December 2007

Mississippi State University Extension Service

Agronomy Notes

Corn and Wheat by Dr. Erick Larson

Corn Hybrid Trials - The new MSU Corn for Grain Variety Trials are now available online at MSUcares.com (http://msucares.com/pubs/infobulletins/ib0438.pdf) and should be available as a printed publication from your local Extension Service office very soon. I also developed a list of top-yielding corn hybrids formulated from Mississippi State's and our neighbors University Hybrid trials to provide a quick reference guide for selection purposes. It is also posted on the website at: http://msucares.com/crops/corn/pdf_files/short-list08.pdf

Corn Hybrid Selection Criteria - I generally recommend growers plant several corn hybrids based upon three primary criteria - grain yield, stalk strength and maturity. High grain yield is obviously the primary consideration because grain is sold on a weight basis. However, hybrid trials may not reflect harvestable yield in production fields unless stalk strength is considered. These leaning or broken stalks may significantly reduce harvest efficiency in terms of higher harvest grain loss, and increased harvest time and fuel expenses. Of course, environmental conditions and crop management influence lodging, but substantial differences between corn hybrids are often apparent. Thus, growers should use this information to select superior hybrids for their farm. Hybrid maturity influences harvest date and may also impact profit through its effect on grain moisture. Hybrids grown may differ in maturity by as much as two weeks, but the highest yielding (best-adapted) hybrids typically are 113-120 days in relative maturity. Large producers can spread harvest somewhat by utilizing hybrids varying in maturity. Producers who market their grain at harvest may also benefit from growing a portion of their crop in earlier-maturing hybrids because market prices often decline through harvest.

Wheat stands and winter management - Wheat has outstanding ability to compensate for thin stands given sound management and a little cooperation from mother nature. Thus, although an optimum wheat stand is generally considered to be 23-30 plants per square foot, little yield loss may occur from stands up to one-third of optimum. Wheat plants compensate for thin stands primarily by producing more tillers (stems) per plant. The critical time period for this compensation is from now through early spring (early-March). After stem elongation begins in the spring, tiller number (potential head number) is determined. In other words, it is too late to influence tiller number after plant development switches from producing more stems to developing existing stems. The ability of wheat to compensate for thin stands depends largely upon planting date (temperatures), soil drainage, soil fertility and weed competition during the December through February period when wheat tillers. Warm temperatures will promote compensation by developing additional tillers. Thus, late-plantings have less potential opportunity to compensate for thin stands, compared to normal plantings. Good soil drainage is imperative through early spring, so saturated soils do not stunt growth. Producers must also supply nutrients and control weed competition during this time to optimize wheat tiller growth. This will likely require earlier-timed fertilizer applications than normal, but not necessary more total fertilizer. Winter weeds should also be controlled this fall or very early next spring, because competition will rob nutrients and reduce wheat development. A couple of common weeds which often are often underestimated because of their short stature are Henbit and Annual bluegrass. However, these weeds can be quite competitive with wheat during this time period and steal precious fertilizer from the crop.

Figure 1. Henbit, annual bluegrass and other winter annuals may compete significantly with wheat during the next few months. Scout your wheat and make herbicide applications, if needed.

Inside this issue:

Nutrient and Soil Management
by Dr. Larry Oldham

Fertilizer prices are a hot topic! Increased wheat acreage erased what many thought would be decreased fertilizer demand after the large 2007 corn acreage. Additionally, there is increased fertilizer demand in India, China, and Brazil due to increased grain prices. Some fertilizer availability may be limited due to transportation and supply issues. This situation requires good management starting now.

- Maintain soil pH to maximize availability of both applied and 'native' P and K. Lime programs are expensive in Mississippi every year, but in the current fertilizer situation, they are critical to maximizing nutrient use efficiency.
- Phosphorus (P) and potassium (K) needs are only determined by soil testing. If producers are not soil sampling, they should begin to sample each field. If producers are sampling on a three year schedule, go to a one or two year schedule.
- Consider banding nitrogen (N) and P applications to row crops to improve plant use efficiency.
- If you are not already doing it, split N applications to minimize potential leaching or volatilization losses from large one-time applications.
- Injecting N applications for cotton or corn to lessen potential losses.
- Meet early and often with your fertilizer suppliers to determine availability, delivery and cost so you have the products when you need them and at the lowest possible cost to meet crop nutrient needs.

There are side effects of good grain prices and uneasiness about fertilizer cost and availability. Beware of some 'good deals'. Recently Delta Farm Press had an Arkansas-based article about soil fertility that I thought should be nominated for a Pulitzer: Fertility Supplement Claims and Long Term Impacts With the current grain price scenario, some folks want to relieve growers of their money but not necessarily with good products.

You may want to question sales pitches such as:

"So new that Extension does not know about it."

"X ounces (or pounds or gallons) supplies as much as XXXX pounds of fertilizer."

"So and so would not have made a crop if he/she had not used it."

"We were traveling through here and wanted to give YOU this great deal."

"The chemistry of this product makes it more plant-available."

My personal favorite (but not in soil fertility) was someone selling silica dioxide as a feed supplement. It is commonly known as '**sand**'.

See additional information on questioning sales pitches in another Delta Farm Press article, Asking About Fertilizer Supplements. University soil fertility faculties are dedicated to sound, objective, and ethical research and Extension programs grounded in good science to serve all the people of our respective states. We have nothing to sell. We want nothing more than to provide information that allows growers to make informed decisions. Ask us about our recommendations if you have reservations.

In Mississippi, soil amendments and fertilizers have to meet regulatory requirements to be sold, including evidence of effectiveness obtained through objective evaluations. Always ask if your miracle product is currently registered with the Mississippi Department of Agriculture Bureau of Plant Industry.

I hope you have a great holiday season. It has been a wonderful year for me because of working with you. Here's to a happy, healthy, and profitable 2008.

Forages
by Dr. Rocky Lemus

The foundation of any good forage fertility program begins with a soil test. When working with perennial forages, soil fertility is vital because it affects the quality of the forage that the animal consumes. Unfortunately, many forage producers in Mississippi do not apply this management practice consistently. Managing soil fertility for forage production depends on three phases of planning: (1) pre-establishment, (2) establishment, and (3) maintenance

Figure 1.

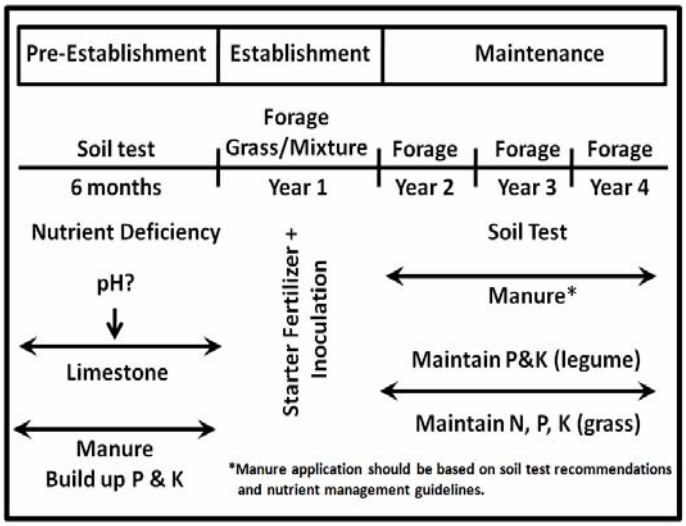

Figure 1. Soil fertility management timeline for forage production

The pre-establishment phase is the most critical part of a fertility management program. Soil samples are collected to determine soil conditions, to fine tune the soil pH or nutrient levels, and to assure optimum conditions for seed germination and establishment. The best time to collect samples is in the fall. To obtain a representative sample, collect soil cores that are 6 inches deep from 15 to 20 random spots in the field. Each sample should not represent more than 10 to 20 acres. When sampling, avoid old fence rows, wet areas, shaded areas, feeding areas, and other spots that are not representative of the whole field. Contact the County Extension Office to determine the soil types in a specific area and proper soil sampling documentation.

Adjusting the soil pH usually increases the availability of essential nutrients for plant growth and development. Forages vary on their sensitivity to soil pH, and legumes are more sensitive than grasses. The optimum pH for legumes ranges from 6.5 to 7.0 and 6.0 to 6.5 for grasses. At low pH levels, bacterial nitrogen fixation in legumes is inhibited causing a reduction in yields.

Lime application will be the most economical way to increase pH and improve fertility versus applying nitrogen (N) to legumes. The amount of lime needed to make an adjustment in soil pH varies with the level of acidity. Small lime applications (1 to 2 tons/ac) should be applied after tillage and incorporated into the soil surface at least six months before planting. Large lime applications (>2 tons/ac) should be split and half should be mixed deep into the soil (at least six inches) with the primary tillage and the other half applied after the primary tillage, but incorporated into the soil surface. This split application will allow a more uniform neutralization process, especially where seedlings will be developing.

Forage crops have a high demand for phosphorous (P) and potassium (K), especially legumes. If soil test results show low P and K, applications prior to establishment are recommended to build up the necessary levels. Potassium and phosphorous are relatively immobile in the soil and losses due to leaching are minimal. These applications will increase root development and establishment. To obtain a good establishment of forages, optimum to high levels of phosphate (P_2O_5) and potash (K_2O) are necessary. These levels should range from 140 to 350 lb P_2O_5/acre and 200 to 500 lb K_2O/acre.

The fertility program is a continuous process that should be carried out into the establishment phase. At this point, pH should be at an optimum range and only minor adjustments should be needed. At establishment, starter fertilizers are applied (banded) one inch below the seed to ensure proper germination. A starter fertilizer should be high in P and fertilizers such as 10-20-10, 10-20-20, and 8-32-16 are commonly used. Nitrogen application for establishing grass should be 25 to 40 lb/ac. In the case of pasture renovation, do not apply N at time of seeding since it will stimulate the growth of the existing sod and increase competition for the new seedlings. If legumes are incorporated into the forage system, ensure that those legumes are properly inoculated. Most legumes are related to specific rhizobia bacteria strain to properly fix nitrogen. Most legumes are usually pre-inoculated. In case the legumes are not pre-inoculated, make sure that the inoculant is specific to the legume being planted, and always check the expiration date. A list of legumes and their inoculants could be found at http://msucares.com/crops/forages/index.html.

The inoculants can be mixed directly with the seed, applied directly to soil in a granular form through an insecticide or fertilizer box in the seeder, or sprayed directly between the seed row using a liquid preparation. Maintaining fertility levels for forage production is also an important part of a good management program. In this case, routine soil testing should be used to monitor changes in pH and nutrient levels, especially if biomass is being removed. Producers may choose to utilize manure (commonly poultry litter) to maintain nutrient levels (especially P and K).

Forages continued ...
by Dr. Rocky Lemus

It is important to know the nutrient levels of the manure being applied and applications should be done according to soil test recommendations and nutrient management guidelines. During the maintenance phase, pastures will be either grazed or harvested for hay. Grazing usually acts as a recycling process since most nutrients are returned through urination or fecal deposition. Uniform distribution of manure should be done at least once a year. When fields are harvested for hay, it is important to determine the extent of nutrient depletion in order to replenish them in the soil (Table 1).

A soil test is the best way to develop an effective nutrient management program. A good soil testing and nutrient management program for forages recommends that pastures be sampled every three years. The test results will indicate how much fertilizer needs to be applied to obtain optimum forage production. If too much fertilizer is applied without knowing what is present in the soil, the cash cost per ton of forage will increase dramatically since the forage can only use a limited amount of nutrients. This, in most cases, causes negative effects such as nitrate accumulation in plant tissues or luxury consumption of potassium and increasing health risks for livestock. Soil sampling should be used as a good nutrient management tool to prevent these future problems and will also reduce excessive fertilizer applications, especially with increasing market prices.

Table 1. Approximate nutrient uptake by forage crops.

	Nutrient (lb/ton DM forage)				
Forage Crop	Nitrogen (N)	Phosphate (P_2O_5)	Potash (K_2O)	Magnesium (Mg)	Sulfur (S)
Alfalfa[1]	56	15	60	5	5
Annual Ryegrass	68	16	67	--	--
Bahiagrass	43	12	35	--	--
Bermudagrass	46	12	50	3	5
Clover[1]-grass	50	15	60	--	
Orchardgrass	50	17	62	--	--
Sorghum-Sudan	40	15	58	6	--
Tall Fescue	39	19	55	4	4
Vetch[1]	56	15	46	--	--
Grass Hay	40	60	13	--	5

[1]Legumes obtain most of their N from the air though N fixation by Rhizobia.

Sources: Johnston, A. and R. Mikkelsen, PPi, 2006; C.S. Snyder, Better Crops, 2003; Clemson University, 2002.

Cotton
by Dr. Darrin Dodds

As the end of 2007 draws near, it is important to look back at the past growing season. 960,000 acres of corn were planted in the Mississippi, the largest corn acreage since 1960 when average yields were 27 bushels per acre and growers were getting $1.18 per bushel. Growers also planted about 370,000 acres of wheat in the fall of 2006, the largest acreage since 1990. As a result of these acreage increases and soybean acres remaining stable, cotton acres declined from 1,230,000 acres in 2006 to 660,000 acres in 2007. Mississippi growers should not feel alone in terms of acreage reductions. Alabama, Arkansas, Louisiana, Tennessee, and Georgia had acreage reductions of 30, 26, 48, 29, and 26%, respectively. Many discussions "around the water cooler" this fall have centered around cotton acres in 2008. On a brighter note, cotton yields were outstanding in 2007. The National Agriculture Statistic Service has estimated cotton yields in Mississippi to be 975 pounds of lint per acre. Average yields this year rank second all time, trailing only the 2004 crop which yielded an average of 1024 pounds of lint per acre. This year like the past three, DPL 555 BGRR was planted on about 30% of the acres. DPL 444 BGRR came in second at 16% and DPL 445 BGRR was close behind on 15% of Mississippi cotton acres. ST 4554 B2RF and 5599 BGRR was planted on 7% and 5% of Mississippi acres, respectively. These 5 varieties accounted for 73% of all cotton acres in Mississippi in 2007. Flex cotton was on approximately 15% of cotton acres in 2007, up from 8.5% in 2006. ST 4554 B2RF was the most popular Flex variety planted. Another popular topic of discussion lately has revolved around new cotton varieties. Registration on Bollgard I varieties will be lost after the 2008 growing season. Due to technology packages currently available, this means that growers will <u>almost</u> have to plant a Bollgard II or Widestrike Flex cotton variety in 2010. Currently, there are very few cotton varieties that will be offered with Bollgard II or Widestrike insect protection and Roundup Ready® (not Flex) technology. I strongly encourage growers to take a long, hard look at planting varieties in 2008 that contain technology packages (B2RF, Widestrike/Flex, etc.) that will be available after we lose the registration on our first generation insect protection products. Begin spreading the risk now so in 2010, when varieties that we have been using are no longer available, you will have a better feel for benefits from the technology and potential yields of various varieties.

Finally, a word about variety selection. Variety selection is one of the most important business decisions cotton growers make. The longstanding and ongoing position of the MSU Extension Service is to extend variety trial research results, coupled with direct professional experience, to allow cotton producers to make their own informed variety selection decisions.

General guidelines for variety-related recommendations by MSU-ES scientists are these:

- 1) to recommend that crop producers combine MAFES variety trial information with on-farm personal experience to select varieties that will perform well on their farms
- 2) to recommend that crop producers try new varieties only on a very limited acreage
- 3) to recommend that crop producers plant the bulk of their commercial acreage in proven performers
- 4) to recommend that growers evaluate fiber quality as well as yield
- 5) to recommend that crop producers critically evaluate the need for value-added traits in transgenic varieties.

Rice

by Dr. Nathan Buehring

With the dry weather early this fall, a good bit of land was prepared and ready for planting rice in 2008. As a result, a good winter weed control program will be the only thing necessary before planting. The two biggest considerations in a winter weed control program are weed spectrum and timing.

In 2007, horseweed became the number one problematic weed at planting. This is a weed that has not typically been a problem in rice. Glyphosate resistance and ideal weather conditions last spring for horseweed emergence ultimately resulted in this weed becoming a major issue in rice.

The cheapest and most effective option for postemergence horseweed control is 2,4-D. The biggest limitation with 2,4-D is that 30 days must elapse before planting. Valor is another option for horseweed control, but it only provides preemergence control. In 2007, some glyphosate plus Valor applications did not provide total horseweed control. In most of these instances the Valor application was early and did not have enough residual left to give adequate control up to planting.

Most of the calls I received last year were from producers that had horseweed at planting. There are not any good options that are worth even mentioning for horseweed control at planting. Therefore, this weed must be controlled earlier than at planting to get satisfactory results and allow for the plant back restrictions to elapse.

When looking at winter weed control program, it is better to be early than late not only from a control perspective but agronomically as well. If I had to pick a time frame where I would like to make my first burndown application it would be from January to the first of February. This would allow you to control the winter weeds before the temperatures warm up and they really begin to grow. If you allow the weeds to grow until the first of March, they will produce a lot of excess vegetation. This will in turn leave vegetation on soil surface at planting, which may affect the rice as it emerges out of the ground. When rice emerges from the ground, I do not want it competing with anything, whether it is excessive dead vegetation or weeds that are alive. My goal is to achieve a clean stale seedbed at planting.

Most burndown programs will require two applications: one at late winter to early spring and one at planting. Be sure on the first application that your herbicide selection will control the weeds present your fields. Table 1 list weed control ratings for various winter weed control programs.

A new product on the market for burndown use in rice is FirstShot. This is basically a reformulated Harmony Extra with a different product ratio. FirstShot contains 25% thifensulfuron (Harmony) and 25% Tribenuron (Express). Harmony Extra contained 33.33% thifensulfuron (Harmony) and 16.67% Tribenuron (Express). FirstShot has a 0 day plant back restriction. FirstShot has a rate range of 0.5 to 0.8 oz/A. If FirstShot is applied with glyphosate, Gramoxone, or 2,4-D, 0.6 oz/A rate should be sufficient. This is a good product of choice for smartweed control at or before planting. As always, please read label instructions before making an application.

Table 1. Winter weed response ratings to herbicides (0 = poor control and 10 = excellent control).

	Annual Bluegrass	Ryegrass	Bitter-cress	Butter-cup	Carolina Geranium	Chick-weed	Cutleaf Evening primrose	Henbit	Shepherds-purse	Vetch	Little Barley	Glyphosate R Horseweed	Smart-weed
Glyphosate	10	8	10	9	7	10	6	7	10	5	10	2	7
+ 2,4-D	10	7	10	10	9	10	10	9	10	10	10	9	8
+ First Shot	10	7	10	10	9	10	7	9	10	5	10	5	10
+ Valor	10	8	10	10	8	10	9	9	9	-	10	8*	6
Gramoxone Inteon	10	7	10	10	9	10	7	8	9	8	8	5	6
+ 2,4-D	10	7	10	10	9	10	10	9	9	9	9	9	8
+ First Shot	10	7	10	10	10	10	7	9	10	5	7	5	10
+ Valor	10	7	10	10	9	10	9	9	9	-	-	8*	6

* Provides preemergence control only.

Meetings and Announcements

The Peanut Short course will be held in Hattiesburg, Mississippi on January 22, 2008 at the Forrest County Extension Office. The program will begin at 8:00 a.m. and end at approximately 4:00 p.m. If you need additional information, please feel free to contact Mike Howell, Area Agronomist at (228) 865-4227.

Mississippi Crop College

The Mississippi Crop College
will be held at
Mississippi State University
Bost Extension Center

February 12 - 14, 2008

We would like to wish you and your family a Merry Christmas and a Happy New Year!

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

Mississippi State University Extension Service

DEPARTMENT OF PLANT & SOIL SCIENCES
MISSISSIPPI STATE UNIVERSITY

Michael Collins