

BECK'S De-Terminator™ Corn Planter Study – 2008

Background: Case IH built a six-row planter called “The De-Terminator” to test the row unit and seed metering systems of five planter manufacturers. They tested the following brands on a single tool bar at 11 locations in six states:

Case IH
 John Deere Vacuum
 Kinze Finger Pickup
 Kinze Vacuum
 White Air

De-Terminator cooperators set up their own test protocol in which they tested speed and multiple seed sizes in 2008.

The row units and meters were all set to plant 32,400 plants per acre.

Of the 54,320 total plant measurements that were taken, just over 35% were done at the three sites associated with Beck's Hybrids (Atlanta, IN, Ft. Branch, IN and Downs, IL).



Purpose: The purpose of this study was to determine the performance of each meter when using different seed sizes, seed treatments and planting speeds.

Data was collected for the following:

- 1) Population
- 2) Variation in plant spacing and growth stage
- 3) Yield, moisture and test weight at harvest

The focus of doing the early stand counts was to determine the Net Effective Stand (NES) which measures “Stand Quality”. NES takes into account both seed spacing and emergence uniformity. To figure NES, count the total emerged population, then subtract the late emerging plants (0.5 for 1-2 leaves behind, 1 for 3+ leaves behind), then subtract poorly spaced plants (0.5 for 1 double, 2 for 1 triple).

Example: Counted 29.0 plants in 1,000th of an acre (29,000 population)
 -1.5 (Counted one plant 1 leaf behind and one plant 3 leaves behind)
 -0.5 (Found one double)
 27.0 productive plants contributing 100% to yield
27,000 is the Net Effective Stand even though there are 29,000 plants emerged.

To figure the Net Effective Stand Percentage, divide the Total Productive Plants by the Final Population.

Example: $\frac{27,000}{29,000} = 93.1$ Net Effective Stand %

NES% is a measure of a planter row unit and meter's ability to accurately space seeds and provide a seed environment that is conducive to uniform emergence. In later pages we will present yield data from the De-Terminator plots in Atlanta, Downs and Fort Branch. Note: Net Effective Stand does not measure how close a meter came to planting the target population. It simply measures the quality of the stand that did emerge.

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Net Effective Stand Percentages

Each number represents the average number of productive plants compared to the total population on a percentage basis for the three Beck locations. The bold numbers represent the NES percentages that are 90% or more. The italicized numbers represent the 2-3 lowest NES percentages. If all NES% are above 90% then no numbers will be italicized. This data can be used as a general guideline for deciding which grade sizes and speeds are optimum and which should be avoided for each type of planter.

Case IH				
Seed Weight (lbs.)				
Speed (mph)	<40	40-50	50-60	>60
4.5	98%	97%	96%	100%
5.5	96%	97%	96%	100%
6.5	92%	95%	93%	98%

Comments: Case IH gave highest overall NES% for all seed sizes and speeds.

Kinze - Finger				
Seed Weight (lbs.)				
Speed (mph)	<40	40-50	50-60	>60
4.5	90%	96%	95%	98%
5.5	92%	97%	93%	95%
6.5	83%	91%	90%	97%

Comments: Handles larger seed at high speeds.
Caution: Seed below 40 lbs.

Kinze - Vac				
Seed Weight (lbs.)				
Speed (mph)	<40	40-50	50-60	>60
4.5	92%	94%	97%	96%
5.5	88%	94%	96%	98%
6.5	92%	89%	90%	98%

Comments: Handles larger seed relatively well.
Caution: <50 lb. seed at speeds > 4.5 mph.

White				
Seed Weight (lbs.)				
Speed (mph)	<40	40-50	50-60	>60
4.5	96%	92%	85%	81%
5.5	94%	89%	89%	76%
6.5	94%	89%	87%	79%

Comments: Likes speed <6 mph.
Caution: High speeds and any seed above 50 lbs.

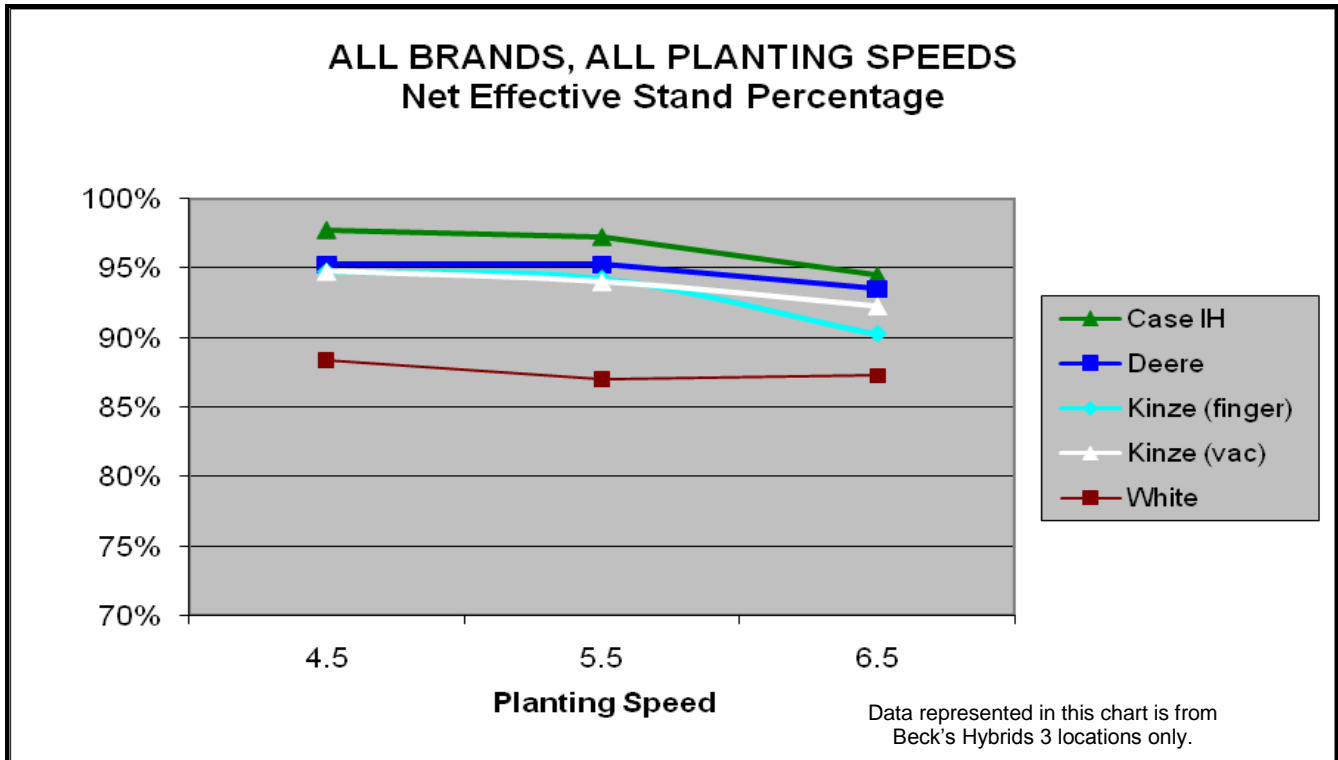
John Deere - Vac				
Seed Weight (lbs.)				
Speed (mph)	<40	40-50	50-60	>60
4.5	96%	95%	95%	95%
5.5	91%	96%	97%	97%
6.5	92%	93%	93%	96%

Comments: John Deere Vac provided NES% >90 at every seed size and speed.

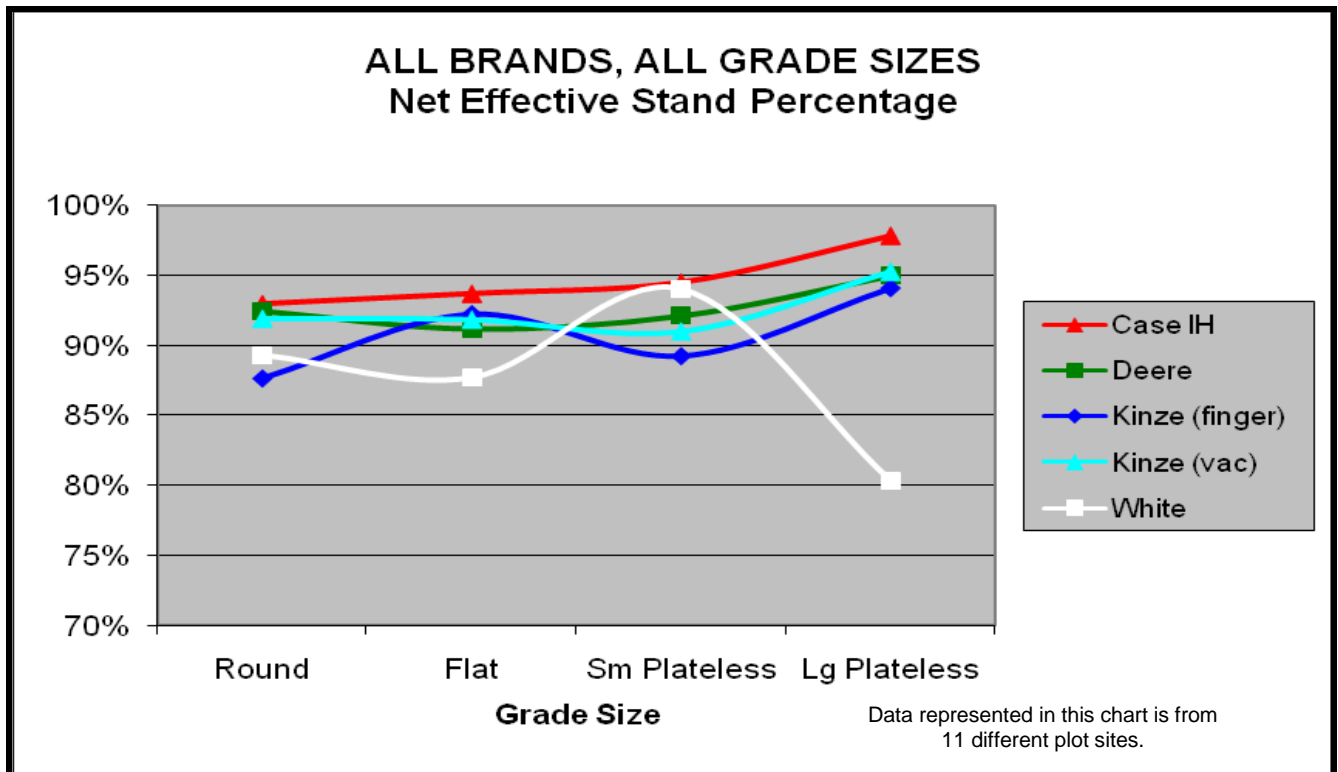
Scott Beck and Toby Ripberger discuss planting information with the CASE IH representatives.



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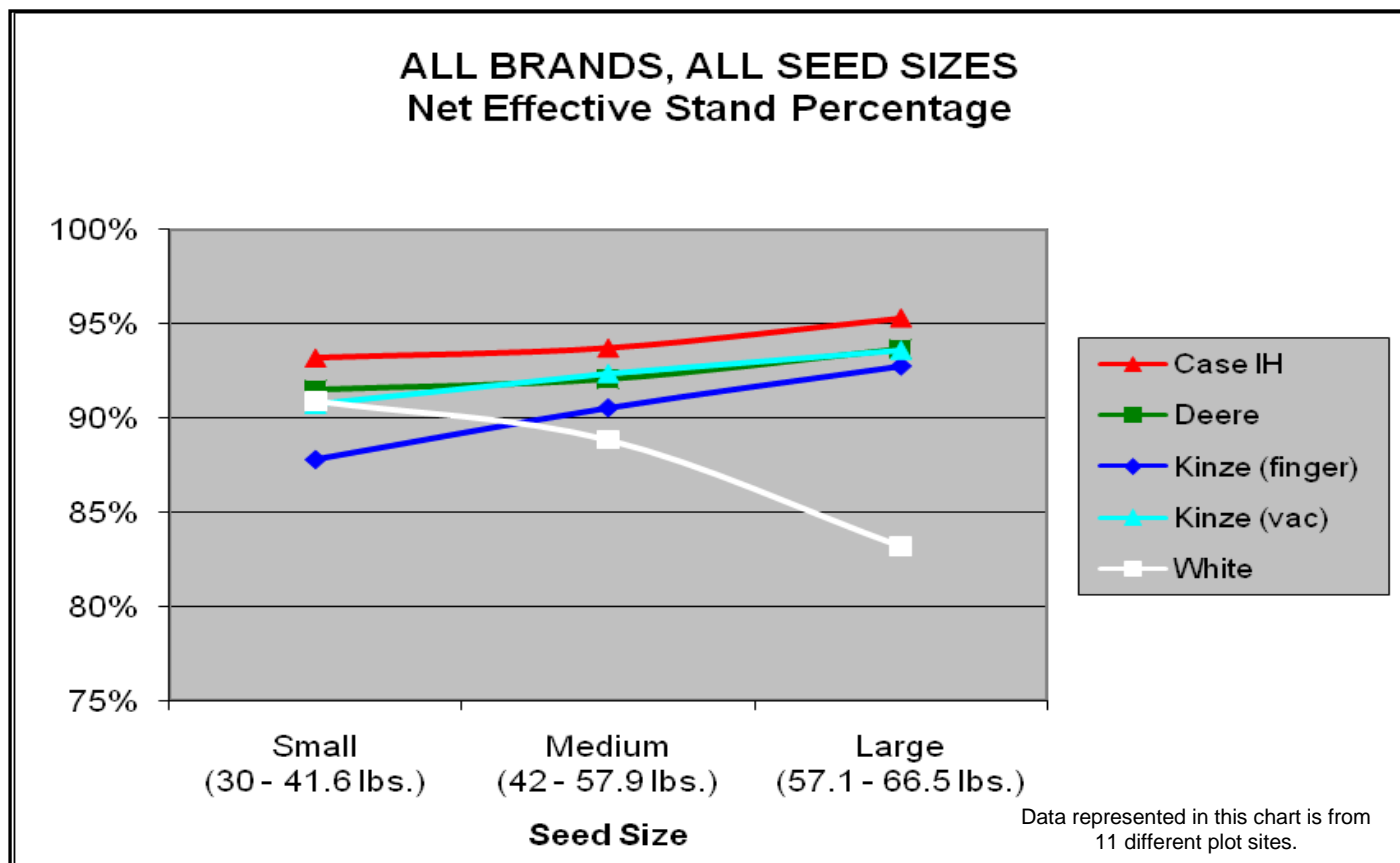


Summary: This data illustrates that the Case IH meter has the highest NES% at all planting speeds. When examining the NES% of all the meters the NES% drops on all units at 6.5 mph except for the White meter.



Summary: All meters except the White brand gave the highest NES% with the Large Plateless grade size. Both the White and Kinze (finger) meters showed more variability than the other meters with respect to grade size and corresponding NES%.

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Summary: We would expect 40-60 lbs. to be the optimum size to plant to obtain the highest NES%. However, we can't explain why all meters except the White showed lower NES% when they planted 50-60 lb. seed, but improved when planting seed >60 lbs. The White unit NES% was comparable at small seed but had lower NES% as seed size increased. The Kinze (finger) unit's NES% was comparable at the medium and larger seed sizes, but not at the smaller seed sizes.



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Overall Results for Yield, Population and NES%

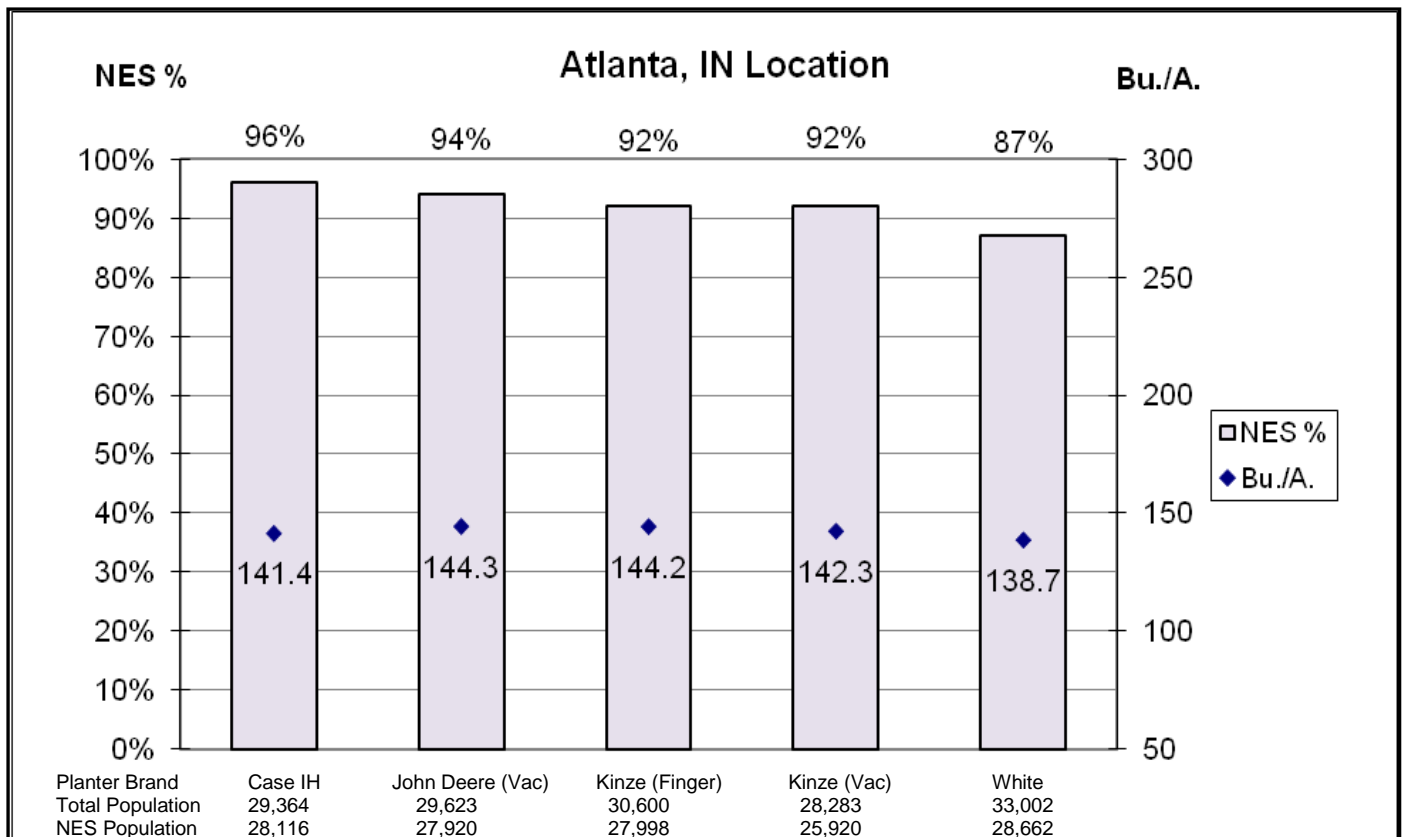
Atlanta, IN Location

Location: E1 - E2 plots
Planted: April 23, 2008
Harvested: October 8, 2008
Rows: Six 30" row
Population: 32,400 seeds/A.
Soil Type: Brookston / Crosby

Previous Crop: Corn
Tillage: V-Rip / S-tine
Herbicide: PPI: 1.6 qts. Bicep II Magnum
 1 qt. Princep
 Post: 1.67 qts. Lexar / 6 oz. Stinger
Insecticide: None

RAINFALL	
April	1.63 in.
May	4.91 in.
June	4.80 in.
July	3.50 in.
August	2.94 in.
Total	17.78 in.

It must be noted that yield performance does not directly correlate to NES% although it is an important part of the equation. Final population must be multiplied by NES% to get NES Population which is a key yield driver. Environmental variables are also an important part of the overall equation; we know that planting thicker does not always produce more yield. One must determine a NES Population target then divide by their expected NES% to determine their target Final Population which then needs to be factored by germination rates to determine their actual planting population. In these plots, each row unit was set to plant 32,400 plants per acre although final populations varied.



Summary: In any given year for any given hybrid the optimum NES Population target may vary. In the case of Atlanta in 2008 the optimum yields were harvested in checks with NES populations of 27,920 and 27,998, even though they did not have the highest NES%. This is calculated by multiplying final population by NES%.

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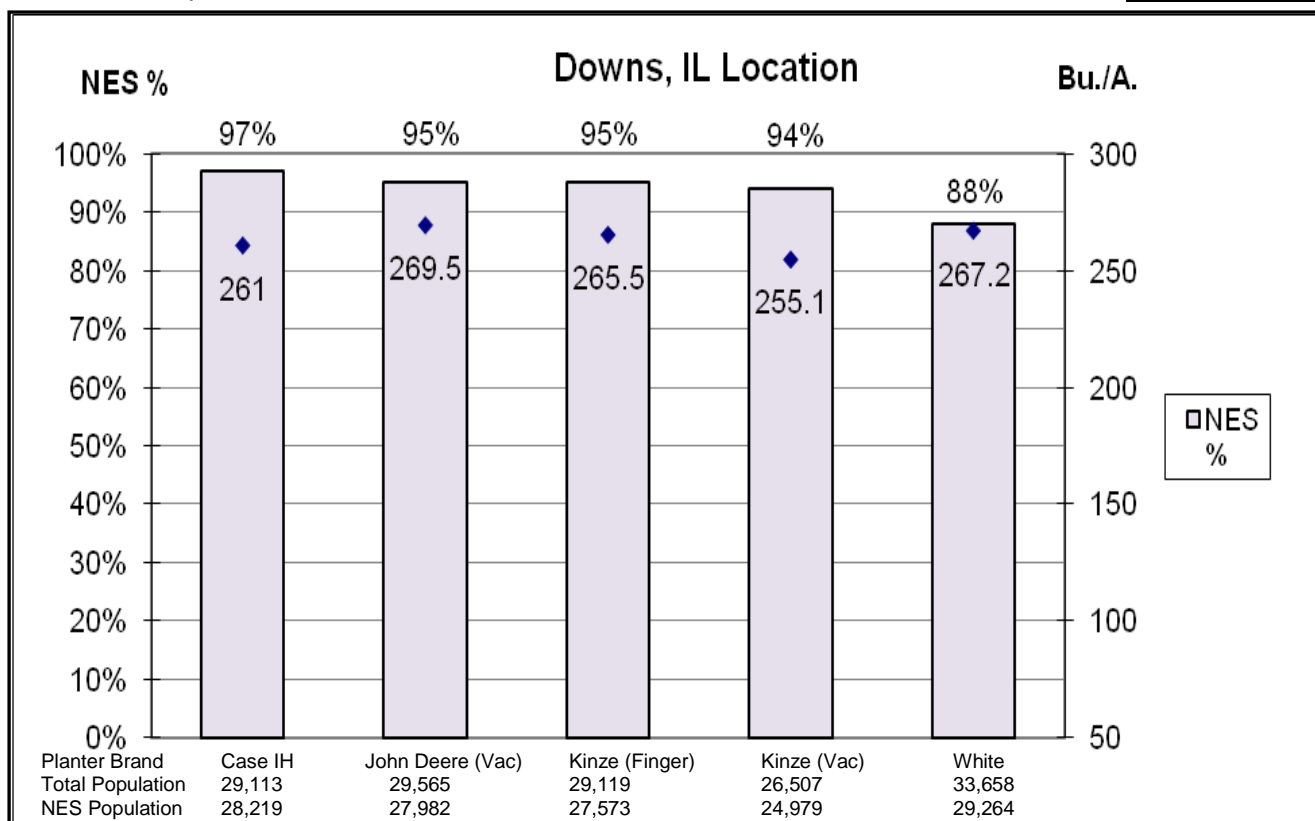
Overall Results for Yield, Population and NES% - Continued

Downs, IL Location

Location: Downs, IL
Planted: April 27, 2008
Harvested: October 25, 2008
Rows: One 30" row
Population: 32,400 seeds/A.
Soil Type: Ipava Silt Loam

Previous Crop: Soybeans
Tillage: Field Cultivator
Herbicide: Degree Xtra
 Roundup Original Max
Insecticide: 6 oz. Headline

RAINFALL	
April	1.88 in.
May	6.41 in.
June	4.44 in.
July	7.05 in.
August	0.91 in.
Total	20.69 in.



Summary: The 2008 yield data at the Downs, IL location best follows the pattern of total population. The planter units with the highest total population ultimately had the highest yields, but this does not correlate with the NES%.

Overall Yield and Population Summaries For Speed and Grade Size Tests

	Atlanta, IN		Ft. Branch, IN		Downs, IL	
	Population	Bu./A.	Population	Bu./A.	Population	Bu./A.
4.5 mph	30,158	141.9	27,931	224.3	29,504	264.3
5.5 mph	30,145	141.9	27,658	217.4	29,575	260.5
6.5 mph	30,224	142.3	27,306	208.5	29,712	264.8
MR	30,520	171.6	28,813	222.4	28,813	294.8
MF	30,589	177.6	29,759	218.3	29,759	260.1
SP	28,965	118.5	27,946	215.3	27,728	239.3
PL	30,648	110.3	28,990	211.3	31,912	260.3
AP	30,154	132.2	27,469	220.2	29,759	261.5

Summary: The speed data from Atlanta, IN and Downs, IL shows that the speeds with the highest population developed into the largest yield. This year at all three locations there is not a direct correlation with grade size to population/yield. Ft. Branch, IN is the only location where the slowest speed correlated to the highest population and yield.