

2018 Alfalfa/Pasture Weed Research Update



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of
WISCONSIN
MADISON

UW
Extension

Alfalfa: Warrant (acetochlor) registered for use

Seeding alfalfa:

- 1.25 - 2 quarts per acre following alfalfa **emergence to the 4th-trifoliate** stage
- 1.25 - 2 quarts per acre may be made after the first or second cutting (sequential)
 - no later than 7 days after the alfalfa is cut

Established Alfalfa Stands (Non-Seeding Year):

- 1.25 - 2 quarts per acre after spring green-up and between cuttings
 - no later than **7 days after alfalfa is cut**

Restrictions:

- minimum of 20 days between an application cutting/grazing of forage
- Do not exceed a total of **3 applications** per year (alfalfa)
- Do not exceed a combined total of **4 quarts** (3 lbs a.i. acetochlor) per acre per year
- Do not use this product on alfalfa grown for seed production.

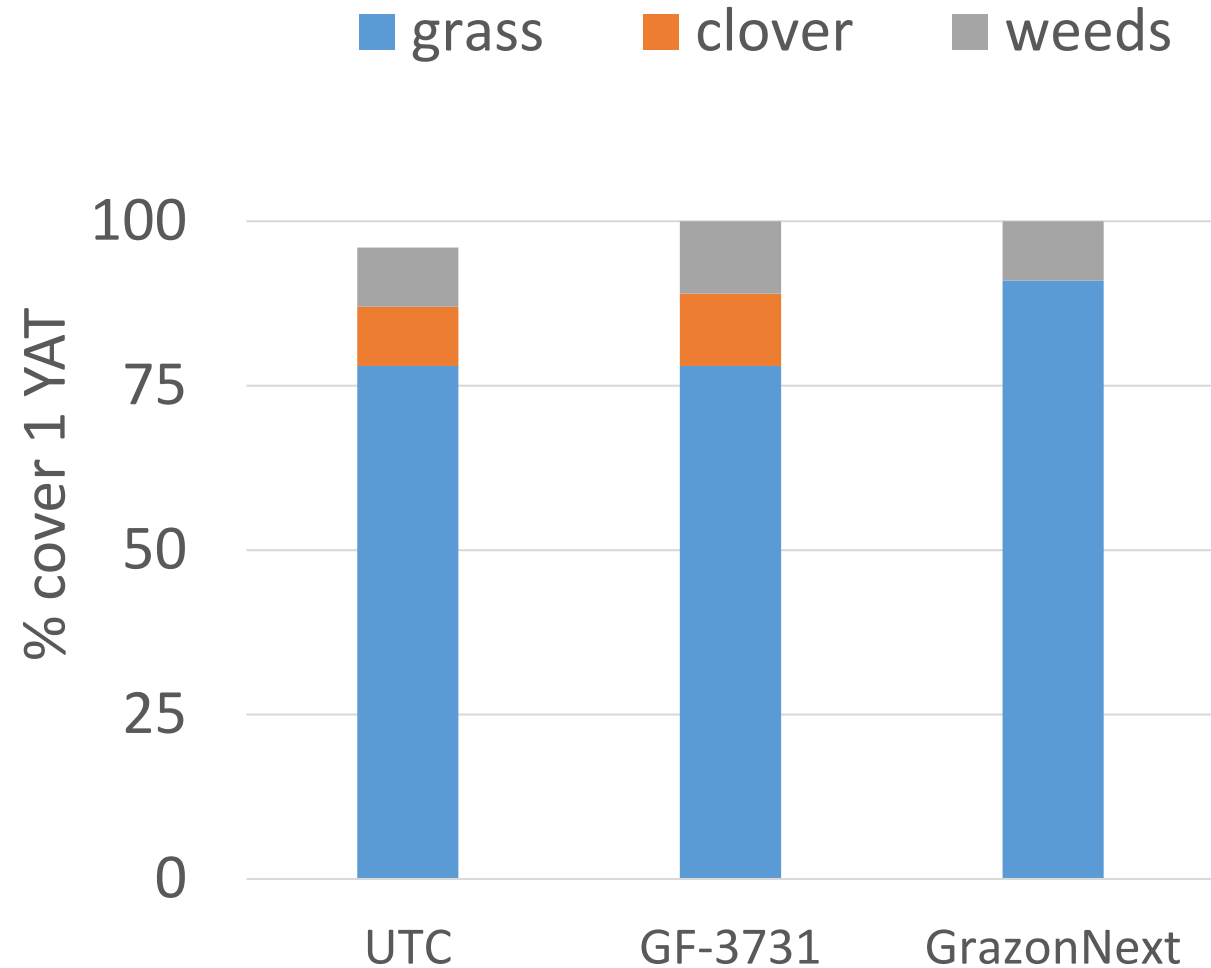
Warrant research

- Seedling alfalfa
 - Pre-plant, PRE, POST (2012-2016)
- Established alfalfa
 - Mid season annual weed control (2017)
 - Effectiveness on winter annuals (2018-2019)
- Interseeding corn + alfalfa
 - Since 2014
- Good efficacy/crop tolerance
 - When alone as a PRE \geq 85% weed control
 - Rarely injury, when present similar to raptor/pursuit injury
 - Added tool for late spring-summer emerging annuals



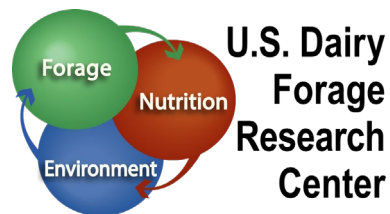
Pasture research

- Evaluating benefits of grazing on public owned lands
 - WI-DNR lands
- Evaluating performance of new pasture herbicides (Corteva)
 - GF-3850 = broad-spectrum control
 - GF-3731 = clover safe product
 - White clover tolerant
 - Red clover sensitive
 - Expected to be released in 2020



Inter-seeding alfalfa into corn silage

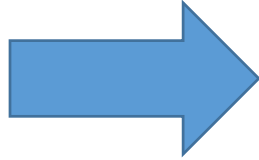
Intensifying Wisconsin's forage production system



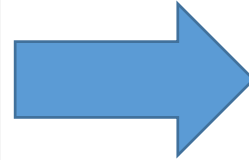
Interseeding alfalfa into corn silage



May



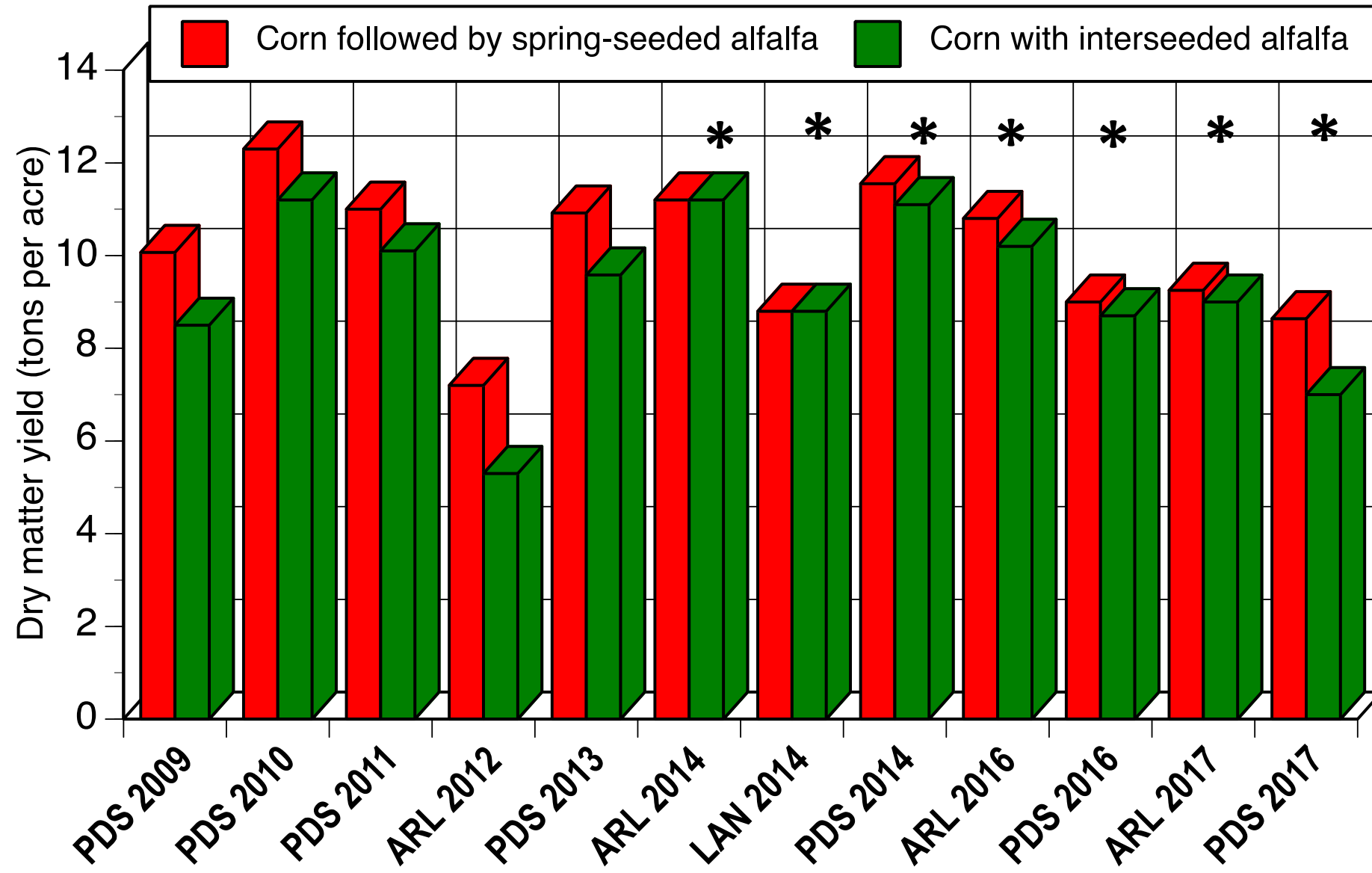
June



October

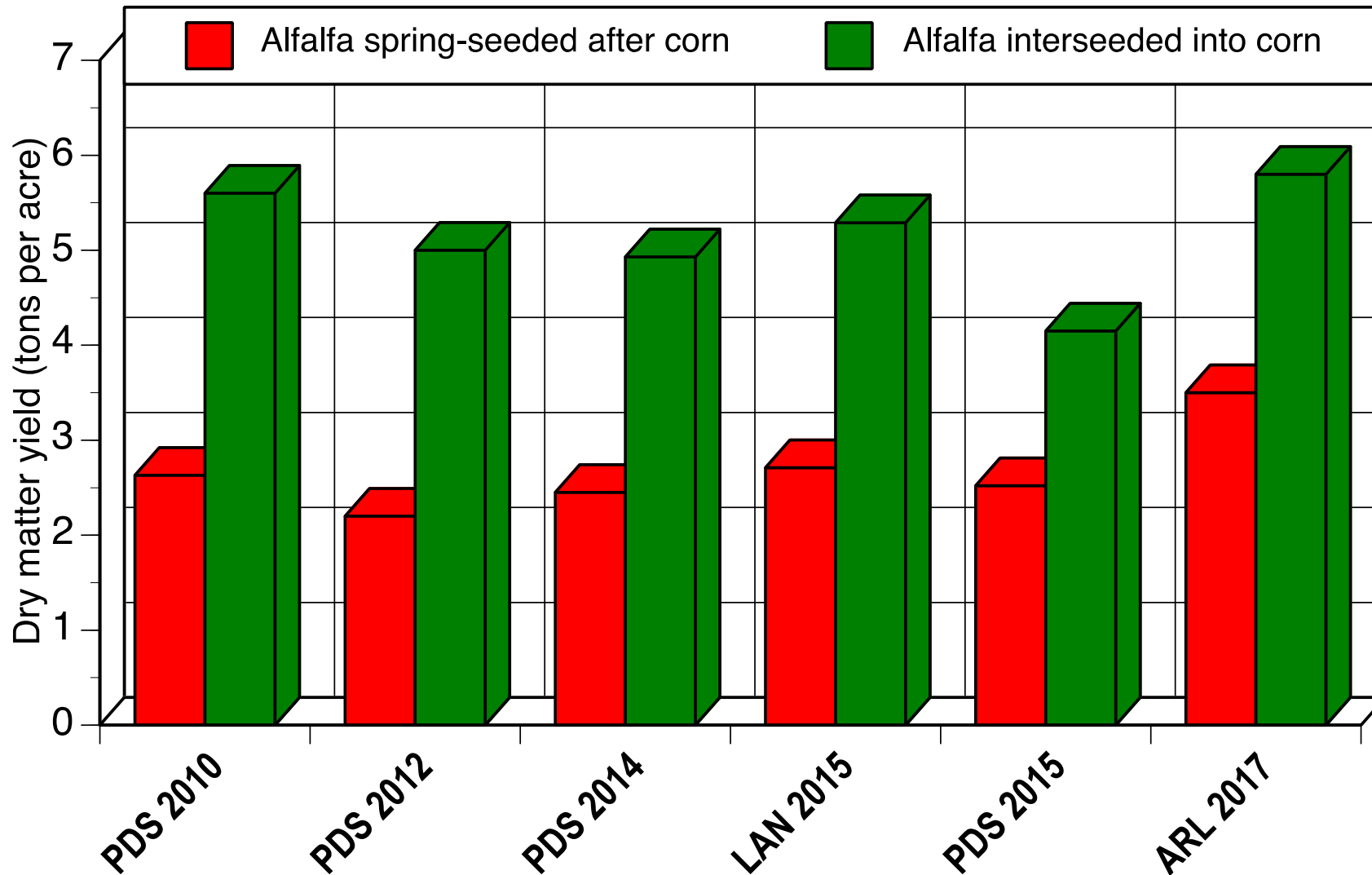
- Alfalfa planted in corn inter-rows
- Corn silage harvested
- Alfalfa re-grows as subsequent year's crop

Alfalfa interseeding can reduce silage corn yields



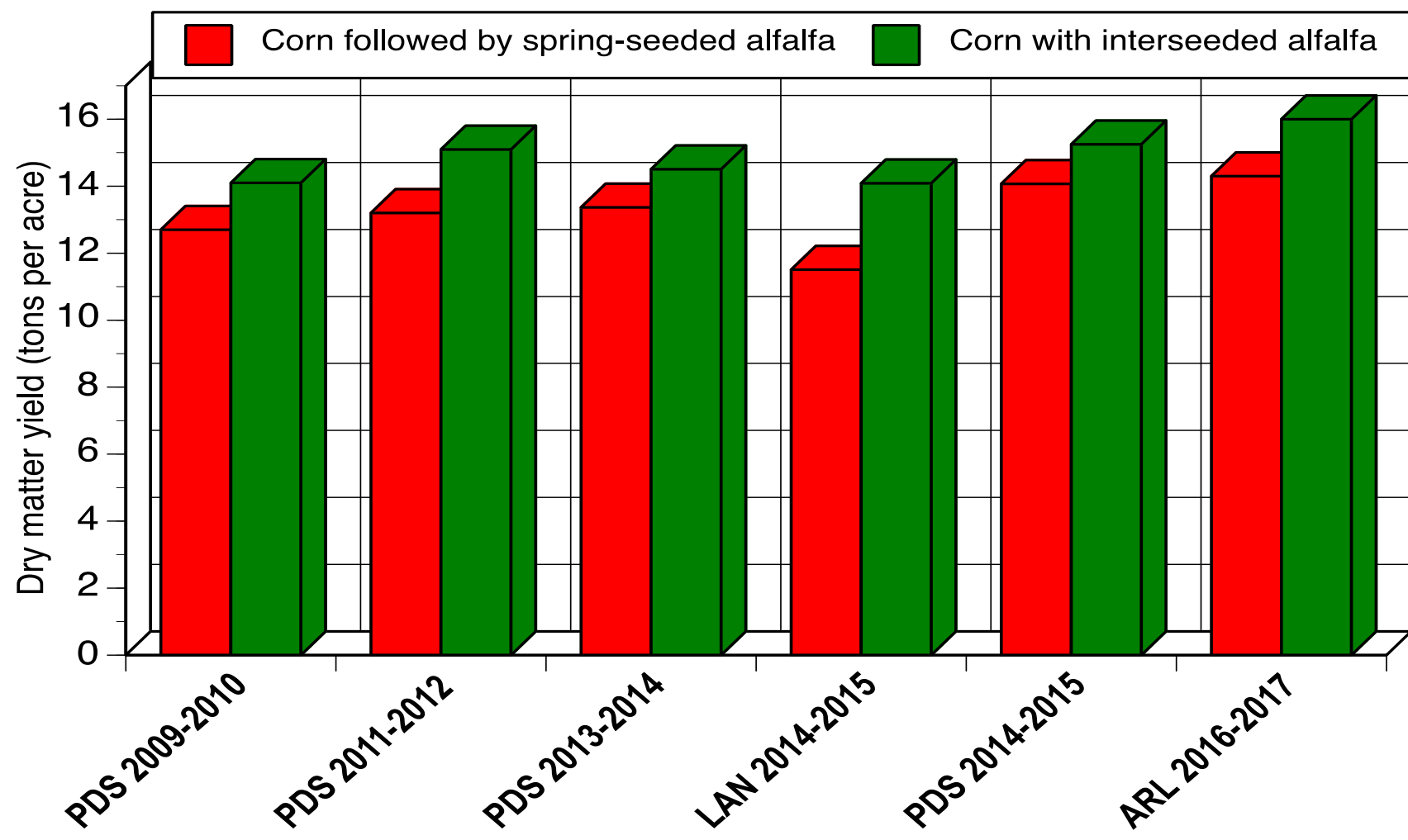
*Yield drag reduced/eliminated when N rate increased to 200 lbs/A

Successful establishment by interseeding roughly doubles first year alfalfa yields



To increase survival
of alfalfa use
prohexadione
(Kudos)

When successful alfalfa interseeding increases total yields of corn plus first year alfalfa



12% increase
= 1.6 tons per
acre

But we get failed alfalfa establishment

Can we improve alfalfa establishment success ?

- What impacts establishment?
- Do added inputs make this system too expensive?

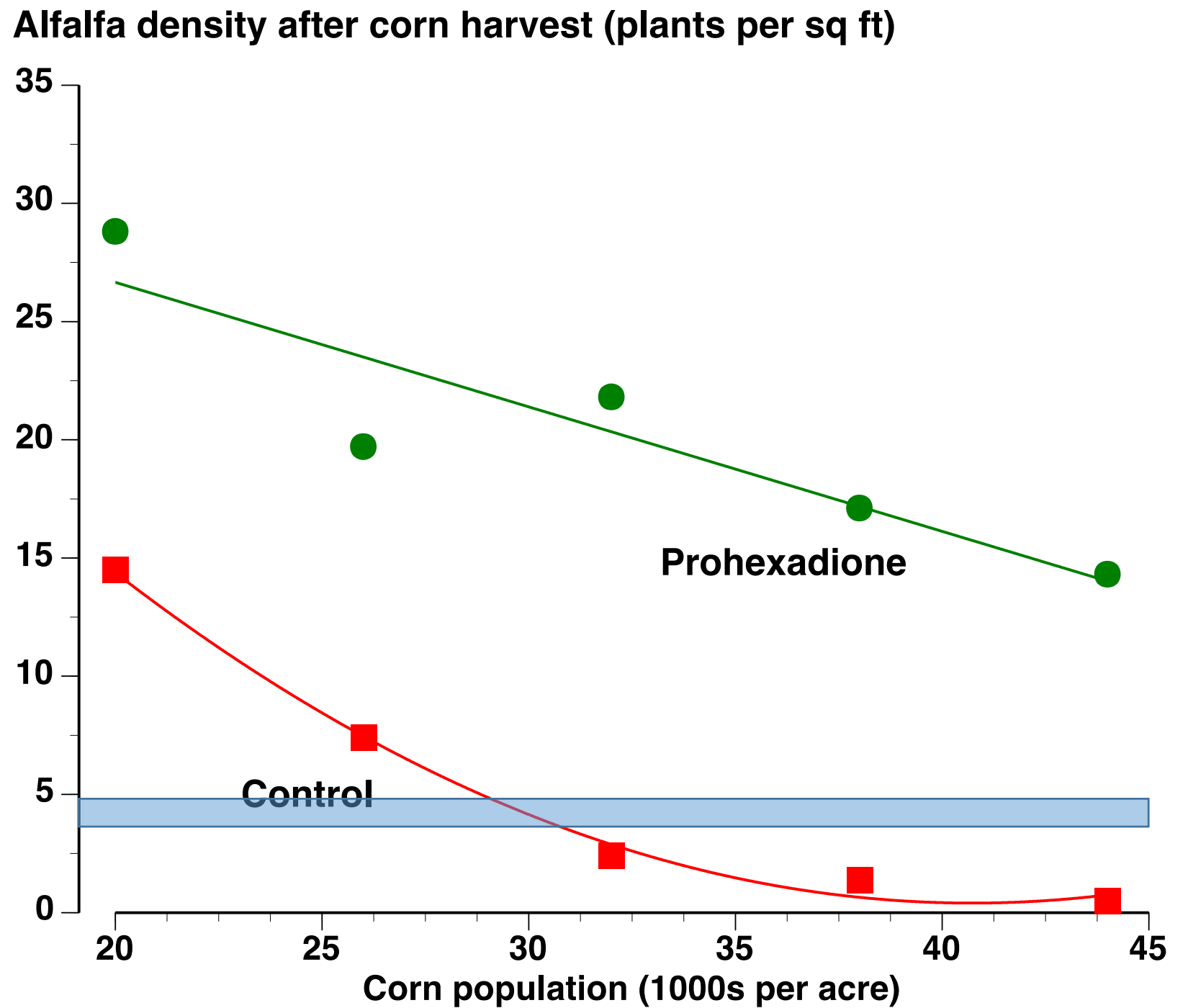


Researching how to minimize failure

presentation at WI Ag Classic

	Problem	Activity	Research
★	Corn density	Evaluating effects between 20-45K	2017-current
	Corn competition	Planting timing corn vs alfalfa	2016-17, 2020
	Nitrogen fertilization	Split vs at plant at various rates	2017-18
	Alfalfa variety	Screening current varieties for tolerance	2016-current
★	Alfalfa root development	Apply prohexadione (Kudos)	2011-current
★	Potato leaf hopper	Apply insecticide (Warrior II)	2017-current
★	Alfalfa foliar diseases	Apply fungicide (Priaxor)	2017-current
	Wheel traffic	Currently evaluating impact	2017-current

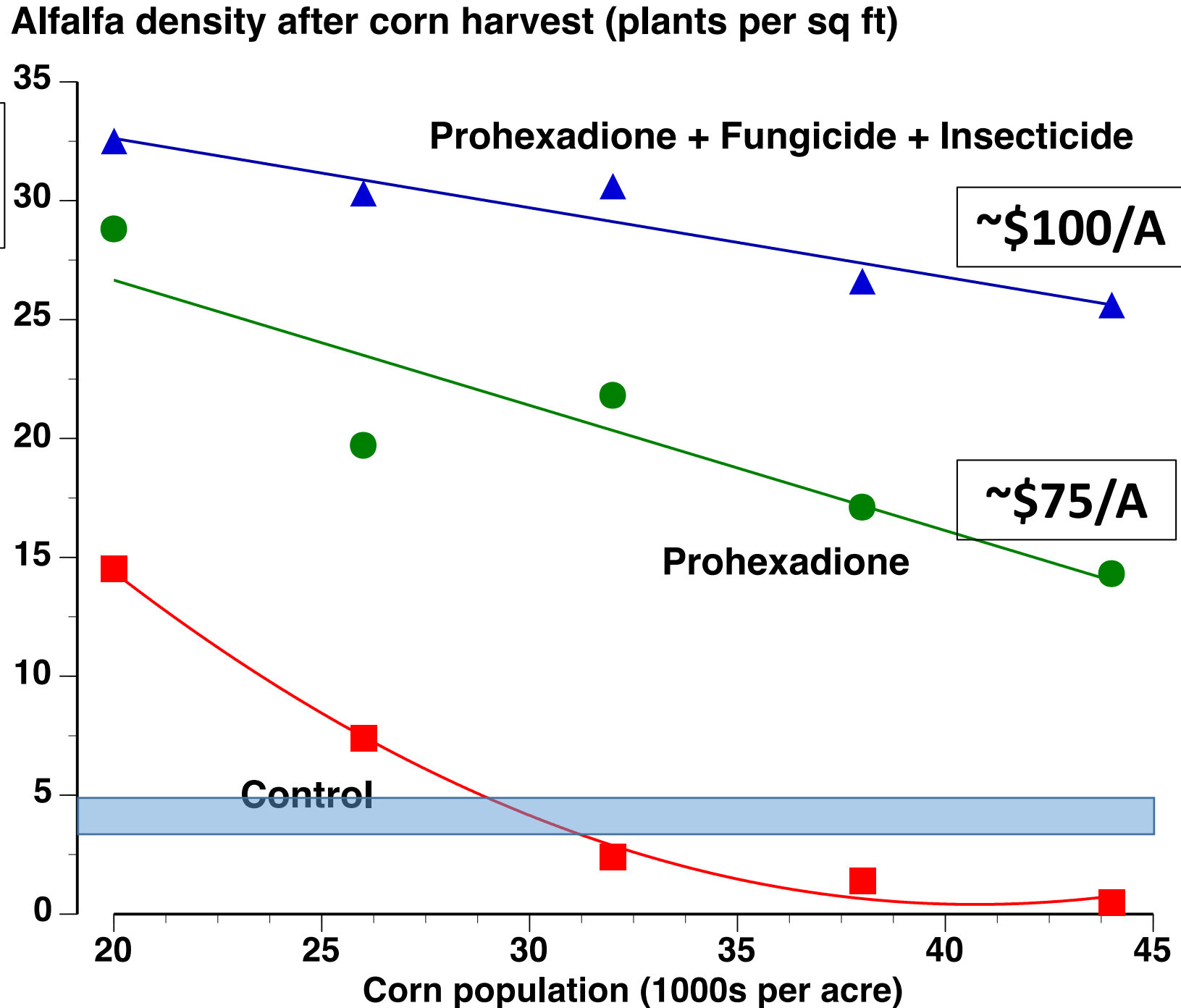
**High corn
density reduces
establishment**
2017 study



Adding Fungicides +
Insecticides to PHD helps

High corn
density reduces
establishment

2017 study



Can we reduce the cost by applying all at once?

- Current recommendation (~\$100/A)
 - Kudos 26oz/a in middle of June
 - Priaxor 4 fl oz/A + Warrior II 1 oz/a applied 2 weeks later
- Can we apply all at once in June?
 - Initial data suggests YES
- Can we reduce Kudos rate if apply fungicide and insecticide
 - Initial data suggests YES (< ~\$50/a)



Economic viability of interseeding

- Compared corn silage-alfalfa rotations with and without interseeding
 - Inter-seeding increased net returns
- Maintaining a corn silage yield penalty below 15% ensured profitability



Challenges from 2018



Efforts will continue in 2019

Problems researching	Research stations	On farm
Corn density	2019	
Corn/alfalfa planting timing	2020	
Nitrogen fertilization	2019	
Alfalfa variety performance	2019	2019
Optimization of Kudos	2019	2019
Optimization of fungicide	2019	2019
Optimization of insecticide	2019	2019
Wheel traffic	2019	
Corn variety performance	2020	

Looking for cooperating farms

Establishing alfalfa by interseeding with corn silage

Interseeding alfalfa with corn silage is a novel technique for establishment of alfalfa fields. Proper management practices can minimize impacts to corn silage yield while also providing cover of soil during fall-spring and allow for full yield of alfalfa in subsequent years.

How?

In Wisconsin the interseeding system is effective when corn silage is planted at moderate densities in early to mid-May, followed by alfalfa interseeded between the rows. Crop management methods have been developed to maximize corn yield and alfalfa establishment as well as minimize pest impacts as the two crops grow together during the summer. Following silage harvest in the fall the field is treated as an established alfalfa field.



Research Insights

Results from interseeding experiments in Wisconsin demonstrate:

- Establishment of alfalfa by interseeding doubles first-year alfalfa yields compared to spring-seeded alfalfa.
- Interseeded alfalfa reduces erosion and loss of phosphorus and nitrogen from cropland.
- Alfalfa varieties differ greatly in performance when interseeded.
- Plant protection chemicals (such as fungicides, insecticides, and plant growth regulators) can greatly increase establishment success of interseeded alfalfa.
- Weeds can be effectively controlled with timely applications of herbicides such as Warrant for establishment of conventional alfalfa or glyphosate for Round-up Ready alfalfa varieties.

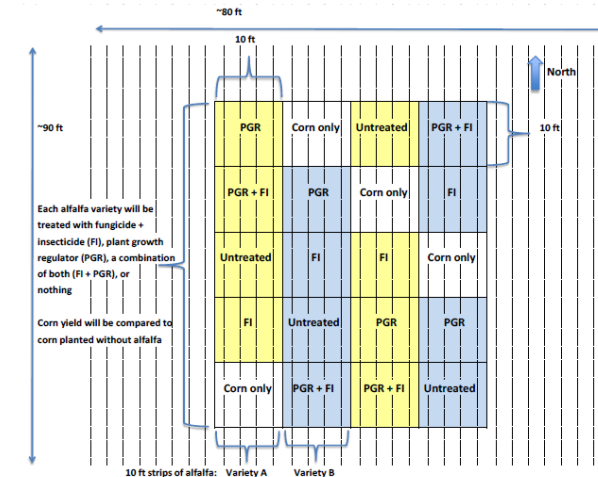
Ongoing Research Efforts

Improved understanding how crop management and environmental factors influence the success of alfalfa establishment by interseeding in corn is needed. Current research efforts are focusing on developing agronomic practices that can optimize corn yield and alfalfa establishment, including recommendations for nitrogen fertility, seeding rates, and plant protection chemical application. Researchers are also working with stakeholders to register products that can enhance alfalfa establishment in this system.



Interseeding Corn and Alfalfa On-farm Research Project

Our research group is cooperating with farmers to establish on-farm experiments at three farms in each of four states (ID, MI, PA, WI). On each farm two alfalfa varieties will be interseeded into corn silage, and the effects of different plant protection chemicals will be tested. As illustrated below, the experiment at each farm will be carried out on twenty small plots (10' x 20'). Each treatment will be applied to two plots in the experimental area to test the consistency of alfalfa and corn responses to various plant protection chemicals. The experiment will be surrounded on all sides by 20' corn borders, so that the total area required on each farm will be approximately 1/4 of an acre.



Farmers participating in this project will:

- Identify an appropriate field to establish interseeded alfalfa that meets project criteria: moderately well-drained to well-drained; pH ≥ 6.5 ; optimal levels of P, K, S, and B for alfalfa establishment; limited crop residues.
- Share the management history of the field including crop rotation used, soil test results, fertilizer and liming rates for the last 3 years, and herbicides used the prior two years.
- Plant silage corn on ~1/4 acre: short to mid-season hybrid planted in the recommended planting window in 30" rows at a density between 25K and 40K seeds per acre. This area can be located near the edge of a larger corn field.
- Fertilize corn and interseeded alfalfa according to typical practices for corn silage. Manure or chemical fertilizer application rates and timings must be recorded.
- Harvest corn silage from border areas at typical harvest timing (at least 3 weeks before first frost date).
- Not permit herbicide applications in the experimental area or traffic through plots after planting alfalfa.

Researchers will:

- Interseed 2 alfalfa varieties between corn planting and the VE growth stage of corn.
- Provide weed control (PRE application of Warrant, POST of Buctril (if needed) in the 1/4 acre area)
- Apply plant protection treatments approximately 5 and 8 weeks after alfalfa interseeding.
- Take monthly measurements of plants and soil from May through late October.

As several agricultural products that will be utilized in this research (Warrant herbicide, Kudos plant growth regulator) are not yet registered for use in corn and alfalfa, scientists will harvest and properly discard corn and terminate alfalfa stands in late October at the end of the study. Corn from the untreated 20' border areas can be utilized by cooperators. Cooperators will receive a modest honorarium (\$200) from the University of Wisconsin to help offset costs.