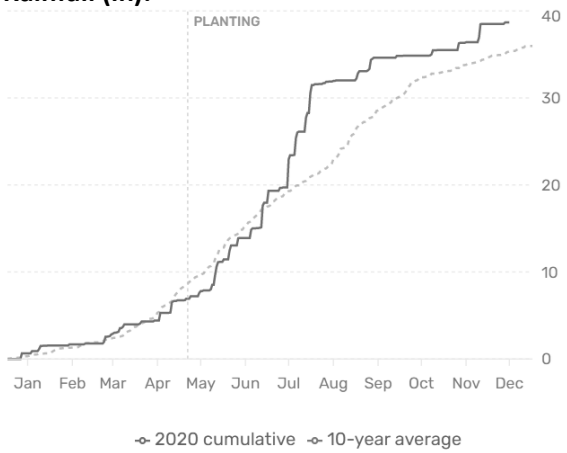
Kinze® True Depth™ Hydraulic Active Downforce vs Manual Downforce

Study ID: 0416147202002
County: Richardson
Soil Type: Zook silty clay loam occasionally flooded
Planting Date: 5/6/20
Harvest Date: 10/8/20
Seeding Rate: 32,000—34,000
Row Spacing (in): 30
Hybrid: Pioneer® P1197
Reps: 4
Previous Crop: Soybean
Tillage: No-Till / Strip-Till
Fertilizer: 180 lb/ac N from anhydrous ammonia on 11/20/19; average of 25 lb/ac N from 11-52-0 variable-rate application on 2/20/20

Irrigation: None
Rainfall (in):



Introduction: When planters use constant, uniform down pressure, varying soil density can result in poor seed depth control. Because of the soil variability, an even distribution of downforce across a planter can lead to uneven planting depth and emergence. Hydraulic active down pressure systems are of interest to reduce sidewall compaction and achieve consistent planting depth across various soil types and conditions. This study evaluated the Kinze® True Depth™ hydraulic active downforce system. The two treatments were:

1) manual pressure setting at a consistent down force of 120 lb in addition to existing unit weight (check)

2) active down pressure set at a custom setting, resulting in a net of 180 lb total downforce between the gauge wheel and the soil surface.

The manual setting of 120 lb down force (check), when combined with existing unit weight resulted in over 300 lb of sensed force (Figure 1). In order to achieve the net of 180 lb total downforce, the active down pressure was lifting up on most row units (Figure 2). Rows 5, 7, 8, and 11 in Figure 2 show where the active down pressure was pushing down; these rows correspond to row units planting behind the planter tractor tires and in sprayer tracks.

Figure 1. Monitor showing the sensed force for the manual setting. When combined with existing unit weight force, the sensed force was over 300 lb.

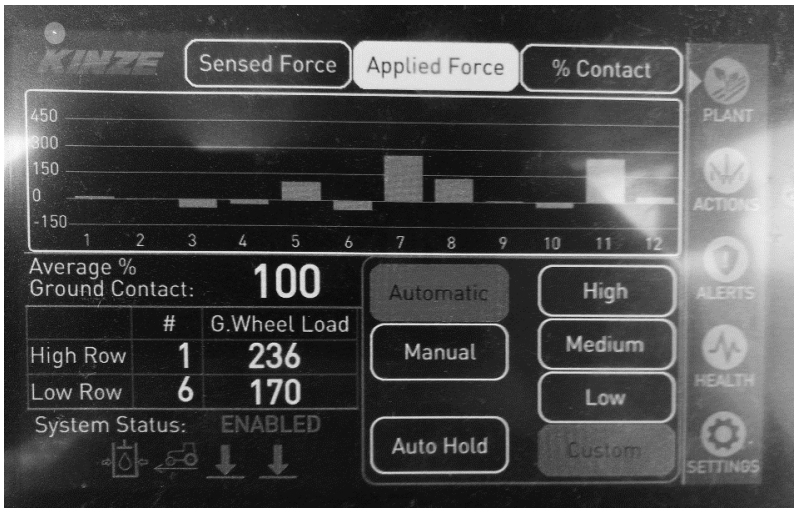


Figure 2. Image of monitor showing the applied force with the automatic down pressure set at 180 lb total downforce.

Emergence counts were taken for one replication as the corn emerged to determine if the active down pressure resulted in a more uniform emergence (Figure 3). Moisture, yield, and net return were also evaluated.

Results:

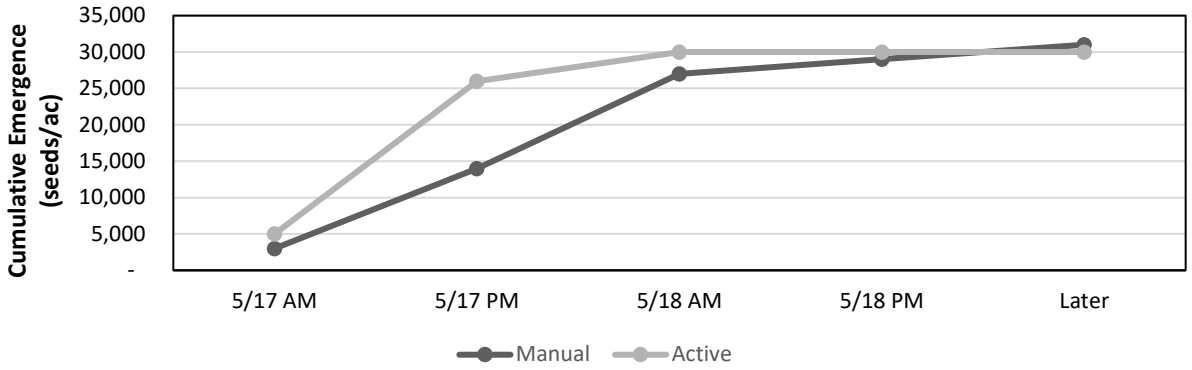


Figure 3. Cumulative emergence by date for manual downforce and active downforce.

	Moisture (%)	Yield (bu/ac)†	Marginal Net Return‡ ($/ac)
Manual Downforce (120 lb/ac)	13.9 A*	233 A	818.03 A
Active Downforce	13.6 A	235 A	820.17 A
P-Value	0.316	0.234	0.676

*Values with the same letter are not significantly different at a 90% confidence level.
†Yield values are from cleaned yield monitor data. Bushels per acre corrected to 15.5% moisture.
‡Marginal net return based on $3.51/bu corn and $4.75/ac for active downforce ($20,000 cost for active downforce system spread over 600 acres and prorated over 7 years).

Summary: There were no statistically significant differences in yield, moisture, or net return between the two treatments. Planting was on a tilled strip of soil created by a fall strip-till operation.

Sponsored by: **In Partnership with:**