Mississippi State University Extension Service

Agronomy Notes

April 2005

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Asian Soybean Rust

By Dr. Alan Blaine

On November 10, 2004, Asian soybean rust was confirmed in Louisiana followed shortly by confirmation in other Southern states including Mississippi, Florida, Georgia, Alabama, Arkansas, Missouri, Tennessee and South Carolina. The disease was confirmed primarily on late maturing soybeans with additional confirmations in Florida and Georgia on kudzu.

Fig. 1

Introduction of the pathogen into the continental U.S. was believed to be by windborne spores moved from the northern part of South America by Hurricane Ivan (Fig. 1) in mid-September. The IVAN Theory of the disease has been strongly supported by the disease distribution throughout the southern U.S. and the degree of symptom development on plants in these nine states which indicated that infection occurred at approximately the same time. While all soybean states have been preparing for the eventual introduction of Asian soybean rust into the U.S. for the last 2-3 years, the confirmations in November have led to an increased sense of urgency as to what should be done to manage the disease in 2005 and subsequent years.

Fig. 2

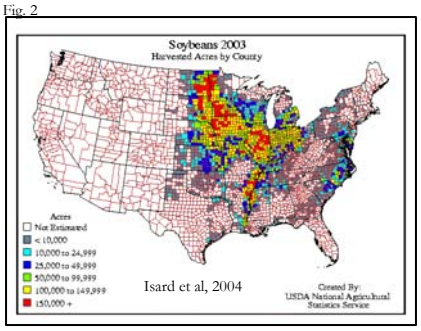

Fig. 3

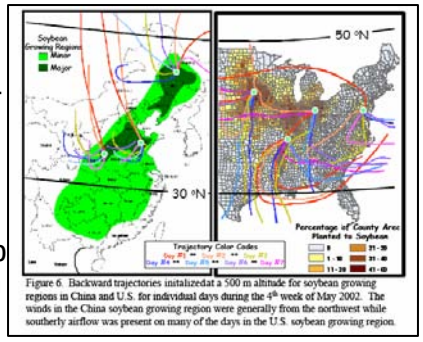

Figure 6. Backward trajectories initialized at a 500 m altitude for soybean growing regions in China and U.S. for individual days during the 4th week of May 2002. The winds in the China soybean growing region were generally from the northwest while southerly airflow was present on many of the days in the U.S. soybean growing region.

The Delta region will be on the front lines. Concerns exist because of the wide distribution and size of soybean acreage (Fig. 2); the diversity of planting dates and production systems within the three states; and spring wind patterns that might move fungal spores from the Gulf Coast region up through the Mississippi Valley into the midwestern soybean production region each year (Fig. 3). An example of the latter is leaf rust of wheat. Given the widespread distribution of the Asian soybean rust pathogen last fall in the southern U.S. (Fig. 4) and historical climate data, it seems likely that the pathogen could successfully overwinter along the Gulf Coast or in the Caribbean (some years) (Fig. 5) and be able to start moving northward into the continental U.S. during the spring of 2005.

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Asian Soybean Rust, Continued from page 1

Fig. 4

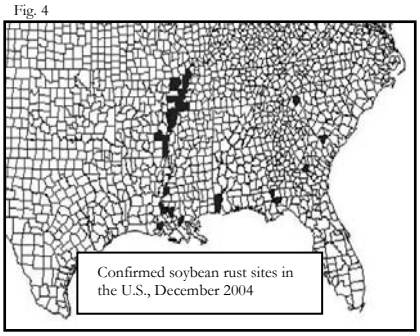
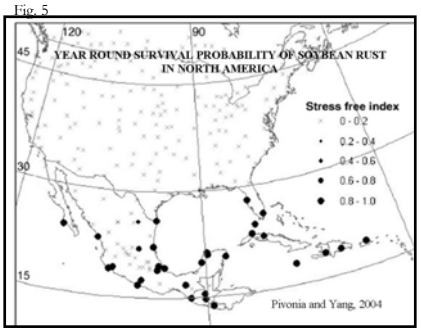


Fig. 5



Unlike the situation with wheat and corn leaf rust, we cannot use resistant cultivars to slow Asian soybean rust or limit its epidemic development over a large area. An effective fungicide program is the only proven management tool. The effectiveness of the program, with regard to a large scale epidemic, will be compromised without the adequate preparation of growers, an intensive crop monitoring program and a reliable "real time" network. Several effective fungicides have been approved for use against soybean rust in 2005, but approval and supply of fungicides is the easy part. Getting producers to apply these products in a timely manner will be the challenge.

In an attempt to make information available, a Mid south Web site has been developed which you can access at www.soyrust.org. The Midsouth email address is info@soyrust.org. From this Web site you will be able to access each state's (AL, AR, LA, MO, MS and TN) soybean rust site. Also, from the Midsouth Web site you will be able to monitor USDA's soybean rust information scouting site and contact information for each state. Each state's site will provide background information, control strategies, fungicide efficacy data and updates on sentinel plantings.

To access the Mississippi Soybean Rust web site directly please go to msucares.com/crops/soybeans/rust/index.html. We also may be contacted via email at soybeanrust@ext.msstate.edu.

Information web site address and email addresses to remember:

Midsouth:
www. soyrust.org *(web site)*
info@soyrust.com *(email)*

Mississippi
msucares.com/crops/soybeans/rust/ *(web site)*
soybeanrust@ext.msstate.edu *(email)*

USDA Soybean Rust Scouting Information
www.sbrusa.net/

Information provided by a Midsouth rust proposal, *Emergency Regional Project concerning Asian Soybean Rust in 2005.*

Forage
By Dr. Richard Watson

Bermudagrass is a warm-season perennial grass that, unlike the name suggests, actually originates from Southeastern Africa. Bermudagrass is very productive from May through September throughout most of Mississippi, and is very tolerant of drought conditions.

Due to its good yield and persistence in the Mississippi environment, bermudagrass has become the most widespread and commonly used forage species. Conservative estimates put the bermudagrass crop size at around 3 million acres, which easily makes it the largest crop in the state (on an acreage basis).

Choosing a bermudagrass variety
Since the pioneering work of Dr Glen Burton at the University of Georgia, who developed and introduced the first hybrid bermudagrass varieties to the market, there has been an explosion of new varieties. These include both hybrids and "seeded" varieties.

I am going to avoid trying to explain the pros and cons of different varieties in this article (especially given that in may cases I am unable to), but I will venture to discuss the various pros and cons of seeded versus hybrid bermudagrasses. As a disclaimer, I would like to state that the generalizations I use in explaining these differences are just that, and there are always exceptions to the rule. Now that I have that out of the way, I can begin to generalize.

Seeded vs Hybrid Bermudagrass
Aside form the obvious differences of hybrid bermudagrass requiring vegetative propagation, due to little or no

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viable seed, whereas seeded types can be directly grown from seed, there are some notable differences in growth habit. In order to explain these further, I need to define what a "seeded" bermudagrass variety is. Common bermudagrass is the most popular seeded bermudagrass and forms the basis of many seed blends that are then sold as seeded "varieties". There are also true varieties that are the result of selection and breeding work to improve specific agronomic traits. It is important to understand the difference as something that may have a "variety" name may, in fact, be a blend of common and giant type bermudagrass, and a not a true pure variety as such. This is not to say that there is necessarily anything fundamentally wrong with these blends, in fact many of them do very well in the MSU variety tests each year. One criticism I have heard about these varieties/ blends, is that they "revert back to common". This is not surprising given the nature of blends. In this situation, it is not a case of the variety suddenly, or even gradually, turning into common bermudagrass, rather it is the common bermudagrass already present in the blend gradually replacing the giant type, due to its greater persistence. Where you have a true variety you will not experience any "reverting back to common", as there was no common in the seed mix to provide a source. Now that I have completely muddied the water, I will try to compare these seeded bermudagrasses to their hybrid cousins.

In general, hybrid bermudagrass varieties will achieve greater yields than the seeded types, but need a greater level of fertilization to achieve these yields. Irrespective of type, bermudagrass needs about 40 units of Nitrogen, 10 units of Phosphate, and 45 units of Potassium for every ton of production. So if you have a hybrid bermudagrass with a greater yield potential, you will need to apply higher rates of fertilizer to realize this potential. Recent advances in seeded bermudagrass have pushed their yield potential towards the hybrids, and even some common ecotypes can achieve yield close to the hybrids when fertilized at high rates. Therefore, yield alone may not be a good enough reason for choosing a hybrid type over a seeded type.

Table 1. Annual yield (3-year average) comparison of seeded vs Hybrid bermudagrass in the variety tests at MSU, Starkville, MS.

	Yield (lb/A)		Yield (lb/A)
Hybrid Bermudagrass	**9145**	**Seeded Bermudagrass**	**11458**

Note: Yield results can differ from location to location in the state.

The hybrid bermudagrasses tend to have a longer growth season than common, and many of the seeded blends that have significant levels of common in them. This longer growth season is, in part, responsible for the greater annual yield potential. The upside of a longer growth season is that your forage supply is more evenly distributed for grazing. Hybrid bermudagrass also tends to have a more open growth habit, which can make it more suitable as a companion species for other forage species, such as clover.

The downside of hybrid bermudagrass it that the longer growth into the fall can delay the establishment of overseeded cool season annuals, such as ryegrass. In addition, the longer growth season of many hybrids, Tifton 44 is an exception to this, can make them less tolerant of cold winters and susceptible to stand loss where long periods of freezing weather are common. Hybrids are also generally less tolerant of close continuous grazing so they require some grazing management to ensure long-term persistence of the stand.

Bermudagrass establishment

Whether sprigging a hybrid or sowing a seeded type, good seedbed preparation is vital for establishment success. The ground should be broken up and worked to a firm seedbed to ensure that the seed or sprigs are planted at the appropriate depth. Seeded types should be planted at a rate of 5-10 lb/A (hulled seed) at 0-1/4" deep during spring or early summer. Sprigs should be planted at >20 bu/A at 1-3" deep during the spring. Sprigs stand a better chance of survival when the weather is cooler. A pre-emergence herbicide (diuron at 0.8- 2.4 lb/A) can be applied to reduce any early competition from weeds.

Failure of sprigged bermudagrass most commonly occurs because one or more of the following factors: Planting when there is inadequate moisture; Using poor quality springs (usually dried out); Planting too few sprigs; Covering sprigs too deeply; Failing to firm soil around sprigs; Failing to control weeds (Source: Southern Forages 3rd Edition 2002).

In many cases, sprigging is done by contract sprigging operators who have a lot of experience and help ensure the best chance of success.

Fertility management of bermudagrass

Bermudagrass grows best on moderate to free-draining soils of medium to high fertility, but can be found growing on practically all soil types in MS. Like all summer grasses, bermudagrass is very responsive to nitrogen (N)

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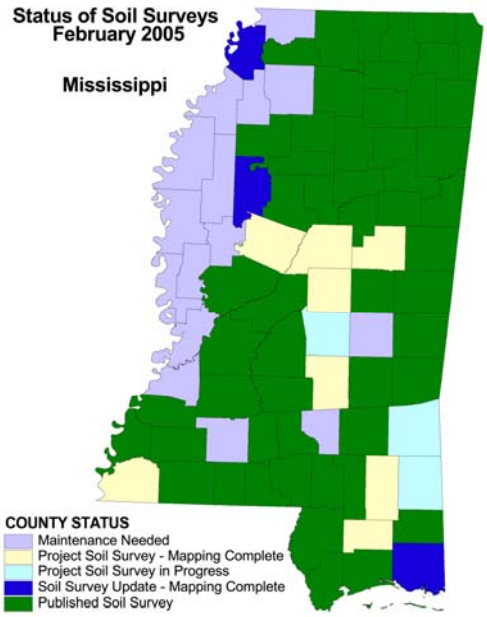
fertilization. What is probably not as well known, it that bermudagrass will use as much potassium (K) as N, so fertilization management should account for this. Low K is one of the major reasons for stand decline in bermudagrass pastures and hayfields. Regular soil testing (every 2-3 years for grazed pastures and every year for hay fields) will help you identify and address all fertility requirements. One of the best times to amend fertility of pastures and hay fields is at establishment when lime and fertilizers can be incorporated into the soil. Nitrogen applications at establishment should be limited to no more than 30 units N/A to avoid stimulating weed growth. Additional 30-50 units N/A applications can be made 4-6 weeks after establishment and at monthly intervals (after each cutting for hay fields) until the end of the growth season. Applications of N after August should be avoided, as this may contribute to winter damage.

Summary

There are many different varieties of both hybrid and seeded bermudagrass currently available. Care should be taken to choose a variety that will perform to your requirement in your environment. The Mississippi State University trials can be a quick reference guide to help make these choices, however, further inquiries may need to be made to determine overall suitability, as yield alone can be misleading. And remember, there is no substitute for good forage management.

For more help and information with selecting bermudagrass, contact your local county extension office.

Soil and Nutrient Management
By Dr. Larry Oldham



Finding fundamental soils information is more user friendly than ever. We tell people to learn as much about their soils as possible, but do not always tell them how. The Soil Survey Division of the Natural Resource Conservation Service performs an amazing job of inventorying the soil resource.

Mississippi's Soil Survey program has two major areas of operation production: soil survey and technical soil services. Quality assurance, and technical assistance for Mississippi's soil survey program are provided by Major Land Resource Area (MLRA) offices. The Major Land Resource offices for Mississippi are MLRA Region #15, Auburn, AL and MLRA Region #16, Little Rock, AR.

Fifty-one counties in eastern Mississippi are in MLRA 15; the western 31 counties are in MLRA 16. The MLRA's are separated according to geographically associated land resources units that are characterized through patterns of soils, geology, climate, water resources and land uses on large scales (1000's of acres).

To the left you will find a map illustrating the status of soil surveys for each county. Some need updating, and that process is underway. If the county soil survey is up to date, and has been published, contact the local NRCS office about obtaining one.

Often there are questions involving one of the over 400 soil series mapped in Mississippi. The soil series is the lowest category of the national soil classification system. The name of a soil series is the common reference term, used to name soil map units. Soil series are the most homogenous classes in the system of taxonomy.

The Official Soil Series Descriptions (OSD) is a national collection of more than 20,000 detailed soil series descriptions, covering the United States, Territories, Commonwealths, and Island Nations served by USDA-NRCS. The descriptions, in a text format, serve as a national standard.

They serve mainly as specification for identifying and classifying soils. The descriptions contain soil properties

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that define the soil series, distinguish it from other soil series, serve as the basis for the placement of that soil series in the soil family, and provide a record of soil properties needed to prepare soil interpretations.

When I have interpretation questions about soil series, I go to http://ortho.ftw.nrcs.usda.gov/cgi-bin/osd/osdname.cgi and search by the name. This returns the information described above quickly and in a standardized format.

Some important series for agronomy in the Delta include Dowling, Sharkey, Tunica, Commerce, Dubbs, Dundee, and Bosket. In south central Mississippi, important series include Savannah, Ora, Ruston, Prentiss, Smithdale, and McLaurin. Blackland Prairie soils include Okolona, Houston, and Brooksville. It is possible for a soil scientist to get lost in querying this database for days.

Again, I encourage you to learn as much about your soils as possible. This can only help you manage them for whatever purpose: crops, lawns, gardens, construction, or wildlife plots.

Rice
By Dr. Nathan Buehring

First, I would like to clarify a few comments that were made in last month's Agronomy Notes on Dynasty seed treatments and seeding rates. I have received more phone calls about using Dynasty as a seed treatment in rice. Syngenta is marketing Dynasty in a Rice Pack with Apron XL LS and Maxim. Therefore, if you are using the Dynasty Rice Pack, you will be protected against *Pythium*. My comments were referring to Dynasty alone. Once again, if I were going to spend the money to treat my rice seed, I would spend it on Allegiance FL or Apron XL LS and Gibberellic Acid.

Other questions I have received were focused on seeding rates, mainly in response to the table I presented last week. The main purpose of that table was to show that if you have a sub-optimal stand (<12 plants/ft^2), you can still produce good yielding rice as long as it is uniform. I would rather keep a uniform stand of 7 plants/ft^2 than terminate the stand and replant. By the time you terminate the stand and replant, it would probably be past the optimum time to plant rice and the yields would probably not change much than from just sticking with the sub-optimal stand. Also when replanting, there is the added cost of diesel fuel and seed to consider as well.

Yes, we can produce high yields with lower seeding rates. This has been shown in hybrids as well as seed production. Right now there is not a lot of money to be saved from lower seeding rates on conventional varieties. As the technology increases in rice seed, as in other crops, our data shows that we can use lower seeding rates if there is more money to be saved.

If you are still planting above 100 lbs/A of rice seed, I would encourage you to lower the seeding rate. A lower seeding rate could reduce the potential for diseases such as sheath blight. Thinner stands can increase air flow through the canopy, which create an environment that is less conducive for pathogens. Also, a lower seeding rate could reduce the potential for lodging, which is especially true with taller varieties such as Francis and Wells. With these varieties, I have been suggesting a seeding rate between 60 and 80 lbs/A, depending on the condition of the seedbed and planting date.

I know with the recent increase in diesel fuel cost, a lot of you are wanting to cut cost in seedbed preparation. I would rather you spend the money on a couple of trips over with a tractor getting the ground smooth, than planting in a less than perfect seedbed. Remember good rice starts with a good stand.

Command has been another topic of interest recently. Many of you have made comments that we cannot get the control that Dr. Ford Baldwin talks about in the Delta Farm Press. I think there are two reasons for that. Most of the rice in Arkansas is grown on Silt Loam soils. By the time they finish planting and rolling, it is generally flat as a table top. Therefore, when the Command application is made, it acts as a protective barrier against grass weeds. On our clay soils, it is harder for Command to be a protective barrier. Clay soils can shrink, swell, and crack which can lead to emerging grasses through the Command application.

The other reason I believe we are not seeing season long control is because of our stale-seedbed and no-till production systems. Dr. Bob Scott with the University of Arkansas had some interesting data regarding the effect

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of tillage and soybean residue on the performance of Command. Basically his data showed that Command did not perform as well in a no-till system than in a conventional system. This suggests to me that the residue on the soil surface, either left by the previous crop or by dead winter weeds, could affect the performance of Command.

I am not knocking Command; it has done a lot for rice weed control, especially sprangletop. I am just trying to give some explanation on as to why I think we are not seeing season long grass control.

If you have any questions or comments, please do not hesitate to call me at Delta Research and Extension Center. Also, if you are interested in being on my email list for any alerts on Blast, Section 24C labels and Section 18 labels, please send your email address to nathanb@ext.msstate.edu. I will be sending out regular alerts through the mail, as done in previous years. However, this information can take up to a week to get to you. I figured email would be the quickest and best way to get information out to you in timely fashion.

Corn, Grain Sorghum and Wheat
By Dr. Erick Larson

Nitrogen rate recommendation – This is the second year MSU has implemented a new, more conservative nitrogen rate recommendation for use on corn. This new recommendation results from several years of research evaluating nitrogen rates in high-yielding irrigated environments and is not influenced by high nitrogen prices. Growers should apply 1.3 pounds of nitrogen per bushel of yield goal. Nitrogen recommendations for corn in the mid-south are based entirely upon corn yield goal, since little if any nitrogen carryover lasts through the winter due to our wet, relatively warm climate, compared to the midwest.

Nitrogen sources and application - Utilizing an appropriate nitrogen source and application method may influence corn grain yield more than the actual applied nitrogen rate. No-tillage research studies in Missouri and Tennessee show N-sol and urea (urea-containing nitrogen sources) broadcast on the soil surface reduced corn yield potential 9-23% compared to ammonium nitrate broadcast, N-sol injected, or anhydrous ammonia injected. This can reduce economic returns from $25-$90 per acre compared to ammonium nitrate or N-sol injected. The urea-containing nitrogen sources reduce corn yield potential because they are subject to volatilization loss when applied to the soil surface. Surface-applied urea sources readily volatilize when substantial crop residue or vegetation is present on the soil surface, temperatures exceed 55 degrees F, and when rates exceed 100 lbs. N per acre, until rainfall incorporates the nitrogen. Thus, corn producers should minimize or eliminate surface application of N-sol or urea in their fertility program.

Nitrogen application timing - Split application of nitrogen fertilizer generally improves corn nitrogen use efficiency. Corn extracts less than 15% of its seasonal nitrogen uptake before rapid vegetative growth begins. Maximum nitrogen use rate occurs just prior to pollination. During early growth stages, considerable nitrogen may be lost due to denitrification and leaching. Therefore, the bulk of a split nitrogen application should be delayed until just prior to rapid vegetative growth. This growth period begins at the V10 growth stage (10th leaf stage) which occurs about 40 days after plant emergence or when plants are about 30 inches tall. The normal nitrogen recommendation specifies applying 1/3 of the total N at planting and applying the remaining N about 30 days later.

Scout fields - Scout corn for stand, weed and insect problems every 2 to 3 days until corn is about 12 inches tall, and be prepared to take control measures. Insects or weeds may quickly ruin a good stand or become too developed to control. Timely problem identification allows specific treatment selection and application timing, which likely will improve control and lower expenses.

Why is my corn not growing off like it should? – Slow growth during early growth stages is often a result of insufficient fertility, combined with sparse root growth. This slow growth rarely results from the nutrient most associated with poor growth – nitrogen. Early season growth is rarely limited by nitrogen availability because corn demand for nitrogen during early growth stages is low (less than 30 lbs./a. when corn is less than 30-inches) and nitrogen mobility in the soil solution is relatively high. The most prevalent fertility problems limiting early corn growth in Mississippi are low soil pH and/or inadequate levels of phosphorus, potassium, magnesium or zinc. These problems can be diagnosed by analyzing

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Corn, Grain Sorghum and Wheat, Continued from page 6

soil and plant samples from specific stunted areas. Supplemental fertilizer application will likely provide an economic yield response, particularly if the problem is addressed before corn enters the rapid vegetative growth stages.

GRAIN SORGHUM

Don't plant too early - Grain sorghum will not germinate at soil temperatures less than 65 degrees F, which will greatly increase likelihood of stand failure. Furthermore, sorghum does not possess as much seed vigor as you may be accustomed to with corn. Thus, the optimum planting dates for sorghum are similar to those for cotton: April 20 to May 15. Optimum seeding depth is 1 ¼ - 1½", rather than a shallower depth at which cotton and soybeans are planted.

Don't plant too much seed - A final plant population ranging from 40,000 to 70,000 plants per acre should produce optimum grain sorghum grain yields grown in dryland culture. Grain sorghum has tremendous ability to increase yield potential if given favorable environmental conditions, especially if plants are spaced uniformly. However, excessive stands compound drought stress, lower stalk quality and increase disease likelihood. Sorghum seeding rate should exceed the population goal by 10 to 20% depending upon seedbed conditions and planting date. This over-planting rate is relatively high because sorghum's seedling vigor is only moderate, compared to corn.

WHEAT

Scout for rust - Southern states, including Louisiana, Texas, Mississippi and Arkansas, have been reporting higher than normal infestations of Stripe rust and Leaf rust in wheat so far this spring. Thus, growers should closely monitor wheat health and be prepared to make fungicide applications, during the next several weeks particularly in susceptible varieties with good yield potential.

Cotton
By Dr. Tom Barber

It appears that Mississippi cotton acreage will increase in 2005 up towards 1.2 million. The total acreage is still uncertain but could potentially be more than expected if spring rains continue to hamper corn planting. Even though the weather seems to be working against us in many areas of the state, it is important not to get too anxious and plant cotton in poor conditions. With the cost of seed, technology and fuel prices continuing to increase, it is important to plant in the most optimal conditions possible. Remember, the optimal window for planting cotton in Mississippi ranges from April 15th to May 15th.

The best planting conditions for cotton are warm soil beds, 68ºF in the top 2 inches, measured at 8 a.m., for 2 to 3 consecutive days. A warm seed bed is the best single fungicide treatment available. Also, a good 5-day weather forecast is essential for germination, emergence and survival of the young cotton seedling. Planters should be adjusted to deliver seeds at a depth from 0.75 to 1.25 inches, depending on soil type and moisture availability. Good seed-to-soil contact is critical and planters should be adjusted to ensure consistent closure of the seed furrow. The optimum plant population is 3 live plants per foot of row on 38 in rows. Always remember to check the cool germ of the seed lot you are planting and adjust your seeding rates accordingly to get the optimum live plant population.

Watch rotational restrictions when planting behind other crops. Some cotton in 2005 may be following soybeans from 2004. In these particular situations make sure no herbicides were applied to the 2004 bean crop that have long lasting residual effects against cotton. Some herbicides that can cause injury from soybean carryover are Canopy XL, Pursuit, Python Scepter and Squadron. Most of these herbicides require an 18 month rotation interval and will cause injury and/or stand failure if cotton is planted where these were applied. Also pay close attention to corn herbicides utilized in corn/cotton rotations. Rotational-crop restrictions may be found on product labels, or for your convenience, this information is included within each crop section of the 2005 Weed Control Guidelines for Mississippi, Extension/MAFES Publication 1532.

Pre-emerge herbicides offer a lot of insurance, especially in a wet season. With the current rain patterns, I would strongly consider the use of a residual herbicide either at planting or with the first application of glyphosate. To maximize cotton yield potential, research has shown that reducing weed competition the first six weeks of production is essential. This can most easily be accomplished with a residual herbicide. Close consideration of past weed histories is important in deciding which residual to use. Pre-emerge herbicides like Cotoran will provide excellent broad-spectrum control of most broadleaf and grass weeds. While Prowl and Dual herbicides focus mainly on grass and piqweeds (small seeded broleaves).

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Whichever residual you choose will give you added protection if the weather will not allow a glyphosate spray in the 4 leaf application window. For more information refer to the 2005 Weed Control Guidelines for Mississippi, extension/MAFES Publication 1532.

Always use common sense during planting season and don't get in too big of a hurry. Remember the 3 keys to a good cotton crop 1) Drainage, 2) Drainage, and 3) Drainage. Establish water furrows before planting and maintain these, as well as tail ditches, after planting. Always remember timing is critical. The earlier you can get in the field and get planted, the better chance you will have to get the crop out in the fall, before the rain or a hurricane. But if you are not patient and plant into poor conditions, by the time you get back into the field to replant, you have lost yield potential and valuable time.

Plant and Soil Sciences
Box 9555
Mississippi State, MS 39762
(662) 325-2701

Dr. Michael Collins
Department Head

This issue of the Agronomy notes was edited by Emily Dabney.

Calendar of Events

APRIL

12-Integrated Pest Management, Calhoun County Extension Office, Pittsboro, Mississippi, 9:00 a.m.-noon. Focus: Cotton, Soybeans and Sweet Potato. For more information contact Bill Burdine (662) 456-4269.

13-Integrated Pest Management, Clay County Extension Office, West Point, Mississippi, 9:00 a.m.-noon. Focus: Cotton and Soybeans. For More information contact Billy Burdine (662) 456-4269.

JUNE

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

JULY

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.