLBEAN.INFO

COOL BEAN
University of Wisconsin-Madison | UW Extension
WWW.COOLBEAN.INFO

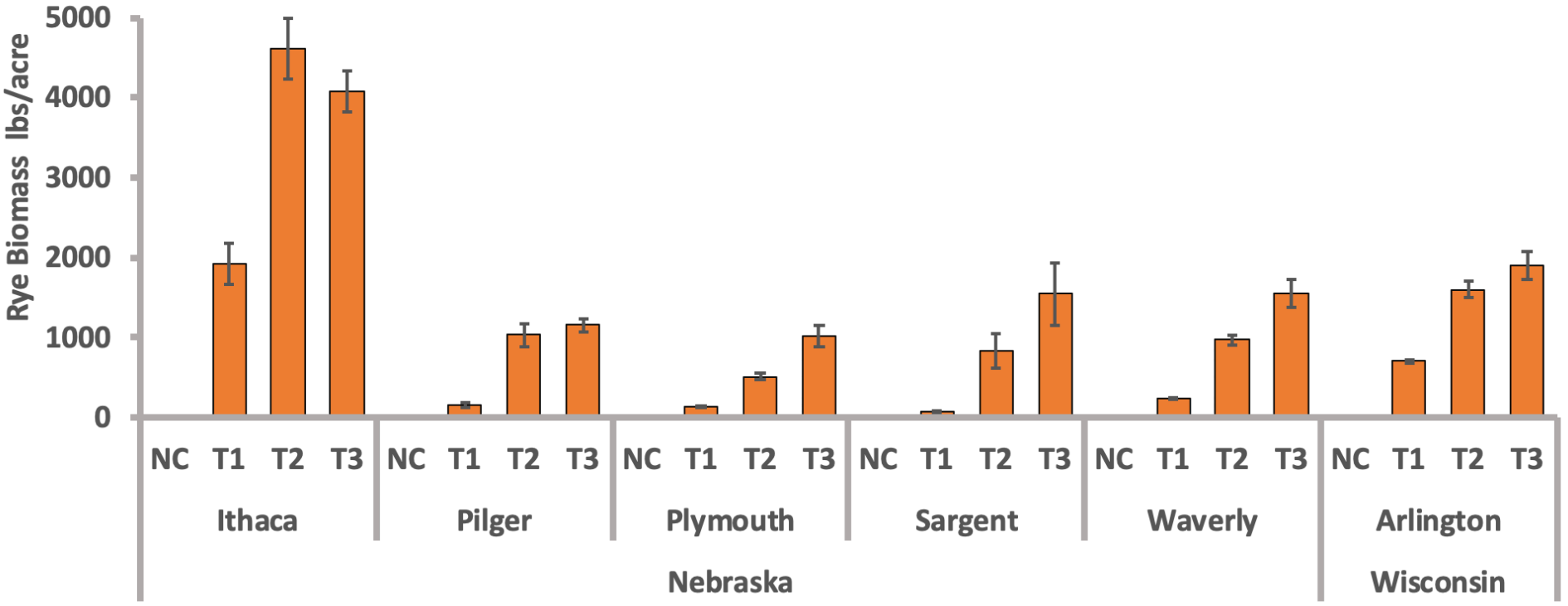
COOL BEAN
University of Wisconsin-Madison | UW Extension
WWW.COOLBEAN.INFO

University of Wisconsin-Madison | UW Extension
WWW.COOLBEAN.INFO

Rye Cover Crop Extended Leaf Height



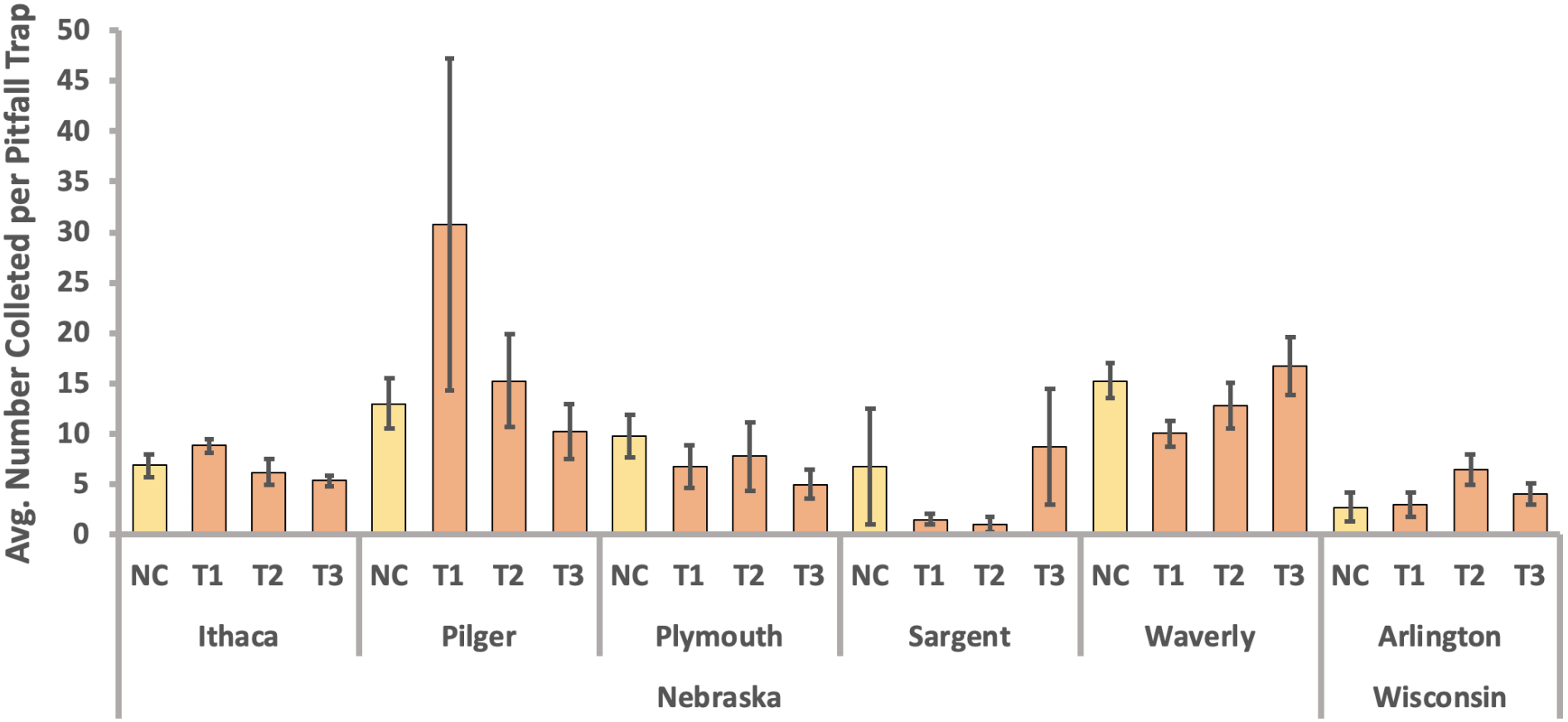
Rye Cover Crop Biomass



COOL BEAN
University of Wisconsin-Madison | UW Extension
WWW.COOLBEAN.INFO

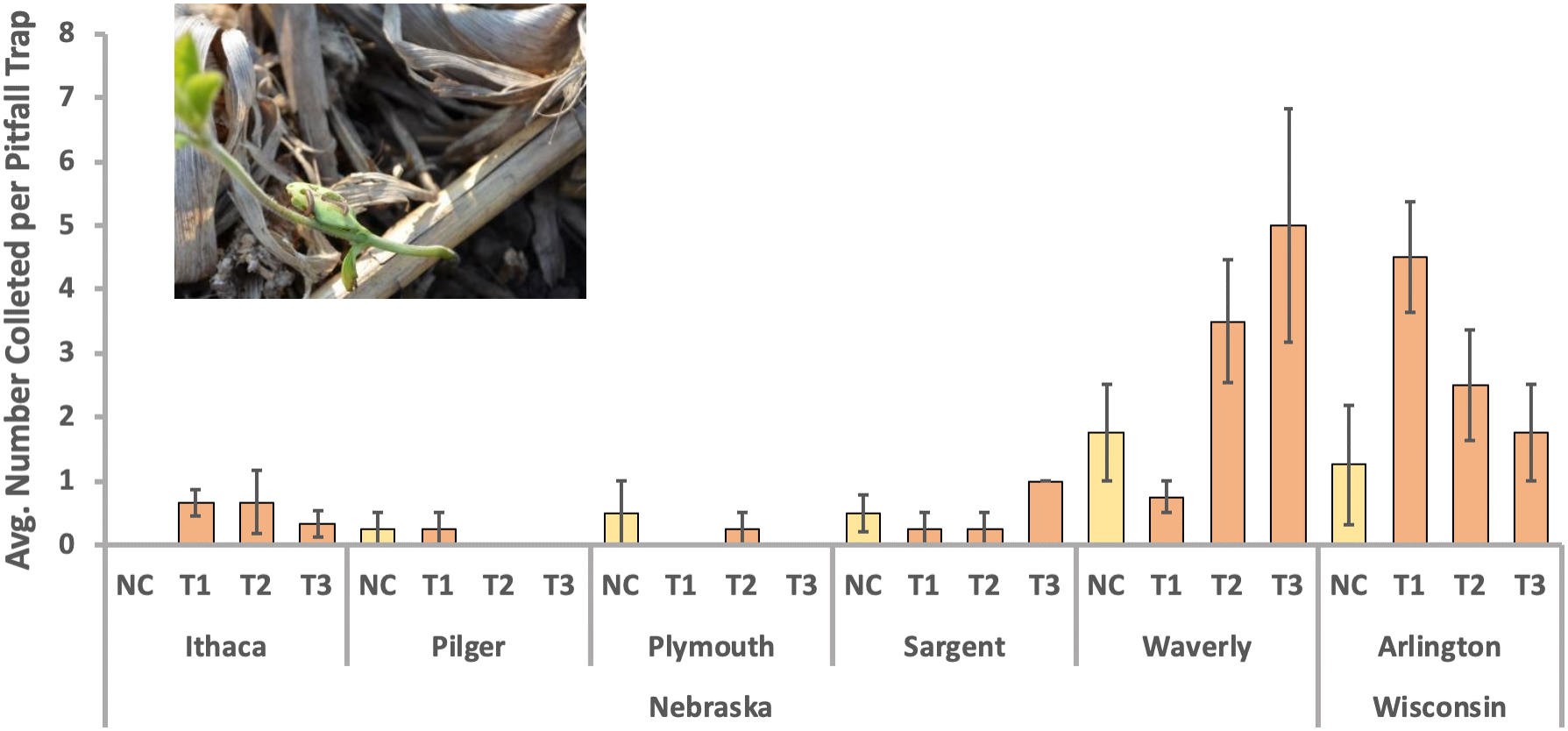
Pitfall Trap

Spiders



Pitfall Trap

Millipedes - Traps placed at V2 for 3 days



Pitfall Trap

Beetles – Traps placed at V2 for 3 days

SLUGS IN A CEREAL RYE COVER CROP

Posted on September 1, 2017

BRYAN JENSEN, UW EXTENSION AND IPM PROGRAM

As the growing season winds down, some growers will be considering a broadcast planting of cereal rye seed over unharvested crops to establish an early cover. Consider scouting for slugs prior to broadcasting the cereal rye. Slugs can severely reduce stands by feeding on the seed

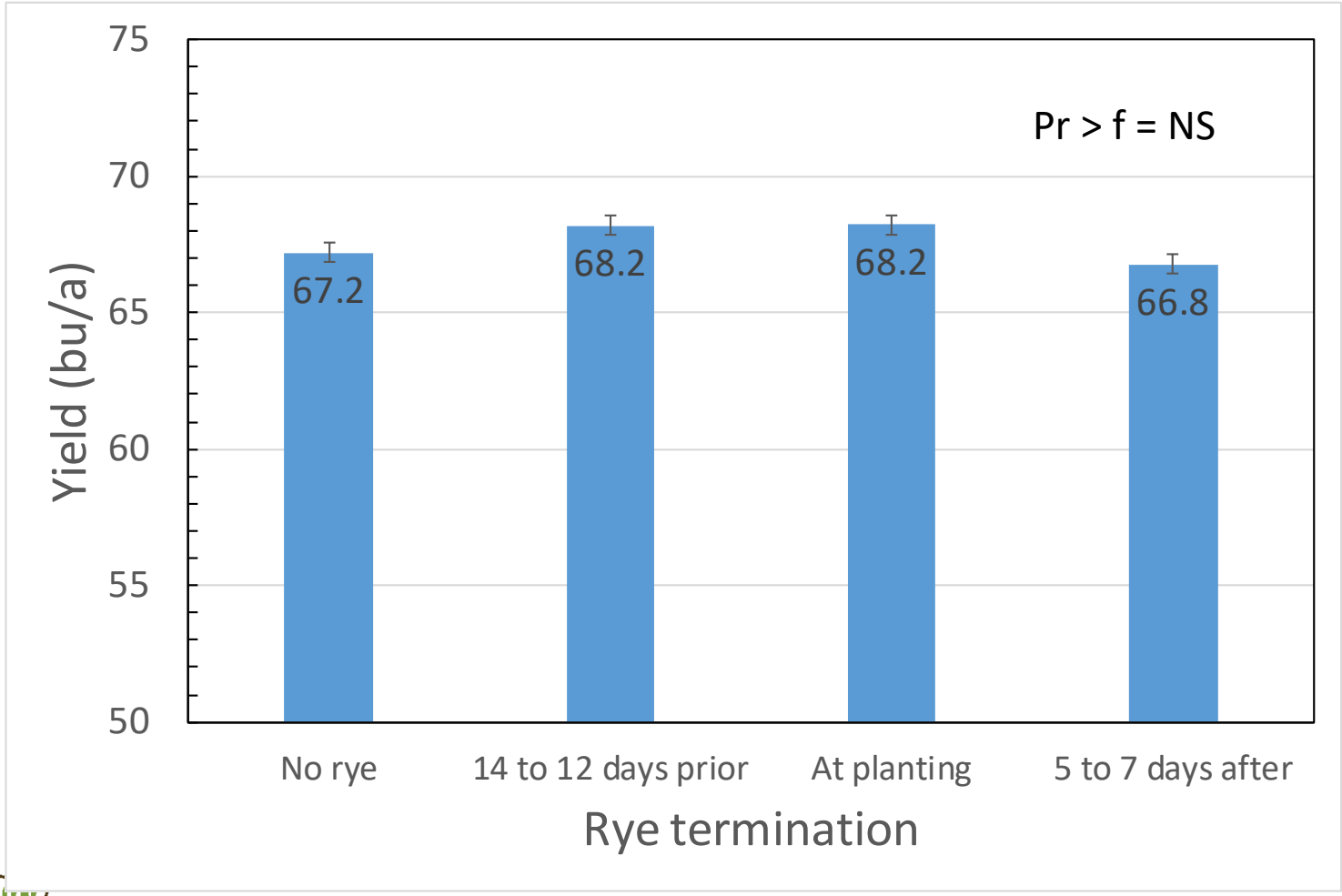
Slugs

#1 question I get

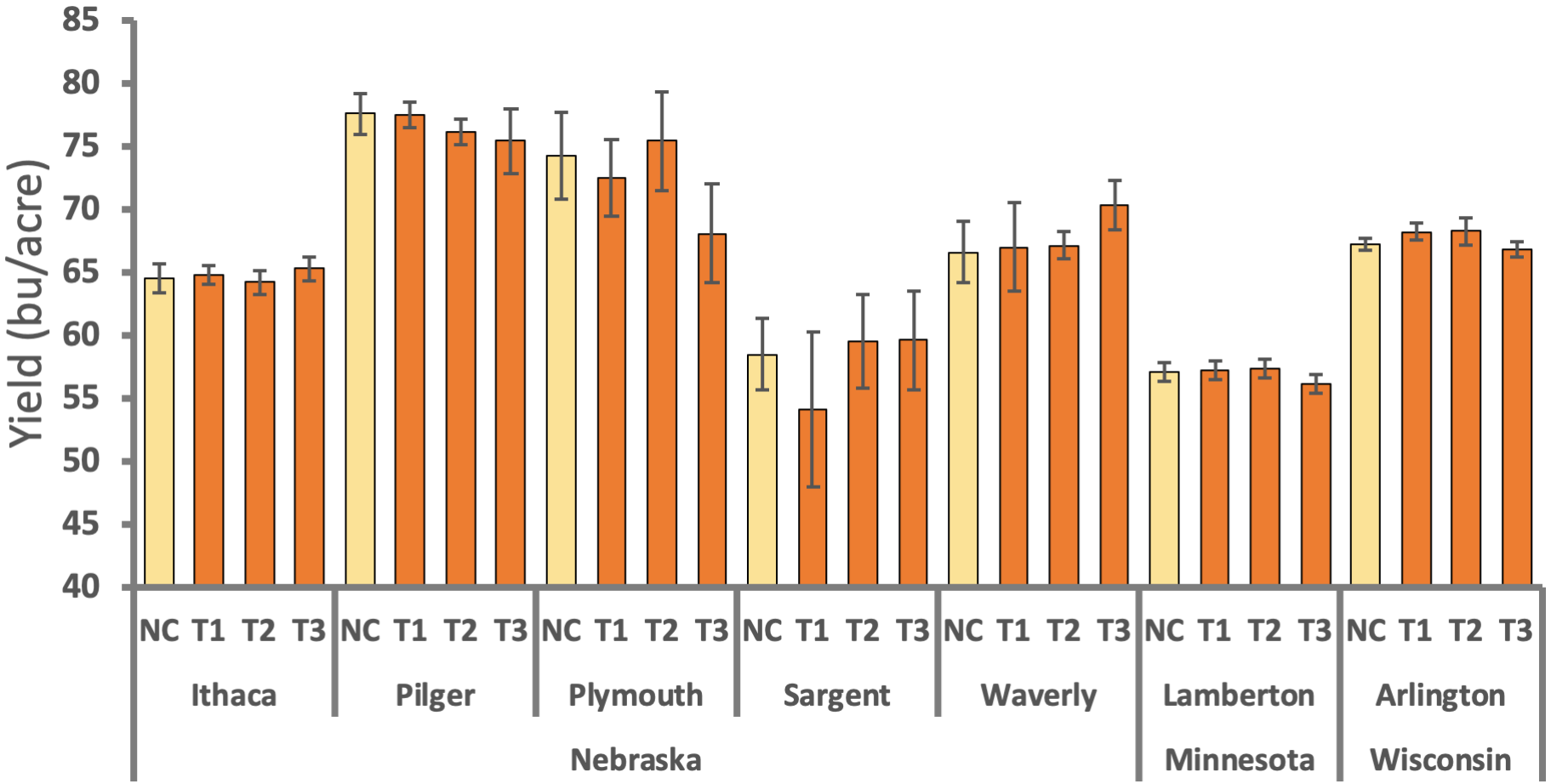
- Many farmers believe that cover crops are part of the problem
- Cover crops can be helpful in the fight against slugs
- Cover crops can help diversify rotations and will promote better populations of beneficial arthropods, which in turn can help control
- Some farmers plant green to help with their slug challenges
- Slugs prefer the dying cover crop, often cereal rye, over the growing cash crop
- Fostering improved, natural-enemy populations, particularly ground beetles helps suppress slug populations
- Natural enemy populations can be suppressed by insecticide use, including seeds treated with insecticides

COOL BEAN
University of Wisconsin-Madison | UW Extension
WWW.COOLBEAN.INFO

Wisconsin Soybean Yield
Rye Cover Crop



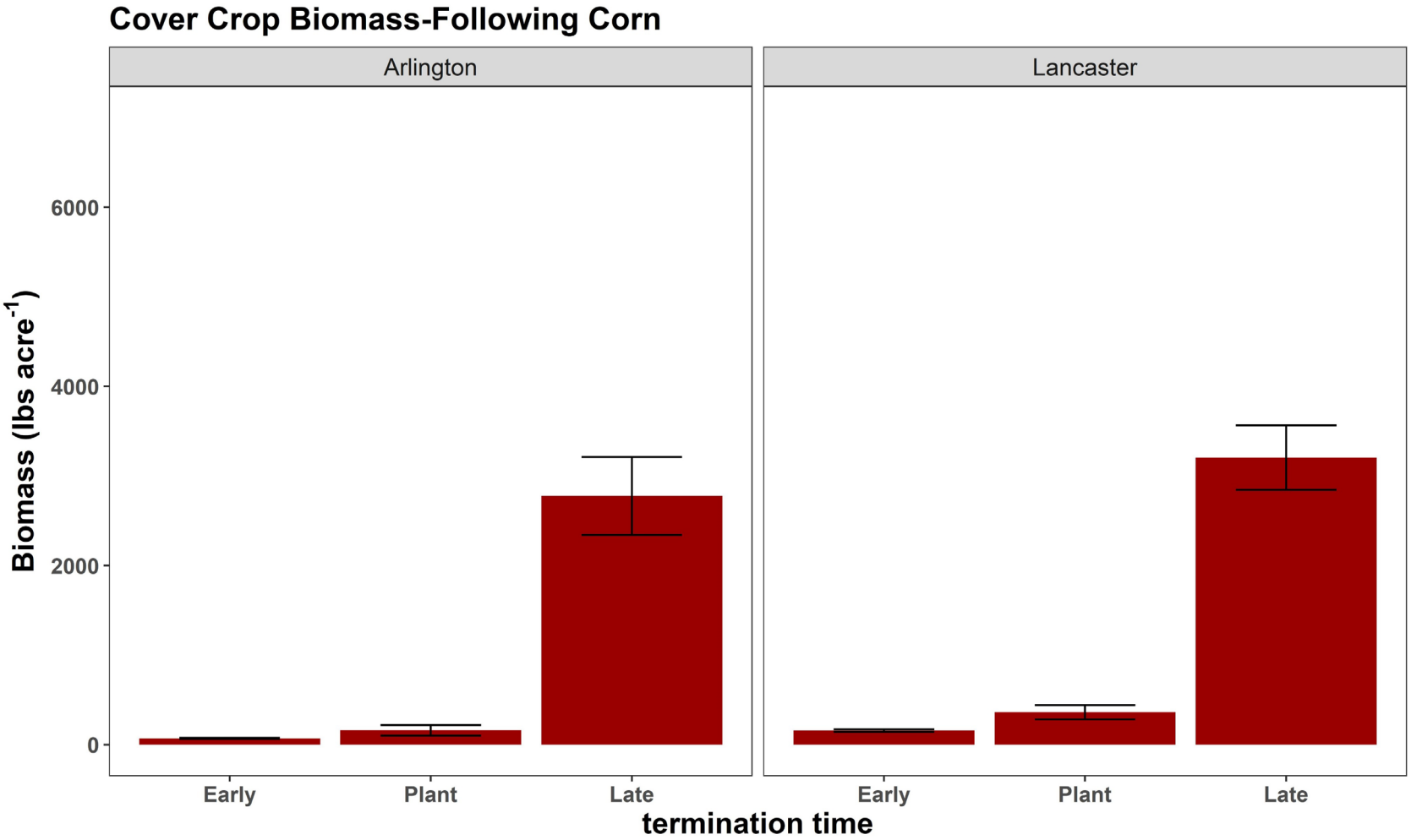
Regional Soybean Yield
Rye Cover Crop



Wisconsin Cropping Systems Weed Science Program

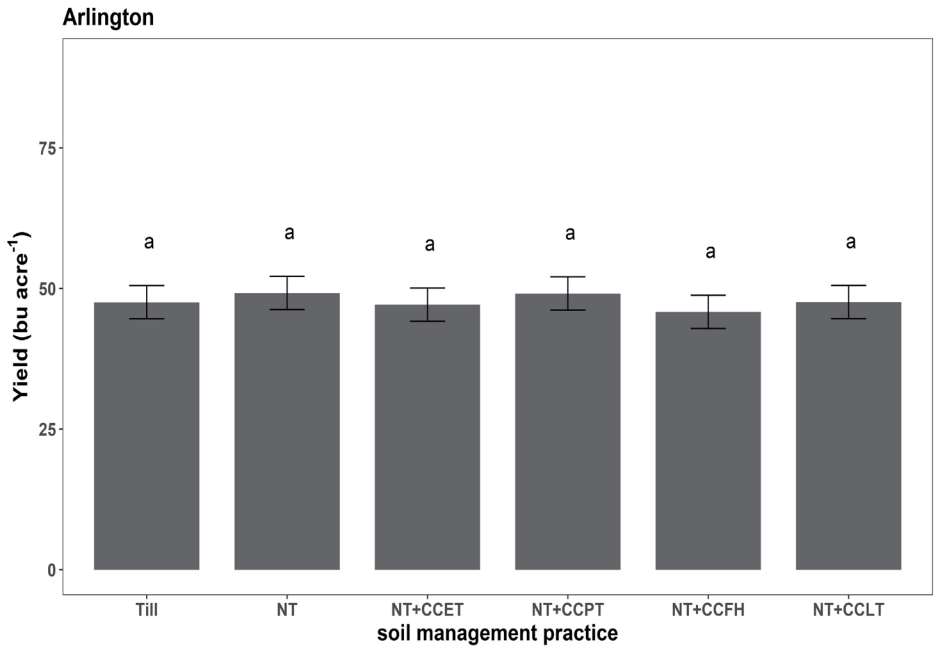
- Cover Crop Planting: Drilled at 60 lbs/acre in October 2018
- Soybean planting: May 23, 2019

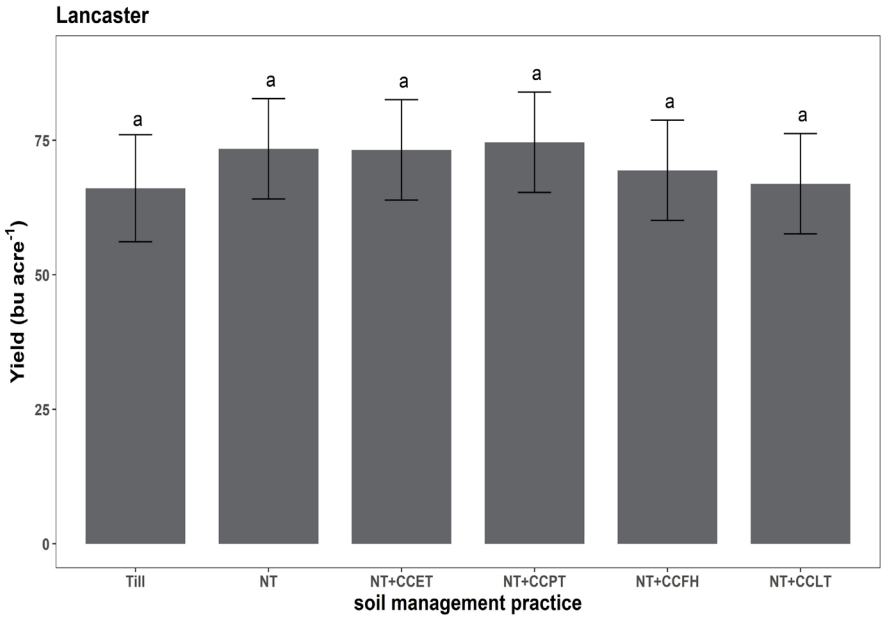
Soybean CC Biomass



Cereal rye cover crop biomass at termination for early (May 7), plant (May 23), and late termination (June 6) timings.

Soybean Yield





Tillage (Till), no-till (NT)
Early cover crop termination (NT+CCET)
Plant cover crop termination (NT+CCPT)
Forage harvest cover crop termination (NT+CCFH)
Late cover crop termination (NT+CCLT)

NPM

COVER CROP TERMINATION

Will it winterkill?

Yes	Maybe	No
Oilseed radish, turnip, kale	Canola, rapeseed	Red clover
Berseem clover	Field pea	Hairy vetch
Japanese millet, pearl millet	Annual ryegrass	Winter barley, triticale, wheat, rye
Sorghum-sudangrass	Sweet clover	
Buckwheat	Crimson clover	
Spring barley, oats		

Specific herbicide recommendations

Annual ryegrass

- Spray before 8" tall, 4"-6" preferred, difficult after 1st node is developed.
- Minimum 1.25-1.5 lb. ae/a glyphosate
- Temperatures above 60 degrees F for 3 days and no nights below 40° F.
- 10-15 GPA, flat fan nozzles, spray 4 hours prior to sunset.

Cereal rye and oats

- Spray prior to boot stage
- 0.75 lb. ae/a glyphosate up to 18" tall
- Temperatures above 55° F for 3 days and no nights below 40° F.

Winter wheat

- 1.1-1.5 lb. ae/a glyphosate up to 18" tall
- Temperatures above 55° F for 3 days and no nights below 40° F.

Hairy vetch and winter pea

- 0.75-1.1 lb. ae/a glyphosate + 1 pt./a 2,4-D or dicamba

Alfalfa and red clover

- 1.1-1.5 lb. ae/a glyphosate + 0.5 lb./a 2,4-D, + 0.25-0.5 ae/a dicamba

Spring forage harvest of rye and annual ryegrass

- 1.13 lb. ae/a glyphosate
- Harvest followed by glyphosate (same day) provides successful termination of both species.
- Glyphosate application prior to harvest of cereal rye or annual ryegrass is illegal.

This publication is available from the Nutrient and Pest Management (NPM) Program. (608) 265-2660, npm@hort.wisc.edu or visit our website: ipcm.wisc.edu

Mechanical termination

Cover crop	Rolling/crimping?	Mowing?	Tillage?
Canola, rapeseed	No	No	Yes
Red clover	No	No	Maybe
Sweet clover	No	No	Maybe
Field pea	No	Yes	Yes
Hairy vetch	Yes (full bloom)	No	Yes
Annual ryegrass	No	No	Yes
Winter cereals, spring cereals	Yes (milk -dough stage)	Yes	Yes

Herbicide termination considerations

Cover crop species: Grass, legume, non-legume, mixture
Cover crop growth stage: Taller generally requires higher rates
Weed species present: Match burndown
Crop to be planted: Plant back restrictions!
Weather conditions at application: Cooler, wetter, cloudy
Type of herbicide used: Contact or translocated

Roundup Ready 2 Xtend soybean

- FeXapan, Engenia or XtendiMax can be used as a burndown application without a planting interval.
- If you use Banvel, Clarity and DiFlexx, you must keep a soybean planting interval of 14 to 60 days depending on the product and its use rate; it doesn't matter if you planted RR2 Xtend.
- Using a dicamba product for spring burndown application is not recommended when planting Roundup Ready, Liberty Link or conventional soybeans.

Corn and dicamba

- **Conventional tillage:** Avoid contact with seed. After planting, if planted less than 1.5 inches, delay application until corn has emerged.
- **No-tillage:** Apply to weeds before, during or after planting a corn crop. When planting into a legume sod, apply after 4"-6" of regrowth.

Always read and follow the label!

COOL BEAN
University of Wisconsin-Madison | UW Extension
WWW.COOLBEAN.INFO

Fact Sheet Series

OGRAIN

19-1 NO-TILL SOYBEAN TRIAL 2018

Introduction

The organic cover crop-based rotational tillage cropping system trial was initiated in 2017 at the Arlington Agricultural Research Station. The trial is a four-year rotation including corn, soybean, fallow and a small grain (see Figure 1). Prior to our trial, the four 6-acre fields were the site of an organic soil-balance (Ca/Mg) fertility trial from 2006 through mid-2014, with a rotation of corn – soybeans - alfalfa/oats - alfalfa. The fields were under alfalfa from fall 2014 through 2016 and have been certified organic since 2009. Every field is split in twenty 450 ft long by 30 ft wide plots, allowing us to use 15 ft wide farming implements for our different treatments.

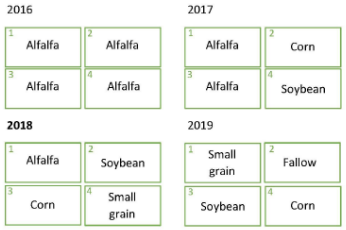


Figure 1 - Rotation on the 4 fields since 2016

Description of the trial

The field used for the 2018 no-till soybean trial was under alfalfa for 2 years before it was planted with corn in 2017. We harvested the corn for silage at the end of September 2017 and planted the cover crops on October 2, 2017. We applied 10,427 gals/ac of liquid manure in the fall of 2016 after termination of alfalfa. No fertilizer of any kind has been applied since then.

Climate

The diagram on Figure 2 shows the minimum and maximum temperature as well as the monthly rainfall from December 2017 until October 2018. Historic average temperature and precipitation values from 1971 to 2000 were found on the Wisconsin State Climatology Office's website (http://www.aos.wisc.edu/~sco/clim-history/stations/470308.html).

December, January and February were comparable to the 1971-2000 averages in terms of temperature and rainfall. March was drier than historical averages. The month of April was drier than historical averages, and the minimum temperature was cooler than usual. However, both minimum and maximum temperature in May were greater than historical averages. This temperature difference between early and late spring played a key role in rye biomass accumulation and maturity. For the remainder of the year, the temperatures were close to historic averages. In May, June, September and October the research station received more rainfall than usual.

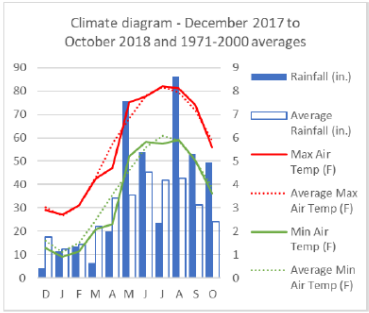


Figure 2 - Climate diagram

This publication is made possible by a grant from the USDA Beginning Farmer and Rancher Development Program. OGRAIN is a collaborative effort of the UW-Madison/UWEX Organic and Sustainable Cropping Systems lab, UW-Madison Center for Integrated Agricultural Systems (CIAS), Farm and Industry Short Course (FISC), and Midwest Organic and Sustainable Education Service (MOSES).

Organic and Sustainable Agriculture Research and Extension
DEPARTMENT OF PLANT PATHOLOGY
UNIVERSITY OF WISCONSIN-MADISON

Termination options

- Herbicide
- Roller crimper
- Organic
  - Roller crimp at anthesis
  - Plant directly into boot stage rye fb roller crimp 2-3 weeks later
- Forage harvest
- Mowing

Conclusions

- Cover crop termination timing in corn can affect nitrogen management
- Cover crops may not increase soybean yields, but they are not detrimental (2-2019 UW Studies)
- Allow as much biomass to accumulate as possible for weed control
- A burndown rate of glyphosate is plenty to terminate rye and should be applied during actively growing conditions (hard to achieve if trying to terminate early)

Do you grow soybeans?
Are you interested in soil health?

- Objectives:
  - Connect management practices to four common soil health measurements.
  - Explore the relationship between soil health measurements and soybean yield.
- Requirements: spring soil sampling, field history survey, report yields.

Contact Lindsay Chamberlain
Email: lachamberlai@wisc.edu
Phone: 585-815-3185

COOL BEAN
University of Wisconsin-Madison | UW Extension
WWW.COOLBEAN.INFO

www.coolbean.info

@badgerbean

COOL BEAN

University of Wisconsin-Madison | UW Extension

WWW.COOLBEAN.INFO