NC Cooperative Extension - Hertford County Center

Wheat Planting Considerations

October 21, 2024

NC State University Wheat Planting Recommendations

Information from Dr. Angela Post, Small Grains Extension Specialist

1. Use at least 30 lb N per acre at planting or within 30 days of wheat emergence.

2. Use a fungicide seed treatment.

3. Plant your wheat before Thanksgiving. Earlier planted wheat has more chance to be successful than late planted wheat. Begin your wheat planting based on the first date in the planting date map (Figure 1) for your region and continue for up to 21 days after. Follow the seeding rate chart (Table 1) to determine how many pounds of seed per acre to plant based on seed size and target population.

4. For high-yielding wheat 90-110+bpa, plan for 150 total lb N total per acre. Count the nitrogen used up front in your total. So if you put 30 up front, topdress total should be 120 lb N. If you are in a sandier region or a region with top yields between 55 and 70bpa, lower your total nitrogen to 90-120 lb N per acre.

5. Spread your risk and plant at least three varieties across your farm and more than one maturity. Choose varieties that are suited to your region and have solid consistency across the statewide OVT data. See variety yield information in charts below.

6. Plan to protect wheat varieties susceptible to diseases with at least one fungicide application.

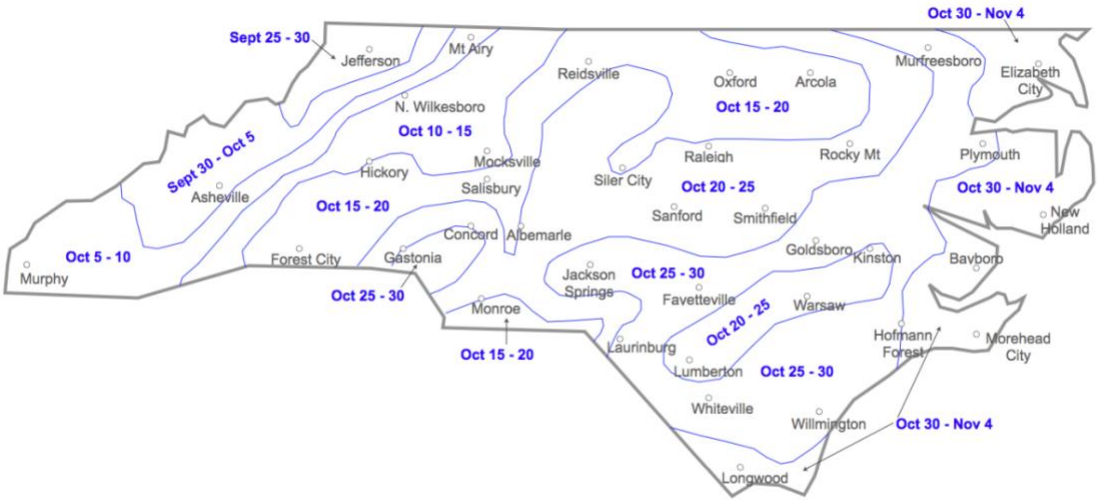


Figure 4.1. The start of wheat planting dates. The dates shown on this map are 7 days earlier than the date when there is a 50% chance of having a freeze.

Information below from NC Small Grain Growers Association: The Wheat Beat
October 18, 2024

123 Next Steps for North Carolina Wheat Production

By Dr. Angela R. Post, Small grains Extension Specialist, North Carolina State University

As we approach prime planting time for most of the state here are some additional tips to get your season off to a great start.

1. Prepare your soil for maximum availability of nutrients

2. Calibrate your drill for accurate population

3. Plant your varieties in the proper sequence to minimize risk of spring freeze

Lime- A proper pH is important to the growth and development of each crop. Low pH caused several issues last season, minimizing availability of several key micronutrients needed by wheat plants. When pH is too low, wheat has a hard time accessing molybdenum, magnesium, calcium, and phosphorous and other important nutrients. Target pH levels are 6.0 for mineral soils, 5.5 for mineral organic soils, and 5.0 for organic soils for optimum wheat production. Adjust pH though liming if your pH falls below this range. High pH can also be a problem but is much less common in North Carolina than low pH.

Drill Calibration- An important component to achieving a proper population is accurate drill calibration. Seed sizes in wheat have evolved over time and there are commercial varieties on the market ranging from 10,000 seeds per pound to as much as 16,000 seeds per pound. If the same calibration of weight were used to plant each of these varieties (150 pounds per acre) the final population would be 1.5 million seeds per acre for the 10,000 seed per pound variety and a whopping 2.4 million seeds per acre for the 16,000 seeds per pound variety. Setting your drill properly and recalibrating between varieties with a varying seed count per pound will optimize plant population and minimize seed cost. You can find seed count per pound on the **variety selection tool** and you may also find it listed on your certified seed bags. Added seed treatment can also impact drill calibration. So make sure to calibrate your drill for each variety and seed treatment combination.

Wheat Maturity- Remember as you start the season to plant your latest maturing lines first and then the middle maturities and finish up with your earliest maturing lines. You can find **GDUs to heading** on the variety selection tool. Commercial varieties currently range from 2150 to 2800 GDUs to heading. Or reference, varieties from 2150 to 2450 would be considered early, 2460 to 2600 would be considered medium and 2610 to 2800 would be considered late maturing.

Weather patterns look good for the next 10-12 days. Start during the optimum planting dates for your area and divide your acreage into thirds, planting each third spaced apart by 3 to 4 days and using a different variety and maturity for each planting date. As an example, I may be planting 600 acres. I have selected 3 varieties. I will plant my latest line first on 200 acres. I will be patient and wait to plant my next 200 acres into the medium maturity and then finish out the end of the season with my earliest line on the final 200 acres.

Seed Treatments

- Insecticide/Fungicide seed treatments are an added cost but increased germination and protection from early season stress can help offset cost.
- Fungicide seed treatments can help when we have cool/wet early conditions.
- Insecticide seed treatments can help with early planted wheat against hessian fly and can protect against fall aphids that can lead to barley yellow dwarf showing up in mid to late spring.

Fall Fertility

- Best time to correct pH, P, and K indexes will be pre-plant.
- Pre-plant N in the 20-40 lb/acre range will be key along with supplying P and K to develop and feed early tillers.
- If following a high yielding corn crop, applying towards the 40 lb N/ac will be necessary due to excess residue that can tie up N.
- Also staying towards a 10:1 or 8:1 Nitrogen to Sulfur ratio season long will be important.

Weed Control

- Starting clean in the Fall is always important. If Italian ryegrass or annual bluegrass has been a problem in the past, there a couple different options.

- If utilizing no-till, Valor can be applied to provide residual broadleaf and grass control but must be applied at least 7 days ahead of planting.
- Anthem Flex is another herbicide that can be applied behind the planter if drilling your wheat that is great at suppressing grass and broadleaf weeds. 0.5 inch of rainfall is needed to activate the herbicide and it is not recommended to apply if 0.25 inches or more of rainfall is expected within 48 hours of planting. Wheat must be planted at least 1 inch deep but not over 1.5 inches.
- Lastly if you were unable to utilize a preemergent, again Anthem Flex or Zidua can be applied to suppress grass and broadleaf weeds that have not emerged when 80% or germinated wheat seeds have a shoot at least ½ inch long until wheat spiking.

Tillage

- Planting behind cotton or full season soybeans, tillage is likely not needed.
- Planting into < 100 bushel/acre corn crop, tillage is likely not needed and no seeding rate increase is needed if planting on time.
- Planting into > 150 bushel/acre corn crop, mowing stalks would likely be needed due to additional residue.
- Planting into > 200 bushel/acre corn crop, mowing stalks and tillage likely necessary due to additional residue. Also increasing seeding rate by around 10% and planting earlier could help with achieving an adequate seeding rate. Another thing to keep in mind with planting behind corn would be selecting a variety that has resistance to head scab.

Seeding Rate & Drill Calibration

- Below are charts from the 2021 North Carolina Small Grains Production Guide to help with seeding rate decisions and drill calibration. It is important to look at your varieties seed per pound carefully. Varieties vary in seed size from year to year and it is easy to make a mistake and under-seed a field if not done properly. If planting on time, 1.3-1.8 million seed is the recommended seeding rate.

Pounds per acre = Target Population / Seeds per pound

Bushels per acre can be calculated from here using this formula:

Bushels per acre = Pounds per acre / 60

Target Population (M)		1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
Seeds/ft²		23	25	28	30	32	34	37	39	41	44	46
Seeds/lb	10,000	115	127	138	150	161	173	184	196	207	219	230
	11,000	105	115	125	136	146	157	167	178	188	199	209
	12,000	96	105	115	125	134	144	153	163	173	182	192
	13,000	88	97	106	115	124	133	142	150	159	168	177
	14,000	82	90	99	107	115	123	131	140	148	156	164
	15,000	77	84	92	100	107	115	123	130	138	146	153

Table 4.2. Pounds per acre values calculated using target population (Seeds/acre or Seeds/ft²) and the seed size (Seeds/lb). The recommended seeding rate range for wheat is highlighted in green. The seeding rates shown above assume 85% germination.

Certified seed in North Carolina requires a minimum 85% germination. Table 4.2 assumes 85% germination rate in calculating a final pounds per acre seeding rate. If your seed has a germination rate lower than 85%,

Seed germination	Increase seeding rates in Table 4.2
80%	5%
75%	10%
70%	15%
65%	20%

Table 4.3. Increase in seeding rates required for lower germination seed.

Target Population (M)		1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
Seeds/ft²		23.0	25.0	27.5	30.0	32.0	34.0	37.0	39.0	41.0	44.0	46.0
Row Spacing	6.0	11	12	14	15	16	17	18	19	20	22	23
	6.5	12	13	15	16	17	18	20	21	22	23	25
	7.0	14	15	17	18	19	20	22	23	25	26	28
	7.5	15	16	17	19	20	22	23	25	26	28	29

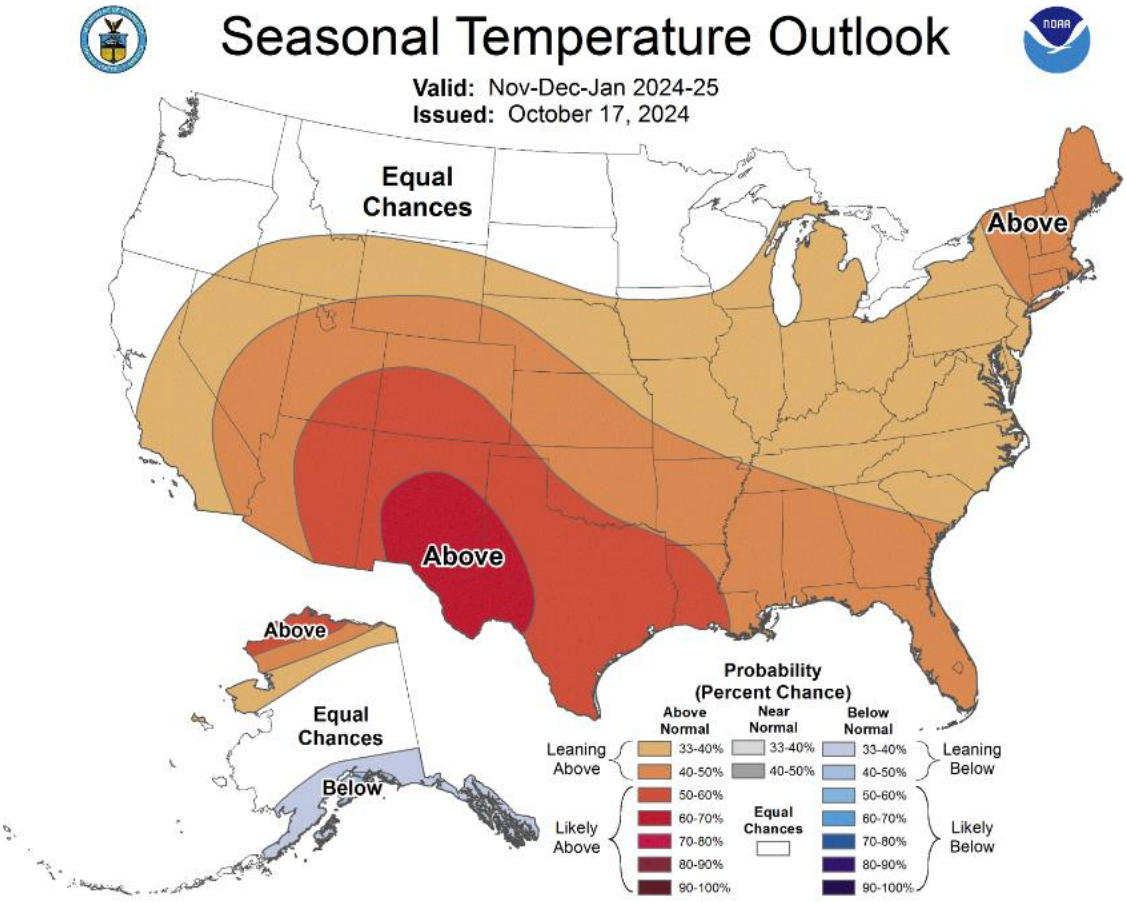
Table 4.4. Number of seeds per row foot calculated using target planting population (Seeds/acre or Seeds/ft²) and row spacing. The recommended seeding rate range for wheat is highlighted in green.

Weather Report

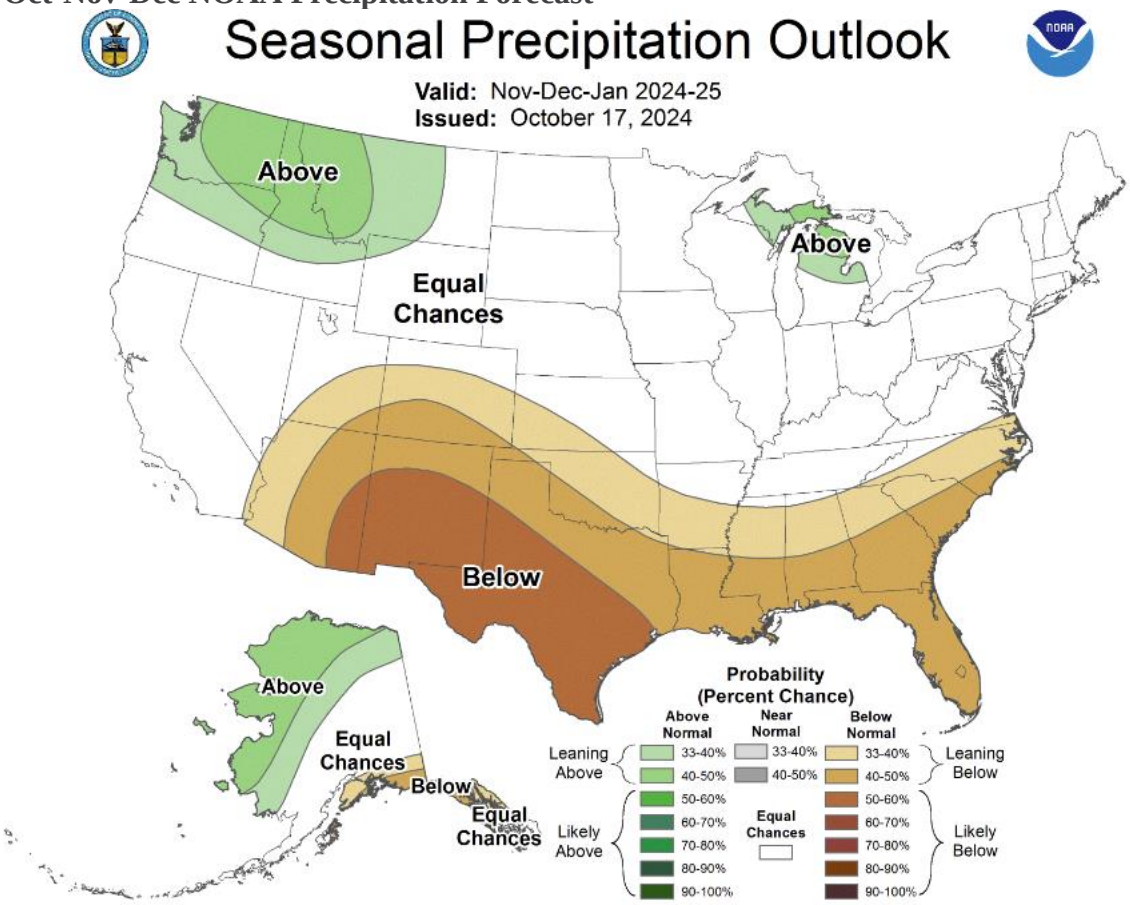
According to NOAA forecast predictions for this fall, the temperature outlook is leaning towards above average for October-December. This should help with getting fall tillers established. For precipitation, we are in the equal chances of average for rainfall.

It is key to be certain of the maturity of the varieties that you are planting. Start with your late maturities and finish with the early lines to ensure that your crop will be safe if we receive a late spring freeze.

Oct-Nov-Dec 2022 NOAA Forecast



Oct-Nov-Dec NOAA Precipitation Forecast



For additional questions, contact Dylan Lilley, Field Crops Extension Agent at 252-358-7822 or by email at dylan_lilley@ncsu.edu.

Read more NC Cooperative Extension Wheat Information >>

Read more NC Cooperative Extension News >>

Information below conducted in Johnston County by NC Cooperative Extension Agent, Tim Britton in collaboration with Dr. Angela Post

Wheat Planting Date and Fertility Study

Methodology

- Three varieties of wheat were planted using a Model 606N Great Plains grain drill on three different planting dates.
  - October 28th, 2021,
  - November 15th, 2021
  - December 2nd, 2021.
- Seeding rates were at
  - 131 lbs./A on 10/28,
  - 144 lbs./A on 11/15
  - 158 lbs./A on 12/2
- After planting, plots were divided for normal management practices verses intense management practices.
- Treatments were replicated four times per planting date for each variety in a Randomized complete black design.

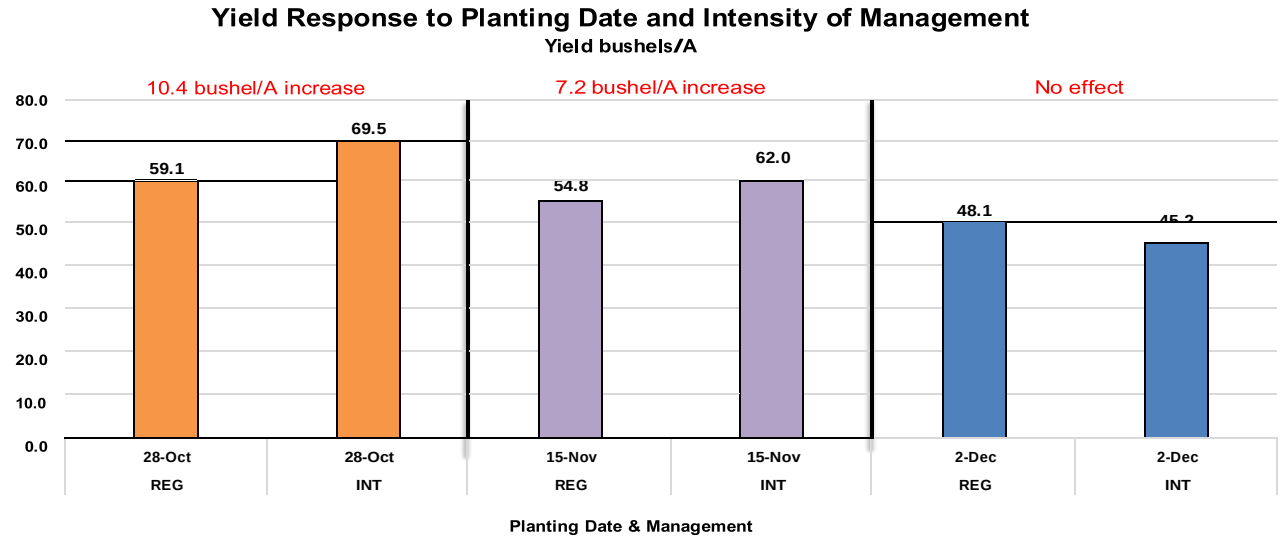
Products used

- Agrimaxx 503, Early maturing variety
- Agrimaxx 505, Medium maturing variety
- Agrimaxx 516, Late maturing variety
- Gramoxone at 3 pints/A
- Anthem Flex at 4 ounces/A
- Fitness at 4 ounces/A
- Quelex at .75 ounces/A
- Warrior II at 1.9 ounces/A
- Sphaerex at 7.3 ounces/A

Treatments and Timings

Normal management Practices	Intense Management Practices
Gramoxone preplant at each planting	Gramoxone preplant at each planting
250 lbs. 21-0-2-24 1/28/2022	300 lbs. 10-0-30 preplant at each planting
200 lbs. 0-0-60 1/28/2022	Anthem Flex applied at Spike Stage for each planting Date11/15, 12/2, and 12/29
100 lbs. 34-0-0-11 3/7/2022	200 lbs. 21-0-2-24 1/28/2022
100 lbs. 21-0-0-24 3/7/2022	50 lbs. 0-0-60 1/28/2022
Quelex 3/7/2022	100 lbs. 34-0-0-11 3/7/2022
Fiitness 4/4/2022	100 lbs. 21-0-0-24 3/7/2022
Warrior II 4/15/2022	100 lbs. Kmag 3/7/2022
Sphaerex 4/15/2022	Quelex 3/7/2022
	Fiitness 4/4/2022
	Warrior II 4/15/2022
	Sphaerex 4/15/2022

NC STATE EXTENSION



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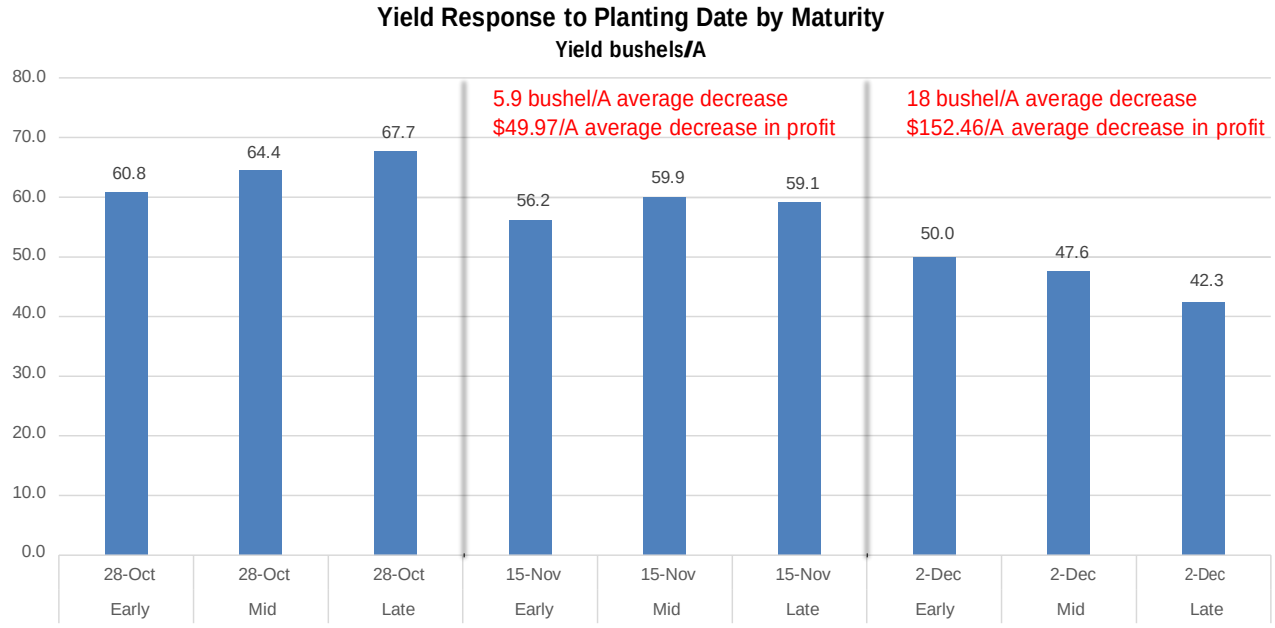

NC STATE EXTENSION

Intense Fertility Management Wheat Trial-Conclusion

- Planting date significantly improves average wheat yield by 5.9 to 18 bushels respectively.
- Intensive management significantly improves yield for wheat planted early or on time through to the middle of the planting window between 7.2 and 10.4 bushels/A, respectively.
- Wheat planted late does not recover the full yield potential of early or on-time planting through intensive management practices.
- When pooled across both management types, the latest lines performed best on October 28th.
- At the November 15th planting date, the medium maturity line performed best.
- At the December 2nd planting date, the earliest line performed best.

NC STATE EXTENSION

Intense Fertility Management Wheat Trial-Conclusion

- Intensive management can improve profitability for growers if wheat is planted on time.
- The earlier the planting in the planting window, the more significant the improvement in profitability.
- As the planting date gets later, a higher price is required to make a per-acre profit because yield potential decreases with later planting dates.
- Even with standard practice, wheat can be profitable with prices above $6 per bushel in many circumstances.
- Once the price drops below $6/bushel, with current input prices in 2022, even the use of minimum standard practices may not be profitable.
- Remember, there is a freeze risk associated with planting early lines first.

Statewide - Commercial Wheat (2024) - Above Average (Yield)

						% of Trial Mean			
Company/Brand	Variety	Yield (bu/a)	Test Weight (lb/bu)	GDUs to 50% Heading	Top Yield Group %	STATEWIDE	Coastal Plain	Piedmont	Tidewater
AgriPro	**GP 348**	99.2	60.3	2297	71%	**8.6%**	**15.4%**	2.2%	**11.5%**
VCIA	**VT Pitman**	98.5	59.1	2273	57%	**8.0%**	**11.5%**	2.8%	**12.3%**
UniSouth Genetics	**USG 3451**	98.0	59.6	2352	43%	**7.3%**	**10.8%**	**6.4%**	**5.1%**
AgriPro	**GP 543**	97.7	56.7	2308	43%	**6.9%**	**4.2%**	**9.0%**	**6.6%**
AgriMAXX	**AgriMAXX 543**	96.7	58.5	2458	43%	**5.7%**	**4.8%**	**5.1%**	**7.5%**
Seedway	**SW535**	96.4	58.5	2458	43%	**5.5%**	**4.0%**	**4.8%**	**8.0%**
Dyna-Gro	**Shirley**	96.1	56.7	2542	43%	**5.4%**	**9.6%**	1.3%	**7.5%**
Croplan	**CP8045**	96.1	58.1	2649	43%	**5.1%**	**3.8%**	**7.2%**	**3.3%**
INSPIRE	**FS 747**	95.8	58.3	2438	29%	**4.5%**	2.1%	**3.0%**	**9.3%**
Progeny Ag Products	**#BUSTER**	95.4	58.8	2498	14%	**4.6%**	**5.2%**	**6.4%**	1.5%
UniSouth Genetics	**USG 3354**	94.9	56.5	2328	14%	**3.6%**	0.4%	**4.7%**	**5.3%**
AgriPro	**GP 381**	94.6	57.8	2432	14%	**3.5%**	1.2%	2.4%	**7.5%**
Revere Seed	**Revere 2169**	94.4	58.1	2581	14%	**3.1%**	**3.1%**	**4.2%**	1.5%
Harvey's	**AP 1991**	94.3	57.8	2446	14%	2.6%	-2.3%	1.1%	**9.8%**
Growmark Inc	**FS 745**	94.3	58.2	2571	14%	**3.3%**	2.4%	**6.2%**	0.1%
Croplan	**CPX93934**	94.1	55.8	2517	14%	2.9%	-1.6%	**6.8%**	1.6%
Dyna-Gro	**9172**	94.1	58.0	2572	29%	**3.0%**	**3.8%**	**5.8%**	-1.9%
KWS Cereals	**KWS542**	94.0	58.9	2458	29%	2.9%	2.8%	2.8%	**3.1%**
Dyna-Gro	**9811**	93.9	57.5	2408	14%	2.6%	1.9%	0.3%	**6.6%**
Southern Harvest	**SH 5123**	93.8	56.9	2401	14%	**3.0%**	**8.6%**	1.2%	0.1%
UniSouth Genetics	**USG 3118**	93.7	58.8	2329	14%	2.1%	**4.5%**	-0.8%	**4.0%**
UniSouth Genetics	**USG 3673**	93.7	57.0	2454	14%	2.3%	**4.5%**	0.4%	**3.0%**
Dyna-Gro	**9120**	93.6	60.0	2505	0%	2.5%	1.4%	0.9%	**5.9%**
AgriMAXX	**AgriMAXX 516**	93.5	57.9	2612	0%	2.3%	2.5%	1.6%	**3.3%**
SUNGRAINS/NCST	**NC18-16900**	93.4	57.9	2505	14%	**3.1%**	**9.0%**	1.4%	-0.2%
Harvey's	**AP 2000**	93.3	57.0	2516	29%	2.5%	**12.0%**	-5.6%	**5.3%**
Harvey's	**AP 1987**	93.3	57.5	2619	0%	1.8%	-1.0%	2.9%	2.9%
Featherstone	**Featherstone 3000**	93.2	58.8	2552	14%	1.2%	-0.1%	-4.6%	**11.0%**
Seedway	**SW 65SR**	93.2	57.8	2510	14%	1.8%	2.2%	1.3%	2.1%
Revere Seed	**Revere 2347**	93.1	57.9	2580	14%	1.8%	-1.3%	1.9%	**4.6%**
Progeny Ag Products	**#CHAD**	92.1	57.6	2314	14%	1.6%	**10.8%**	-2.4%	-1.5%
UniSouth Genetics	**USG 3884**	92.1	55.3	2495	14%	1.1%	-0.3%	**4.4%**	-2.6%
KWS Cereals	**KWS 529**	91.9	55.7	2455	29%	0.7%	2.6%	2.5%	-3.9%
UniSouth Genetics	**USG 3661**	91.7	56.9	2583	0%	0.5%	**3.9%**	0.4%	-2.5%
AGSouth Genetics	**AGS 4043**	91.6	58.8	2335	14%	0.2%	**4.8%**	-6.8%	**6.0%**
Dyna-Gro	**9231**	91.4	57.5	2591	0%	-0.1%	-5.8%	**3.4%**	0.6%

Above average yielding varieties from 2024 testing. 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

Locations represented: STATEWIDE = 7**, Coastal Plain** = Lenoir and Robeson; **Piedmont** = Person, Rowan, and Union; and **Tidewater** = Beaufort and Perquimans

Coastal Plain - Commercial Wheat (2022-2024) - Above 3% Trial Mean

Company/Brand	Variety	Yield (bu/a)	Test Weight (lb/bu)	Top Yield Group %	Years in Test	% of Trial Mean
UniSouth Genetics	**USG 3118**	87.5	59.0	40%	3	16.0%
UniSouth Genetics	**USG 3451**	85.8	58.9	40%	3	13.7%
Harvey's	**AP 2000**	85.6	57.9	40%	3	12.5%
SUNGRAINS/NCSU	**NC18-16900**	92.2	58.5	25%	2	11.5%
AGSouth Genetics	**AGS 4043**	83.2	59.5	0%	3	10.3%
AGSouth Genetics	**AGS 4714**	81.0	60.5	20%	3	8.8%
Southern Harvest	**SH 5123**	90.3	57.2	25%	2	8.5%
AgriMAXX	**AgriMAXX 535**	89.9	59.6	0%	2	8.3%
Dyna-Gro	**Shirley**	81.7	57.4	20%	3	7.8%
AgriPro	**GP 348**	82.3	59.7	40%	3	7.0%
Harvey's	**AP 1995**	81.4	59.8	20%	3	7.0%
AgriPro	**GP 381**	81.1	57.3	0%	3	6.9%
AGSouth Genetics	**AGS 4023**	79.3	60.5	20%	3	5.6%
AgriMAXX	**AgriMAXX 516**	79.0	58.2	20%	3	5.3%
Growmark Inc	**FS 745**	78.5	58.6	20%	3	5.2%
Harvey's	**AP 1987**	78.4	58.2	20%	3	4.6%
UniSouth Genetics	**USG 3673**	87.4	56.8	25%	2	4.5%
Southern Harvest	**SH 7222**	79.7	59.5	20%	3	4.1%
AgriMAXX	**AgriMAXX 502**	77.7	57.8	20%	3	4.0%
Progeny Ag Products	**#CHAD**	78.6	57.5	20%	3	4.0%
UniSouth Genetics	**USG 3661**	79.7	57.5	0%	3	4.0%
Harvey's	**AP 1991**	78.7	57.0	0%	3	3.8%
Revere Seed	**Revere 2169**	77.7	58.1	20%	3	3.3%

Varieties above 3% Trial Mean for the Coastal Plain 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 **% of Trial Mean** 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. For more details on these varieties, visit ncovt.medius.re

Statewide - Commercial Wheat (2022-2024) - Above Average (% of Trial Mean)

						% of Trial Mean			
Company/Brand	Variety	Yield (bu/a)	Test Weight (lb/bu)	Top Yield Group %	Years in Test	STATEWIDE	Coastal Plain	Piedmont	Tidewater
AgriPro	GP 381	97.2	57.7	33%	3	**11.1%**	**6.9%**	**12.1%**	**13.5%**
Dyna-Gro	Shirley	94.4	57.1	33%	3	**8.0%**	**7.8%**	**5.5%**	**12.2%**
Harvey's	AP 1991	94.0	57.5	22%	3	**7.3%**	**3.8%**	**6.3%**	**12.4%**
Harvey's	AP 2000	93.6	57.2	22%	3	**7.3%**	**12.5%**	1.7%	**11.1%**
Harvey's	AP 1987	92.3	57.4	17%	3	**5.7%**	**4.6%**	**5.9%**	**6.5%**
Southern Harvest	SH 7222	92.8	58.8	28%	3	**5.6%**	**4.1%**	**4.9%**	**8.3%**
UniSouth Genetics	USG 3451	92.3	58.9	28%	3	**5.4%**	**13.7%**	2.6%	1.5%
SUNGRAINS/NCST	NC18-16900	95.6	58.3	8%	2	**4.9%**	**11.5%**	-0.9%	**7.7%**
Croplan	CP8045	91.8	57.5	28%	3	**4.8%**	1.9%	**7.0%**	**4.2%**
Growmark Inc	FS 745	91.2	57.5	22%	3	**4.6%**	**5.2%**	**5.4%**	2.9%
AgriMAXX	AgriMAXX 502	90.8	57.5	17%	3	**4.4%**	**4.0%**	**6.1%**	2.1%
Revere Seed	Revere 2169	90.9	57.5	11%	3	**4.1%**	**3.3%**	**6.0%**	1.9%
AgriMAXX	AgriMAXX 516	90.7	57.4	17%	3	**4.0%**	**5.3%**	2.8%	**4.6%**
Harvey's	AP 1995	90.9	59.4	6%	3	**3.9%**	**7.0%**	2.1%	**3.6%**
Featherstone	Featherstone 3000	95.2	58.7	15%	2	**3.6%**	1.6%	-3.2%	**19.7%**
AgriMAXX	AgriMAXX 535	94.7	59.0	8%	2	**3.2%**	**8.3%**	0.2%	2.2%
Southern Harvest	SH 5123	94.2	57.6	8%	2	**3.2%**	**8.5%**	-2.8%	**8.0%**
UniSouth Genetics	USG 3661	90.4	57.2	11%	3	**3.1%**	**4.0%**	1.4%	**4.9%**
Pioneer	26R59	90.2	56.7	11%	3	**3.1%**	1.2%	**3.2%**	**5.1%**
Pioneer	26R45	89.7	56.8	6%	3	2.8%	1.2%	1.6%	**6.3%**
UniSouth Genetics	USG 3118	89.6	58.7	28%	3	2.7%	**16.0%**	-3.5%	-0.7%
UniSouth Genetics	USG 3472	89.3	57.4	17%	3	2.3%	0.6%	**4.4%**	0.5%
UniSouth Genetics	USG 3673	93.7	57.5	8%	2	2.2%	**4.5%**	-2.2%	**8.1%**
AgriPro	GP 348	89.9	60.1	33%	3	2.2%	**7.0%**	-3.6%	**6.5%**
Revere Seed	Revere 2347	93.9	57.7	23%	2	1.7%	-2.9%	**3.9%**	**3.3%**

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 **% of Trial Mean** 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% Trial Mean are highlighted in green. For more details on these varieties, visit ncovt.medius.re