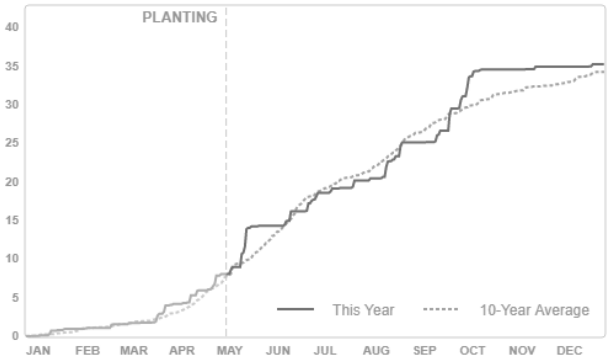
Multi-Hybrid Planting for Corn Hybrid Placement

Study ID: 078155201703
County: Saunders
Soil Type: Filbert silt loam; Tomek silt loam; Yutan silty clay loam
Planting Date: 5/7/17
Harvest Date: 10/29/17
Population: 31,000
Row Spacing (in): 30
Previous Crop: Soybean
Tillage: No-Till

Irrigation: Pivot
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**, 732-99AM, 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: Five years of yield data were used for clustering in Management Zone Analyst Version 1.0 (USDA-ARS, University of Missouri, Columbia, MO). Pivot corners were assigned as the defensive 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.

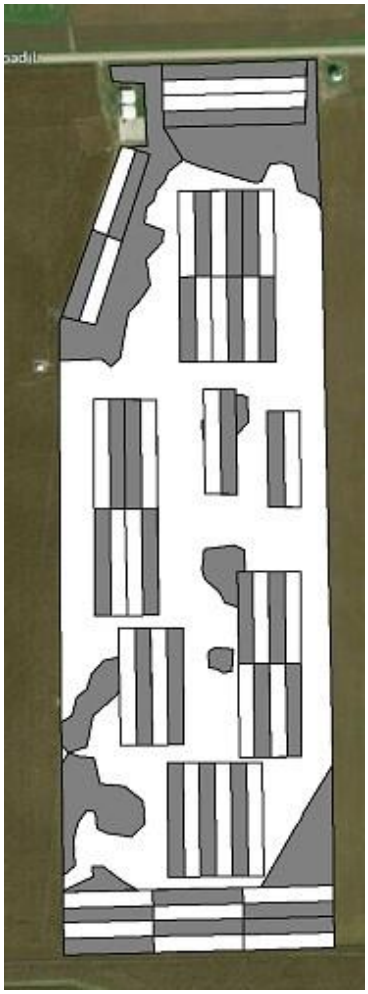


Figure 1. Management zones for defensive hybrid (dark grey), and offensive hybrid (light grey) with check strips of the opposing hybrid.

Treatment	Curry 732-99AMX (defensive hybrid)	Pioneer 1197AM (offensive hybrid)	P-Value
	***Yield** (bu/ac) †*		
Defensive Zone	195 B*	214 A	0.030
Offensive Zone	217 B	227 A	0.004
	***Marginal Net Return** ($/ac)‡*		
Defensive Zone	549.67	589.69	
Offensive Zone	620.39	633.95	

*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 $190/bag for Curry 732-99AMX and $242/bag for Pioneer 1197AM.

Summary: The offensive hybrid, P1197AM, yielded higher than the defensive hybrid, 732-99AM, in both the offensive and defensive zones. Moisture was adequate throughout the growing season for this location. Rainfall was supplemented by center pivot irrigation (for the irrigated portion of the field). Although not statistically analyzed, yield was numerically lower in the defensive zone for both the offensive and defensive hybrids, but P1197 still out yielded 732-99 even in non-irrigated pivot corners.

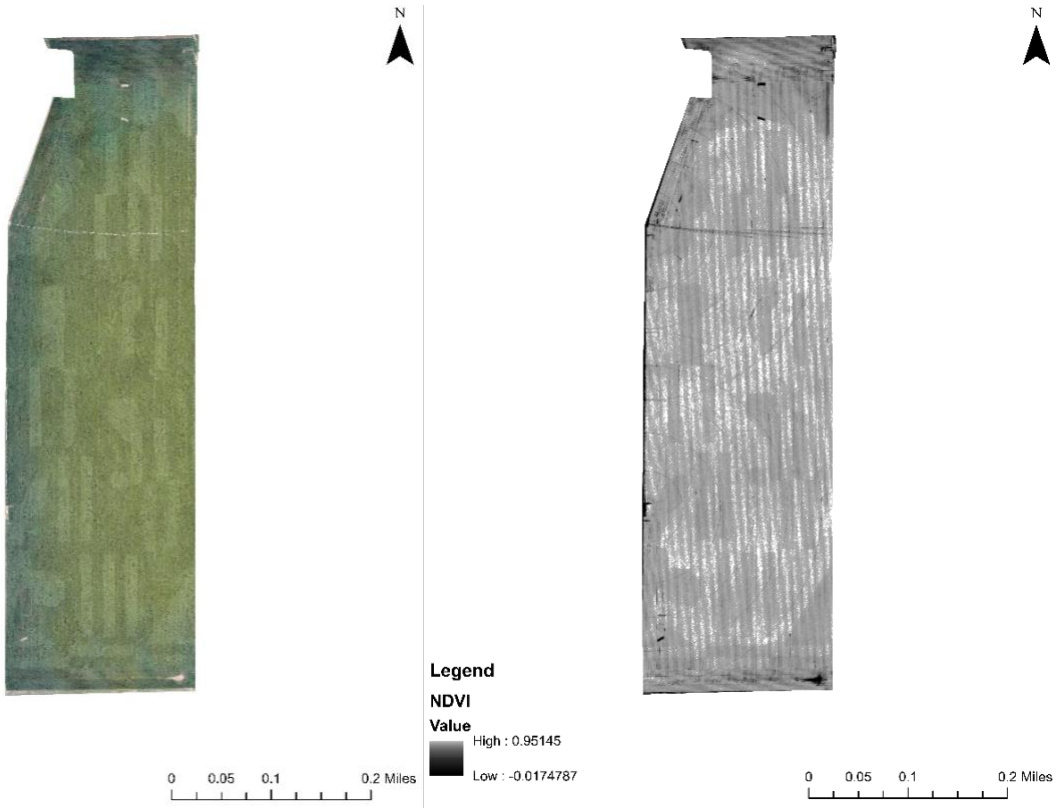


Figure 2. True color (left) and NDVI (right) imagery for the field from mid-July.

Aerial imagery was collected with a drone in mid-July *(Figure 2)*. Hybrid zones and check strips are apparent in both the true color (RGB) and NDVI (normalized difference vegetative index).

Sponsored by: University of Nebraska Lincoln; Nebraska Corn Board

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