

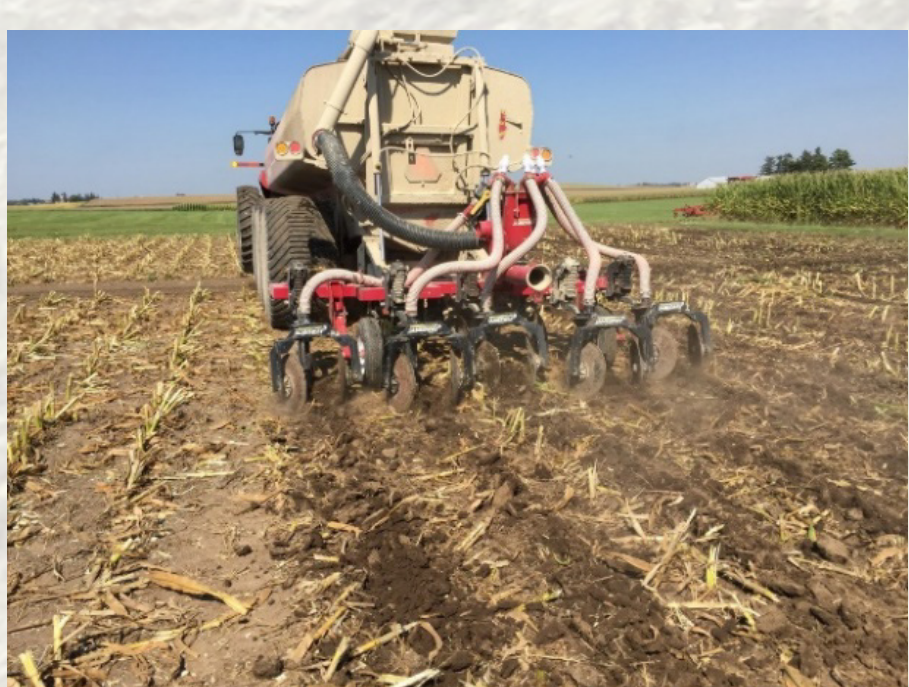
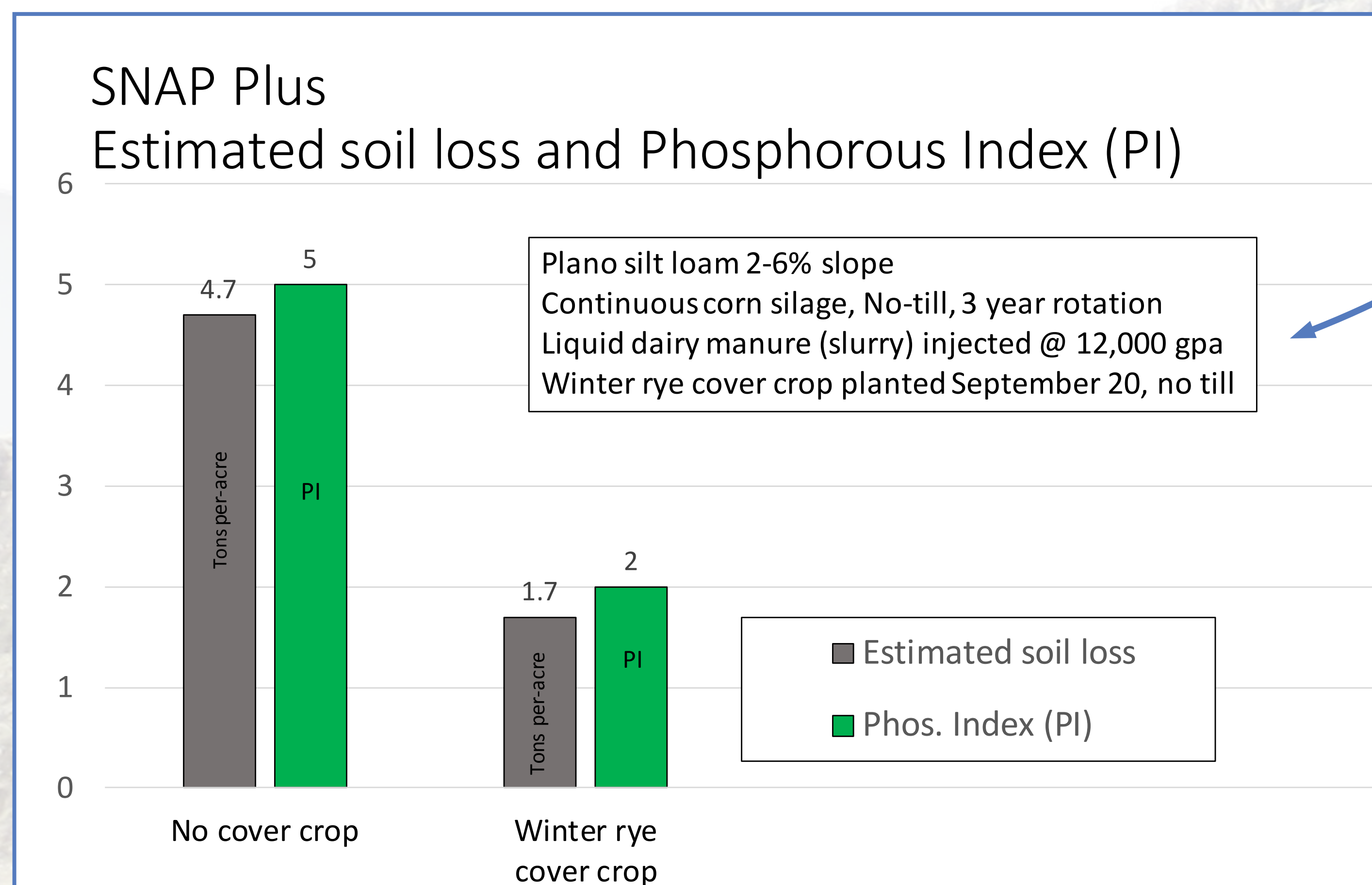
# 5 YEAR TRIAL - ARLINGTON AGRICULTURAL RESEARCH STATION

## Corn Silage with Winter Rye Cover and Forage Crops

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### Why rye after corn silage?

- ▶ Establishes fast over-winter cover when planted in fall
- ▶ Prevents soil and nutrient losses (runoff)
- ▶ Scavenges soil nitrate ( $\text{NO}_3^-$ )
- ▶ Provides potential early-season forage crop



### Continuous corn silage rotation/no-till corn silage followed by three treatments



Each plot is 30 ft x 135 ft = .093 x 3 plots (reps) = 0.6 acres planted to winter rye and 0.3 acres = no cover crop

### Trial results and recommendations:

- ▶ Winter rye as a cover crop did not affect subsequent corn silage yield.
- ▶ Rye termination 10 days to two weeks prior to planting the subsequent crop likely helps alleviate possible negative effects on soil conditions and seedling development, particularly with corn.
- ▶ Winter rye as a forage crop decreased subsequent corn silage yield in some years, but total forage production was comparable or increased.
- ▶ Economic returns considering potential milk yield from all forages produced favored the rye forage system 4 of the 5 study years compared to the no rye treatment.
- ▶ Planting rye in late September, in Wisconsin, will likely increase rye forage yield and result in earlier rye forage harvest potential as compared to October planting. This should be favorable to economic outcomes with this practice.

# Corn Silage with Winter Rye Cover and Forage Crops



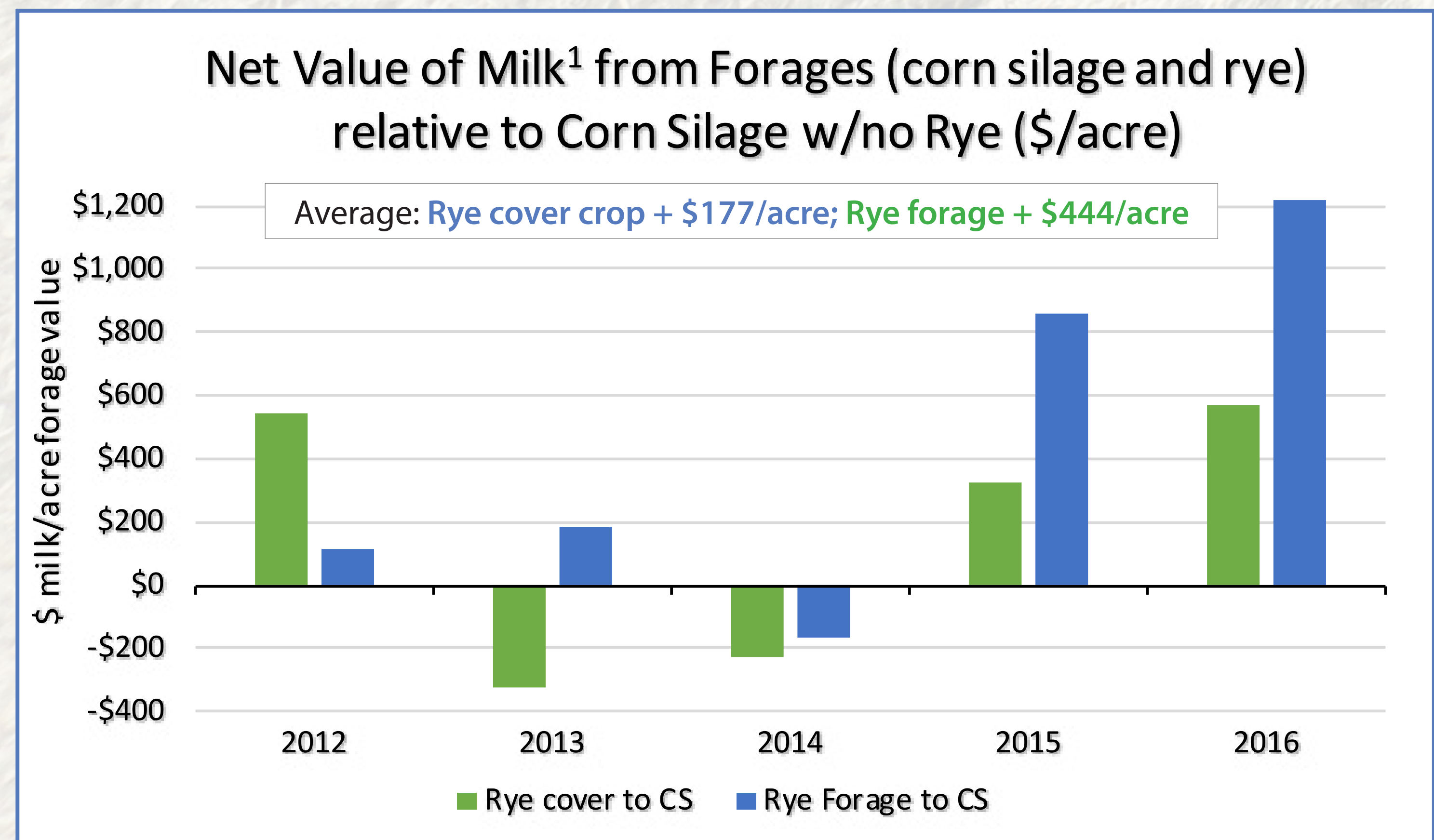
## Average forage yields 2012-16 (tons DM/acre)

<div></div>	Corn silage with no rye	8.6
<div></div>	Corn silage following rye cover	9.2
<div></div>	Corn silage following rye forage	7.5
<div></div>	Rye forage	1.8



## Economic Return +/- from adding rye as cover crop or forage crop = Value of all forages produced – Relevant costs associated with adding rye

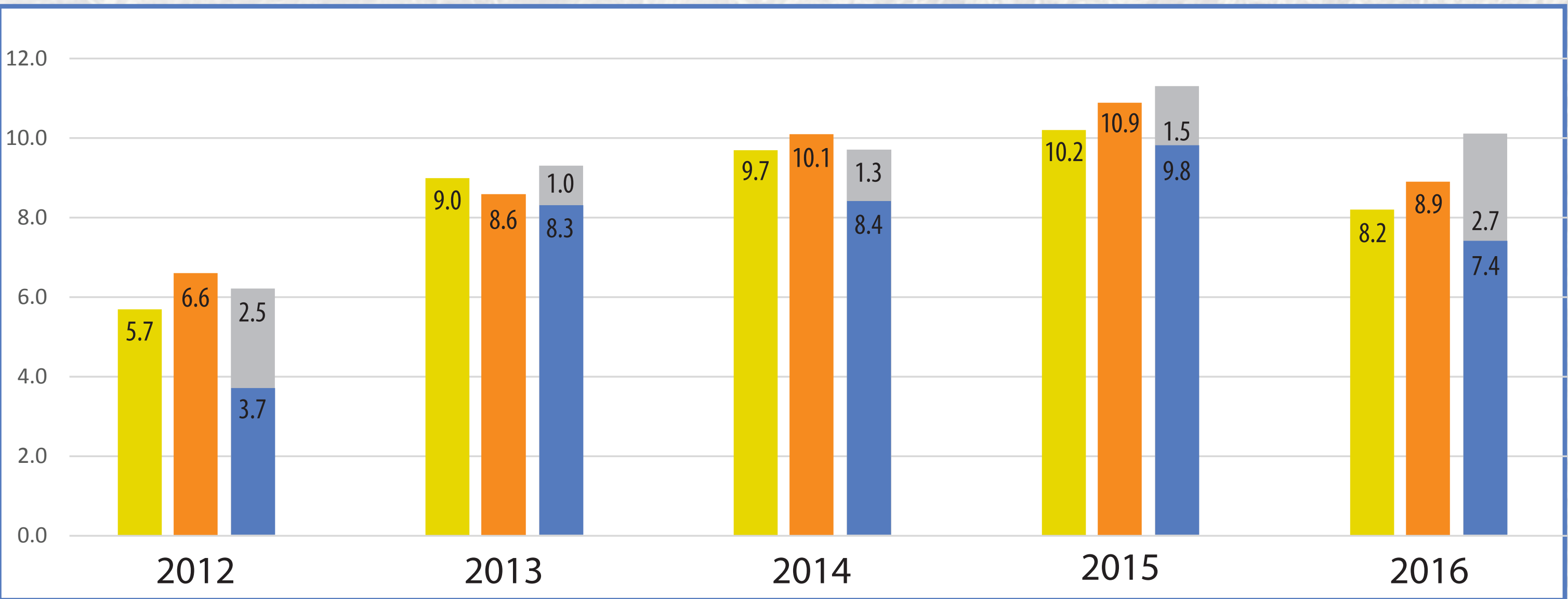
[Milk/TDM forage<sup>1</sup> x DM forages x Milk price (mailbox)] - Input costs relevant to rye cover or forage<sup>2</sup> = Gross return to forage and cover crop system



## Corn silage and rye management

	2011/12	2012/13	2013/14	2014/15	2015/16
Liquid dairy manure applied	10,000 to 12,000 gallons per-acre. N credit = 60 – 100 lbs N per-acre				
Rye planted - date Lbs seed/acre	10/5 119	10/11 100	10/18 93	10/10 109	9/23 93
Rye harvest - date Growth stage	5/10 boot	5/21 pre-boot	5/30 boot	5/21 Late boot	5/12 Late boot/head
Corn planted - date No rye & cover crop Rye forage	5/14 5/14	6/3 6/3	5/23 6/5	5/8 5/22	5/6 5/16

## Forage yields (tons DM/acre)



## Rye forage quality % DM (average/3 reps)

	Crude Protein	NDF	NDFD	RFQ	Milk/TDM	K
2012	16.4	53.72	64.39	149	3213	2.33
2013	20.1	46.98	70.54	189	3638	3.15
2014	19.7	50.25	66.60	169	3480	2.55
2015	17.6	44.64	83.62	235	4114	2.37
2016	10.9	60.59	65.93	139	3270	1.98

<sup>1</sup>**Milk/TDM forage:** Index of milk production potential based on energy content using forage analysis parameters CP, NDF, in vitro NDF digestibility, starch, and non-fiber carbohydrate and an estimate of DM intake (Shaver, et al. 2001).

<sup>2</sup>Input costs differing between the three systems: Rye seed and planting, rye forage harvest and storage, and soil nutrient removal in all harvested forages.