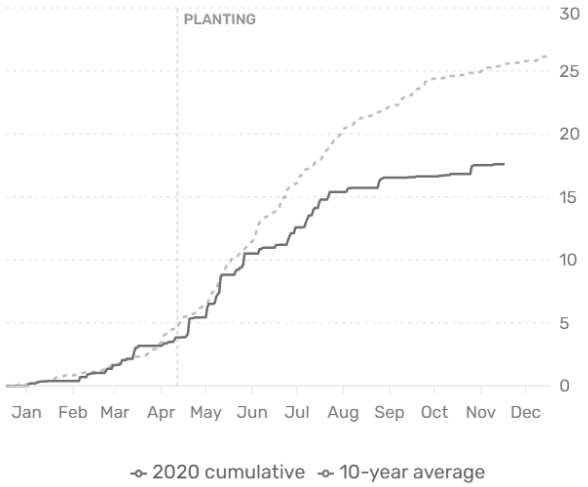
Corn Planting Speed with Ag Leader® SureForce™

Study ID: 0709047202004
County: Dawson
Soil Type: Cozad silt loam; Hord silt loam, 0-1% slope
Planting Date: 4/26/20
Harvest Date: 10/24/20
Population: 34,000
Row Spacing (in): 30
Hybrid: Pioneer® P1353Q
Reps: 5
Previous Crop: Corn
Tillage: Strip-till
Herbicides: ***Pre:*** 2 oz/ac Sharpen®, 24 oz/ac Durango® DMA®, 1 pt/ac atrazine 4L on 4/30/20
Post: 24 oz/ac Durango® DMA® on 6/03/20
Seed Treatment: None
Foliar Insecticides: 5 oz/ac bifenthrin 2 EC, 2 oz/ac lambda-cyhalothrin 1 EC on 7/20/20
Foliar Fungicides: 10.5 oz/ac Quilt Xcel® on 7/20/20

Fertilizer: 19 gal/ac 32-0-0, 10 gal/ac 10-34-0, 5 gal/ac 12-0-0-26s on 4/11/20 with strip-till; 1 gal/ac Altura™, 1 gal/ac ReaX™ K, 0.5 gal/ac ReaX™ Mn, 0.125 gal/ac ReaX™ Zn on 4/27/20 in-furrow; 10 gal/ac 32-0-0 on 4/30/20 in burndown; 8 gal/ac 32-0-0, 2 gal/ac 12-0-0-26S on 6/13/20 by chemigation.
Irrigation: SDI, Total: 5.2"
Rainfall (in):



Soil Tests (Dec. 2019):

Soil pH 1:1	Soluble Salts 1:1 mmho/cm	Organic Matter LOI %	KCl Nitrate – N ppm N	Nitrate lb N/A	Mehlich P-III ppm P	$CaPO_4$ SO_4-S ppm	Ammonium Acetate (ppm) K	Ca	Mg	Na	Sum of Cations me/100g	DPTA (ppm) Zn	Fe	Mn	Cu
6.4	0.4	3.0	13	31	72	5	488	2867	332	38	19	2.1	24.2	14.8	0.7
6.7	0.4	2.8	11	26	53	4	580	2800	358	37	19	1.8	20.1	9.9	0.7
6.7	0.4	2.8	6	14	62	2	600	3287	432	37	19	1.1	19.9	9.0	0.8
6.8	0.4	2.3	9	22	17	2	389	2467	261	31	19	1.0	17.9	10.1	0.6

Introduction: Too high planting speeds coupled with uneven distribution of downforce across a planter can lead to uneven planting depth and emergence. An electric drive system coupled with hydraulic active down pressure systems are of interest to reduce sidewall compaction, achieve consistent planting depth and achieve consistent spacing across various soil types and conditions. This study evaluated the Ag Leader® SureForce™ system coupled with the SureForce™ system and evaluated if faster planting speeds are possible when using an active down pressure system. The standard planting speed of 5 mph was compared with faster speeds of 7 mph and 10 mph. The $1.90/ac treatment cost for the active downforce system was included in net return calculations for the 7 mph and 10 mph planting speeds.

Emergence counts were taken for each replication on a near-daily basis as the crop emerged to determine if the active down pressure resulted in a more uniform emergence (Figure 1). Early season (V4—V6) and harvest stand counts, moisture, yield, and net return were also evaluated.

Results:

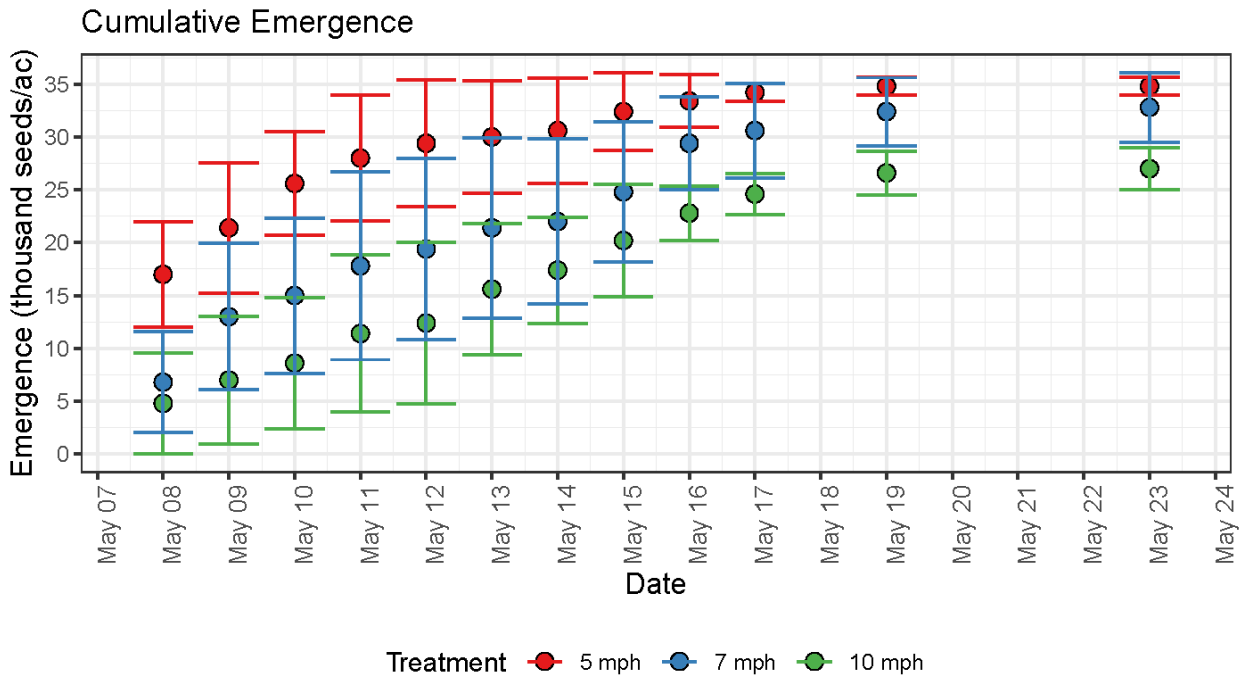


Figure 1. Cumulative emergence by date for 5 mph, 7 mph, and 10 mph planting speeds.

	Early Season Stand Count (plants/ac)	Harvest Stand Count (plants/ac)	Moisture (%)	Yield (bu/ac)†	Marginal Net Return‡ ($/ac)
5 mph	34,067 A*	32,400 A	17.8 A	240 B	841.64 B
7 mph	33,733 A	31,467 A	17.8 A	256 A	895.10 A
10 mph	27,667 B	26,267 B	17.8 A	235 B	821.05 B
P-Value	<0.0001	0.0001	0.546	0.006	0.006

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 15.5% moisture.
‡Marginal net return based on $3.51/bu corn and $1.90 for active downforce for the 7 mph and 10 mph treatment ($20,000 cost for active downforce system spread over 1,500 acres and prorated over 7 years).

Summary:

- The emergence for the 7 mph and 10 mph treatments were initially lower than the 5 mph treatment and continued through May 17. At the final two emergence count dates (May 19 and 23), the 7 mph treatment caught up to the 5 mph treatment, and only the 10 mph treatment lagged in emergence. This is also apparent in the early and harvest stand counts where the 10 mph treatment had lower stand counts than the 5 mph and 7 mph treatments. There were no difference in stand counts between the 5 mph and 7 mph treatments.
- Yield and marginal net return was significantly higher for the 7 mph treatment. It is unclear why the 7 mph treatment, which initially emerged slower than the 5 mph treatment, resulted in higher yields. Additionally, despite the lower final stand count for the 10 mph treatment, there was no yield difference between the 5 mph and 10 mph treatments.

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