2013 CASSELTON YIELD TRIAL

The NDSU corn breeding program planted 52 breeding experiments across >50 state and regional locations in 2013.
Our program managed, in 2013 (as in previous years), the largest testing network of commercial hybrids for North Dakota.
Nine locations were grown with the objective to find strengths and weaknesses of hybrids available in the market.
A hybrid with top yields at only one testing site could be hiding weaknesses not easily seen in just one location.
Growing the same hybrids across several testing sites within regions increases chances to expose weaknesses.
There is a need to grow as many locations as possible within North Dakota regions in order to select top hybrids
Select genetically diverse hybrids showing unbiased and stable performance across locations and regions

Company	Hybrid	RM	Grain Moisture (%)	Grain Yield (bu/A)	Test Weight (lb/bu)	Stalk Lodging (%)	Root Lodging (%)	Ear Drop (%)
Proseed	1283 VT2P	83	13.6	126.0	59.5	0.0	0.0	0.0
Dairyland	DS-7985	85	13.8	118.5	58.0	0.0	0.0	0.0
Syngenta	N19L-3110A	85	13.9	134.4	56.5	3.7	0.0	0.0
Stine	9201 VT3Pro	86	14.0	124.1	59.0	0.0	0.0	0.0
Proseed	1389 RR	89	14.1	126.2	55.0	2.7	4.1	0.0
Syngenta	N20Y-3220	85	14.1	138.2	55.0	0.0	0.0	0.0
Proseed	1287 GT	87	14.2	143.2	56.2	0.0	0.0	0.0
Integra	Integra 9412VT2Pro	91	14.3	120.2	57.6	0.0	0.0	0.0
Dahlman	Dahlman R44-66	88	14.4	130.8	54.5	1.4	2.7	0.0
Proseed	1286 VT3P	86	14.4	128.1	58.7	6.6	0.0	0.0
Legacy	L-2643 VT2Pro	86	14.4	135.6	60.1	6.4	0.0	0.0
Wensman	W 8097VT2RIB	88	14.5	137.0	54.7	9.7	0.0	0.0
NorthStar	VS 92-492	92	14.5	137.5	54.8	10.6	4.8	0.0
Wensman	W 90904STX	90	14.5	127.2	57.0	0.0	0.0	0.0
Nutech	5B-290™	90	14.6	128.1	53.8	2.6	3.9	0.0
Hyland	8202	85	14.6	136.6	55.0	0.0	0.0	0.0
Syngenta	N23M-3110A	88	14.6	139.4	57.8	0.0	0.0	0.0
Nutech	5X-795™	95	14.7	124.3	52.8	0.0	1.6	0.0
Peterson	PFS 57H87	87	14.7	125.2	58.1	2.6	4.1	0.0
Hyland	8295	88	14.7	150.1	58.6	0.0	0.0	0.0
Partner Brand	PB 5503 GT	85	14.7	150.4	58.8	0.0	0.0	0.0

Proseed	990 VIP 3111	90	14.8	122.2	52.5	0.0	21.0	0.0
Nutech	5X-193™	93	14.8	113.7	54.6	0.0	17.4	0.0
Proseed	1288 VIP 3111	88	14.8	140.3	58.1	5.7	0.0	0.0
NorthStar	VS 91-591	91	14.8	138.4	58.9	0.0	0.0	0.0
Nutech	5Z-091™	91	14.9	114.6	51.6	18.8	1.7	0.0
Monsanto	DKC38-03	88	14.9	132.8	59.4	10.0	1.5	0.0
Nutech	5X-890™	90	15.0	136.1	55.8	4.0	12.2	0.0
Nutech	5X-894™	94	15.0	121.4	57.5	14.9	0.0	0.0
Peterson	PFS 90G88	88	15.0	129.6	57.6	0.0	0.0	0.0
Nutech	5B-888™	88	15.1	118.6	52.1	1.3	0.0	0.0
Legacy	L-2341 3000GT	84	15.1	116.3	53.0	0.0	0.0	0.0
Proseed	1292 VT2 P	92	15.1	146.9	59.5	3.9	1.3	0.0
Hyland	8300	91	15.2	121.7	56.2	5.3	0.0	0.0
Proseed	PX 85 VT2P	85	15.2	144.9	63.4	0.0	0.0	0.0
Partner Brand	PB 6003 VIP 3122	90	15.3	147.3	55.7	1.4	1.4	0.0
Nutech	5N-9404™	94	15.4	126.4	56.9	15.4	0.0	0.0
LATE RM	CHECK	97	15.5	139.9	56.3	8.3	0.0	0.0
Nutech	5N-186™	86	15.6	109.0	51.5	0.0	5.9	0.0
Peterson	PFS 74K89	89	15.6	140.2	59.1	5.1	0.0	0.0
Legacy	L-3043 VT3Pro	92	15.7	123.7	56.4	0.0	0.0	0.0
Dairyland	DS-9791RA	91	15.7	136.8	56.8	1.3	0.0	0.0
Proseed	1191 SS	91	15.8	141.9	56.1	1.5	0.0	0.0
Syngenta	N29T-3220	92	15.9	135.3	53.0	0.0	35.1	0.0
Dairyland	DS-9694	94	16.0	126.4	54.9	0.0	0.0	0.0
Dahlman	Dahlman R46-27VT2F	92	16.0	124.8	57.5	8.8	0.0	0.0
Proseed	PX92R VT3P	92	16.2	134.4	55.8	0.0	4.1	0.0
Hyland	8315	92	16.6	119.4	54.5	2.9	13.2	0.0
Proseed	1295 SS	95	17.1	148.6	59.8	1.4	0.0	0.0
Mean			15.0	131.3	56.4	3.2	2.8	0.0
Efficiency compared to a RCBD			**155.0**	145.6	119.7	111.0	108.6	**0.0**
CV%			4.4	10.1	2.1	196.5	308.6	0.0
LSD (5%)			1.1	19.1	2.4	12.5	17.2	0.0

Experiments conducted by the NDSU Corn Breeding Program in dryland condition in Casselton 2013.

RM = Relative maturity given by Industry. Be cautious. As shown in results they may not correspond to moisture at harvest

The Lattice design was up to 155% (MOISTURE) more efficient than a Randomized Complete Block Design (RCBD)
Most fields in North Dakota have undesirable field variation. Therefore, field trial managers should avoid RCBDs.
LATTICES are grown by the NDSU corn breeding program, they are planted and harvested the same way a (RCBD) would be.
The statistical analyses, however, eliminates bias due to the environment even in uniform fields. They are very simple to manage.
The larger the number of hybrids in one experiment the larger the variation that cannot be explained by hybrid differences.
Therefore, the NDSU corn breeding program grows experiments arranged in lattice experimental designs.
These can fix undesirable experimental variation seen in randomized complete block designs (RCBD) for each trait evaluated.

Harvested Stand = 32,000 plants/A

No significant differences across hybrids for stand

The information generated by the ND corn breeding program in multi-location high and low yielding environmental trials
of the same industry hybrids across ND regions was worth $ Millions for hybrid selection by farmers,
based on the genetic differences found among hybrids in lattice designs.
This information is generated UNBIASED for farmers and industry. No bias from any institution is added.

It is very tempting to discard test trials due to high *Coefficients of Variation (CVs)* or large *Least Significant Differences (LSDs)*.
In many cases, data is proposed to be discarded when it could be the most useful to easily expose hybrid deficiencies.
Be cautious, experimental errors are much more important than CVs. CVs do not tell the whole story.
CVs are dependent of experiment means as low mean experiments will make CVs to be larger in accurate experiments.
There is the need to grow hybrids in low yielding environments to expose their weaknesses.
If trials have low yields due to drought, CVs might look high but they are the best trials showing drought susceptible hybrids.
If you see hybrids with 50% and 0% lodging across locations, both CVs and LSDs could be large but useful for hybrid selection.