

*Clint Beiermann¹, Nevin Lawrence¹, Stevan Knezevic³, Amit Jhala², Cody Creech¹

¹University of Nebraska-Lincoln, Scottsbluff, NE, ²University of Nebraska-Lincoln, Lincoln, NE, ³University of Nebraska-Lincoln, Concord, NE
E-mail: clint.beiermann@huskers.unl.edu

Introduction

- Palmer amaranth resistant to ALS and EPSPS inhibiting herbicides is increasing in Nebraska (2).
- Herbicide options are limited in rotational crops dry bean and sugarbeet.
- Attaining near complete control of Palmer amaranth in corn is essential to lower the soil seed bank for successive crops (1).
- There are limited herbicide options available in corn due to rotation restrictions (5).
- Group 4 and 15 herbicides are the only effective POST herbicide options in corn that will allow rotation to dry bean or sugarbeet the following year.

Objective

- Find the optimum combination of group 4 and 15 herbicides for controlling late emerging Palmer amaranth in corn preceding dry bean or sugarbeet.

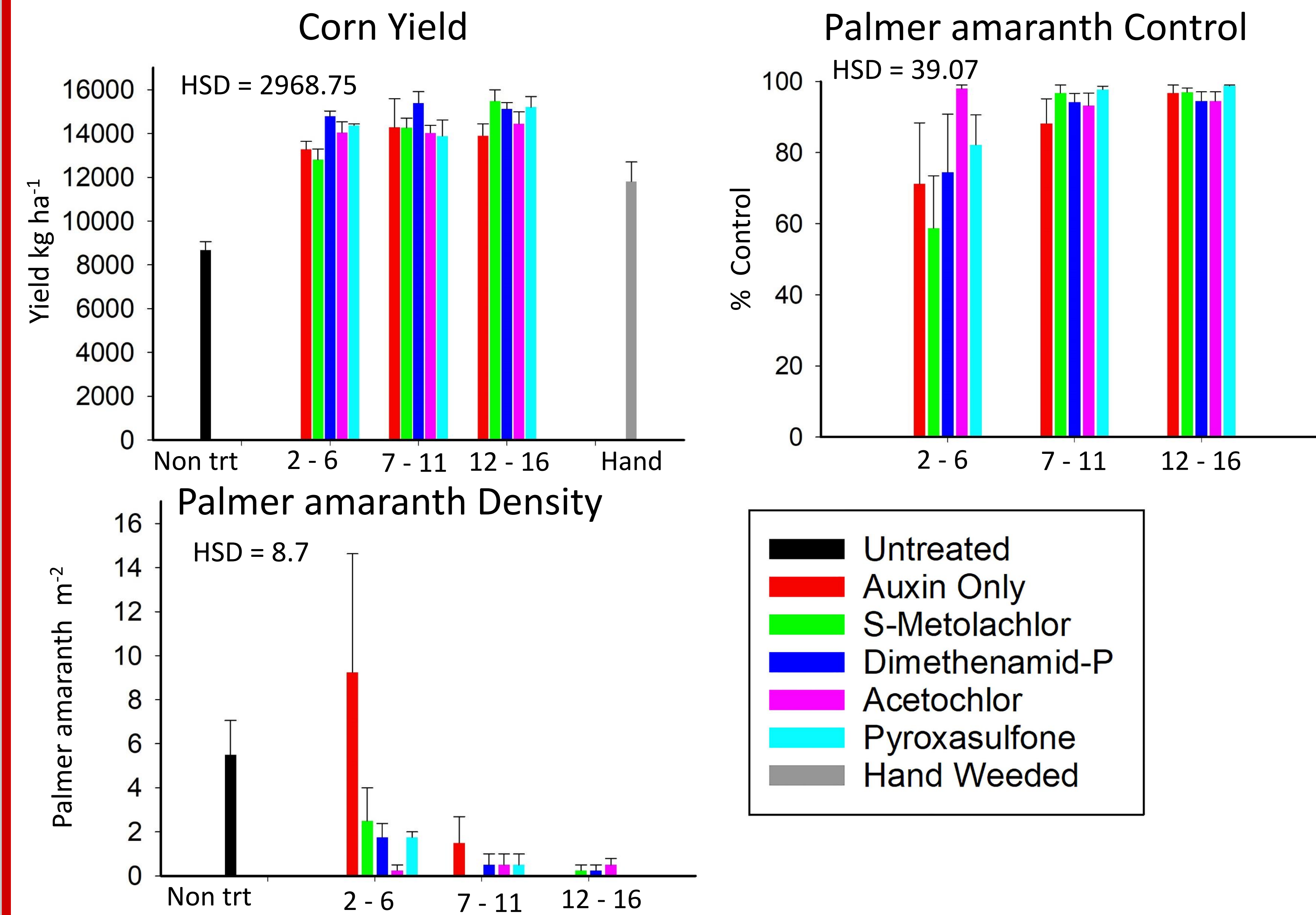
Materials & Methods

- The study took place over the 2017 growing season at the Panhandle Research and Extension Center in Scottsbluff NE.
- Study design was a RCBD with four replications. Plot size was 3.4 x 7.6m
- Treatments were applied at V4 when Palmer amaranth was 5 cm in height. AIXR nozzles were used and carrier volume was 28 L hectare⁻¹
- Visual control assessments were made at 2, 4, and 6 weeks after application and at harvest.
- Palmer amaranth density was recorded and biomass was collected before harvest.
- Weed control and yield were analyzed through AOV, while density was analyzed using a GLM with a quasipoisson distribution in R.
- Contrasts were used to compare the value and significance of Group 4 herbicides using the Dunnett Procedure in R (3).

Trt.	Group 4	Group 15	Group 4 Rate	Group 15 Rate
1	Non-treated Check			
2	-----			
3		S-Metolachlor		1424
4	2,4-D	Dimethenamid-P	399 ^a	736
5		Acetochlor		1681
6		Pyroxasulfone		164
7	-----			
8		S-Metolachlor		1424
9	Dicamba	Dimethenamid-P	420	736
10		Acetochlor		1681
11		Pyroxasulfone		164
12	-----			
13		S-Metolachlor		1424
14	Dicamba +	Dimethenamid-P	210	736
15	Diflufenzopyr	Acetochlor		1681
16		Pyroxasulfone		164
17	Hand Weeded			

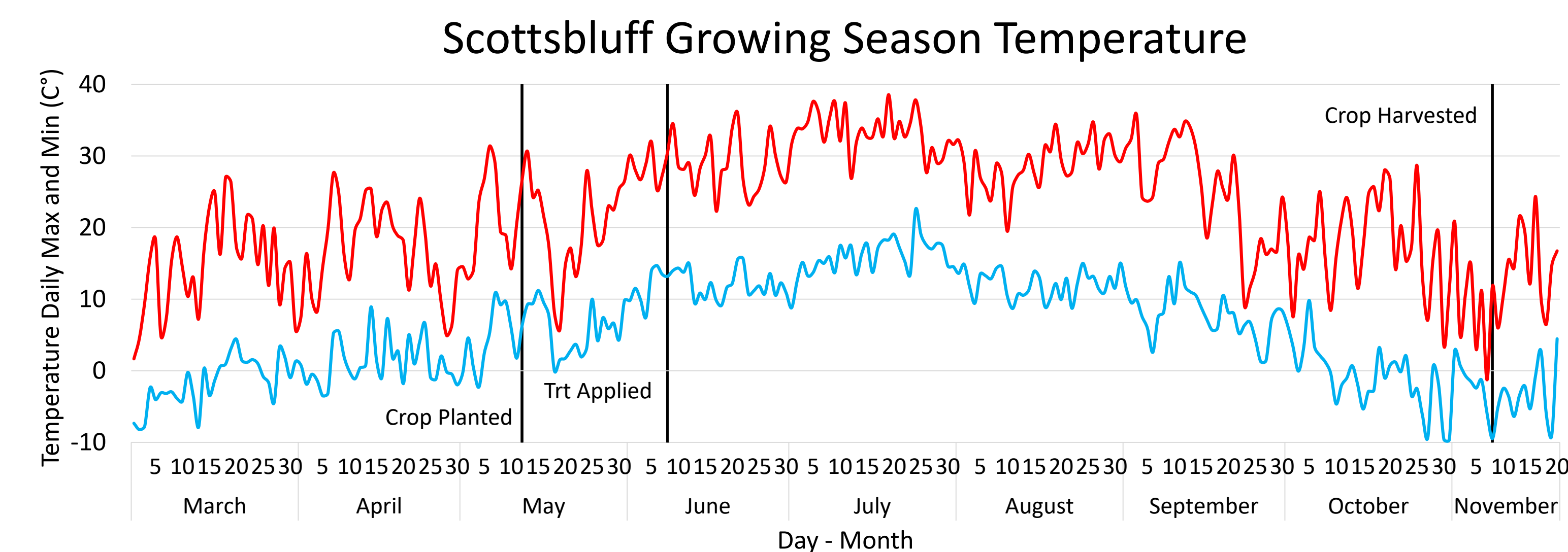
^aAll rates are in g ai or ae hectare⁻¹

Results



Contrast of Group 4 Trt's	% Palmer amaranth Control	Palmer amaranth Density	Yield
2,4-D vs Dicamba	-17.1**	2.5*	-514.6
2,4-D vs Dicamba+Diflufenzopyr	-19.4**	2.9*	-977.4*
Dicamba vs Dicamba+Diflufenzopyr	-2.3	0.4	-462.8

* Indicates significance $\alpha = 0.05$



All photos are 6 weeks after application

Discussion & Conclusion

- Dicamba and Dicamba + Diflufenzopyr provided superior weed control when compared to 2,4-D.
- There was no distinction between Dicamba and Dicamba + Diflufenzopyr in weed control or density.
- Dicamba + Diflufenzopyr resulted in superior yield as compared to 2,4-D.
- There wasn't any direct benefit from adding a group 15 herbicide this season due to lack of late emerging Palmer amaranth. In most years, late season emergence of Palmer amaranth is common. Weather patterns observed during the 2017 growing season may have induced secondary dormancy and reduced germination later in the year (4).
- This study will be repeated again in the 2018 growing season.

Literature