Mississippi State University Extension Service

# Agronomy Notes

MAY 2005

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## Rice
## By Dr. Nathan Buehring

Planting this years rice crop has been somewhat less than optimal. When growing rice on clay soils that is just the nature of the beast because it is wet one day and dry the next. Also, with the increase in diesel fuel prices, more growers are planting no-till or into stale seedbeds, which is good as long as the ground is flat. However, if you are planting into uneven ground, this can lead to uneven emergence (due to poor seed placement) unless it rains or the rice is flushed. Keep a close eye on your rice as it emerges. It can go from great conditions to very poor in a couple of days.

The weather has shown to be uncooperative at times this spring and I do not expect that to change any time soon. Therefore, when the weather breaks and gives us an opportunity to make a herbicide application, we need to take advantage of it. I would rather see you spray weeds that were small than get caught in the weather and end up having to spray a grown up mess.

I have recently been informed by BASF that the potential rate increase of Newpath to 6 fl oz/A was denied by EPA. Therefore, Newpath can only be applied twice at 4 fl oz/A per application for a total of 8 fl oz/A during the growing season. BASF is still working on getting Beyond label changed so that it can be applied up to 14 days after panicle initiation.

There have been a few questions raised about the benefits of an early season nitrogen application. In our research, we have not shown an increase in yield from an early season application of ammonium sulfate unless sulfur is a limiting factor. However, in some situations ammonium sulfate can be a benefit. The biggest benefit that I often hear is that it gets me to flooding quicker, therefore, I will not have to worry about late emerging weeds. The other benefit is where the rice stand is thinner than you would like it. Under these conditions, ammonium sulfate could be used to promote early season growth to help fill in thinner areas of rice.

# Soil Testing
# By Dr. Keith Crouse

Soil samples in the laboratory have slowed down. This spring we averaged a three to four working day turn around once the soil samples received in the laboratory.

If you have a client in your county who has submitted a soil sample and it has been five to seven days since it was mailed, please call us at (662) 325-3313; because, the soil analysis probably has been completed, or we have not received the samples.

It appears that we are receiving more cash money in the mail for soil test payments. Please discourage your clientele from this practice. Remember, soil samples submitted for troubleshooting needs to be submitted in the county agent's name and not the client's.

Soil test results and recommendations can be accessed through the extension intranet for county offices. Clientele can access their results via the internet at: www.ext.msstate.edu/special/soiltest.cgi. The client **must** know their customer and AAA numbers.

# Forage
# By Dr. Richard Watson

**What does a bale of hay cost?**

Hay season is just around the corner and many of you will be preparing for another season of dodging the rain. Hay is an important part of the cattle industry in Mississippi and is also used to generate additional income for many producers. However we often underestimate the cost of hay production. By "cost", I do not mean the price for which you can go out and by a bale of hay, I am referring to the dollars it costs for all the inputs it takes to make a bale of hay. It is this cost that many of us have trouble identifying, and will generally underestimate.

Whether you are making hay to sell, or for your own use, there are very real costs associated with every bale of hay we make. We need to be able to identify these costs and quantify them so we determine how this affects our profitability. This has become even more important with the recent sharp upward trend in gas and fertilizer prices. The fact is, the cost of doing business in the hay industry is getting more and more expensive and many of us do not realize exactly what each bale of hay is costing to make.

In discussing the cost of a bale of hay, I am only going to talk about the direct cost of production, and not indirect costs, such as rent on the land etc.

**Fertilizer**

Fertilizer is one of the major inputs into hay production and represents one of the most significant costs. Fertilizer inputs in hay production include the major nutrients Nitrogen (N) (e.g. Ammonium nitrate and Urea), potash (($K_2O$) (e.g. muriate of potash), phosphate ($P_2O_5$) (e.g. triple superphosphte), and limestone (calcium carbonate). It should also be noted that other nutrients, such as sulfur, might also be required on hay fields.

**Nitrogen (N)**

As we all know, there is a direct like between N fertilization and the tonnage of hay produced/acre. Therefore, N is generally considered the most important nutrient and the most frequently applied fertilizer to hayfields. Cost per unit of Nitrogen has risen over the last 2 years from around $0.30/lb to between $0.36-$0.39/lb. This increase has had a large impact on the cost of hay production. Your average 1000 lb bale of bermudagrass hay has about 20 units of N in it. If you assumed that Nitrogen recovery rates (lb N in the forage/ lb N applied) were close to 100%, which they are not, the equivalent amount of N fertilizer required for this

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bale of hay would cost between $7.20 and $7.80. Nitrogen recovery rates depend on a number of factors, such as plant growth rate, climatic conditions, and the type of fertilizer product applied, but we can assume that N recovery rates are generally well below 100%. In general, recommended N rates for a summer grass hay field will be around 180 units N/acre (assuming a 3 ton yield/A). Therefore, a more realistic cost/bale would probably be closer to $11.00.

**Potash ($K_2O$)**

What many people may not realize is that there is as much $K_2O$ in a bale of hay as there is N. However, $K_2O$ is less mobile in the soil than N so can be built up over time to a point where $K_2O$ may not need to be applied every year. There are also some soil types that are naturally high in $K_2O$ so may not require additional $K_2O$ fertilization. However, even soils naturally high in $K_2O$ will eventually need some supplementation under an intensive hay production system. Unless $K_2O$ levels are in the high to very high range, we should at least replace the $K_2O$ that is removed in the hay. If we look solely at the value of the $K_2O$ within a bale of hay it is worth about $4.50-$5.00 (about $0.20/ lb $K_20$).

**Phosphate ($P_2O_5$)**

A 1000 lb bale of hay contains about 5 lb of $P_2O_5$, which is worth about $1.50. Phosphate is one of the most stable nutrients in the soil but many of the soils in Mississippi are naturally low in $P_2O_5$, therefore, will need fertilization to replace what is taken off in the hay.

If we look at the major nutrients discussed above, we find that we have about $15.00 worth of Nutrients (not including any lime) invested in the bale. In reality, because recovery rates of these nutrients from fertilizer applications are not 100%, the cost per bale, in terms of fertilizer, is likely to be significantly more than this.

**Organic Fertilizer Sources**

Nutrient-rich byproducts of the poultry and swine industry can be used on hay fields to help reduce the cost associated with fertilization. This practice is largely used in central and southern Mississippi where there is ready access to these byproducts. The price of these can vary depending on transportation and spreading costs, but if we used a ballpark figure of $12/ton spread then the value of the nutrient in the same bale of hay only comes to $6.00 (a saving of $9.00/ bale), assuming that the byproduct is at least 2% N, 2%P, 2%K. However, it should be noted that when you apply a product that has similar levels of N-P-K (i.e. 2-2-2), and the plants are removing 20-5-20, then you will have a gradual buildup in soil $P_2O_5$.

**Costs Associated with Machinery**

The next biggest input into a bale of hay is the costs associated with running the tractors, mowers, rakes, and balers. This will depend largely on yield, i.e. as your number of bales/acre goes up your cost per bale generally goes down. The 2004 Mississippi hay crop report indicated that the average yield/ acre was 2.9 tons, which represents about 6 big round bales.

Per acre costs of hay production can vary greatly depending on equipment used, cutting frequency, and factors such as the weather (e.g. if your hay gets rained on you may need to make one more pass with the rake to help dry the hay).

In a hay production system that takes 3 cuttings a year, and yields 1 ton/cutting (2 big round bales), based on the 2004 forage budgets generated from the Department of Agricultural Economics at MSU, the cost per acre per cutting is around $10.00. This figure includes mowing, raking twice, and baling. With the recent increase in agricultural diesel prices the cost may be closer to $15/acre. If we add in the costs of spreading the fertilizer then we bring the per acre cost closer to $20. This gives us a total cost of around $10.00/bale.

We now have a bale that has just dropped out the back of the baler, and we have at least $25-$30 invested in it. From here, we need to move and store the bale until we feed or sell the bale all of which adds additional cost to the bale. If we stored these bales outside we can expect to lose around 30% of the bale, which effectively drives the per bale costs up to around $40-$45. If we lose an additional 20% from feeding loses due to not using a hay ring and/ or animal refusal, then the cost per bale actually

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consumed increases to $55-$60, or around $0.06/lb.

I would like to reiterate that hay production is a very important component of the cattle business in Mississippi and a vital tool for distributing our abundant forage resources throughout the year. However, we need to pay close attention to the costs associated with this practice and try and minimize or reliance on it. Remember, the cheapest means of using forage in a livestock production system is to have the animal harvest the forage for itself. The most profitable farms are where the animal works for the farmer not visa versa.

Hay quality is also another big factor, as you generally have the same value invested in a poor quality bale of hay as you do good quality bale of hay. Therefore, by focusing on making a quality product, you will get more bang for your buck.

If you have any questions about cost of hay production, please contact you local county extension office.

# Cotton
# By Dr. Tom Barber

Cotton planting got off to a slow start in April due to the fact that the weather would not cooperate. According to the Mississippi Agricultural Statistics service, 18% of Mississippi's cotton acres were planted by April 25th. This percentage is down from 22% the year before but on target for the five year average of 15%. However, in spite of the wet spring and cool temperatures in April several fields in the delta were planted, totaling close to 50% of some delta areas by the end of April. Growers in the hill region of the state have just started planting the first of this month. If weather cooperates will be planted by the middle of May. It is always important not to get in too big of a hurry during planting season; the 1st of May is an optimum time to plant cotton. If weather cooperates we still may have the majority of the cotton acres planted by May 15th.

Some last minute decisions may need to be made before planting in some fields. If you still have a horseweed problem and could not take it out in a timely fashion before planting, there are several options to consider. A tankmixture of glyphosate (if resistant horseweed is not suspected), Ignite, or Gramoxone with a residual such as Caparol (1 qt/A), Direx (1 pt/A) or Cotoran (1qt/A) will offer good control of the horseweed at planting with residual control lasting several weeks into the season. These residuals will also help to keep troublesome grasses and broadleaves at bay during the first critical weeks of cotton seedling development. Remember even in a Roundup Ready system it will pay off to incorporate a residual herbicide either at planting or applied with Roundup over the top such as Dual II Magnum. This will especially pay off when wet weather keeps you out of the field and you miss the Roundup application window.

Let's hope we don't have to make a decision to replant; but if we do, it is often a difficult one to make. In fields with questionable stands, you must consider several things before making a replant decision.

1. What is the calendar date?
2. What is the population of plants that will survive?
3. What is the health of those plants, especially their roots?
4. What is the population uniformity, are there large skips and frequent skips?
5. What is the productive capability of the soil, and is the field irrigated?
6. What variety is planted in this field, the surrounding fields, the rest of the farm and what seeds are available at the critical time?

A big consideration is soil type and moisture. If the soil type is one that dries quickly, replanting decisions must be made ASAP and carried out before moisture falls out of the beds. If plant distribution is fairly uniform in fields on productive soils, good

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yields can be made with low plant populations, perhaps in the low 20,000 plants per acre range, or as low as one per row-foot with no or few skips. If the stands are broken with numerous skips, replanting is in order at populations below 30,000 plants per acre, depending on the size and frequency of skips. In some cases a grower may "spot-in" areas of the field with his planter. Calendar date is significant; a stand you would plow up on May 1 would probably be kept on May 25. Bt cotton and boll weevil eradication have really made the late replant decision easier.

If replanting is necessary, continue to use fungicides as a stale row, use a burn-down herbicide to kill the old stand of cotton and any weeds that may have emerged on the row. In some cases the bed may need to be "freshened" before planting. This decision will need to be made on a field by field basis.

Always remember "If you have enough cotton left to make the decision difficult, you probably have enough to keep."

# Corn and Grain Sorghum
# By Dr. Erick Larson

**Not Growing Off Well? -** Many corn fields differ in early plant health due to various fertility limitations. Many initially believe these problems result from inadequate or poor nitrogen availability, but this is rarely the case. Nitrogen is very mobile in the soil and corn requires relatively little nitrogen until rapid growth begins, so nitrogen fertilizer placement and amount rarely limit early season corn growth. However, soil pH, phosphorus, potassium, magnesium and zinc commonly limit early season corn growth in Mississippi. Field scouting will frequently reveal symptoms indicating a specific problem. However, the best method to diagnose fertility limitations is to collect soil and plant tissue samples from stunted and adjacent healthy field areas and submit these samples to a soil testing laboratory, such as the MSU Soil Testing Laboratory, for analysis and recommendations. This method is particularly useful for identifying marginal problems, which may not show up when using a composite soil-sampling technique.

**Purple Corn -** Young corn plants appearing stunted with purple lower leaves are likely suffering from phosphorus deficiency. This deficiency is especially prevalent when corn is grown following a rice crop. New leaves emerging from the whorl are usually green, but may turn purple shortly thereafter. Phosphorus deficiency symptoms often occur as young plants are exposed to good growing conditions following cool and wet conditions. This results in a lag phase where vegetative growth exceeds the roots' ability to supply phosphorus. Young plants are especially vulnerable because their root systems are small and phosphorus is immobile in the soil solution. Any cultural or environmental factors capable of limiting root growth will aggravate deficiency symptoms. Examples of such conditions include: cool temperatures, very wet or dry soil, compacted soil, herbicide injury, insect damage, and root pruning by side-dressing knives or cultivators. Acidic soil can also intensify phosphorus deficiency symptoms. Low soil pH severely limits phosphorus availability to plants, which may cause deficiency symptoms even where high soil test phosphorus levels exist.

**Correcting Phosphorus Deficiency:** Phosphorus deficiency symptoms normally slowly disappear when favorable growing conditions promote more root growth. However, phosphorus deficiency will likely reduce yield by delaying maturity, decreasing root and stalk development, and reducing energy transfer and storage. Treatment options to remedy phosphorus deficiency produce gradual results, particularly compared to nitrogen application, because phosphorus is immobile in the soil solution. Thus, plant roots must grow into the zone where fertilizer was applied before phosphorus uptake and plant response will occur. Surface application of phos-

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phorus fertilizer will limit availability to the top couple inches of soil. Thus, broadcast phosphorus application would be best suited to irrigated and/or minimum tillage fields with substantial crop residue on the soil surface, where these factors would promote soil moisture, root activity and nutrient uptake in the upper few inches of soil. Phosphorus injected as a side-dress treatment would generally increase availability to roots in most situations, particularly in dryland fields. However, be extremely careful not to prune roots when sidedressing. Corn root diameter is generally similar to plant height, so don't sidedress much closer to the row than the plant height.

**Roundup Ready Recommendations** – Growers utilizing Roundup Ready corn have experienced some problems with glyphosate herbicide application timing the past couple of years. These problems normally result from rainfall/wet soils delaying herbicide application. These problems often develop because application timing in the Roundup Ready system is slightly later, when corn and weeds are growing more quickly, compared to a conventional herbicide program. I highly recommend supplementing your Roundup Ready corn system with atrazine and apply it (and the first glyphosate application) before the corn reaches 12-inches tall. Atrazine greatly enhances the effectiveness of the Roundup Ready system by providing economical residual weed control of some key weeds, such as morningglories, that glyphosate may have difficulty controlling. Atrazine may be tank-mixed and applied with glyphosate. The first glyphosate application timing should be based primarily upon emerged weed species, size and density as these factors affect competition. Precise timing of the first Roundup application is critical to minimizing early weed competition, which can drastically affect corn yield potential. Producers growing large acreages may consider using reduced rates of preemergence herbicides to provide some residual relief, since optimal postemergence herbicide timing on the entire acreage is not realistic, particularly if rainfall persists. Growers may also be caught off guard because corn growth accelerates very quickly after it gets 12-inches tall. In fact, corn may grow from 12-inches to exceeding V8 growth stage or 30-inches tall (the maximum legal height to broadcast glyphosate on Roundup Ready corn) in less than 10 days. Thus, all glyphosate applications should be completed by this time, unless growers are prepared to use drop-nozzles to avoid whorl contact. I suggest using drop-nozzles when corn exceeds 20-inches to improve herbicide coverage and weed control, particularly for morningglories.

**When should I start irrigating? -** Dry early season conditions sometimes prompt growers to consider beginning irrigation in May. Drought stress can potentially reduce corn yield anytime during corn's developmental stages. Therefore, irrigation should commence whenever soil moisture becomes limiting. Since corn's water requirement increases with plant size during vegetative stages (from emergence until tassel), plant growth stage does play a determining role, but there is not a definitive growth stage when irrigation should commence. Irrigation initiation is most dependent upon seasonal rainfall and temperatures. Corn's most critical and largest moisture requirement time interval is from tasseling through milk stages.

## Grain Sorghum

**Sorghum establishment -** Scout sorghum fields diligently during establishment for stand, insect and weed problems. Sorghum seedlings have considerably less vigor than corn, which often translates to more difficult stand establishment. Chinch bugs also prefer sorghum compared to corn and since chinch bug populations tend to thrive during warm, dry conditions, they can cause major sorghum establishment problems. Postemergence herbicide options for sorghum are quite limited, so timely identification and response also is imperative to control weed problems. Scout sorghum fields at least twice a week until sorghum exceeds six inches tall to identify and manage field problems.

**Minimum Stand -** Grain sorghum has tremendous ability to compensate for low stands by producing tillers, especially if plants are spaced uniformly. Thus, the optimum plant population for sorghum is very broad, ranging from 40,000 to 70,000 plants per acre for dryland production. Replanting would be required only if stands were reduced to less than two plants per foot of row or skips exceeding five linear feet occur in adjacent rows.

# Soybeans
# By Dr. Alan Blaine

As of April 25, 2005, we have just completed our fourth round within the state surveying for rust. Scouting took place from north of Mobile Bay across south MS to south of Natchez. From Natchez sentinel fields are located every 50-100 miles, up the river to North Sunflower County. Additional fields are located in the central and eastern part of the state.

Figure 1

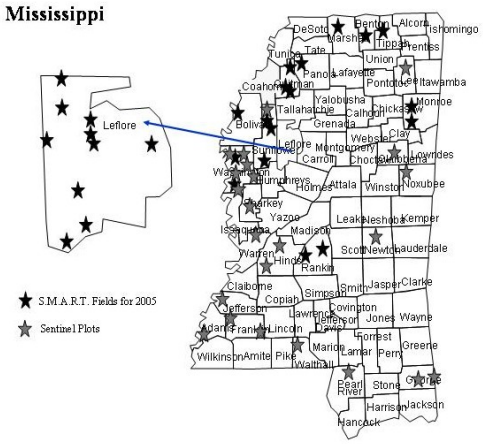


Figure 1 is an updated map of the sentinel plots planted within the state. Planting began on February 18th and the majority were planted by March 18th. Twenty one of the proposed sentinel plots were planted prior to the majority of the crop being planted. The remaining two were planted in late April once these locations dried out.

Soybean Rust control guidelines and efficacy rankings are available at our msucares web site, www.msucares.com (http://msucares.com/crops/soybeans/index.html) or www.soyrust.org.

Scouting for rust is an excellent practice but one that will prove to be difficult. It is our hope that by planting the statewide sentinel plots early we can aid you in this decision process.

Based on past history growers preparing to spray at bloom and then 21 days later will probably be premature this year. As of today (4/25/05) we have found nothing in the mid South. Confirmations have been made in Florida on kudzu and on April 27th (on volunteer soybeans) in Georgia.

Positive confirmation may occur in the mid South soon but the later it happens if it happens it will place us further along in the growing season thus limiting the number of fungicide applications. An application at R3 (early pod set) has yielded the best, most consistent yield increase in our fungicide work. Positive results from fungicides have been obtained in Louisiana, Arkansas and Tennessee in addition to our state. Since 1996 the average acreage yield increase in 138 on farm comparisons has been 5.9 bushel/acre.

Staying on top of our sentinel findings should enable you to make the best informed decision on timing and material choice. This growing season trigger spraying may be premature. In the absence of rust everyone should concentrate on an R3 application. Growers who have used this program previously know the benefits and are ready.

If you have not utilized an R3 application in the past, get prepared. If you still question the benefits of a fungicide spray leave an untreated strip and observe plant health to reassure you of the benefits.

A positive (April 27th) find of soybean rust was confirmed in Seminole County, Georgia. This is near the Georgia/Alabama border. The sighting was confirmed on volunteer soybean plants. Since it was found on volunteer plants that means some spore activity has occurred. However, we will continue to monitor our state.

Planting took place very rapidly once it stopped raining. More re-plating occurred this year but much of this could have been avoided. The number one problem continues to be due to planting too deep (early). This is a worse problem on coarse to silty soils. Remember, it is cooler at deeper depths and if we experience that hard packing rain in April it requires more energy for seed emergence.

A lot of calls have been coming in regarding final plant populations. Planting seed has become a major input cost. Take time to accurately set planters. Check seed out put every time you change varieties

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or lots. In determining whether or not a stand is adequate consider the following factors:

1. Are the emerged seedlings healthy?
2. Are there any large skips?
3. The number of seedlings/per linear foot?

Our row planting recommendations for a final stand are 75,000-125,000 plants per acre. This is more than adequate for an above average yield. With our earlier planting we are planting much higher populations. These higher can be beneficial, but we can make excellent yields at a lot lower populations.

Many would be shocked at how low you can go. The downside to lower populations is slower canopy closure. On a 15 inch row I would not bat an eye at a uniform, healthy stand of two plants per linear foot of row. You could keep a lower population but it depends on the entire field population.

A stand today even though thin, if healthy has a much greater yield potential than one planted three weeks later, particularly dryland.

## Calendar of Events

**JUNE**

**3-4 Mississippi Cattlemen's Association Summer Conference**, Eola Hotel, Natchez, Mississippi. For more information contact missca1@bellsouth.net.

**JULY**

**9 Mississippi Boll Weevil Management Annual Meeting**, Holmes Community College Forum, Grenada, MS, 10:00 a.m. For more information contact Jeannine Smith (662) 325-2993 or email msbwmc@ext.msstate.edu.

**20 Cotton Field Day**, Delta Research and Extension Center, Stoneville, Mississippi, 8 a.m.-noon. For more information contact Dr. James Smith (662) 686-9311.

**21 Rice/Soybean Field Day,** Delta Research and Extension Center, Stoneville, Mississippi, 8 a.m.-noon. For more information contact Dr. James Smith (662) 686-9311.

**27-30 Mississippi Agricultural Industry Council and the Mississippi Seedsmens' Association Annual Summer Meeting**, Orange Beach, AL. For more information contact Tracy Gregory (662) 325-3992 or visit MAIC's website at www.maicms.org.

**AUGUST**

**4 Agronomic Practices Research and Demonstration Tour for Cotton, Soybeans, Corn and Sweet Potatoes**, Pontotoc Ridge Flatwoods Branch Experiment Station, Pontotoc, MS, 7:30 a.m. For more information contact Dr. Mark Shankle (662) 566-2201.

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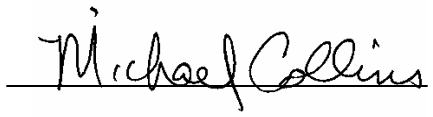

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