

Corn and Grain Sorghum

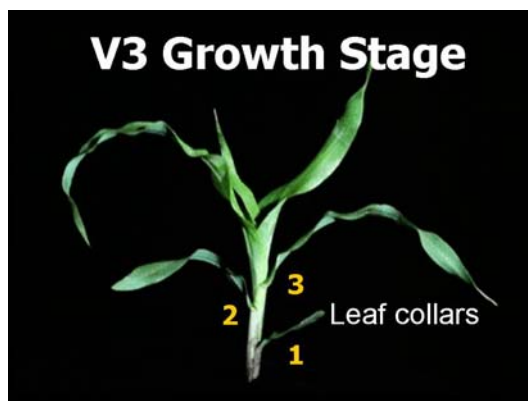
by Dr. Erick Larson

Agronomy Notes

Will corn recover from freeze damage?

The freezing temperatures which occurred during Easter weekend hopefully will only produce minor to inconsequential damage to most of our corn crop, although nothing is certain. Although emerged corn foliage was completely burnt by frost in northern areas of the state, which will temporarily produce the visually striking appearance of “dead plants” – young plants have the capability to fully recover, if mother nature cooperates. This is because the vital growing point of young corn plants remains under the soil surface and generally protected, until corn reaches the V6 growth stage (about 12 inches tall – refer to Figures 1 and 2). Thus, freeze-damaged corn plants should quickly recover, given favorable growing conditions (warm temperatures and adequate, but not excessive moisture). Conversely, some plants may die, if unfavorable weather persists and/or diseases flourish. The recoverability potential of smaller or younger plants are generally better than larger or older plants, because energy reserves in the seed are greater, than that of older plants. Of course, the more undamaged foliage capable of producing energy via photosynthesis, remaining after a marginal freeze, the greater the recoverability.

Figure 1. V3 growth stage corn plant. V stages are assigned based upon number of completely emerged leaves with leaf collars present. This does not include the leaves in the whorl.



Assessing Corn Freeze Injury - Assessing corn recovery will require monitoring plants daily for new leaf growth at least a week or more after the last freeze event.

Newly emerging leaves often experience some initial resistance from dead leaves stuck in the whorl, twisting or bending leaves as they attempt to unfurl. The growing point may be evaluated by splitting the stem and observing the pyramid-shaped stalk tissue stacked within the stem. Crop yield reduction will be primarily dependent upon the degree of stand reduction resulting from injured plants which die from starvation and/or secondary pathogens infecting damaged tissue.

Short-term corn management - It would be prudent to delay application of most any management input until the corn fully recovers from the freeze damage or injury is not apparent. This would include herbicides and fertilizer, as well as supplemental irrigation. Water demand for corn with no living leaf tissue is minimal and irrigation over-application, resulting in saturated soils, could unnecessarily intensify an already critical situation.

Don't plant Sorghum too early - Grain sorghum will not germinate at soil temperatures less than 65 degrees F. Thus, planting before minimal soil temperatures are stabilized above this threshold 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 seeded.

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 presented favorable environmental conditions, especially if plants are spaced uniform. However, excessive stands compound drought stress, reduce stalk/plant health and increase disease likelihood. Sorghum seeding rate should exceed the population goal by 10 to 20% depending upon seedbed conditions.

Inside this issue:

Corn	1
Wheat	2
Cotton	3-5
Weed Management	5
Forages	6
Peanuts	7
Soil and Nutrients	8

Wheat

by Dr. Erick Larson

Wheat Freeze Injury – Temperatures sustained Easter weekend were not quite as cold as predicted, particularly in the central Mississippi Delta and areas south. However, severe wheat injury may be likely in the north Delta, and particularly in northeast Mississippi, where temperatures were coldest. Wheat sensitivity to freezing temperatures varies depending upon crop growth stage, and unfortunately, early heading stages (the current age of much of our crop) are extremely sensitive to freezing temperatures. Well above normal March temperatures promoted wheat heading about two weeks earlier than normal this season. Wheat is most sensitive to freezing temperatures while flowering, about a week after head emergence. Injury can be expected from temperatures around 30 degrees F on heading wheat or around 28 degrees F on wheat in the boot stage, where heads are nearly ready to emerge from within the upper leaf sheath. The extent of freeze injury will vary depending upon actual temperature in the crop canopy and the duration of freezing temperatures, which can also be influenced somewhat by topography, and wind.

Assessing Freeze Injury - The male reproductive parts (anthers) are particularly sensitive to freeze damage (Figure 1). Since wheat is primarily self-pollinated, dead anthers may sterilize spikelets (the part that develops an individual kernel), resulting in complete or partial head sterility and severe grain yield loss. Injured anthers will appear desiccated or shriveled, and white, instead of their normal yellow-green color (Figure 2). The tissue will not turn whitish-brown until about 3 days after the freeze. Using hand lens is necessary to detect this injury.

Figure 1. Healthy, green, trilobed anthers. Stigmas are white and feathery.



Figure 2. Injured anthers appear twisted, shriveled and white three or more days after freeze-damage.



Freeze injury may be diagnosed by the presence of initially water-soaked, discolored heads which may initially appear yellow, before turning white or light brown as the tissue dries. Wheat varieties possessing awns or beards are also quite vulnerable and may be white and/or misshapen.

Figure 3. Yellow, water-soaked appearance of freeze-damaged head.



Cotton

by Dr. Tom Barber

Mississippi Ag Report

Volume 07-08

Released: April 3, 2007

Highlights

*Producers in the State intend to plant the largest crop of corn since 1960 when 1.12 million acres were planted.

*Mississippi cotton farmers are expected to plant only 740,000 acres, the lowest planted acreage since the 1983 record low of 687,000 acres.

1. Intended plantings in 2007 as indicated by reports from farmers.
2. Intended area harvested 2007 as indicated by reports from farmers.
3. Winter Wheat was planted last fall.
4. Estimates began in 2005.

March 1, 2007, Crop Acreage Intentions, with Comparisons

Mississippi and United States

Crop	Area Planted	To be planted	2007/2006
	2006	2007	
	1,000 Acres		Percent
Mississippi			
Soybean	1,670	1,550	93
All Cotton	1,230	740	63
All Rice	190	180	95
Sorghum,	15	100	667
Corn, All Purposes	340	950	279
All Hay 2	780	800	103
Winter Wheat 3	85	350	412
Sweet potatoes	18.0	17.0	94
Peanuts 4	17.0	17.0	100
United States			
Soybeans	75,522	67,140	89
All Cotton	15,274	12,147	80
All Rice	2,838	2,644	93
Sorghum,	6,522	7,109	109
Corn, All Purposes	78,327	90,454	115
All Hay 2	60,807	63,056	104
Winter Wheat 3	40,575	44,505	110
Sweet potatoes	95.6	92.9	97
Peanuts	1,243.0	1,197.0	96

Prospective Plantings Agricultural Statistics Board
March 2007, NASS, USDA

Cotton continued...

by Dr. Tom Barber

Cotton Acreage Reduction—The number one question repeated to me several times during the winter meetings was “How many acres of cotton will Mississippi plant this year?” This was quickly followed by jokes about job security and questions regarding what a cotton specialist would do with that much free time on his hands. The predicted planting forecasts released by the USDA at the end of March have revealed what we all knew to be true for the 2007 season. The prediction thus far is that Mississippi cotton acres will fall 40%, from 1.2 million last year to 740,000 this season. If this number holds true it will be the second lowest acreage planted to cotton in Mississippi since 1983. In 1983 only 687,000 acres were planted to cotton in Mississippi. The 2007 cotton acreage is still not decided. Recent rainfall, although fairly scattered could increase corn and soybean acreage because market prices continue to favor those crops over cotton. If this trend continues, there is a good chance that Mississippi cotton acreage will drop below the all time record low of 687,000. The average 5 and 10 year acreage in Mississippi exceeds 1 million. Many have voiced concerns, especially in small delta communities about the infrastructure that may be affected because of this drop in cotton acres. No doubt ginneries will most likely be impacted with the drastic reduction in acres, and many will not open the doors for business this season. Others that will be affected in some shape, form or fashion will be seed and chemical dealers, agriculture consultants, commercial applicators by air and ground, farm laborers, and small communities that thrive economically around large cotton acreage.

Cotton Planting Checklist -

Check soil temperature. The general Extension recommendation is to wait until the top two inches of soil reaches 68F with a good 5 day forecast (accumulation of 50-60 DD60's and no heavy storm systems). The hard part is determining when to start. The long term average indicates that the last two weeks of April and the first two weeks of May are perhaps the most favorable for planting cotton.

Check soil moisture. Moisture seems to be a big one this year over much of the state. Cotton is not like corn and will not emerge from depths up to 3 inches. Cotton should be planted 1.5 inches deep max. Chasing moisture deeper than that will most likely lead to skimpy or uneven stands that will be tougher to manage and may have to be re-planted.

5 day forecast. Check high and low temperatures in the next 5 days after planting. Average DD60 accumulation

should be close to 50 for those 5 days following planting.

30 Year Seven Day Average DD60 Accumulation: Stoneville, MS

Apr 9-15: 28.7

Apr 16-22: 45.6

Apr 23-29: 48.4

Apr 30-May 6 53.8

May 7 - 13: 71

May 13- 20: 85.2

Seed Quality. The standard and cool germ test can be an accurate measurement of seed quality. The standard germ should be 80% or better and the cool germ 65% or better. The cool germ test will reflect more accurately the expected emergence under cooler and wetter conditions.

Planter Calibration. Check and double check the planter to make sure you are calibrated to the seed population you want to deliver in the field. Plant for a final plant population of no less than 3 live plants per foot of row on 38, 40 in. rows and 2 plants per foot on narrow 30 in. rows.

Seeds/ Row ft.	Seeds per acre			
	15" rows	30" rows	38-in rows	40-in Rows
1	34,848	17,424	13,756	13,068
1.5	52,272	26,136	20,634	19,602
2	69,696	34,848	27,512	26,136
2.5	87,120	43,560	34,389	32,670
3	104,544	52,272	41,267	39,204
3.5	121,968	60,984	48,145	45,738
4	139,392	69,696	55,023	52,272
4.5	156,816	78,408	61,901	58,806
5	174,240	87,120	68,779	65,340

Cotton continued...

by Dr. Tom Barber

Seed Protection. Cool and wet soil conditions provide excellent opportunities for soil-borne diseases such as Pythium, Phytophthora and Rhizoctonia to destroy a cotton stand. An emerged cotton seedling has a better chance of surviving adverse weather (cool front with an associated shower) than a sprouting seed. Remember - common sense must apply - look at the soil and weather and not be handcuffed to a particular calendar date. It is important, especially the earlier you plant to utilize some type of fungicide treatment.

In summary, this will be my last contribution to the Agronomy Notes Newsletter. I would like to thank all of you for allowing me to serve as your Extension Cotton Specialist in Mississippi. As many of you already know, I have accepted the position of Cotton Specialist with the University of Arkansas and will begin work there soon. Those of you that know me well understand that Arkansas is my home state and getting my children back to where they can experience their grandparents means a lot to me. It was not an easy decision, I love working in Mississippi and will argue with anyone that some of the friendliest, most generous people in this world reside in the great state of Mississippi. I have valued my time here and have made many friends, who have made this job easy and fun. Thank you again for this opportunity and may God continue to bless each of you during the 2007 growing season.

Maverick Section 18 Granted for 2007 Season

by Dr. John Byrd

EPA has again granted a Section 18 label to use Maverick (sulfosulfuron) herbicide in bermudagrass and bahiagrass pastures and hayfields to control johnsongrass. The use rate of Maverick is 1.33 oz product per acre with 1 quart nonionic surfactant per 100 gallons spray. Two applications per year can be made at least 40 days apart, as long as the total rate used per acre per growing season does not exceed 2.66 oz per acre. Treated fields may not be grazed or harvested for hay within 14 days after an application. Maverick cannot be applied by air and treated sites can only be planted in wheat if a rotational crop is desired. Lastly, no more than 10,000 acres can be treated with Maverick.

Sulfosulfuron has been used for some time on highway rights of way for johnsongrass control. It is probably the most effective herbicide against johnsongrass currently on the market. In some research plots, good johnsongrass control has been seen the season of the application plus 2 additional seasons after a single Maverick treatment. Unfortunately, there is no activity on other grasses or broad-leaf weeds, except the sedges. Maverick has activity on a variety of sedge species. Forage producers with a johnsongrass problem will be excited about this new herbicide.

Forages

by Dr. David Lang

Bermudagrass Planting

Bermudagrass continues to be the mainstay of summer forages in the southeast USA. It is highly productive if it receives sufficient rainfall and adequate fertilizer. Most varieties are highly tolerant of close grazing and all types are suitable for hay. There are now some good seeded types of bermudagrass available in addition to the 'Common' variety. 'Pasto Rico' and 'Tierra Verde' are old but good mixtures of common and giant bermudagrass. The giant type in these mixtures are not very winter hardy and will winterkill when temperatures drop into the teens, but common will survive and you'll be left with a field of common bermudagrass. 'Cheyenne' provides for quick cover and good yields. It's included in the 'Ranchero Frio' blend that includes some improved common and giant types of seeded bermudagrass. It's not available in 2007 as a stand alone variety due to a seed shortage and will be replaced by an improved Cheyenne II in the future. 'Texas Tough' also looks promising. Seeding rates for bermudagrass range from 5 to 10 lbs per acre. It's best established on a smooth well prepared seedbed with cultipack seeder. Alternatively it can broadcast and cultipacked or spread on the surface with a grain drill and cultipacked. It's important to plant bermudagrass shallow as its seed are very tiny. Rolling or cutipacking is also critical to restore soil water seed contact. There are no legally labeled herbicides to control grassy weeds in seeded bermudagrass. Broadleaf weed control is relatively easy but wait until the bermudagrass seedlings are 3-4 inches tall before applying broadleaf herbicides containing 2,4-D, banvel, picloram, etc.

Hybrid types of bermudagrass do not produce seed and must be planted from vegetative sprigs. These contain plant parts such as stems, stolons, rhizomes and roots. It's important to plant sprigs within 24 hours of digging as they will heat up like a wet bale or silage and damage viability. It's best to hire a commercial digger and sprigger who have specialized equipment to handle the heavy workload and can do the job correctly. If you do it yourself it can be successful if you have access to a manure spreader and cultipacker to firm the soil. Several good varieties are available in Mississippi including old stand bys such as 'Coastal' and 'Tifton 44'. 'Alicia' makes good looking hay and is very easy to establish but its digestibility is inherently lower than other varieties. Some good new varieties from local spriggers include 'BY101', 'Dixie' and 'Sumrall 007'. Be sure to ask if the sprigs have been certified by the Mississippi Seed Association as this will provide assurance of high quality planting material. Karmex (diuron) must be applied within a day or two of sprig-

ging to help suppress germination of annual weeds. Weed control on all forage bermudagrasses is quite limited so the best weed control is a strong stand that will help to exclude many weeds.

A healthy stand of bermudagrass can be achieved by using high quality planting material, fertilizer and lime according to soil test recommendations. Soil potassium (K) otherwise known as potash needs to be in the medium to high range on the soil test to assure stand longevity and soil pH needs to be greater than 5.8. Bermudagrass needs and will respond to as much nitrogen fertilizer as you can afford. Usual N rates range from 50 to 80 lbs of actual N per acre per clipping or grazing interval of 28-35 days. Clovers can help provide some of this nitrogen but broadleaf weed control becomes limited.

Forage quality of bermudagrass declines rapidly as grazing or clipping interval increases beyond 28 days. Young vegetative bermudagrass has a digestibility level greater than 60%, but declines to less than 45% at 6 weeks following the last clipping or grazing cycle. A digestibility level greater than 50% is generally required to meet the maintenance requirements of most livestock and a digestibility level greater than 55% is needed for productive animal gains. It's best to utilize bermudagrass more frequently rather than waiting for an impressive number of bales per acre that are low in quality. Have your hay tested for protein and digestibility. See your local county extension office for details.

Peanuts

by Michael Howell

Final checklist for planting - As we prepare for the planting season, there are several things growers should remember. First, we need to make sure that we have a good inoculation program. Remember that these inoculants are live bacteria, and need to be treated with care. Don't leave inoculants in the back of the truck to bake in the sun. Keep them in a cool place until they are ready to be applied. Read the label carefully and make sure that you are using the proper nozzles for this application. Also, remember that the inoculants cannot be mixed with community water. These water systems contain chlorine to kill bacteria in the water system. Mix inoculants only in non-chlorinated water. Only mix enough inoculant to treat the acreage you will be able to plant that day. Some of these bacteria will die if left in the tank overnight, which could lead to inoculation problems.

Plant peanuts at a depth of 1.5 to 2 inches, and plant into good soil moisture conditions to allow quick germination and seedling emergence. This is one of the best ways to reduce the risk of tomato spotted wilt virus, and ensure a good uniform stand. Planting into dry soils can also cause inoculants to die.

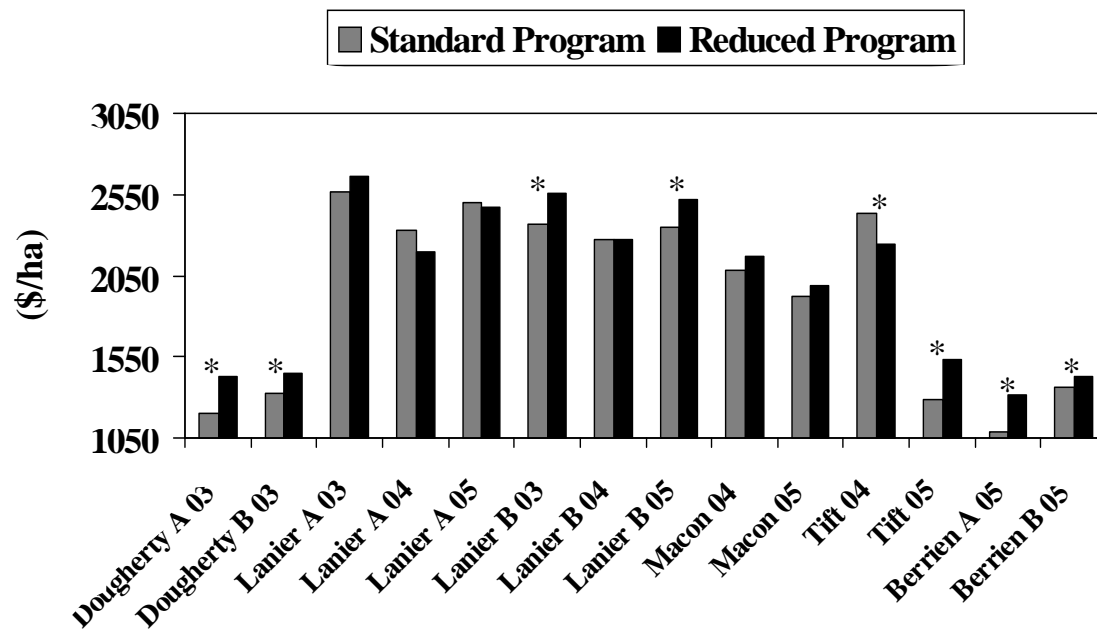
Disease Control - Many growers have been asking about the possibility of reducing fungicide applications. There are some definitely possibilities for doing this, but we need to plan these decisions now. Use the Georgia Disease Risk Index to assess the risk of disease on a

field by field basis. There are several factors that influence the risk on a particular field, including field history, planting date, and variety. After you have determined your risk, then you can plan a spray program that will best meet your needs. Data from Georgia indicates that growers who use the disease risk management plan to plan fungicide applications significantly improved profits in 7 of 14 trials (Figure 1). There were no differences in income in 6 of the trials, and in only 1 case did the standard program have significantly higher income than the reduced program.

Peanut Hot Topics Video/Conference Call

This summer, we will begin conducting Peanut Hot Topics Video/Conference calls. These will be conducted on a monthly basis to provide timely information to help growers make management decisions. These meetings will be set up so growers can watch the presentation on Interactive Video, available at every County Extension Office, or you will be able to call into a 1 800 telephone number if you are unable to attend at one of the Video Locations. These meetings will start at 7:30 AM and will conclude at than 8:00. Our first conference will be April 20. The speaker will be Dr. Marshall Lamb, Economist with USDA/ARS National Peanut Research Lab. He will speak about peanut marketing and factors affecting peanut prices. We are still trying to work out all of the details for these meetings, so check with your local county extension office for more information.

Figure 1. On-Farm Fungicide Trials Value of harvest – cost of fungicide program, Woodward et al.



Nutrient and Soil Management

by Dr. Larry Oldham

Fertilizer prices and availability have been hot topics this year. As always, phosphorus and potassium fertilization should be based on sound soil testing programs. Nitrogen management in warm, humid Mississippi should be based on solid recommendation philosophies.

Some say they want to curtail or eliminate fertilization to lower production costs: be aware that crop nutrition decisions are a form of risk analysis. Know what will happen if you cut back. One set of my field trials with corn a few years ago had a significant response to nitrogen averaged across rates, but not between rates. According to these results, lowering application rates may be acceptable; however deciding to eliminate nitrogen altogether could be disastrous.

Fertilizer efficiency is a management outcome, as plants do not discriminate about the nitrogen they use. To them a pound of nitrogen is a pound of nitrogen. The properties of different nitrogen fertilizers let us maximize their usefulness. Ammonium nitrate (33 or 34-0-0) fertilizers are very popular among Mississippi farmers, commercial vegetable growers, and home horticulturists. Ammonium nitrate is also a powerful explosive, so significant quantities are used in mining; and because it is a powerful explosive, ammonium nitrate availability to the public has been curtailed. However, other fertilizers with the same analysis are available; this alternative is often a 50-50 blend of ammonium sulfate and urea, other common nitrogen containing fertilizers.

While the blend provides the same net N content as ammonium nitrate, other factors need to be considered when using it to fertilize crops, home gardens, or lawns.

Many nitrogen fertilizers acidify soils, however ammonium sulfate has three times the acidifying capacity of ammonium nitrate. Therefore adding the alternative product to acid soils may exacerbate the situation for some time.

To illustrate the acidification difference, it takes one unit

of calcium hydroxide to neutralize the acidity of urea or ammonium nitrate, two units to neutralize one unit of diammonium phosphate (18-46-0), and three units per unit of ammonium sulfate.

The other half of the mixture requires other management considerations. Urea availability after application depends on three factors: 1) how much of the soil enzyme 'urease' is present; 2) temperature; and 3) soil water content. These are critical because urea must be converted to the ammonium ion that plants can utilize. However, in poor situations, the conversion may go to ammonia, which is not plant available and is lost to the atmosphere by a process called volatilization.

A brief summary of the chemistry is that urease must be present and the urea must be dissolved by soil water. The rate of reaction increases with higher temperatures, thus increasing potential loss due to volatilization.

When urea is incorporated, or a half-inch of rain occurs just after application, little urea source nitrogen is lost. A factor that increases potential loss is surface residue as present in conservation tillage production or forage production. Urease concentrations are higher in the residue, thus the urea conversion is more rapid. However the rate is too rapid for ammonium to diffuse away which creates a higher pH area near the surface, which then leads to faster ammonification and loss.

What does this excursion into soil fertilizer chemistry mean for management of fertilizers? Ideally urea, UAN solutions, or urea/ammonium sulfate blends should be applied when temperatures are less than 65 degrees, or rainfall is imminent. If the conditions are not 'perfect', the most efficient application method is incorporation. Otherwise, significant amounts (probably 20 to 50%) are lost to the atmosphere.

The blended 34-0-0 that I have seen has both pellet shaped and flake shaped particles that can also present some application issues. Be sure that all application equipment is properly calibrated and maintained.

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

Copyright 2007 by Mississippi State University. All rights reserved. This publication may be copied and distributed without alteration for nonprofit educational purposes provided that credit is given to the Mississippi State University Extension Service



Michael Collins