



The University of Georgia

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CRISP CO. AG NEWSLETTER – November 09

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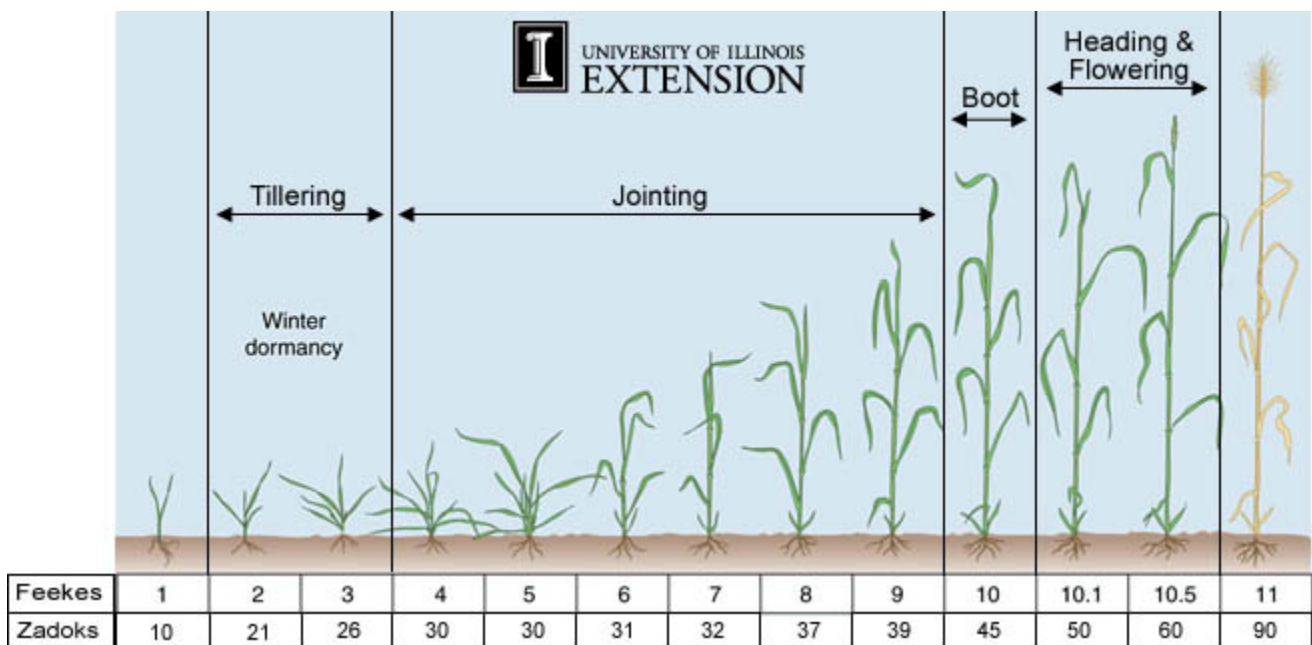
Winter Production Meetings:

Some of the crop production update meetings have been set. Also, anyone can attend the Georgia Watermelon Association Educational Session – this is going to be an excellent program. You'll get letters on all these meetings closer to the dates.

January 14, 2010	12:00 Noon	Crop Economics Update
January 20, 2010	12:00 Noon	Peanut Update
January 30, 2010	8:30 AM	GA Watermelon Association Educational Session
February 2, 2010	12:00 Noon	Corn & Soybean Update
February 10, 2010	12:00 Noon	Cotton Production Update
February 22, 2010	9:00 am	Weed Control for All Crops

• Growth Stages of Wheat

You will often come across references to Zadoks or Feekes growth stages of wheat. This diagram should be helpful.



- **Wheat Production Guide** – The entire guide is online at:

<http://www.caes.uga.edu/commodities/fieldcrops/gagrains/wheat.html>

- **WHEAT FERTILIZATION AND LIMING** - *Glen Harris*

Fertilization and liming are critical management practices for wheat production. A properly managed fertility program, including recommended fertilization and liming practices, can improve yield and quality more than any other single management practice. Such a program includes soil testing, knowledge of crop nutrient requirements and removal, timely application of nutrients, and record-keeping.

Soil pH and Liming

Maintaining proper soil pH is critical to ensure availability and uptake of fertilizer and soil nutrients essential for good wheat production. Economic wheat yields are optimized at soil pH between 6.0 and 6.5. Not only are the essential plant nutrients, including micronutrients, available in this range, but soil elements toxic to plants such as aluminum are kept unavailable.

Liming is the best management practice required to maintain soil pH in the proper range. Lime recommendations should be based on soil testing. It is not uncommon on sandy soils and with modern crop rotations, to need lime applications as often as every year. Dolomitic limestone, which is commonly used, will also provide both essential secondary nutrients, calcium and magnesium.

Nitrogen (N)

Nitrogen rates and timing of application are key management factors for making good wheat yields. Nitrogen is also the most expensive fertilizer nutrient and variable input cost for wheat. Therefore, nitrogen rates should be based on soil potential, cultivar, realistic yield goal, previous crop and residual N. For expected wheat yields of 40 to 70 bu/A, use a total N rate of 80 to 100 lb/A. Adjust this rate based on the preceding crop. If following peanuts or soybeans, decrease the N rate by 20 to 40 lb/A. If following grain sorghum or cotton, increase by 20 to 40 lb N/A. Timing of N fertilization should be based on the pattern of uptake by the crop. Demand for N is relatively low in the fall but increases rapidly in the spring just prior to stem elongation. Therefore, apply 20 to 40 lb N/A at planting, and the remaining N prior to stem elongation. Use the lower rate at planting on heavier-textured soils and the higher rate on sandy soils. Also, excessive N rates applied in the fall could result in a number of problems including surplus vegetative growth, winter kill, disease incidence and possibly nitrate contamination of the groundwater.

When the yield goal exceeds 70 bu/A, use a total N rate of 120 lb/A. Adjust this rate for the preceding crop as above. Also, on sandy soils, use two topdress N applications, one at early tillering and another at early jointing. This can improve yields when N leaching conditions occur. Although yields may not always be improved, this practice can also reduce the amount of N released into the environment and offers the chance to adjust N rates downward if climatic or economic conditions do not warrant the added expense of the last N application. Adjust N rates up or down as you experiment with you particular farm. Avoid excessive N rates in the spring, as it leads to lodging and a reduction in milling properties and flour quality.

Phosphorus and Potassium (P and K)

Phosphorus and potassium fertilizer applications should be based on soil testing. Because 65 percent of the total P uptake and 90 percent of the total K uptake occurs before the boot stage, these nutrients should normally be applied before planting. Split applications (half at planting and half at topdress) of K is recommended on deep

sandy soils (greater than 12 inches to subsoil clay). Use of starter fertilizer containing P, especially in reduced tillage systems, is being investigated but not recommended at this time.

Secondary Nutrients

Calcium and magnesium (Mg) are normally supplied when maintaining proper soil pH with dolomitic limestone. If soil pH is adequate but calcium or magnesium are not, applications of fertilizers containing calcium such as calcium sulfate or magnesium such as magnesium sulfate will be recommended.

Sulfur (S) is an essential nutrient that used to be contained in many other fertilizers and in atmospheric deposition or fallout from smokestacks. Today's fertilizers are largely free of sulfur and sulfur is often scrubbed or removed from smokestack emissions. Therefore, wheat growers now need to make a conscious effort to include at least 10 pounds of sulfur per acre in their fertilizer applications. This can be accomplished either with preplant fertilizer or by including sulfur with topdress N. Because sulfur is mobile in sandy soils, including S with topdress N is the preferable applications timing. In addition, the N:S ratio in plant tissue should be maintained between 10 and 15 to 1 (N:S) and can be easily checked by using plant analysis.

Micronutrients

Micronutrient levels in Georgia's soils are usually adequate for wheat production unless soils have been over-limed. The two micronutrients most likely to be deficient, and the ones routinely tested for with soil testing, are zinc (Zn) and manganese (Mn). Adequate baseline levels of soil test Zn and Mn should be maintained. If low levels of either of these essential micronutrients are detected, low doses in soil-applied fertilizers should be added to build up the soil test levels. Plant tissue analysis should be used in conjunction with these applications, and foliar Zn or Mn should be used if deficiencies are detected by plant analysis. Attempting to correct low soil test levels with soil-applied fertilizers in one application can be expensive and possibly ineffective and therefore are not recommended. Manganese deficiency occurs most frequently in poorly drained soils of the Flatwoods region. Availability of Mn declines significantly as pH increases above 6.2 to 6.5 in these soils. Deficiencies of other essential micronutrients such as molybdenum, copper, boron, iron, and chloride in wheat are rare.

Doublecropping

Other crops, such as soybeans, are often doublecropped following wheat. Fertilizer recommendations are available to try to supply P and K fertilizer for both crops before planting wheat. These recommendations are often based on crop removal of nutrients by both crops. Because fertilizer nutrients such as K and soil pH levels can drop rapidly on sandy Coastal Plain soils, taking a soil sample after wheat is harvested but before the next crop is planted is encouraged if possible.

• Poultry Litter in Wheat Production

Managed properly, poultry litter (manure mixed with bedding material) can be a valuable source of plant nutrients for wheat production. It is most like a complete fertilizer, containing significant amounts of primary, secondary, and micronutrients except for boron. It can be a relatively inexpensive source of P and K, but trying to meet all of the N requirement with poultry litter is not recommended.

On average, broiler litter contains approximately 3 percent N, 3 percent P₂O₅ and 2 percent K₂O (fertilizer value of 3-3-2). Based on this average, one ton of poultry litter contains 60 lb of N, 40 lb of P₂O₅ and 40 lb of K₂O. Based on current fertilizer prices for N, P and K, poultry litter is valued at approximately \$25/ton. The nutrient content of litter varies significantly however, depending on moisture content, type of bird, feed ration, and especially storage and handling methods. Therefore, it is highly recommended that litter be analyzed for nutrients by a reputable laboratory before determining application rates and value.

Application rates of poultry litter for fertilizer are usually based on the nitrogen requirement for the crop grown. Poultry litter is also best used as a preplant incorporated, complete fertilizer to supply P, K, secondary and micronutrients to the crop on a timely basis. For wheat, an application of 2 ton/A of poultry litter (preplant incorporated) will supply an adequate amount of fall N and should meet the P and K requirements of even a soil testing low in P and K. The availability of P and K in poultry litter is considered comparable to commercial fertilizer. For N, it is estimated that only 25 percent of the N in poultry litter is readily available. The remainder is in a slower released organic form. Therefore, excessive N in the fall should not be a problem. Release of adequate amounts of N from litter in the spring will depend on a number of factors, especially weather conditions. At the recommended 2 ton/A rate of poultry litter, topdress applications of approximately 50 lb N/A are likely needed. The crop should be monitored in the spring and topdress N applications should be adjusted accordingly.

• Nutrient Removal

Nutrient uptake and removal varies with yield (Table 7). Most fertilizer recommendations account only for nutrients removed in the grain. When straw is also removed, additions of P, K and S should be increased for the following crop. In addition, burning wheat straw, which is not recommended due to loss of organic matter that is potentially valuable to sandy soils, returns P and K but not N to the soil.

Table 7. Nutrient uptake and nutrient removal by wheat at different yield levels. Removal based on grain only

Nutrient	40 bu/A yield		70 bu/A yield		100 bu/A yield	
	<i>Uptake</i>	<i>Removal</i>	<i>Uptake</i>	<i>Removal</i>	<i>Uptake</i>	<i>Removal</i>
N	75 lb/A	46 lb/A	130 lb/A	80 lb/A	188 lb/A	115 lb/A
P ₂ O ₅	27 lb/A	22 lb/A	47 lb/A	38 lb/A	68 lb/A	55 lb/A
K ₂ O	81 lb/A	14 lb/A	142 lb/A	24 lb/A	203 lb/A	34 lb/A
Mg	12 lb/A	NA	21 lb/A	NA	30 lb/A	NA
S	10 lb/A	NA	18 lb/A	NA	25 lb/A	NA



SHOWY CROTALARIA

Here's a weed you've probably seen along roadsides, but hopefully not in your pastures. This is toxic to livestock. Cold weather will usually knock these out. All parts of the plant are toxic including seeds. In pasture or hayfields they should be pulled up and removed.



Statistical Comparison	Application Method	Application Rate (lbs/a)	Nitrogen Form	Yield (lbs/a)
A	BANDED	100	Urea	102,366
a	BANDED	150	Urea	101,059
ab	BANDED	200	KNO3	100,623
ab	Broadcast	200	Urea	99,752
abc	BANDED	150	KNO3	93,218
abc	Broadcast	150	KNO3	95,396
abc	Broadcast	150	UAN	93,654
abcd	BANDED	200	UAN	92,347
abcde	BANDED	150	UAN	85,813
abcdef	Broadcast	50	Urea	84,506
abcdefg	BANDED	50	KNO3	78,408
abcdefg	BANDED	50	UAN	77,972
abcdefg	BANDED	200	Urea	82,764
abcdefg	Broadcast	100	KNO3	78,408
abcdefg	Broadcast	200	KNO3	81,021
abcdefg	Broadcast	200	UAN	78,408
bcdefg	Broadcast	50	KNO3	75,358
cdefg	Broadcast	150	Urea	71,002
defg	Broadcast	100	UAN	67,518
defg	Broadcast	100	Urea	67,518
efg	BANDED	100	KNO3	64,033
efg	BANDED	100	UAN	62,726
fg	Broadcast	50	UAN	59,677
g	BANDED	50	Urea	58,370

NITROGEN SOURCE, RATE, AND APPLICATION METHOD STUDY

Here are overall results from a “Watermelon Nitrogen Source, Rate and Application Method” trial we did this summer in Crisp County. This work was in collaboration with UGA Soil Fertility Specialist Glenn Harris.

We put N out in the form of KNO₃, UAN, and Urea at 50, 100, 150 and 200 lb rates banded and broadcast. All plots were treated with 100 lbs potash and 100 lbs phosphorus. All fertilizer was put out at planting – no sidedress.

Comparing all data there was no **statistical** yield difference between banded vs. broadcast nitrogen applications:

Banded → 83,199 lbs/a
Broadcast → 79,279 lbs/a

Nor was there a statistical difference when comparing Potassium Nitrate (KNO₃), Urea, and Urea Ammonium Nitrate:

KNO₃ → 83,199 lbs/a
Urea → 83,635 lbs/a
UAN → 77,101 lbs/a

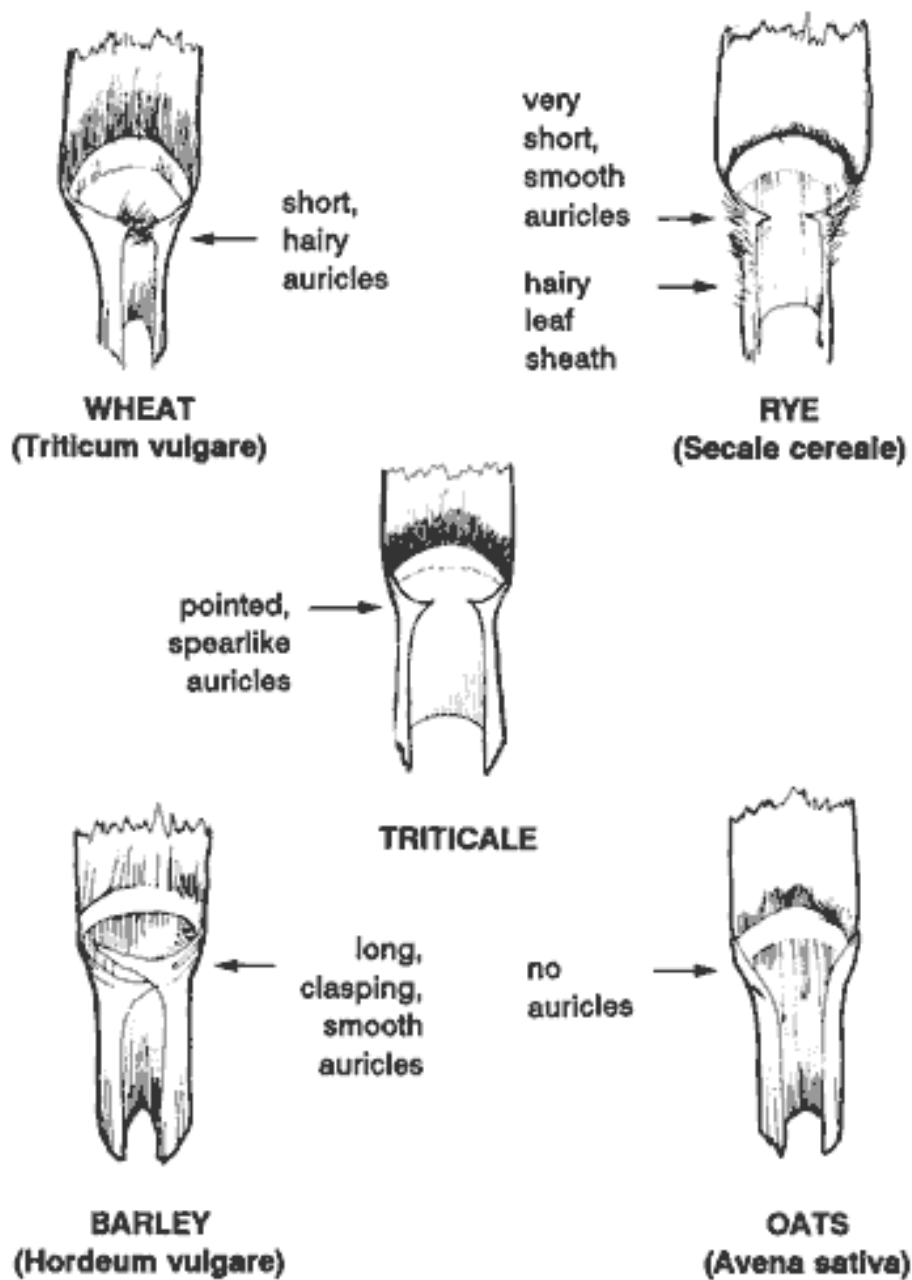
However significant yield differences were observed in rate of nitrogen application:

50 lbs N → 73,309 lbs/a
100 lbs N → 74,052 lbs/a
150 lbs N → 90,169 lbs/a
200 lbs N → 89,298 lbs/a

Hollow heart incidence was insignificant regardless of N source, rate or application method. This is in contrast to last year in which we saw a direct

Wheat or Rye – How do you tell the difference?

This question pops up from time to time. Here is a comparison of leaf characteristics between small grains.



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