

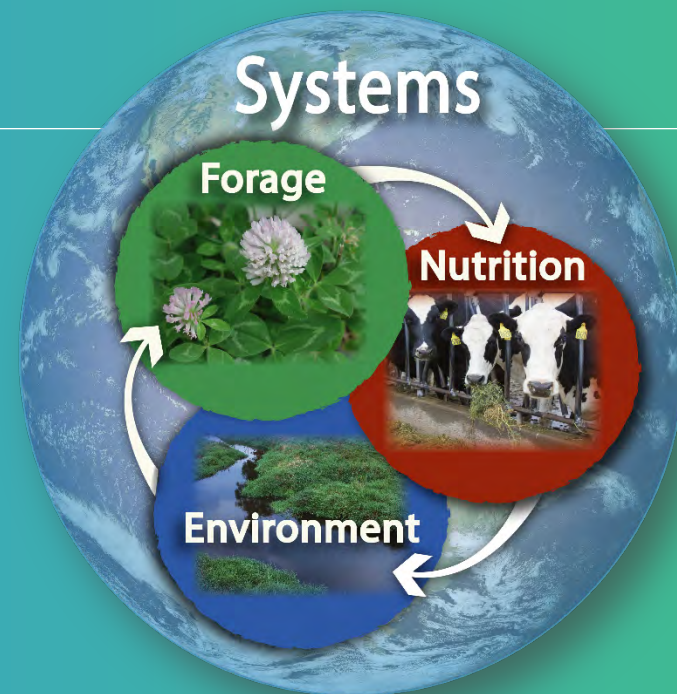


United States Department of Agriculture

Keys to alfalfa establishment in high yielding silage corn

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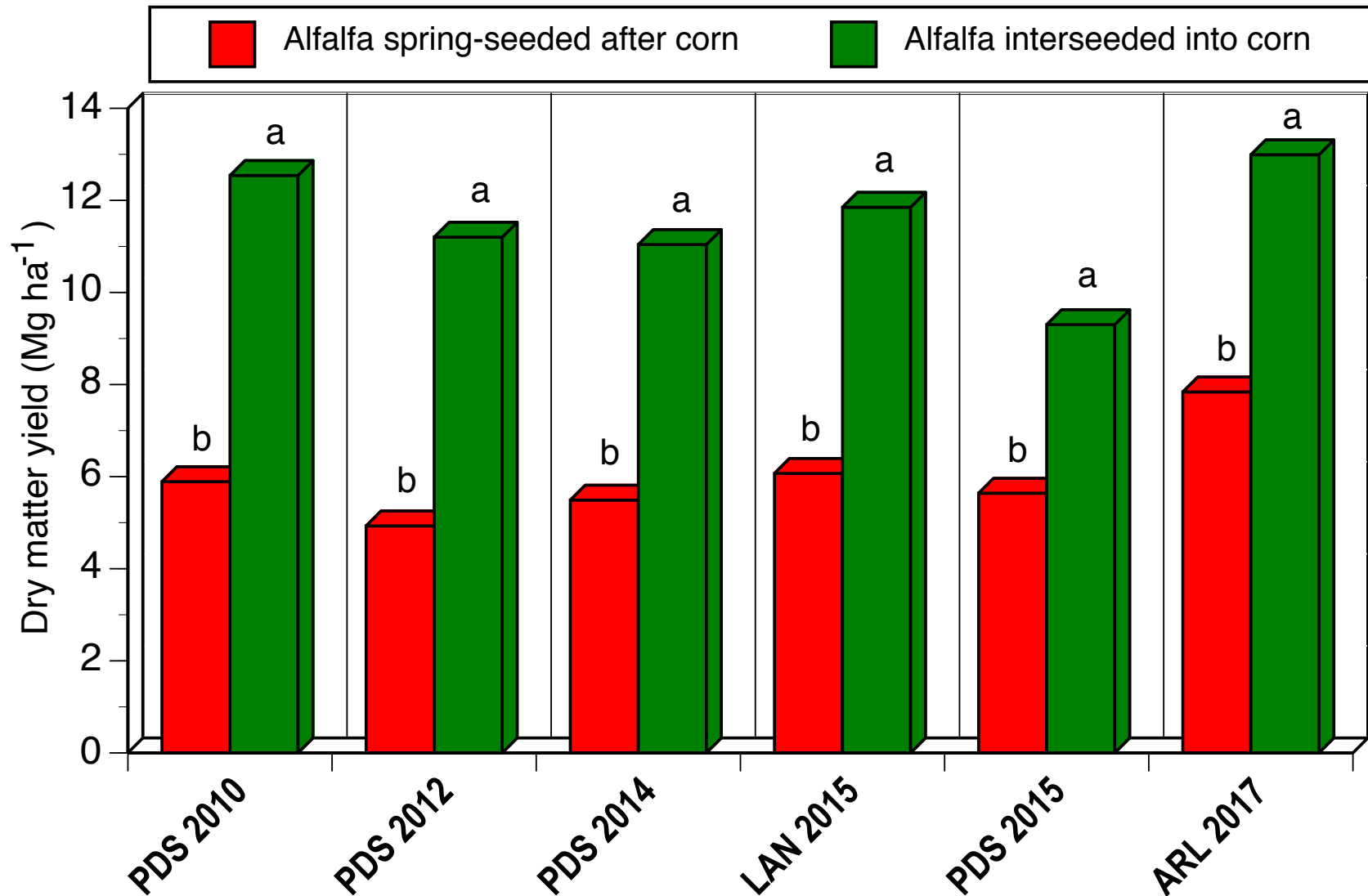


Goal: Interseed alfalfa into corn to protect soil and jumpstart full alfalfa production the following year

- **Alfalfa planted into corn interrows**
- **Corn silage harvested, alfalfa remains as a cover crop**
- **Following year(s) alfalfa harvested as a forage crop**



Successful establishment by interseeding roughly doubles first year alfalfa yields



Grabber, J.H. Agronomy J. 108:726-735 (2016); Osterholz et al. Agronomy J. 110:85-94 (2018); unpublished data

Establishing alfalfa by interseeding rather than conventional spring seeding reduces soil and nutrient loss from cropland

Reductions in runoff
due to interseeding
alfalfa in corn

Timing of runoff study	Soil	N	P
Early June during corn production	45%	23%	36%
October after silage corn harvest	86%	72%	62%
Following April before alfalfa production	87%	75%	82%



Osterholz et al. J. Soil Water Conser. (submitted)

Problem: Establishment of interseeded alfalfa is poor under densely planted silage corn in Wisconsin...



But new management approaches can ensure successful establishment of interseeded alfalfa

Keys to ensure establishment of interseeded alfalfa

- Apply “plant protection” products such as prohexadione, fungicide & insecticide to alfalfa seedlings



Applying prohexadione typically doubles stand survival of interseeded alfalfa during establishment under silage corn

No prohexadione

With prohexadione

July

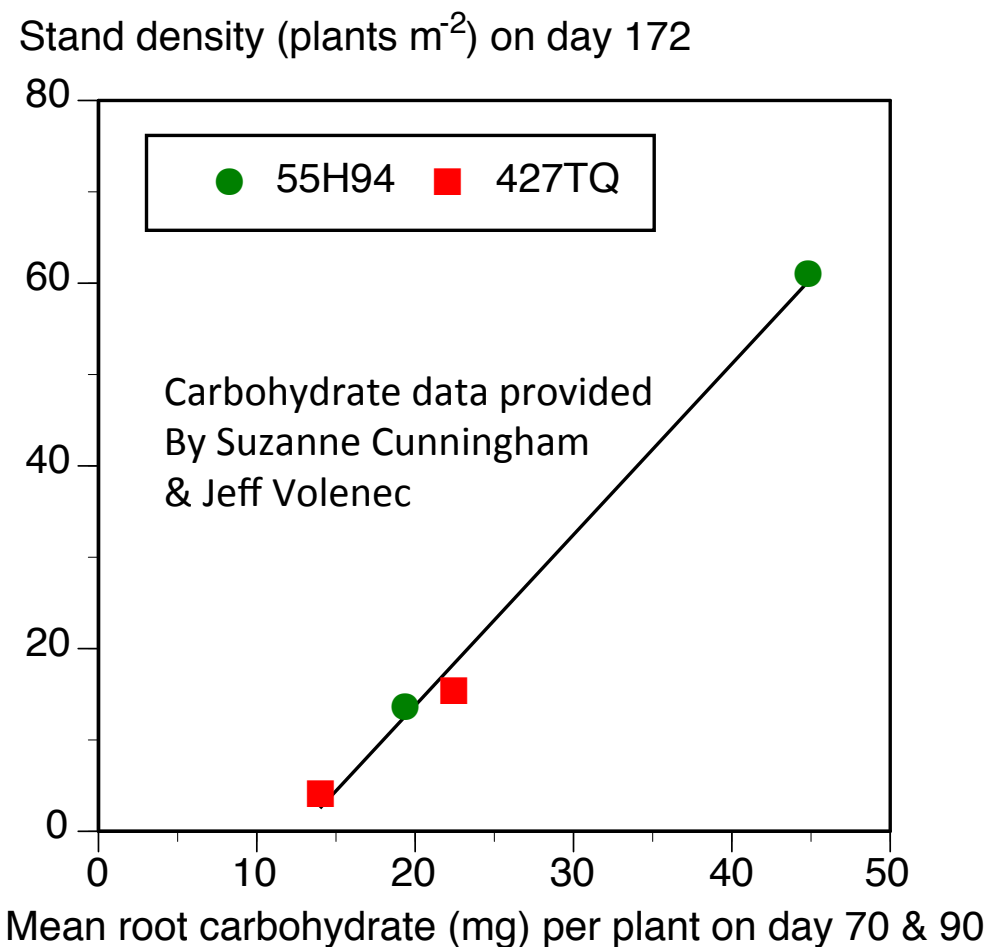
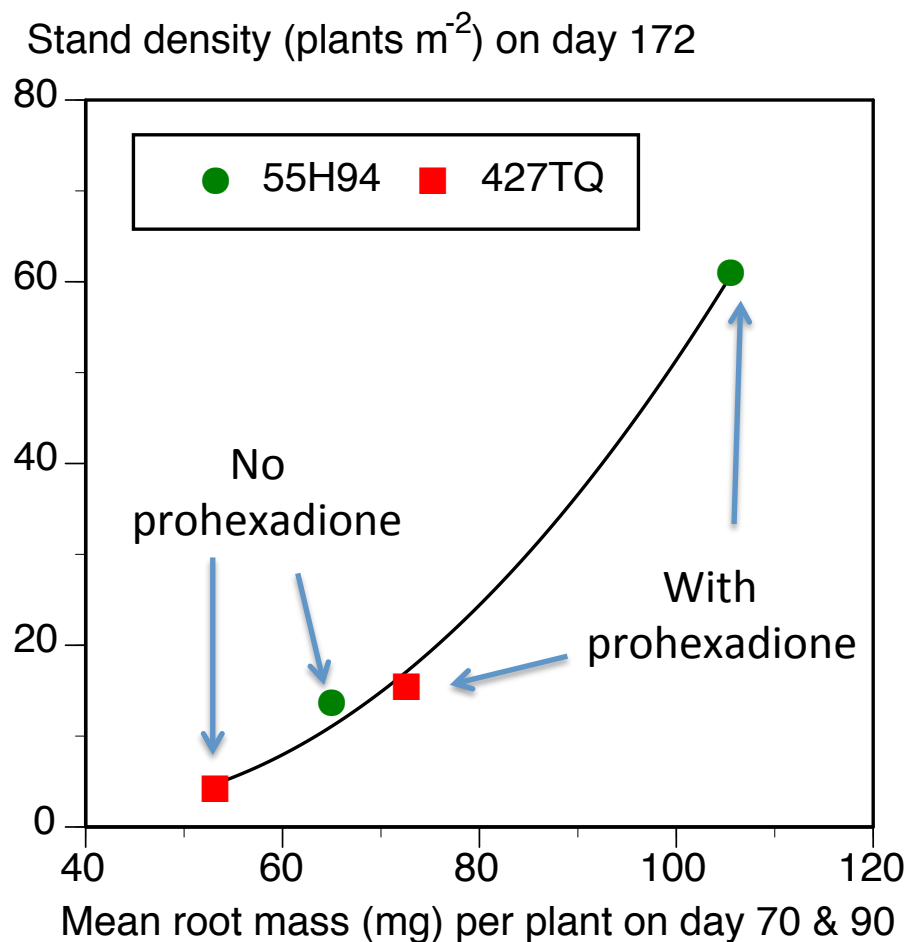


October



Grabber, J.H. Agronomy J. 108:726-735 (2016); Osterholz et al. Agronomy J. 110:85-94 (2018); unpublished data

Survival of interseeded alfalfa under corn might be related to mid-season root mass and carbohydrate storage

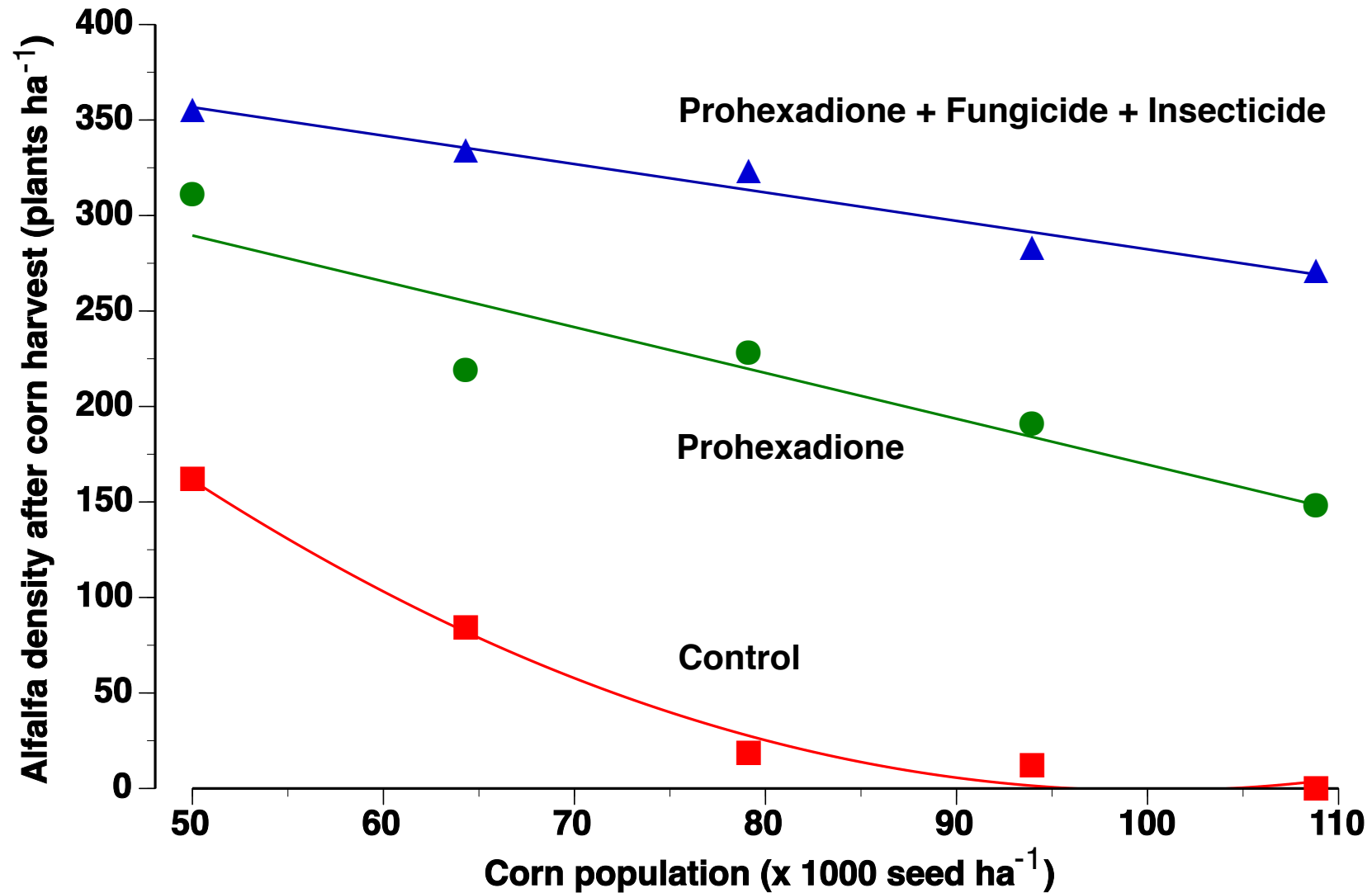


Grabber et al, unpublished data (2016)

Registration status of prohexadione for use on alfalfa interseeded into silage corn

- Based on work with related crops, Inter-Regional Research Project #4 (IR4) and EPA will establish residue tolerances for interseeded alfalfa and corn within the next one or two years. Metabolism trials will not be needed.
 - Daniel Heider (UW-Madison) played a key role in IR4 taking on registration of prohexadione for interseeded alfalfa
- Registration supported by Fine Americas Inc., manufacturer and marketer of Kudos 27.5 WDG
 - Jim Scruggs, Technical Services Manager

Applying fungicide and insecticide after prohexadione further enhances survival of interseeded alfalfa under corn



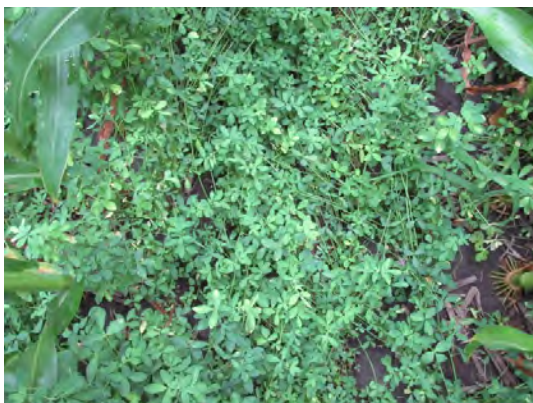
Grabber et al, unpublished data (2017)

July

August

October

Control



Prohexadione



**Prohexadione
+ Fungicide +
Insecticide**



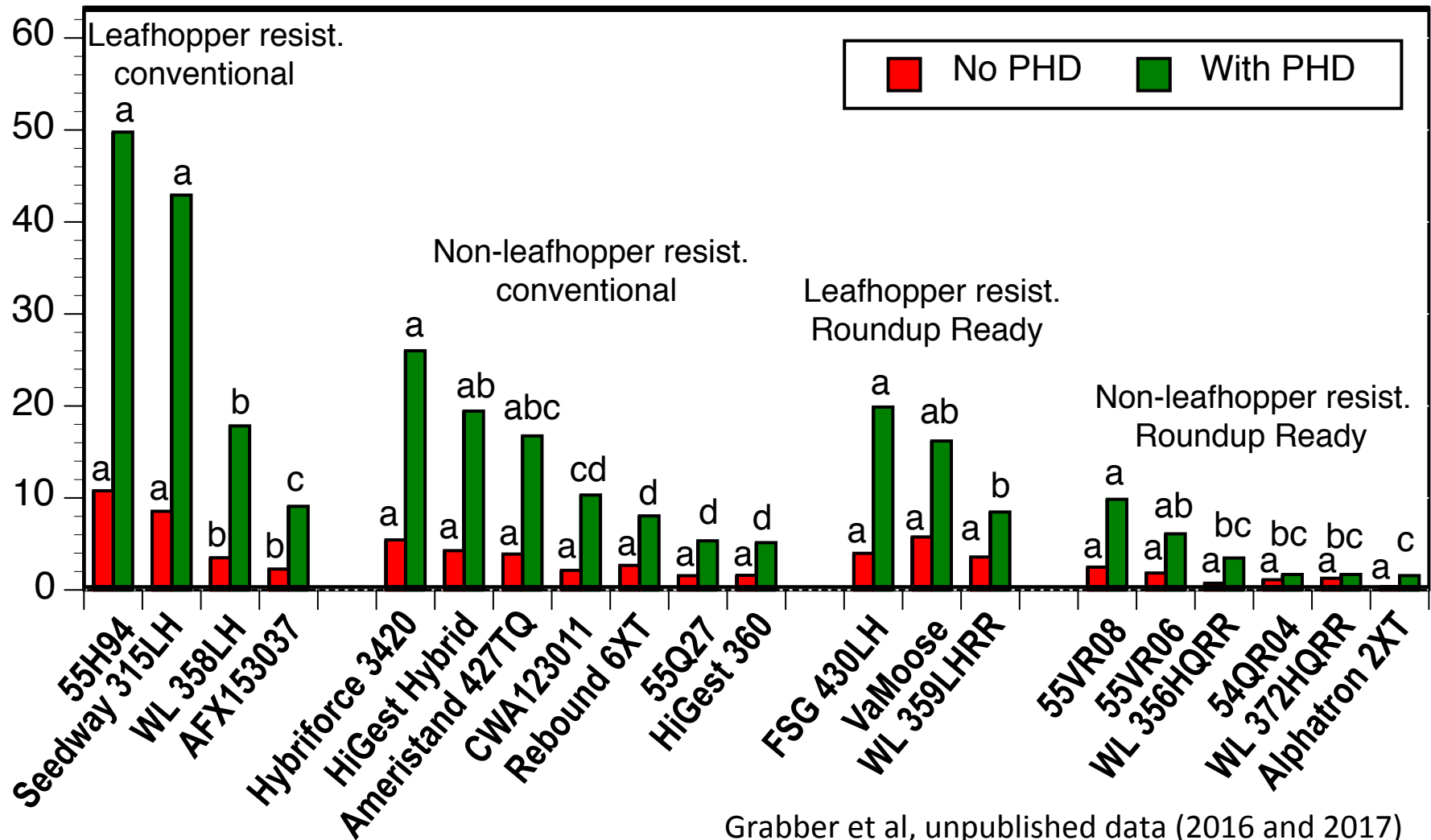
Keys to ensure establishment of interseeded alfalfa

- At planting, use an appropriate alfalfa variety, seeding rate, and seeding time



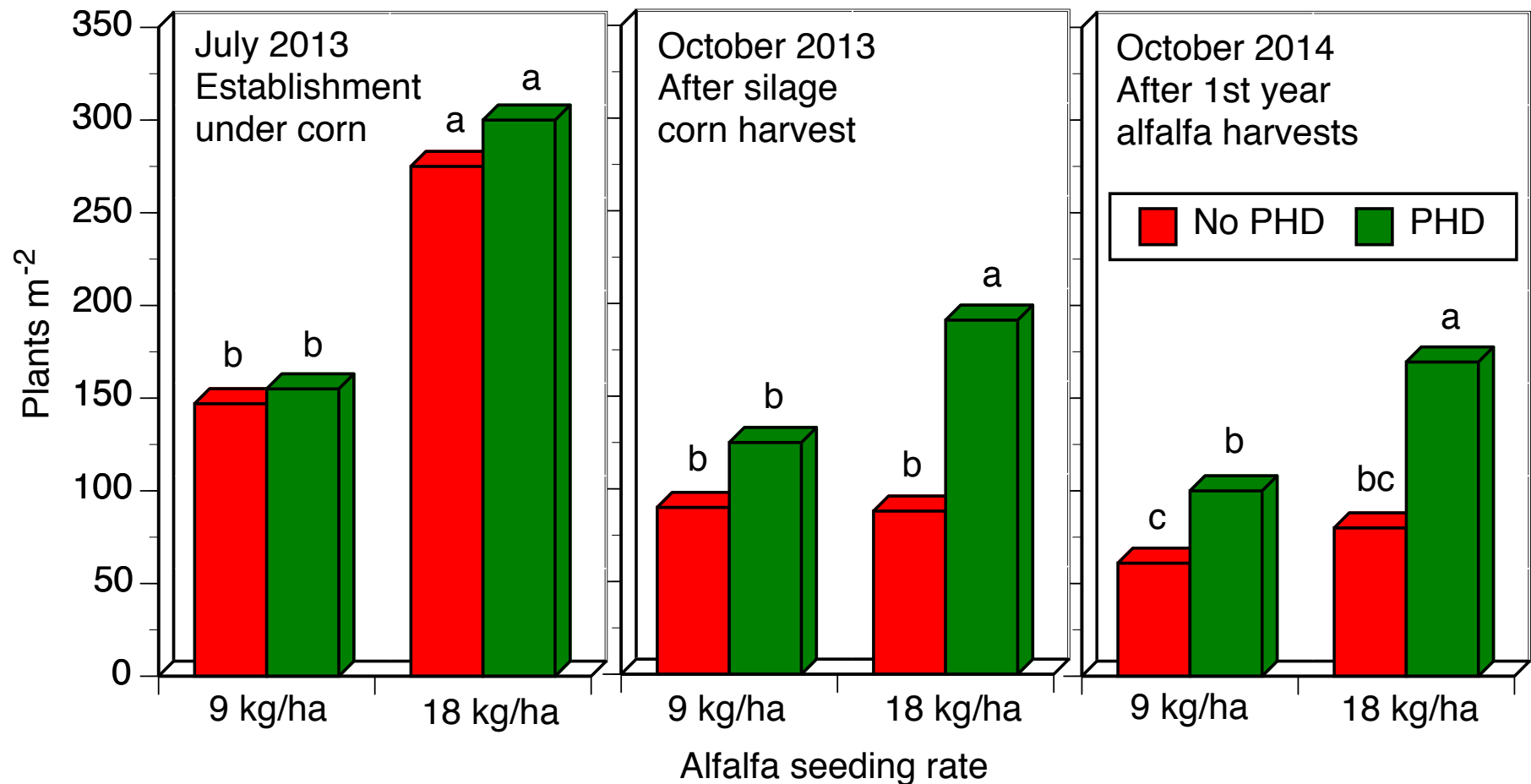
Interseed adapted alfalfa varieties and treat with plant protection products such as prohexadione (PHD)

Alfalfa stand density after silage corn harvest (plants per square meter)



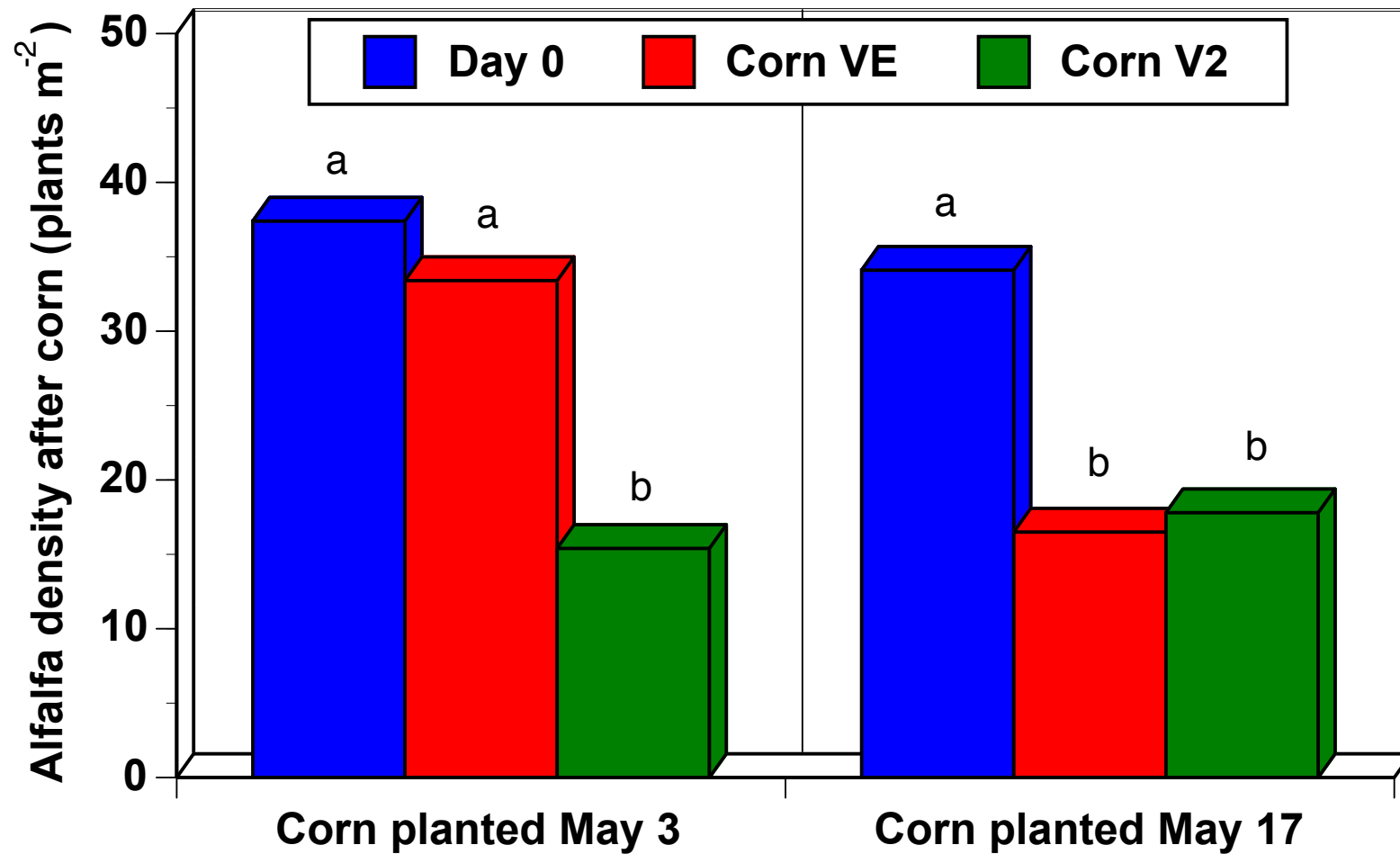
Grabber et al, unpublished data (2016 and 2017)

Use normal alfalfa seeding rates and treat seedlings with plant protection products such as prohexadione (PHD)



Interseed alfalfa soon after corn planting

Timing of alfalfa interseeding after corn planting



Grabber et al, unpublished data (2016)

Ongoing and planned alfalfa interseeding studies

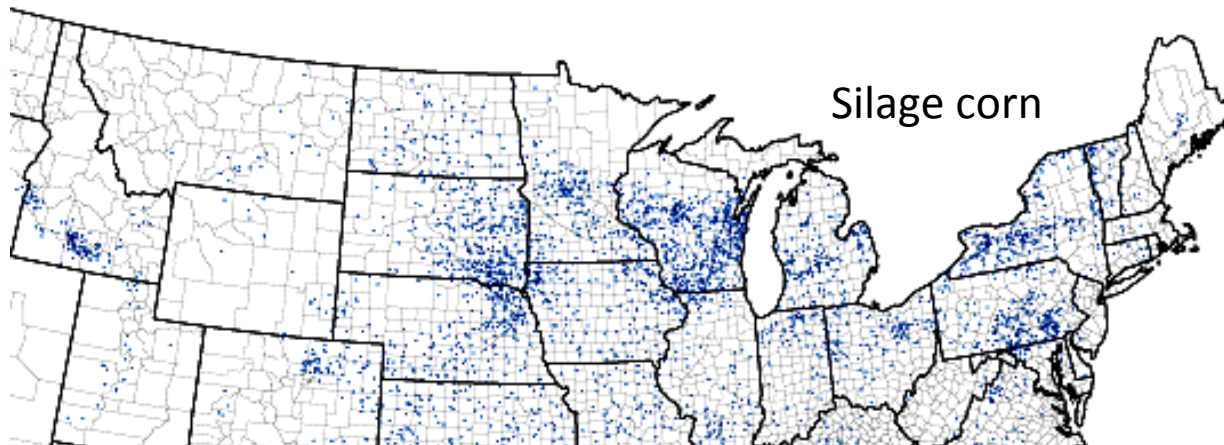
- **Optimal planting and harvest management**
- **Best rates/timing for prohexadione, fungicide, and insecticide**
- **Long-term survival and yield of interseeded alfalfa**
- **Corn hybrid selection and populations**
- **Fertilizer and manure management**
- **Economics as influenced by crop rotation, input costs, crop values, etc**
- **Breed alfalfa specifically for interseeding**
- **Understand factors influencing success rate in various environments...**

New USDA-NIFA grant project will be “Identifying Factors to Optimize Establishment of Alfalfa Interseeded in Corn”

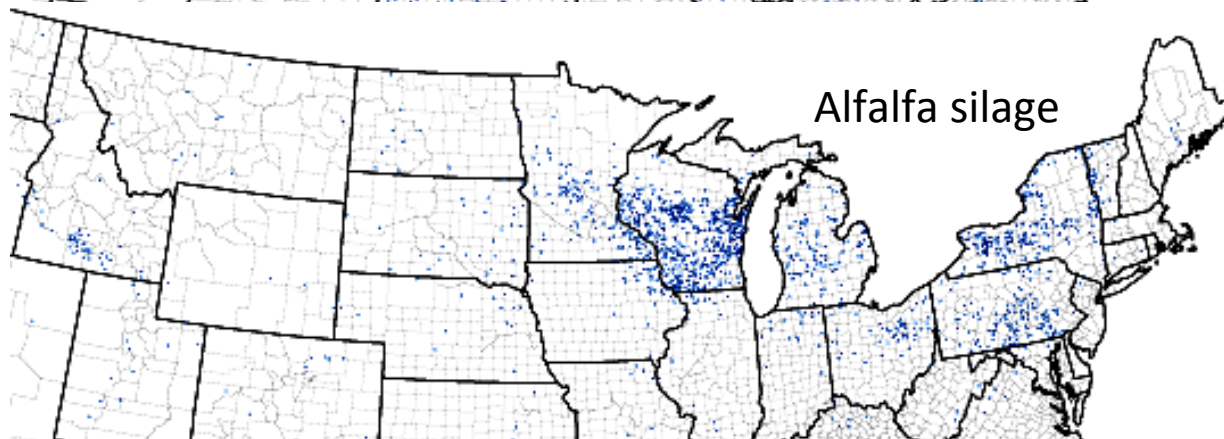
- **Investigators: Mark Renz and Will Osterholz (Univ. of Wisconsin), John Grabber and Dave Bjorneberg (USDA-ARS), Kim Cassida and Erin Burns (Michigan State Univ), and Jessica Williamson (Penn State Univ.)**
- **Experiment station and on-farm studies conducted in Pennsylvania, Michigan, Wisconsin and Idaho during 2018 and 2019 will identify management and environmental factors that most impact establishment of interseeded alfalfa.**



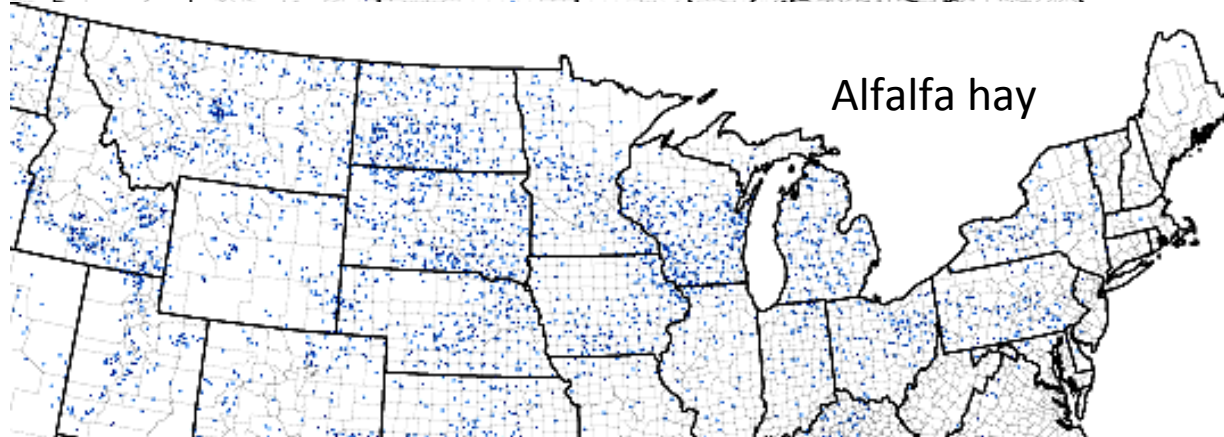
**Where in the USA could
alfalfa interseeding be used?**



Silage corn



Alfalfa silage



Alfalfa hay

- 5 million acres of silage corn and 2 million acres of alfalfa are sown annually in cold northern regions of the USA
- Interseeding may be a good option in this region where alfalfa cannot be established after silage corn harvest

Source: NASS 2012



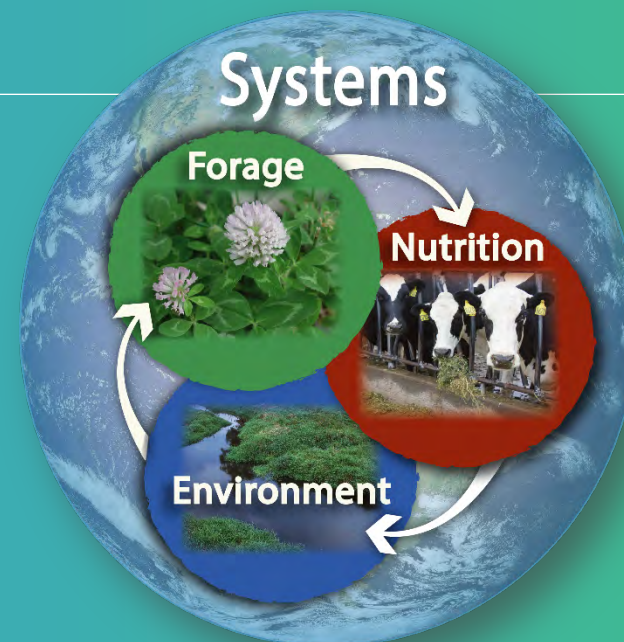
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QUESTIONS?

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