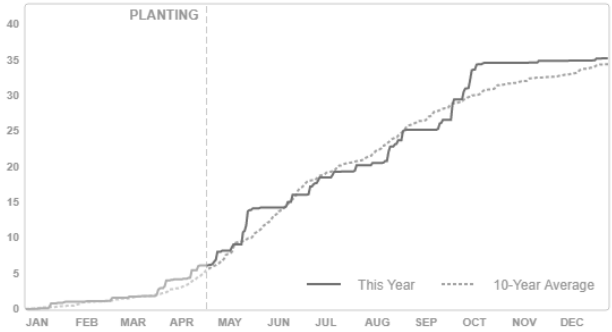
Multi-Hybrid Planting for Corn Hybrid Placement

Study ID: 108155201702
County: Saunders
Soil Type: Filbert silt loam; Scott silt loam; Tomek silt loam; Yutan silty clay loam
Planting Date: 4/24/17
Harvest Date: 11/2/17
Population: 28,000
Row Spacing (in): 30
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**, P1151AM, was placed in portions of the field that typically had lower water retention (light grey).
- The **offensive hybrid**, DKC62-98RIB, was placed in portions of the field that normally maintained adequate moisture across the growing season (dark grey).
- Check strips of the opposing hybrid were placed in each zone as shown in *Figure 1*.

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

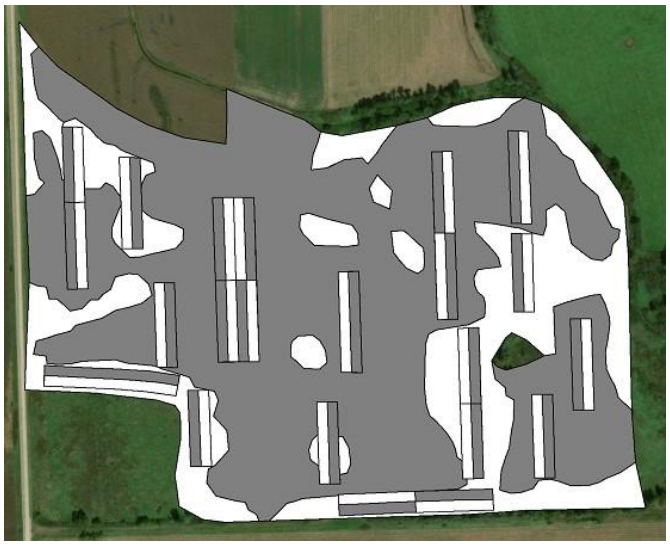


Figure 1. Management zones for defensive hybrid (light grey), and offensive hybrid (dark grey) with check strips of the opposing hybrid.

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.

Treatment	Pioneer 1151AM (defensive hybrid)	DKC 62-98RIB (offensive hybrid)	P-Value
	Yield *(bu/ac)* †		
Defensive Zone	160 A*	165 A	0.374
Offensive Zone	193 B	200 A	0.014
	Marginal Net Return *($/ac)*‡		
Defensive Zone	428.06	443.74	
Offensive Zone	534.49	556.09	

*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 $236/bag for Pioneer 1151AM and $238/bag for DKC 62-98RIB.

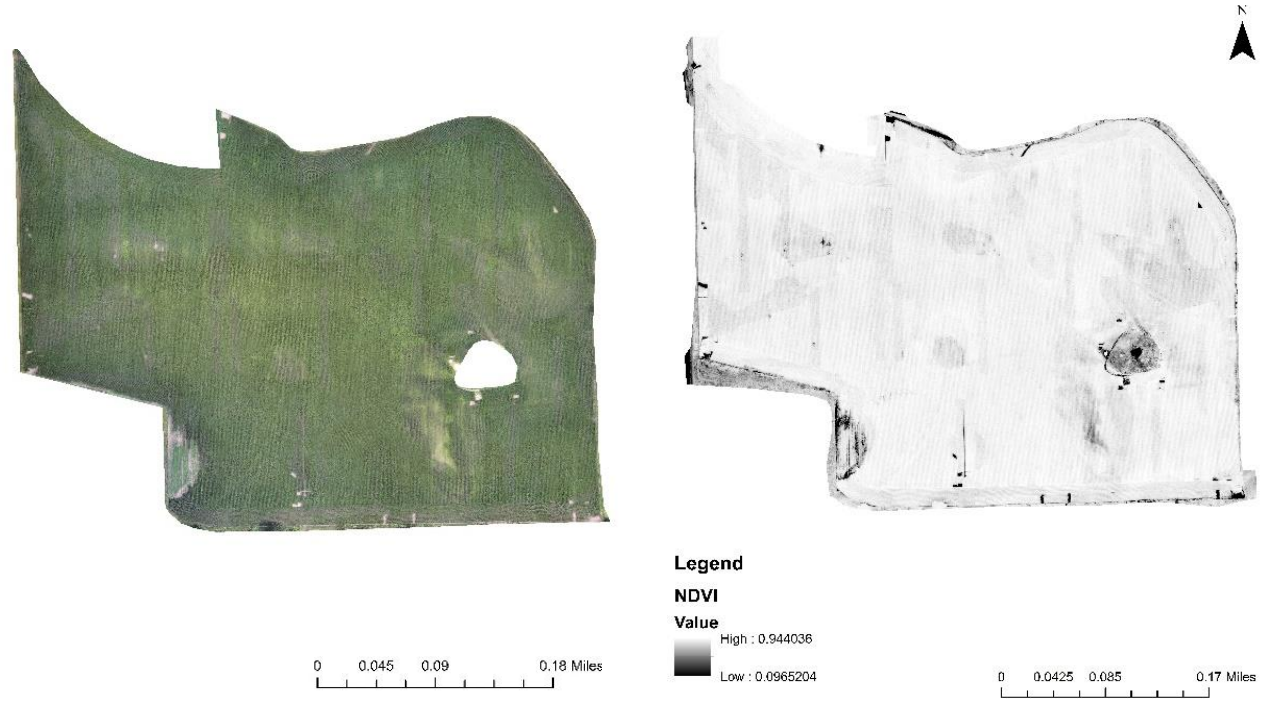


Figure 2. True color (left), and NDVI (right) imagery of the research field from mid-July.

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

Summary: In the offensive zone, the offensive hybrid, DKC62-98RIB, yielded higher than the defensive hybrid, P1151AM. In the defensive zone, there was no difference between the two hybrids. This indicates that the offensive hybrid was placed correctly in the offensive zone. This year the growing season rainfall was 4.3" above the 30-year average; therefore, water limiting conditions were not an issue and the traits provided by the defensive hybrid were not needed. However, it is notable that using the defensive hybrid, even in a year where dry conditions were not experienced, did not result in reduced yield.

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