

Field Crops Newsletter

Granville and Person County
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Aerial photo of on farm plots. *Photo by NC State Extension.*

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Why Should You Care About Statistical Significance?

On publications from NC State or other places where you get data to make decisions on your farm, you may have seen the terms “statistical significance” or “statistically significant.” At field days, workshops, or production meetings, you may see some data and there is a numerical difference between two different treatments, but the scientist states that there was “no difference” or that the difference “was not significant.” Why should you care about statistical significance? Why should you care how a plot or trial was set up as long as you have the numbers from it in front of you?

First off, lets explain, as simple as possible, what statistical significance is. This is basically saying that there is a certain probability (usually a 90% or 95% chance) that the difference between treatments in a research trial did not occur by sheer chance. We all know that within a field, the environment can change from one side to the other. There could be a slope, causing one side to accumulate more water. There could be trees on one side of a field causing more shade than on the other. There could be a strip of a completely different soil type running through the middle of the field which can cause crops to grow differently. Statistical significance states that the difference between two or more treatments is due to the actual treatments, and not because of these differences in environment. In other words, this allows researchers to separate the grain from the chaff. So, make sure you are basing your decisions off of STATISTICAL significance, not NUMERICAL difference.

Now that you understand why statistically significant results are important, lets discuss trial replication. As stated before, the environment in a field can differ as you look across it. Wet spots, pockets of different soil types, hills, shade, and much more can change the way a crop responds to a treatment. In order to make sure that these environments do not impact the results, you want multiple places in a field, or “replications,” of the treatments. Having replications makes sure that you see the same treatment impact on

This newsletter is designed to give you up to date information on crops from NC State University and other sources. For more information:

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Why Should You Care About Statistical Significance?

Continued...

the crop across the entire field. For example, if you have a fungicide that you are wanting to test out and you apply the fungicide on half of the field and leave the other half untreated to see what the yield impact is. When you go to harvest, you find that the fungicide treatment yielded 5 bushels higher per acre than the untreated half. However, that treated half of the field yielded higher because it was a wet year and it was at the top of a slope, and the lower side of the field had some drowned or water stressed spots. How do you know that yield difference is due to the fungicide, not the water stress?

There are ways to set up trials that span across a field to test the impact of treatments, like fungicides, that allow *replication*, which then allows for a scientist to identify *statistical significance* between treatments. Make sure to check for these two important agriculture research features before making a decision off of that data!

Do I Have Enough?

Dr. Ron Heiniger – NC State Corn Specialist

As we reach the end of the growing season there is always one question that comes to my mind when it comes to growing corn. Do I have enough (N) nitrogen to finish the crop? This question is particularly pertinent in a season like this where in many places in North Carolina timely rainfall has occurred and the crop is finishing in excellent condition. Did I leave some yield in the field because I didn't apply enough N? There is ample evidence that tissue concentrations of N in the ear leaf at dent stage are directly related to yield potential. Such that 2% N equals 200 bushel per acre corn yield, 3% equals 300 bushels per acre, 4% equals 400 bushels per acre, and so on. Therefore, having enough N in the corn is important at this stage of the season. So, how do I make sure that I have enough N to finish this crop?

The first step in having enough N is making sure that the corn plant is finding all the N that is in the soil or that you have applied as fertilizer. This means having a strong, massive root system that is exploring the entire field both vertically and horizontally. Such a root system has its foundations on quick, uniform emergence, good management of seeding rate and row configuration and excellent vertical distribution through reduced soil compaction. Root health must be maintained throughout the growing season by maintaining good drainage and meeting the nutritional needs of the plant. Nitrogen fertilizer should be applied near the root system of the plant and protected against losses from volatilization, denitrification, and leaching. The second step to having enough N is a good assessment of crop yield potential. When the crop gets off to a good start and then has excellent environmental conditions growers should consider adjusting N rates to match the condition of the crop. The final step is finding ways to mine more N from the soil (or the environment) during the grain fill period. Farmers on organic soils know that these soils have the potential to release N late in the season, farmers on sandy soils utilize manure or litter to release N during grain fill and some of the new technologies such as N-fixing biologicals have the potential to fix more N right up to physiological maturity. These are the steps to answering the question – Do I have enough – and finding that you are covered!



Along with knowing that you have enough N the other important question is - Am I capturing all the light I can? A positive answer to this question depends on three things: a full, healthy canopy of leaves, good soil moisture to maintain leaf function, and the right atmospheric conditions that maximize light intensity. A full healthy canopy of leaves means having the right plant density (plant population) and utilizing hybrids with optimum leaf angles. Good soil moisture, moderate temperatures, and optimizing the metabolic systems of the leaf are essential to good leaf function. Finally, the right atmospheric conditions – crystal clear skies – are important. While we can do something about canopy cover and leaf function there is very little we can do about atmospheric conditions. Recent hazy skies due to smoke contamination from wildfires or to higher humidity are concerning but not something that we have any control of.

As this season wraps up we should consider these two “do I have enough” questions and make sure these areas of plant needs are always covered. We have an opportunity this season to have one of the most successful corn crops ever. Lets make sure to take advantage of that opportunity.

2023 Small Grains OVT Data Release

This year, the Official Variety Trial (OVT) program at NC State added a location for the Small Grain variety trials in our area. This data was released recently, and can be found at multiple places.

- The OVT Website - officialvarietytesting.ces.ncsu.edu/small-grains-2023/
 - Tables of the Location Summary, Statewide One-Year, and Statewide Multiple-Year data can be found on this website. I have included some of these charts at the end of this newsletter.
 - *keep in mind that the green boxes indicate that those varieties did not perform statistically different from the highest yielding variety in that location*
- The Variety Selection Tool - ncovt.medius.re
 - The Variety Selection Tool is a dynamic software that allows growers to more deeply explore OVT data. The quickest and simplest way to get to this information is to go to the website (<https://ncovt.medius.re>), make sure you are in the "wheat" section, click "OVT Data," then click the box that pops up saying "YIELD". This will give you a summary of this year's OVT data. I encourage growers to play around with this tool, as it has a lot of power to help you find the best variety for your operation.

UPCOMING EVENTS

Alternative Crops Field Day

Thursday, August 17th, 2023 @ 9:00 AM

- In-person at the Oxford Research Station (901 Hillsboro Street, Oxford, NC 27565)
- Speakers: Dr. David Suchoff and Hannah Moshay
- 1 hour N, O, D, and X NCDA&CS pesticide credit *PENDING*
- Breakfast will be provided
- Register at go.ncsu.edu/alternativecropsfieldday



Corn TURN ROW Field Day

Monday, August 21st, 2023 @ 9 AM

- SHORT 1 hour field day
- Close to 396 Walnut Grove Church Road, Hurdle Mills, NC 27541
- Speakers: Dr. Chad Poole and Mikayla Berryhill
- Register at go.ncsu.edu/2023cornfieldday

Pond Management Workshop

Monday, August 28th, 2023 @ 5:30 PM

- In-person at the Oxford Tobacco Research Station – Currin Farm (2511 US-158, Oxford, NC 27565)
- Speakers: Byron Currin, Dr. Rob Richardson, Danci Giot, and Thomas Cobb
- Register at go.ncsu.edu/pondmanagementworkshop



ABOUT N.C. COOPERATIVE EXTENSION

North Carolina Cooperative Extension is a strategic partnership of NC State Extension, The Cooperative Extension Program at N.C. A&T State University, USDA-NIFA, and 101 local governments statewide. Extension professionals in all 100 counties and the Eastern Band of Cherokee translate research-based education from our state's land-grant universities, NC State and N.C. A&T, into everyday solutions. Extension specializes in agriculture, youth, communities, food, health and the environment by responding to local needs.

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Cultural practices and soil information for small grain OVT test sites, 2023.

		Granville	Lenoir	Perquimans	Robeson	Rowan	Union
Nitrogen Applications	Pre-Plant (lb/A):	30	30	30	30	0	30
	Early Split (lb/A):	60	45	0	0	61	0
	Top Dress (lb/A):	60	75	120	120	99	120
	Total N (lb/A):	150	150	150	150	160	150
Soil Information	Soil Type:	Vance sandy loam	Goldsboro loamy sand	Chapanoke silt loam	Goldsboro loamy sand	Lloyd clay loam	Tarrus gravelly silty clay loam
	HM %:	0.27	0.56	0.36	0.46	0.41	0.71
	W-V:	1.21	1.23	0.96	1.28	0.93	0.85
	CEC:	2.7	3.4	4.3	4.8	8.3	11.5
	BS %:	66	72	75	83	81	89
	Ac:	0.9	1.0	1.1	0.8	1.6	1.3
	pH:	5.2	5.5	5.6	6.0	6.0	6.1
	P-I:	87	84	61	247	117	444
	K-I:	31	57	35	56	78	97
	Ca %:	42	47	55	59	52	69
	Mg %:	18	16	16	19	24	16
	Mn-I:	234	147	311	74	1681	257
	Zn-I:	192	83	60	272	277	665
	Cu-I:	49	88	30	170	206	1435
	Total Rainfall (in.):	27.04	21.62	23.25	18.6	27.08	22.8
	Planting Date:	10/28/2022	11/10/2022	11/4/2022	11/18/2022	10/27/2022	11/2/2022
	Harvest Date:	6/15/2023	6/5/2023	6/16/2023	6/2/2023	6/6/2023	6/14/2023

Commercial Summary		Statewide			Granville	
Company/Brand	Variety	Yield (bu/A)	Test Weight (lb/bu)	Top Yield Group %	Yield (bu/A)	Test Weight (lb/bu)
AgriPro	GP 381	106.7	58.1	50.0	112.7	58.0
Southern Harvest	SH 7222	104.7	59.9	50.0	106.3	60.6
Dyna-Gro	Shirley	103.9	58.2	50.0	111.0	57.9
Harvey's	AP 2000	102.8	57.6	16.7	111.4	58.7
Southern Harvest	SH 9520	102.4	58.4	50.0	111.9	59.3
AgriMAXX	AgriMAXX 535	102.4	59.3	16.7	103.4	59.9
UniSouth Genetics	USG 3661	101.6	58.8	33.3	108.1	58.8
Harvey's	AP 1995	101.1	60.1	16.7	104.7	60.0
Scout Seed Co	SC 4922	100.8	58.1	33.3	107.3	57.6
Dyna-Gro	9120	100.2	60.0	33.3	106.8	60.6
Harvey's	AP 1991	99.1	57.7	16.7	107.7	58.0
Viking	Viking 822	98.7	58.1	16.7	105.1	58.3
NC Foundation Seed	Hilliard	98.2	58.8	16.7	107.7	59.2
NCSU	NC18-16900	98.1	58.8	0.0	100.5	59.4
Harvey's	AP 1987	97.8	57.4	16.7	107.5	57.1
Featherstone	Featherstone 3000	97.4	58.6	16.7	96.5	59.5
Revere Seed	Revere 2277	97.3	58.4	50.0	111.5	59.8
UniSouth Genetics	USG 3451	96.8	59.0	16.7	109.4	60.9
Pioneer	26R59	96.7	57.5	16.7	92.3	57.5
AgriMAXX	AgriMAXX 513	96.7	58.5	16.7	105.2	59.0
AgriMAXX	AgriMAXX 502	96.5	57.8	16.7	110.2	59.1
Scout Seed Co	SC 6822	96.4	59.8	16.7	107.5	60.0
Dyna-Gro	9481	96.3	57.8	0.0	100.9	58.1
Dyna-Gro	9811	96.2	58.4	0.0	103.8	58.5
AgriMAXX	AgriMAXX 503	96.0	58.1	16.7	101.7	59.0
Dyna-Gro	9701	95.7	57.5	0.0	102.0	57.5
Pioneer	26R45	95.4	57.5	0.0	104.7	58.0
UniSouth Genetics	USG 3234	94.9	59.7	0.0	102.9	60.9
CROPLAN	CP8045	94.8	56.9	16.7	108.1	57.6
Revere Seed	Revere 2347	94.8	57.4	33.3	105.8	58.6
Southern Harvest	SH 5123	94.8	58.2	0.0	86.7	57.5
UniSouth Genetics	USG 3118	94.8	59.5	33.3	107.1	59.9
NCSU	NC18-16901	94.5	59.4	0.0	101.0	60.2
Growmark	FS 745	94.5	57.1	16.7	110.4	57.1
CROPLAN	CP8224	94.4	58.8	16.7	91.4	59.6
AgriMAXX	AgriMAXX 516	94.0	57.0	16.7	105.2	57.1
UniSouth Genetics	USG 3673	93.8	58.0	0.0	93.6	58.8
Scout Seed Co	SC 8322	93.7	56.9	16.7	107.9	56.8
Progeny	#BUSTER	93.5	59.1	0.0	100.0	59.0
Dyna-Gro	9231	92.8	57.7	16.7	108.5	58.8
UniSouth Genetics	USG 3463	92.7	57.5	0.0	98.1	57.2
Dyna-Gro	9070	92.7	57.5	16.7	108.4	58.6
Revere Seed	Revere 2169	92.3	57.0	0.0	101.5	57.2
Growmark	FS 743	92.2	57.3	0.0	103.3	59.1
Southern Harvest	SH 4222	92.1	57.6	0.0	104.1	59.4
Growmark	FS 891	92.0	58.0	0.0	98.6	58.5
UniSouth Genetics	USG 3472	91.8	56.8	0.0	100.4	56.3
AGSouth Genetics	AGS 4043	91.8	59.2	0.0	100.9	60.6
UniSouth Genetics	USG 3783	91.7	57.4	0.0	91.3	57.7
CROPLAN	CP9606	91.6	57.2	0.0	87.8	55.6
Dyna-Gro	9172	91.5	57.2	0.0	100.0	57.0
Dyna-Gro	9393	91.5	57.1	0.0	98.9	57.8
AgriPro	GP 348	91.3	59.7	0.0	85.7	60.9
AGSouth Genetics	AGS 3026	91.0	57.5	0.0	96.8	58.7
Pioneer	26R33	89.8	57.9	0.0	100.2	58.9
UniSouth Genetics	USG 3352	89.4	57.8	0.0	100.7	59.1
AgriMAXX	AgriMAXX 505	89.2	58.6	0.0	98.4	60.2
Pioneer	26R41	89.2	57.6	0.0	94.0	58.0
AGSouth Genetics	AGS 4023	89.1	60.0	0.0	93.3	61.2
Harvey's	AP 2003	88.7	55.0	0.0	98.2	54.0
Dyna-Gro	Laverne	88.6	58.4	0.0	104.5	59.1
AGSouth Genetics	AGS 2024	88.3	58.4	16.7	106.3	59.4
Dyna-Gro	9422	88.2	56.5	16.7	108.6	57.9
AgriMAXX	AgriMAXX 525	87.8	57.1	16.7	105.8	58.6
AgriMAXX	AgriMAXX 492	87.7	59.3	0.0	99.4	60.4
Progeny	#BINGO	87.2	56.8	0.0	96.1	55.5
AgriMAXX	AgriMAXX 514	87.2	57.3	0.0	97.8	57.0
NCSU	NC1525-20	87.0	59.3	16.7	81.1	59.8
NCSU	NC11546-14	84.1	59.8	0.0	82.7	61.4
Pioneer	26R10	83.9	56.4	0.0	94.1	56.7
Progeny	#CHAD	83.8	57.4	0.0	87.6	57.9
Growmark	FS 597	78.2	58.1	0.0	98.8	58.7
Southern Harvest	SH 7200	78.1	58.7	0.0	89.0	59.5
AGSouth Genetics	AGS 3015	75.7	59.8	0.0	99.0	59.7
AGSouth Genetics	AGS 3040	75.6	57.0	0.0	90.1	59.1
AGSouth Genetics	AGS 3022	74.1	59.2	0.0	86.5	60.7
Mean		92.9	58.1		101.0	58.7
LSD (p=0.10)					7.7	1.0
DF					306	

Bolded varieties are not significantly different than highest yielding variety.

Above Average Statewide - Commercial Wheat (2021-2023)									
Company/Brand	Variety	Yield (bu/a)	Test Weight (lb/bu)	Top Yield Group %	Years in Test	% of Trial Mean			
						STATEWIDE	Coastal Plain	Piedmont	Tidewater
AgriPro	GP 381	98.8	57.6	45%	2	15.9%	10.7%	18.0%	17.6%
Southern Harvest	SH 7222	94.5	59.1	36%	2	10.3%	11.4%	9.1%	11.3%
Harvey's	AP 2000	93.8	57.3	18%	2	10.3%	12.9%	6.1%	14.9%
Harvey's	AP 1991	93.8	57.3	27%	2	10.3%	7.9%	9.4%	14.1%
Harvey's	AP 1995	91.5	59.7	9%	2	7.3%	12.9%	3.7%	7.6%
USG	USG 3661	89.5	57.4	18%	2	4.8%	4.1%	2.1%	9.9%
Growmark Inc	FS 745	89.2	57.0	27%	2	5.5%	7.0%	4.9%	4.8%
NCSU	NC18-16901	88.7	58.5	9%	2	6.0%	20.2%	-4.5%	9.2%
Dyna-Gro	Shirley	87.9	57.3	31%	3	8.5%	6.0%	8.1%	12.3%
Revere Seed	Revere 2277	87.6	57.9	45%	2	0.7%	-25.5%	17.4%	-0.8%
AgriMAXX	AgriMAXX 502	87.4	57.2	31%	3	8.4%	7.9%	10.5%	5.2%
Harvey's	AP 1987	86.8	57.3	25%	3	7.4%	7.2%	6.6%	9.2%
USG	USG 3783	86.4	57.4	0%	2	2.1%	6.0%	1.2%	-0.2%
Croplan	CP8045	85.6	57.3	25%	3	5.9%	4.1%	5.5%	8.8%
Pioneer	26R59	85.4	57.2	19%	3	5.3%	5.0%	7.7%	1.5%
Growmark Inc	FS 743	85.2	57.0	9%	2	-0.3%	-5.6%	4.7%	-3.4%
AgriMAXX	AgriMAXX 503	85.0	57.5	19%	3	5.0%	1.5%	10.0%	0.5%
Revere Seed	Revere 2169	84.8	57.3	19%	3	5.2%	5.5%	5.2%	5.1%
Southern Harvest	SH 4222	84.8	57.1	9%	2	-1.1%	-8.3%	5.5%	-4.9%
Pioneer	26R45	84.6	57.1	19%	3	4.8%	6.3%	4.1%	4.3%
AgriMAXX	AgriMAXX 516	84.5	56.9	25%	3	4.8%	8.4%	2.0%	5.2%
NC Foundation Seed	Hilliard	84.4	57.7	19%	3	3.7%	3.1%	3.0%	5.6%
USG	USG 3118	84.2	58.6	44%	3	4.9%	20.1%	-3.3%	0.3%
AGSouth Genetics	AGS 4043	84.1	58.4	0%	2	-0.4%	14.0%	-9.0%	-0.6%
USG	USG 3451	84.1	58.0	19%	3	3.9%	12.8%	1.5%	-3.1%
Progeny Ag Products	#BUSTER	84.0	58.7	0%	2	-2.1%	-6.4%	-3.0%	3.7%
Southern Harvest	SH 9520	84.0	57.7	31%	3	1.6%	-12.9%	12.3%	1.1%

Above average yielding varieties that were tested for 2 or more years. The yields for these varieties are greater than or equal to 1 standard deviation from the average. Varieties are sorted by yield from high to low. Top Yield Group % is the percentage of time the variety was in the top yield group across all locations tested in this category. Any values above 3% are highlighted in green. For more details on these varieties, visit ncovt.medius.re