2013 BARNEY 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
The same hybrids were planted in Barney, Milnor, and Colfax to represent southern North Dakota
Look at how each hybrid performs across locations

Company	Hybrid	RM	Grain Moisture (%)	Grain Yield (bu/A)	Test Weight (lb/bu)	Stalk Lodging (%)	Root Lodging (%)	Ear Drop (%)
MID RM (non GMO)	NDSU Corn Breeding CHECK	92	**13.1**	206.1	**60.4**	0.2	0.0	0.0
Integra	9455VT2Pro	94	13.2	205.5	59.3	0.8	0.0	0.0
Monsanto	DKC43-10	93	13.5	192.8	57.2	0.1	0.0	0.0
Wensman	W 90935VT3PRO	93	13.6	197.2	58.8	0.0	0.0	0.0
Peterson	PFS 73D91	91	13.7	184.9	59.9	0.0	0.0	0.0
Monsanto	DKC46.20	96	13.8	201.2	56.8	0.1	0.0	0.0
Nutech	5X-894™	94	13.8	185.6	62.5	0.6	0.1	0.0
Monsanto	DKC38-03	88	13.9	182.1	57.8	0.0	0.0	0.0
Peterson	PFS 76S92	92	14.0	159.2	55.2	0.1	0.0	0.0
NorthStar	VS 96-596	96	14.2	194.9	58.2	0.7	0.0	0.0
Nutech	5Z-9605™	96	14.5	186.6	59.4	0.1	0.0	0.0
Proseed	1191 SS	91	14.6	199.2	59.8	0.0	0.0	0.0
Stine	9422 VT3Pro1B	94	14.7	179.3	56.8	0.7	0.3	0.0
Hyland	4398	96	14.8	199.6	59.6	0.2	3.5	0.0
Proseed	1292 VT2 P	92	15.0	209.3	58.6	3.9	0.0	0.0
Hyland	8315	92	15.1	185.9	59.0	0.7	0.3	0.0
Nutech	5N-9802™	98	15.2	203.5	57.1	1.0	0.0	0.0
Nutech	5X-698™	98	15.5	190.0	57.9	0.0	0.0	0.0
Dahlman	R48-32VT3PRIB	96	15.6	163.1	58.1	3.8	0.0	0.0
Nutech	5B-290™	90	15.6	206.8	55.7	0.8	0.0	0.0

Peterson	PFS 55S96	96	15.6	172.9	58.1	0.7	0.0	0.0
Stine	9313 VT3Pro	94	15.7	168.0	57.8	0.0	0.0	0.0
Wensman	W 90967STX	96	15.7	198.6	58.1	0.0	0.0	0.0
Proseed	1295 SS	95	15.9	188.8	59.3	0.7	0.3	0.0
Nutech	5X-795™	95	16.3	198.5	56.7	0.8	0.3	0.0
Proseed	PX92R VT3P	92	16.9	187.6	58.4	0.7	0.3	0.0
Nutech	3F-198™	98	17.2	207.3	52.4	0.7	0.0	0.0
Dahlman	R47-35VT3PRIB	94	17.3	187.5	57.8	0.8	0.0	0.0
NorthStar	VS 94-594	94	18.0	159.0	53.5	0.0	0.0	0.0
Nutech	5N-9404™	94	19.2	166.8	58.2	4.3	0.1	0.0
Mean			15.2	188.9	57.9	0.7	0.2	0.0
Efficiency compared to a RCBD			148.0	**205.2**	105.8	99.8	99.9	0.0
CV%			5.9	11.2	3.7	242.2	474.5	0.0
LSD (5%)			2.8	29.5	4.4	4.9	1.7	0.0

Experiments conducted by the NDSU Corn Breeding Program in dryland condition in Barney 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 205% (YIELD) 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 = 34,500 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.