Multi-Hybrid Planting for Corn Hybrid Placement

Study ID: 078155201701
County: Saunders
Soil Type: Judson silt loam; Nodaway silt loam; Pohocco-Pahuk complex; Tomek silt loam; Yutan, eroded-Aksarben silty clay loam; Yutan, eroded-Judson complex
Planting Date: 5/8/17
Harvest Date: 11/3/17
Population: 28,000
Row Spacing (in): 30
Reps: 11
Previous Crop: Soybean
Tillage: No-Till

Irrigation: None
Rainfall (in):

Introduction: Using a multi-hybrid planter, hybrids can theoretically be placed to optimize production in stable management zones. This study compares two contrasting hybrids, one with a drought tolerant trait and one geared towards high production, placed in defined management zones *(Figure 1)*.

- The drought tolerant/**defensive hybrid**, A6499, was placed in portions of the field that typically had lower water retention (dark grey).
- The **offensive hybrid**, P1197AM, was placed in portions of the field that normally maintained adequate moisture across the growing season (light grey).
- Check strips of the opposing hybrid were placed in each zone as shown in *Figure 1*.

Management Zone Creation: Six years of yield data, wetness potential, deep EC, and organic matter were used for clustering in Management Zone Analyst Version 1.0 (USDA-ARS, University of Missouri, Columbia, MO).

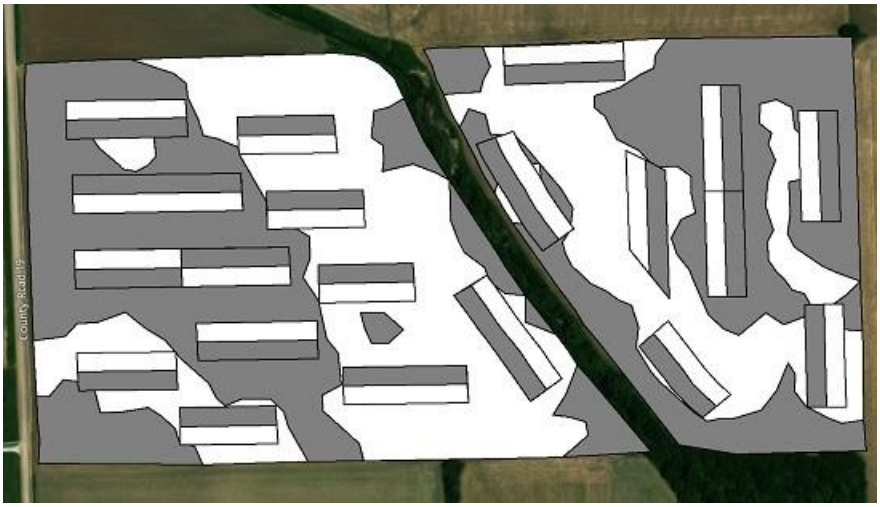

Figure 1. Management zones for defensive hybrid (dark grey), and offensive hybrid (light grey) with check strips of the opposing hybrid.

Results: Within each zone, success of the offensive and defensive hybrid was evaluated by comparing the yield of the check strips to the yield in an adjacent strip of the hybrid assigned to that zone. Data were analyzed using the GLIMMIX procedure in SAS 9.4 (SAS Institute Inc., Cary, NC). Mean separation for hybrids within a zone was performed with Fisher's LSD. Letters below apply for differences within a zone.

Figure 2. True-color imagery (top) and NDRE imagery (bottom) for the field from July 6.

Aerial imagery was collected with a drone on July 6, 2017 *(Figure 2)*. Hybrid differences are apparent in both the true color (RGB) and NDRE (normalized difference red edge index). More ground is visible in the defensive hybrid zone (A6499) as leaves were rolled in this hybrid.

Treatment	Agrigold A6499 (defensive hybrid)	Pioneer 1197AM (offensive hybrid)	P-Value
	***Yield** (bu/ac) †*		
Defensive Zone	179 A*	181 A	0.641
Offensive Zone	184 A	181 A	0.424
	***Marginal Net Return** ($/ac)‡*		
Defensive Zone	495.07	493.83	
Offensive Zone	510.08	493.07	

*Values with the same letter are not significantly different at a 95% confidence interval. Letters apply within zone.
†Bushels per acre corrected to 15.5% moisture.
‡Net return calculated using $3.20/bu corn and seed costs of $221/bag for Agrigold A6499 and $242/bag for Pioneer 1197AM.

Summary: The offensive hybrid, P1197AM, and defensive hybrid, A6499, yielded the same in both the offensive and defensive zones. Yield in both zones was relatively similar across the whole field. Several hot days around July 6 resulted in the defensive hybrid, A6499, having rolled leaves during the hottest part of the day, while the offensive hybrid, P1197, did not. This response can help conserve water and maintain cellular function. Despite these different responses, there were no yield differences.

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In Partnership with: Nebraska Soybean Checkoff; Nebraska Corn Growers Association; Nebraska Dry Bean Commission