



The Potential for Inter-planting to Reduce Nitrate Leaching to Groundwater in Agriculture Farm Fields in Central Wisconsin

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Introduction

Fertilizer is an essential component of modern agricultural systems. This fertilizer is often applied at a massive scale to a multitude of crops. Once applied, the fertilizer infiltrates the soil profile where some of it is taken up by the crops and some is lost as nitrate to groundwater. Some studies suggest that inter-planting could reduce nitrate leaching losses; this study will determine if interplanting is a viable option for commercial potato production.

Methods

- Two 5-acre plots were established within a commercial potato field in Central Wisconsin.
- One plot inter-planted with mixture of rye, oats, and millet in the furrows between potato rows served as the treatment and one plot served as a control with no inter-planting.
- Plots were monitored for the next 8 weeks and measurements of canopy cover, vegetation height, soil moisture content, and soil temperature were taken each week.
- Biomass and nitrogen uptake for the interplanting and the potato crop were measured prior to harvest.

Table 1: Lab results from potato residue collected in field

Site	Analyses	Potato Residue Biomass lb/acre	Potato Yield CWT/acre	Cover Crop Biomass lb/acre	Potato Residue Nitrogen lb/acre	Total Biomass lb/acre	Potato Nitrogen lb/acre	Total N Uptake lb/acre
Treatment	Average	1141 ^a	248 ^a	1631	26 ^a	2825 ^a	42 ^a	117 ^a
	Stdev	447	60	920	12	1242	10	40
Control	Average	1146 ^a	314 ^a	0	29 ^a	1146 ^b	46 ^a	75 ^a
	Stdev	143	35	0	12	143	10	19

Means followed by the same letter across a factor in each location-response variable combination are not statistically different at $\alpha=0.05$

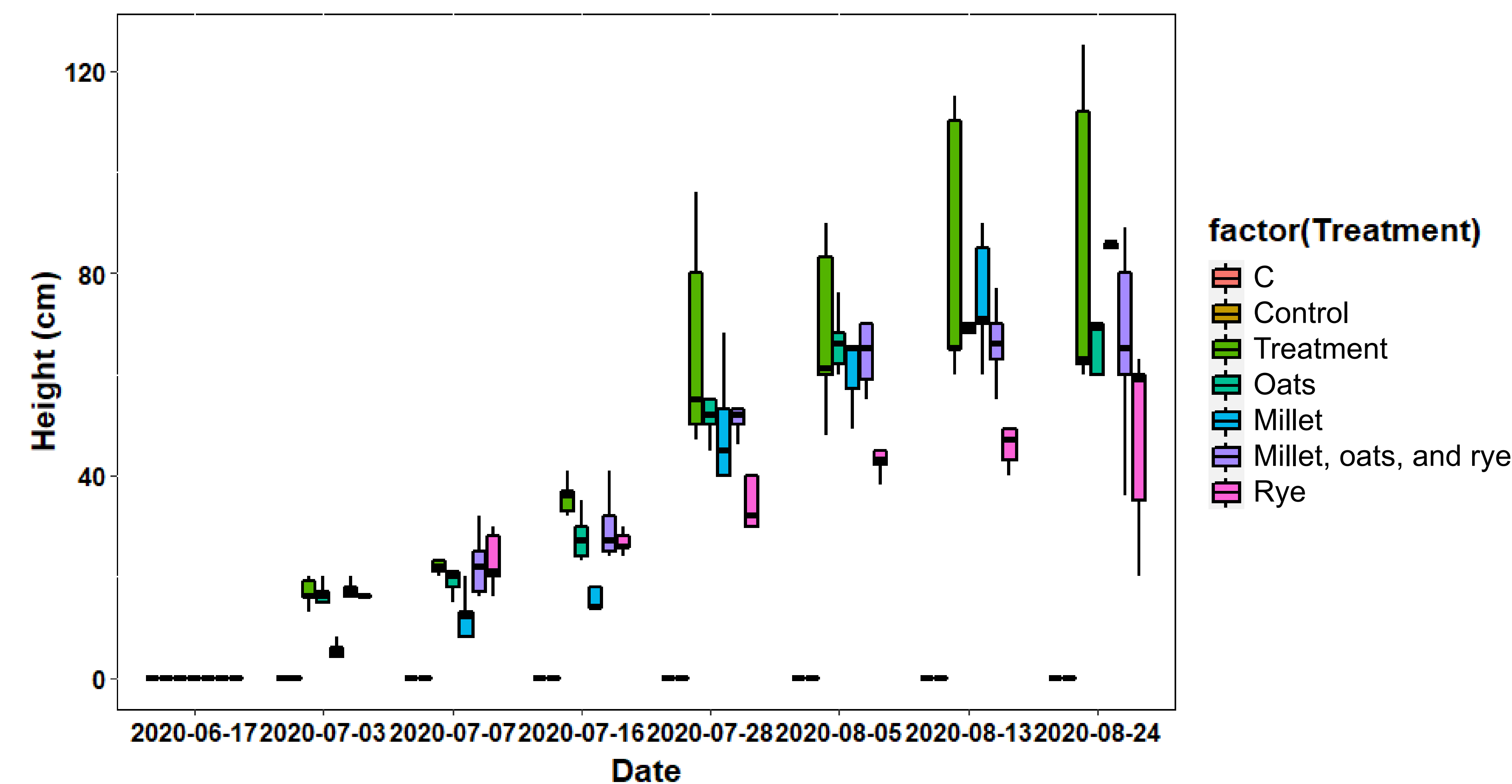


Figure 1: Boxplot of CC height and biomass over growing season

Analyses

- Box plot of cover crop height over 8 week period
- Two sample t-test assuming equal variances for potato and cover crop residue and N uptake

Discussion

- No significant differences observed in data due to the small number of samples used at each site
- More Nitrogen was taken by treatment but it was not statistically different from the control
- Repetition of experiment over more than one growing season with the Millet as the cover crop of choice as it grew the best in terms of height

Conclusion

At this time, it is too early to tell if large scale interplanting of cover crops is a viable option for commercial potato production. More data needs to be collected and analyzed before any serious management decisions can be made.

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