October 2006

Mississippi State University Extension Service

Agronomy Notes

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Corn and Wheat

by Dr. Erick Larson

Addressing Fertility Problems - Fall is a good time to begin addressing many fertility problems. Applying and incorporating lime during the fall is necessary to allow pH neutralization before the cropping season begins. Of course, soil testing is the foundation of a sound fertility program. Soil testing recommendations eliminate guesswork, allowing growers to address limitations with the right fertilizer before problems arise. Thus, your fertilizer expenses are reduced and the crop grows off better! However, I believe more frequent or even annual soil testing is required when rotating crops, compared to continuous cropping, because crop nutrient needs may differ substantially. Phosphorus deficiency often occurs following cotton or soybeans, because corn requires double the amount needed for cotton or soybeans. Potassium deficiency often occurs following a high-yielding soybean crop, since 70 bu./a. soybeans remove about 100 pounds of potassium from the soil. However, delay application of potassium on low CEC or sandy soils until spring because of leaching problems.

Fall Weed Control - Many perennial weeds, including Johnson grass and Bermuda grass, are very susceptible to herbicide application at this time of year, because they are storing energy in their rhizomes in preparation for winter. A translocated herbicide, such as glyphosate, will be drawn into the rhizomes and have a higher likelihood of killing these reproductive organs. Apply herbicides when weeds are actively growing and at least two weeks before the normal first frost date. Tillage or stalk shredding should be avoided for several weeks prior to or after herbicide application.

Keys to High Wheat Yields - While many inputs, such as wheat variety selection and fertility needs are critical to high wheat yields, spending money on inputs will not substitute for poor management timing. In fact, I believe poor management timing likely generally limits Mississippi wheat yields considerably more than management inputs. Thus, wheat profitability largely hinges upon implementing timely management practices. The most common management timing issues limiting wheat yield potential for Mississippi producers are planting too early, and applying nitrogen, herbicides, and fungicides too late. This month's newsletter will highlight wheat planting practices.

Don't Plant Wheat Early – Please refrain from the early planting strategies you successfully employ with summer crops, such as corn and soybeans, because that strategy will likely fail miserably for winter wheat. In other words, planting wheat for grain in September or early October is akin to planting corn in May or soybeans in June. Planting too early unnecessarily exposes wheat to potential development, fertility, weed and numerous pest problems which ultimately reduce yield potential. Thus, growers accustomed to gaining developmental advantages from planting summer crops early, such as corn and soybeans, may run into severe problems by using the same strategy with winter wheat. The adverse effects from excessive fall growth potentially include winter and spring freeze damage, development of Barley yellow dwarf, Hessian fly and armyworm infestation, disease problems, more weed competition, poor nutrient use, and increased lodging.

Optimum Wheat Planting Dates - The suggested wheat planting dates (within 10 to 14 days of the average first frost date in the fall) should provide warm enough temperatures and long enough days for seedling emergence and tillering to begin before dormancy occurs. This normally corresponds to:

North and Central: Oct. 15 - Nov. 10
Delta: October 20 – November 15
South MS: November 1 - November 25
Coastal: November 15 - December 10

Wheat continued...
by Dr. Erick Larson

Suggested Seeding Rates - Wheat growers should strive to establish 1.0 to 1.3 million plants per acre or 23 to 30 plants per square foot. Assuming 85% successful emergence planting with a grain drill, you will need a seeding rate of 1.2 to 1.5 million seeds per acre. Using the number of seeds per pound listed on the seed tag, you can then calculate how many pounds of seed per acre are needed. For example, 1.35 million seeds per acre divided by 14,500 seeds per pound is 93 pounds of seed per acre. This seeding rate is equivalent to 18 seeds per foot for seven-inch drill spacing. Growers broadcasting and incorporating seed should use higher seeding rates (40-45 seeds/ft.^{2}), because emergence success will likely be modest (60-70% of planted seed). Growers broadcasting small grain seed on the soil surface should generally utilize very high seeding rates (50-60 seeds/ft^2), because emergence and seedling survival can be relatively low (around 50% of planted seed).

High Yield Seeding Rates? – Many growers wonder whether wheat yield can be improved by drilling more seed than standard. However, wheat grain yield is relatively unresponsive to seeding rate, unless planting dates vary considerably from normal. In fact, a seeding rate study in Arkansas showed no yield difference for seeding rates from 60 to 180 pounds per acre. Healthy wheat has tremendous tillering ability to compensate for variable stands and the south's warm winter climate typically allows wheat to fulfill this potential. Higher than normal seeding rates also promote lodging, disease infection and interplant competition for nitrogen.

Wide Drill Row Spacing – Many producers are considering planting wheat with a relatively wide row-space (10-15 inch) drill more appropriately designed to plant soybeans or other crops. Research data generally indicates only slight yield difference between 10-inch drill spacing and narrower widths. However, expect about 5-15% yield reduction with 15-inch spacing compared to normal widths (8-inch or less). This yield loss cannot be overcome by increasing seeding rate. In fact, seeding rates (per acre) might be reduced some in 15-inch rows with little yield loss, because the seeding rate per linear foot is comparable. However, I would choose relatively tall varieties that develop lush canopies and tiller well for use in wide rows.

No-Till Planting - Growers can successfully establish and produce small grains in no-till systems, but need to closely manage factors capable of limiting planting performance and stand establishment, particularly plant residue. The presence of heavy plant residue in no-till systems, may restrict drill penetration, seed placement, and furrow closure. Thus, growers should closely check drill performance in the field, reduce drill ground speed, and increase seeding rate by 10-15%, compared to drill rates in conventionally prepared seedbeds, to compensate for difficult planting conditions. Large amounts of loose, tough stalk residue often accumulate in planter equipment framework, drastically restricting performance. Drill performance in standing stalks may be improved by drilling at an angle slightly different from the direction of the existing crop row. This redistributes the residue concentration zone continuously along the drill's frame, minimizing residue accumulation. In most cases, applying a burn down herbicide prior to planting will improve seeding establishment and kill emerged winter weeds.

Seed Treatments - We routinely recommend planting wheat seed treated with a fungicide to inhibit or prevent seed-borne and seedling diseases. Raxil MD (5.0 oz/100 lb), Raxil Thiram (3.5 oz/100 lb) or Dividend Extreme (2.0 oz/100 lb) should provide broad-spectrum seedling protection. Seed insecticide treatments, such as Gaucho or Cruiser, are also available for use on wheat. However, they have not consistently produced enough wheat yield improvement relative to their expense to justify their routine use. These seed treatment insecticides primarily protect wheat against early fall aphid infestation. Aphids reduce wheat grain yield potential primarily by vectoring the disease Barley yellow dwarf. This disease is a virus and is not affected by foliar fungicide application or other direct methods. The activity of the seed insecticide treatments may protect seedlings up to about 30 days after wheat emergence, but will need a supplemental insecticide application if a later or a very heavy fall aphid infestation occurs. Research has shown inconsistent wheat yield response to seed insecticide treatments, depending upon aphid populations and infestation timing. University of Tennessee data showed a 2 bu./a. advantage in 2005 (9 treatments at 5 locations) and a 1 bu./a. disadvantage for treated seed in 2006 (3 treatments at 4 locations). Generally, more yield benefit can be expected from early wheat planting dates, because early planting greatly increases wheat exposure to fall insect infestation. This is one of many vital reasons to refrain from planting wheat before recommended planting dates (near the normal first frost date). Planting near the first hard frost will reduce aphid populations, movement and reproduction.

Soil Testing
by Dr. Keith Crouse

Early fall is a good time to improve pastures and hay fields. During the past few weeks we having been receiving soil samples that were cropped for cool season forages. Soil acidity appears to be the major fertility problem for these fields. This can easily be taken care of by applying quality lime at the recommended rates. Most cool season grasses grow best at a pH level above 6.0.

Depending on the specific species, hay harvest removes approximately 30 lbs of potassium per ton of hay. Plants utilize potassium to improve plant heath and many physiological functions including, stem/stalk strength, winter hardiness, disease resistance, photosynthesis, carbohydrate metabolism and breakdown, translocating starches, activating various enzymes; adjusting stomatal movement, and plant-water relations. Therefore, to determine you fertilization needs, take random, representative soil samples of your hay fields and have them tested. Potassium fertilizer recommendations may be requested for the specific species grown.

Remember to always take soil samples from a uniform area no more than 10 acres in size. Take enough separate cores within the area for a representative soil sample. Generally, this is about 15 to 20 cores. Take your soil cores from the surface to plow layer (6-inch depth). Mix your soil cores thoroughly. Send a full soil box or a pint of soil, completed form(s) and payment of $6.00 per sample. Soil test results and recommendations can be accessed through the extension intranet for county offices. Clientele can access their soil test results at: www.ext.msstate.edu/special/soiltest.cgi. You must know your customer and AAA numbers to access this data.

Forage Considerations in a Drought Year
by Dr. Mike Collins

Severe drought conditions have persisted through most of the 2006 season in much of the state. Pasture production has been extremely limited but recent rains have allowed pastures to rebound significantly in several areas. Pastures specifically, and forages in general, are the least expensive means of providing feed for our ruminant livestock. Thus, they should be managed carefully to get the most out of what we have available. Controlled grazing can help extend pasture use. Research from the University of Missouri found that allocating a 3-day supply in each strip rather than a 14-day supply, stretched the grazing days by 40%. Hay supplies will be extremely limited in most areas this winter. Consider protecting the hay you do have on hand by storing it inside or by covering pyramid- shaped stacks with tarps. Hay stored outdoors can lose 25 to 35% of the hay DM during one season of storage.

The potential for toxicities on pasture, hay and silage is elevated in a drought year like this one. Two problems that can show up with forages in a drought year are nitrate toxicity and prussic acid poisoning. Nitrate toxicity can result when ruminant livestock consume hay or pasture that is high in nitrate. Higher levels of nitrate are often found during drought years because plants cannot readily assimilate the nitrate they take up from the soil into amino acids and proteins. Grasses are more likely to cause nitrate toxicity than legume forages because grasses more commonly receive N fertilization. Drought-affected corn is sometimes associated with this syndrome because corn receives high rates of N and this crop is often grazed under drought conditions when grain production is not a viable option.

Nitrate levels between 0 and 0.5% in forages on a DM basis (equivalent to 5,000 parts per million) are generally safe to feed, while levels between 0.5 and 1.0% present a risk to pregnant cows and to animals that are not accustomed to forage containing some nitrate. Forages with 1.0 to 2.0% nitrate should not make up more than one-half of the diet. Supplementation of high-nitrate forages with corn grain or other readily available energy sources lessens the risk because the supplemental energy stimulates the rumen microbes responsible for metabolizing nitrate. High-nitrate hay retains the nitrate contained in the standing crop and nitrate poisoning potentials still exist during the winter feeding period following drought. Ensiling normally reduces nitrate levels to one-half or less of the amount initially present, but the reduction only occurs if the crop contains sufficient moisture to undergo significant fermentation. Symptoms include labored breathing, muscle tremors, a staggering gate followed by collapse. The membranes of the eye and mouth can become bluish in color, blood becomes chocolate-brown. Acute toxicity can lead to death, or the effects can be chronic with negative effects on production such as abortion. Green chopped forage fed directly is especially prone to causing nitrate toxicity because nitrite can be produced within the mass of chopped forage before consumption by animals.

Forages continued... by Dr. Mike Collins

Stocker cattle weighing 800-1000 lb have grazed successfully on standing corn since early September in two MSU trials. These cattle have performed well on corn in which laboratory tests have shown nitrate levels of around 0.35% in the leaves and 0.5% in the upper portion of the stalk. Within a plant, the highest levels of nitrate typically occur in the lower portion of the stalk. If you have concerns about nitrate, the Mississippi State Chemical Laboratory offers a qualitative test which indicates whether nitrate is present or not, for a price of $15 per sample, and a quantitative test that determines a specific nitrate percentage in the sample for a price of $35 per sample. The CVM Diagnostic Laboratory also provides nitrate analysis, for a cost of $20 per sample.

Prussic acid poisoning results when livestock consume plants containing cyanogenic glycosides from which hydrogen cyanide (HCN) is released. Plants in the sorghum group, including Johnson grass, are most often implicated. In the case of sorghums, epidermal cells contain a cyanide-producing compound that can be released when cell walls are ruptured. Cattle, sheep, and other ruminants are more susceptible than are horses because HCN release may also result from the activity of rumen microorganisms. Prussic acid poisoning occurs most commonly when livestock graze sorghum-type forages that are less than 15 to 18 in. tall or when grazing occurs soon after frost. Young shoots of these species have the highest concentrations of the cyanide-producing compound, but levels decline rapidly as the plants develop. The incidence of poisoning increases immediately following frost because freezing disrupts cell membranes and allows the mixing described above to occur prior to ingestion of the forage by animals.

Poisoning can also occur with sorghums taller than 18 inches, if grazing takes place soon after frost. In this case, young tillers at the bases of the older shoots have been protected from freezing. Delay of grazing for 1 to 2 weeks after frost greatly reduces the risk of poisoning.

Cyanide release also occurs at high levels when sorghum forage is green chopped for feeding because chopping also disrupts cells. High rates of N fertilizer can also increase cyanogenic levels in the plant. For this reason, management recommendations for minimizing HCN poisoning include splitting larger applications of N fertilizer. Sorghum hay and silage are generally safe because the toxic compounds dissipate over time during storage.

Symptoms of cyanide poisoning include rapid breathing followed by labored, slow breathing, muscle spasms, dilated pupils. Death may occur quickly, within 15 minutes to 2 hours after ingestion of a toxic amount of HCN. In contrast to the brown blood coloration typical of nitrate toxicity, animals affected by cyanide poisoning have bright “cherry red” blood.

Recommendations to avoid prussic acid poisoning:

1. Graze sorghum or Johnson grass only when shoots are at least 15 inches tall.
2. Do not graze plants during or shortly after drought periods when growth is severely stunted.
3. Do not graze wilted plants or plants with young tillers.
4. Do not graze for two weeks after a frost.
5. Do not graze after a killing frost until plant material is dry (the toxin is usually dissipated within 48 hours).
6. Do not leave animals on sorghum pasture overnight when frost is expected.
7. Allow silage fermentation to proceed for 6 to 8 weeks before feeding to allow toxins to dissipate.

Peanuts
by Mr. Mike Howell

Harvest Report - Harvest is currently in full swing and it appears that the drought did not hurt peanuts as bad as we thought earlier. Early yield reports are ranging from 1,000 pounds to over 6,000 pounds per acre. USDA estimates a state average of 3,000 pounds, but I am optimistic that we will surpass this mark.

Variable Maturity - Several growers have asked about an unusual situation that we have observed in some of the driest areas. The fields have a small early crop, and a huge late crop. This poses a problem in determining when to dig these fields. If we harvest based on the early crop, we risk losing potential yield from the late crop. On the other hand, if we wait, we could lose the early crop and still not mature the late crop. I am making recommendations on these fields on a case by case basis. If peg strength is still good, and the nuts are not sprouting or separating from the hull, I am recommending to delay digging as long as possible. If pegs begin weakening, or if too many nuts begin to sprout, we need to dig as soon as possible. Keep in mind that Georgia Green does tend to sprout sooner than some other varieties.

Fungicide Applications - For those fields that are not ready to dig, growers still need to stay on a spray schedule, or scout intensely for disease. Continue fungicide applications until you are within two weeks of harvest. Conditions are now more favorable for leaf spot disease than they have been for most of the growing season.

Baling Peanuts for Hay - I have also had many questions about baling peanut straw for hay. First and foremost, most of the fungicides, and many of the insecticides that we typically use in peanut production state on the label not to feed the vines to livestock. If you are in a situation that you have not applied any restrictive pesticide, the question then becomes how much is the hay worth. Data from Georgia indicates that a peanut crop yielding 3,000 pounds of nuts will remove about $55-60 of nutrients (using current fertilizer prices), if the vines are removed. This does not include any fertilizer application costs, and does estimate a beneficial value for organic matter removed in hay. With these prices, and given the fact that vine production was low in many areas, selling peanut hay will probably only break even.

Peanut Short Course - Mark your calendars now for the 2007 Peanut Short Course. This event will be held in conjunction with the Mississippi Peanut Growers' Association Annual Meeting January 8-9 in Hattiesburg, Mississippi. Peanut specialists from across the country will be speaking on variety selection, disease control, weed control, insect control, and peanut production practices. This will be an excellent opportunity for growers to learn the latest about peanut production.

Cotton
by Dr. Tom Barber

According to the September 25th Crop Condition Report, published by the Mississippi Agricultural Statistics Service, 43% of the Mississippi cotton crop has been harvested. By the time this newsletter is printed, more than 50% of the crop will be out of the field. The USDA predicts our crop to be 793 lbs average cotton lint per acre. The yield numbers reported on some of the furrow irrigated cotton are unbelievable. I have heard many fields have averaged 3 bales or more. This, of course, is on good ground with timely irrigation. Not all irrigated fields will make this average, but several have. I think 800 lbs per acre is not out of the question for an average this year, especially if this cotton keeps turning out. Quality of the 2006 cotton crop is not as bad as was once expected. According to the quality reports that I have received from the Dumas Classing office: out of 265,980 bales that have been classed, the average staple length is 33.84, micronaire 4.41, strength 28.37, uniformity 80.73, 31 color and 3 leaf. Therefore, the average bale would fall into the loan chart at approximately 52.25 cents.

Some later cotton is still being defoliated for the first or second time, depending on rainfall amounts. Because temperatures have cooled off to the lower 80's during the day and 50's at night, some defoliants will not work as quickly, or as well. Combinations of thidiazuron (Dropp, FreFall etc.) will not work as well under these cool conditions. Boll openers (ethephon) and phosphate (Def, Folex) activity will be slowed as well. You can overcome the slower activity with higher rates of these products. For a first application, I would switch to the Def/Folex (1:10/1:12) plus ethephon (Finish, FirstPick) 1:5 or 1:6. According to growers this mix has worked pretty well during this cool snap. Ginstar a mixture of thidiazuron and diuron will also perform well under cool conditions and will provide more re-growth suppression than the Def/Folex. The PPO herbicides, Aim or ET are not as temperature sensitive and have worked well on second applications to remove re-growth and the lower leaves.

After harvest, the most important topic that needs attention is soil fertility management. If it has been several years since you have tested your soil, then it is time to do so now. You should test your soil at a minimum of once every 3 years, and if you are in a rotation program such as cotton and corn, or cotton and grain sorghum, then you should test every year. One of the main things you should look for in your soil test results is the pH levels. Low pH levels (< 5.5) can reduce root growth and reduce nutrient uptake by the plant. If pH levels are low, primary nutrient availability and utilization will suffer considerably, particularly for phosphorous. Fall is the preferred time to apply lime. Lime should be incorporated, for best results, several months before planting.

Remember that all MSU lime recommendations assume a Calcium Carbonate Equivalent rating of 100, therefore it is important to know the CCE of the lime you are using and calculate your rate accordingly. Fall is also an acceptable time to apply mixed fertilizer to soils with a CEC of 7 or greater. Applications of mixed fertilizer to soils with a CEC lower than 7 could result in losses of the nutrient levels due to leaching. When basing your mixed fertilizer recommendations on the MSU soil test data remember that a 50% increase in potassium is warranted if realistic yields are over 2 bales per acre.

Right after harvest is also an excellent time to sample for Nematodes. Nematode populations are increasing, especially Reniform. Therefore if you have been experiencing problems with erratic growth and yields in a field or parts of a field, then it would be a good idea to test your soil for nematode populations. Using nematicides and/or rotating cotton with corn or grain sorghum have proven to provide significant yield increases in Reniform infested fields.

Register Now for the 23rd Annual Cotton Short Course

PRE-REGISTRATION FORM

December 5-6, 2006
Mississippi State University
Bost Extension Center

Pre-registration and information are available online at:
http://msucares.com/crops/cotton/short_course.html

Please print or type

Name_____

Institution or Firm_____

Address_____

City_____ State_____ Zip Code_____

Social/Dinner, December 5th at 6:00 p.m.

☐ Will attend the social/dinner on the 5th ($10.00 Fee).

☐ Will not attend the social/dinner on the 5th.

Pre-registration $80
On - site registration $100

Pre-registration DEADLINE is November 24th.
On - Site registration begins at 8:30 a.m. on December 5.

Mail pre-registration form and payment to: Cotton Short Course, Attn: Tammy Scott, Box 9555, Mississippi State, MS 39762. Please make check payable to: ***MSU-ES Cotton Short Course***.

Rice
by Dr. Nathan Buehring

Producers around the state are winding down and wrapping up this year's rice crop. Most of the rice left in the field at this point is replanted rice following glyphosate drift. This year has been a surprisingly excellent rice year. In rice, the weather can make you or break you, and this year it made us. I do not think there was a particular moment in this year's weather that contributed to the high yields; I think it was a multitude of weather conditions that contributed to the higher yields.

This planting season, the temperatures were above normal and rice stands came up quickly and very uniform. The weather from mid-May till the end of the summer was extremely warm as well. I believe this weather improved yields by increasing the number of panicles per unit area.

The weather during the heading phase was hot as well. The average high during heading was the same as last year (~ 94 F); however, the average low night temperature was about 1 degree cooler (~ 70.5 F). I have seen a lot of blanks behind combines, but less than we saw last year.

One last factor in this year's weather is solar radiation. The daily average solar radiation values were higher this year than in years past. This indicates there were fewer cloudy/rainy days than in recent years, which could have contributed to the excellent yields as well.

The RITE program was very successful this year. Right now, it looks like we will average between 185 to 190 bu./a., which will be 35 to 40 bu./a. more than last year's average. The weather has contributed to the increase in yield, but having a good and timely management plan has also shown to boost the yields. Having a good, timely management plan can take your yields from average to above average.

The 'LL601' contamination issue calmed down to a manageable level. As of today, we are still awaiting the results from testing our foundation seed stock. Once the results are completed and released, you will be notified of our official status.

To receive Agronomy Notes via email, please contact Tammy Scott at (662) 325-2701.

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DEPARTMENT OF PLANT & SOIL SCIENCES
MISSISSIPPI STATE UNIVERSITY

Michael Collins