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Mississippi State University Extension Service

Agronomy Notes

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Soybeans

By Dr. Alan Blaine

The 2006 soybean crop is winding down rapidly. There was no doubt that is was a let down for most everyone statewide. Even though this was the earliest crop ever many acres went from early May until the first of August with little if any appreciable rainfall.

The closest year for comparison is 1980. The state average yield in 1980 was 14 bushels per acre. The major differences between 2006 and 1980 are basically three fold: 1.) We planted the crop later, 2.) We planted fuller maturity groups at that time, and 3.) the dry weather in 1980 did not occur as early in the growing season.

Dry weather this year has played us since the crop was planted. In 1980 the dry weather occurred from late June on. This crop has essentially deleted the profile of needed moisture by late June and none remained to help finish out the crop.

This was a perfect year for irrigation, but I feel many still failed to water correctly. Those that started and stayed on schedule will make as good a yield as ever but it will be an expensive crop. The majority of this crop needed water in late May. Keep in mind think about the needs of the crop not the time of year. If you plant early things will happen earlier. Failing to start on time or stressing the crop at anytime during the growing season will delay the maturity and decrease yields.

Insect and disease pressure has been fairly light. Bean leaf beetles, grasshoppers, and stink bugs have been a greater concern than diseases. As always pest pressure was sporadic. Every field needs to be treated as an individual. We did experience some difficulty controlling bean leaf beetles with pyrethroids for whatever the reason. Dr. Catchot did some screening work and found that if a mixed population exists (bean leaf beetles and stinkbugs) .75 pounds of Acephate was a good choice.

The same weather that brought little if any rainfall contributed to essentially no disease pressure. Rust was found on August 1, 2006, in South Mississippi. However, given the current weather scenario, the stage of the majority of the crop, and the amount of inoculum found we feel it will not be a problem this growing season. Acreage planted after mid-May could be affected but whether or not you attempt to protect the crop will need to be based on yield potential and the amount of inoculum found from this point on.

If a fungicide application is warranted what you use will depend on what is in the field. However, even if rust increases a close field evaluation is needed because dry weather these limited the potential of this crop.

Questions have been coming in regarding the use of desiccants. The extended dry weather has made fields dry down a little more uniformly. Refrain from spraying too early. If a field has green areas, harvest the mature areas and allow these other areas to further mature. As hot as it is Gramoxone is probably all that is needed. Sodium chlorate will help desiccate green leaves and grasses but is not as effective on vines and green stems. A Gramoxone application in hot conditions works pretty fast and slightly increasing the rate, aids in control. Wait until at least 80 percent of the pods are a mature color/dry. Premature defoliation will reduce yields.

If you have any questions or concerns feel free to contact me at anytime.

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Corn and Wheat
By Dr. Erick Larson

Stress necessitates prompt harvest – Widespread drought stress around the state hastened corn maturity substantially this season, causing leaves to die prematurely in severely stricken areas. This limits and/or ceases energy production via photosynthesis, causing plants to mobilize energy from the stalk to finish filling kernels as well as possible. This cannibalization of energy reserves will weaken stalk strength and may promote stalk rot development. This degradation of stalk strength can promote lodging, particularly if the corn crop is not harvested promptly. In fact, some corn fields have already had the stalks collapse above the ear from recent thundershowers. Thus, growers should harvest corn fields as soon as possible.

Grain moisture dockage - Corn may be harvested any time after grain reaches physiological maturity, which occurs at around 30% moisture. However, corn may not be safely stored until considerable moisture loss occurs. Thus, grain elevators discount wet corn to account for drying expenses and moisture weight loss during drying. Moisture dockage schedules between elevators may vary significantly, so thoroughly compare rates. Most schedules discount about 2.5% per each percent moisture above the standard, and may increase as moisture content rises. Water evaporated during drying (shrinkage) accounts for 1.18% of the dockage per each percent moisture. The producer loses this weight regardless of whether they sell wet grain to the elevator, dry it mechanically or let the grain field dry. Thus, a producer should subtract this value from the dockage rate to show their realized or "actual" dockage.

Harvest losses - Harvest losses are just as important as moisture dockage rate in evaluating your harvest timing decision. The longer corn stays in the field, the greater the likelihood of substantial field losses. Factors such as stormy weather and southwestern corn borer damage can cause considerable lodging in unharvested fields. Late summer rainfall can also promote morning-glory growth, which can greatly inhibit harvest efficiency. Each of these factors may cause substantial field loss, which would considerably outweigh moisture savings. Producers should also consider their harvest capability -- the longer it takes to complete harvest, the earlier you should start harvest. Besides harvesting drought-stricken fields promptly, growers should also harvest non-Bt hybrids infested with corn borers, early maturing hybrids or fields, and those possessing below average stalk quality as quickly as possible. Producers should closely check for loss while the combine is harvesting and make adjustments accordingly. Two corn kernels per square foot or one dropped ear per 100 feet of row equals about 1 bushel per acre yield loss. Research generally indicates combine efficiency is best (harvest losses are lowest) when corn grain moisture is about 20-22%. Thus, growers seeking maximum profitability should always strive to finish harvest before grain moisture falls below 15%.

Don't Give Away Corn - Producers selling corn at less than 15% moisture are giving away profit. A producer harvesting 150 Bu./A. corn at 14% moisture is losing $4.43 per acre or $8.85 per acre at 13% moisture (at $2.50/Bu.). This loss is solely from reduced grain weight due to lower moisture content. This moisture weight loss closely approximates the "actual" dockage most elevators charge for high moisture corn. Since corn loses approximately 0.6% per day during the harvest season, begin harvest early enough to guarantee all corn is harvested before it reaches 15%.

Aflatoxin tips – Aflatoxin contamination may be more likely this year, since aflatoxin is usually associated with extreme drought and stress. However, early harvest reports have indicated no apparent problems thus far. If aflatoxin is present, growers have a few management options to minimize levels during harvest/handling/storage. Separately harvest obviously stressed, stunted or damaged areas and field edges, if you suspect any aflatoxin problem. These areas are much more likely to contain high levels of aflatoxin. Fungal infection is more likely in shriveled, cracked kernels and foreign material. Thus, grain quality may be significantly improved by reducing the combine ground speed, increasing fan speed and opening sieves, so that these sources of contamination are removed from the sample. A post harvest mechanical cleaner or gravity separator may also help. Improper grain handling can quickly promote aflatoxin development after harvest. High moisture grain should be immediately dried to below 15% moisture or hauled to an elevator (which will dry the grain). Wet grain should not be stored in trucks, combines, bins or any non-aerated site more than 4-6 hours before beginning drying. These conditions are critical to grain quality, because the fungal growth which causes aflatoxin will escalate to excessive levels very quickly in wet, warm grain. Conversely, fungal growth becomes dormant when grain moisture drops below 15%. Producers should also thoroughly sanitize handling and storage facilities before and during harvest.

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Wheat

Wheat Production and Marketing Conference - The MSU Extension Service will conduct a Production and Marketing Conference on Thursday, August 17 at 1 pm. If you are interested, please contact your Area Crop Agent or County Director, so they can schedule a location for you to attend.

Rice

By Dr. Nathan Buehring

Since the end of last week I have been getting calls on CL-131 having kernels very loose on the head. We did not see this to be an issue last year even through two hurricanes. We have looked at several fields and plots over the last couple of days. Leflore county seems to be were we are seeing the problem the most. In these CL-131 fields we are finding that the kernels can easily be shaken or removed from the head, mainly on top of the panicle where the kernels are the driest. We have looked at other varieties (Cocodrie and Cheniere) and found that the kernels are a little looser than we have normally seen, but CL-131 seems to be worse. The hybrid lines have also exhibited the potential to shatter; however, we have seen this in prior experiences.

I have randomly looked at other CL-131 fields in Bolivar and Washington counties and found that kernels are somewhat loose, but not to the extent they are in the Leflore county area.

The biggest difference between last year and this year is the heat. We have had many days in excessive of 95F and nighttime temperatures in the mid-70's. With these high temperatures CL-131 is maturing quickly, which could be making the kernels looser.

In light of these recent findings, we have established our approach on how we need to manage these field problem fields until they are in the bin.

1) **Draining:** We are not recommending to drain any earlier than our recommendations (half of the panicle straw color on clay soils and two-thirds to three forths straw color on silt loam soils). Fields that have been drained already are drying a rapid pace. Do not try to save $5-10/A with draining early because it may cost you more than that in yield.

2) **Identify if you may have a problem with shattering:** Look at all of your fields (regardless of what variety or hybrid it is) as they get close to fully maturing and determine if there could be a potential of shattering. This will help you identify any particular fields that you may need to harvest first to avoid a shattering problem.

3) **Harvest your rice at a little higher moisture:** If you have identified a field(s) that have a potential to shatter, I would suggest starting at a moisture of 18-20%. I know with high drying cost you would like to let it dry a little more in the field. However, if high winds or a thunderstorm come through you have the potential to lose more in the field.

4) **Adjust your combines on a regular basis:** Just because that is the setting you had on last year does not mean it will be the proper setting for this year. Adjust reel speeds on rigid and draper headers to prevent any shattering before it gets in the combine. Be sure that your cutter bar has good blades on it to prevent any excessive vibration that may cause the rice to shatter before it gets in the combine. Adjust rpm's and platforms on stripper headers to prevent shattering as well. Also, you may need consider harvesting at a slower speed instead of just ripping through the rice. Check behind your header to be sure you are not losing any rice.

Currently, we are just in beginning stages of identifying this problem. We do not know why one area of the state is having more of a problem than others or if this problem will become more widespread as more rice matures through the state.

Please keep your eyes and ears open for more information as it becomes available from us. We will keep you informed on the situation as more information becomes available. If you have any questions, comments, or concerns do not hesitate to call me any time at 662-822-7359.

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Cotton
By Tom Barber

Xylem Cavitation: There are many questions about young bolls turning brown and hanging on the plant. There are two schools of thought about the cause of this. Some Plant Pathologists have described this as "Phomopsis." This organism has been isolated from the petiole wound. Whether it is the cause or is secondary is still up for debate.

This has also been described by some Physiologists as a form of **"xylem cavitation" or "vascular cavitation."** This occurs when the plant has a burst of elongation, or growth, after a period of stress. Actually, when the flower opens there is a corresponding increase in transpiration rates of the fruiting structure. This is due to several factors which include a sharp increase in surface area, development of the ovule, and the beginning of fiber elongation. This rapid increase in transpiration puts a tremendous demand on the xylem tissue. If conductive tissue secondary cell wall (thickness) development has not been able to keep pace with elongation and transport demand, stress may cause a rupture. When this happens the fruiting form basically dies before an abscission layer forms and the dry fruiting form hangs on the plant by a dangling piece of tissue. This is where we get the term "boll dangle."

This cavitation injury has been seen before, in past years, and was observed to occur on some varieties at a higher frequency than others. The fact that it is physiological in nature and related to a plant may account for why it may be more pronounced on some varieties than others. It also appears to be more pronounced in the dryer or more drought stressed areas of the field.

There is no "cure" for this problem. After it has occurred the grower should be prepared to manage the crop as a "later maturing" crop. This is because the first position fruit on the lower and central fruiting branches are gone. When this happens, the plant may tend to produce rapid vegetative growth and a PGR such as mepaquat chloride (PIX) may be in order. Insect control will need to be continued longer in order to mature the fruiting forms on the upper fruiting nodes.

Estimating Yield By Boll Counting: Estimating yield by counting bolls can often be **misleading.** Variation in boll size, lint percent, future weather conditions, harvest losses and ginning losses can all effect how boll counts relate to final yield. However variable, people associated with cotton will at some point try to use boll counts to estimate production or make comparisons.

The following Tables are designed to help you **estimate** yields using boll counts.

Following are some suggestions for using these tables:

1)Count all harvestable bolls on at least 10 feet of row selected at random in at least four representative locations in the field. Using this data calculate an average number of harvestable bolls per row foot.

2) Establish an estimate of boll size. Two suggestions – a) At random, pick all the seed cotton from 50 to 100 bolls representing all boll sizes on the plant. Weigh the composite sample on an accurate scale calibrated in grams. Divide the weight (in grams)

by the number of bolls picked and this will give an approximate average boll weight for the field. This calculation should be made for several samples taken to represent the field. b) Pick all the seed cotton from all harvestable bolls on each of ten randomly selected plants. 50 to 100 bolls representing all boll sizes on the plant weigh the composite sample on an accurate scale calibrated in grams. Divide the weight (in grams) by the number of bolls picked and this will give an approximate average boll weight for the field. This calculation should be made for several samples taken to represent the field.

3) Once average boll size and average number of bolls per row foot are established, go to the appropriate table based on expected turnout (33 to 35 % is a good average) and determine how many bolls are estimated to be required per row foot to make a 480 pound bale of cotton. To determine estimated yield in bales per acre, divide the number of bolls per row foot counted by the number required per bale from the table.

Example - 40 inch rows, average 16 bolls per row foot, average boll weight 3.5 grams

(rounded off to the nearest one half gram) and an expected turnout of 35% - Go to Table

3 (for 35% turnout), go to the 40 inch row line, follow across to the 3.5 gram per boll

column and you find that 12.5 bolls per row foot are required to press a 480 pound bale

of lint per acre. 16 bolls per row foot divided by 12.5 is equal to an **estimated** yield of

1.3 bales per acre. Note the word estimated is in bold text – this is only an **estimate.**

Table 1	Calculated bolls per row foot needed to produce one bale (480# lint) per acre at various row spacings and boll weights.							
	Turn out is assumed to be 40%							
		Boll Weight in Grams and Ounces (seed cotton)						
Row Width (in)	Row-feet/ac	5.0 gm / 0.18 oz	4.5 gm / 0.16 oz	4.0 gm / 0.14 oz	3.5 gm / 0.12 oz	3.0 gm / 0.11 oz	2.5 gm / 0.09 oz	2.0 gm / 0.07 oz
50	10454	10.4	11.6	13.0	14.9	17.4	20.8	26.1
40	13068	8.3	9.3	10.4	11.9	13.9	16.7	20.8
38	13756	7.9	8.8	9.9	11.3	13.2	15.8	19.8
36	14520	7.5	8.3	9.4	10.7	12.5	15.0	18.8
32	16335	6.7	7.4	8.3	9.5	11.1	13.3	16.7
30	17424	6.3	6.9	7.8	8.9	10.4	12.5	15.6
20	26136	4.2	4.6	5.2	6.0	6.9	8.3	10.4
15	34848	3.1	3.5	3.9	4.5	5.2	6.3	7.8
10	52272	2.1	2.3	2.6	3.0	3.5	4.2	5.2

Table 2	Calculated bolls per row foot needed to produce one bale (480# lint) per acre at various row spacings and boll weights.							
	Turn out is assumed to be 35%							
		Boll Weight in Grams and Ounces (seed cotton)						
Row Width (in)	Row-feet/ac	5.0 gm / 0.18 oz	4.5 gm / 0.16 oz	4.0 gm / 0.14 oz	3.5 gm / 0.12 oz	3.0 gm / 0.11 oz	2.5 gm / 0.09 oz	2.0 gm / 0.07 oz
50	10454	11.9	13.2	14.9	17.0	19.9	23.8	29.8
40	13068	9.5	10.6	11.9	12.5	15.9	17.6	23.8
38	13756	9.1	10.1	11.3	11.9	15.1	16.7	22.6
36	14520	8.6	9.5	10.7	11.3	14.3	15.8	21.4
32	16335	7.6	8.5	9.5	10.0	12.7	14.0	19.1
30	17424	7.1	7.9	8.9	9.4	11.9	13.2	17.9
20	26136	4.8	5.3	6.0	6.3	7.9	8.8	11.9
15	34848	3.6	4.0	4.5	4.7	6.0	6.6	8.9

Forage
By Dr. Richard Watson

I have discussed in previous articles the numerous benefits of incorporating legumes (e.g. clovers) into your pastures, and many cattle producers in MS are beginning to include clovers in their forage systems to help offset the rising costs of nitrogen and improve forage quality.

The major challenge facing legumes in MS is the diverse soil and climatic conditions as you go from north to south. The south end of the state is a particularly challenging region, as many of the temperate perennial legumes (e.g. white and red clover) do not persist very well in the sandy, acidic soils types. While there have been great advances made in breeding more persistent perennial clover varieties for our southern environment, the coastal plain regions are still considered outside the primary area of adaptation for these new varieties. This leaves annual legumes as the primary option for south MS pastures. The challenge now becomes, "which of the many annual legumes is right for you"?

In the fall of 2004 we established plots of 32 different annual legume species/varieties at the Mississippi Agriculture and Forestry Experiment Station beef cattle research unit at White Sands MS. The trial included many of the annual clovers (Arrowleaf, Ball, Crimson, Rose etc..), annual medics (Black, Burr, Snail etc..), and less common species such as caley peas, vetches, and sweet clover. After 2 years of grazing these plots and letting them reseed 'naturally' we have found some interesting things about which legumes seem to work best in this environment. The key attributes we were looking for were yield, tolerance to grazing, length of the growth season, and the ability to come back each year from seed.

First let me start with the ones that apparently are not well suited to the south MS environment. While fast out of the ground, the annual medic species (Black medic, Burr medic, Snail medic, and Strand medic), and sweet clover had low annual yields (compared to the other legumes), and did not recover very well after grazing. The poor post grazing regrowth and low overall production resulted in poor seed yields and limited reseeding ability in this environment. The annual medics are related to alfalfa, and like this perennial cousin are not tolerant of the low pH soils that dominate the southern coastal plain. Trials in west Texas and Oklahoma, where the soils are more alkaline (high pH), show that the medics will yield and reseed themselves as good, if not better, than any of the annual clover species. These species are often very drought tolerant and will grow well into the summer, which is in part due to the large taproot common to the medics. However, it is possible that it is this taproot that may also be the downfall of the medics in our environment. We all know that we can raise soil pH by adding lime to our pastures. What is perhaps less well understood is that this pH change occurs almost exclusively at or near to the soil surface. The underlying (literally) problem with many of our southern soils is an acidic subsoil that is too deep to be affected by surface lime applications. Therefore, when the taproot of these species with poor tolerance to low pH soils encounters this acidic subsoil toxicity occurs and the plant will suffer low productivity and often death.

The vetches and caley peas were generally as productive in the 1st year as many of the clovers but showed fairly poor reseeding ability, and a shorter growing season compared with some of the clovers. The poor reseeding of these species could have been made worse by the dry fall that followed hurricane Katrina, but it is fairly safe to say that the annual clover species were superior to these forages in their ability to come back the second year from seed.

Overall the annual clovers provided the most consistent forage production over the 2 years, which was a reflection of the good yields, grazing tolerance, and superior reseeding ability. Berseem clover was an exception with poor yields in the 1st year and rapid stand decline after grazing. Berseem prefers soils with a higher pH (>6.5) and a better water holding capacity than those found on the gulf coast. Balansa, persian, and subterranean clovers all did fairly well in the first year and stood up to grazing, but were very poor at reestablishing themselves in the second year. The most productive clovers over the 2 year period were crimson, ball, and arrowleaf. This is based on their superior yields (> 3000 lb/A in year 1), tolerance to frequent grazing and an ability to come back from seed in subsequent years. I was particularly impressed with ball clover. While overall yields were lower that crimson clover, ball clover had a higher second year yield than any other legume, and actually had a greater stand density in the second year than the first year, which suggests an excellent reseeding ability. Crimson clover is still a good producer but it appears that yields and reseeding beyond the 2nd year might be its weakness when compared with ball clover, particularly where grazing pressure if high. Ball clover appears to be able to produce a lot of flowers even under close grazing, whereas crimson clover has a more erect growth habit that may reduce flowering when grazed too close. Both arrowleaf and ball clover also grew further into the summer than crimson, which many producers may find an advantage when trying to bridge the gap between cool-season and warm season forage growth.

Table 1. Two-year dry matter yield, and the stand density of different annual legumes under grazing in South Mississippi.

	Year 1 (establishment)		Year 2 (reseeding)	
	Yield (lb/A)	Stand (%)	Yield (lb/A)	Stand (%)
		Clovers		
Arrowleaf	3783	60	255	33
Balansa	1754	52	40	0
Ball	3041	60	1231	88
Berseem	966	16	0	0
Crimson	5533	43	1193	58
Persian	1155	70	0	0
Rose	2219	42	220	35
Subterranean	1328	60	140	0
Medics*	1047	2	0	0
Caley pea	1638	75	0	0
Vetch	2428	45	40	10

* Medic data is the mean for all the species (i.e. barrel, black, burr, snail, and strand).

In summary, during the 2-year study at White Sand MS, Arrowleaf, Ball, and Crimson clover had the best yields of all the annual legumes planted. Ball and crimson clover had the best second year yields and reseeding ability. Overall, ball clover appeared to have the most complete set of favorable attributes in this environment (i.e. yield, reseeding ability, grazing tolerance, and a growth season that extended into the summer).

For more information on establishing legumes in your pastures, contact your county office of the Mississippi State University Extension Service.

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Peanuts

By Mr. Mike Howell

Most peanuts across the state have started getting some much needed rainfall. There are still a few areas that are suffering from drought stress, but as a whole is in good condition. The dry conditions have allowed growers to reduce the number of fungicide applications being made this year. Many growers have only applied 1/2 of the total number of applications as made for the same time period last season, and some have not made any applications as of yet. I am encouraging growers that are getting these afternoon showers get back on a spray schedule as long as this weather pattern exists.

Several areas have been battling cutworms. These insects are feeding near the top of the plant, and in some fields, we are seeing as much as 50% defoliation. Currently, most of these insects have pupated, but moths should be laying eggs again soon. If you encounter an infestation of cutworms, you need to use something other than a pyrethroid insecticide. This class of insecticides is not giving satisfactory control of these insects even at the highest rate. This problem is also occurring in much of Georgia. Growers there have switched to using Steward at a rate of 9 ounces per acre. They are seeing excellent control at this rate. The only other alternative at this time in Tracer. Data from Georgia however, indicates that this treatment is only as good as the pyrethroids.

Aphids have also been showing up in several areas. These aphids have been identified as cotton aphids, however there appearance is somewhat different in peanuts. They are black in color, and have a shiny appearance. I have not seen these insects at damaging levels to this point, and very few peanut entomologists have seen them at all.

Harvest will begin in some of the earliest peanuts within the next month. Don't base harvest timing decisions on calendar days. Variation in temperatures, rainfall, and soil type will have an effect on the time it takes for a peanut to mature. Harvest timing should be based on the hull scrape method. This involves taking a random sample of peanuts from each field, and removing the outside portion of the hull with a sand blaster or more efficiently a pressure washer. If you are not familiar with this procedure, please contact me for dates and times I will be running samples in your area.

On August 24, there will be a peanut field day in Marianna Florida. This is one of the best field days in the country, and I highly encourage growers to attend. All aspects of peanut production will be covered at this field day, including varieties, disease control, weed control, insect control, rotation options, and much more.

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Fence Row Weed Control

By Dr. John Byrd

Most all cattle producers have fences that must be maintained. Gap have to be repaired, new cross fencing built, broken posts replaced, broken wire replaced, etc. Weeds continue to grow along the fence line and must be dealt with quickly to avoid more significant problems in the future. This issue is especially dear to my heart since I built over a half mile of new woven wire fence August of last year and I've watched blackberry vines, maypop, cedar seedlings, ironweed and honeysuckle grow along that line this summer despite the lack of rainfall. I've also been evaluating treatments in several on-farm and one experiment station sites to control vegetation that has been established along fence lines for more than a few years, ie 20 and 30 feet tall cedar, hackberry, bois d'arc, honey locust, and vines of more types than I can remember. Surmount, PastureGard, Velpar, and Spike have done excellent on a wide variety of weedy vegetation. I have made a few observations that may be helpful to producers. Of the treatments we've used, only Spike has activity on grasses in the fence line. PastureGard has looked best on Smilax or greenbriar. Spike is ineffective on cedars, while Surmount, PastureGard, and Velpar are effective if all plant foliage is treated.

The effects of Surmount and PastureGard could be seen a few days after application, while the Velpar and Spike treatments more slowly materialized. In our study sites, Spike and Velpar were applied as a spray to the soil surface about a foot wide at the base of the fence and along both sides of the fence. Surmount and PastureGard were applied to the ground as well as foliar treatments to the small cedars. Three additional treatments, Arsenal, Cimarron and Telar were used to spot spray woody brush clumps in the pasture. While Cimarron controlled mock orange and bois d'arc sprouts very well, neither Cimarron nor Telar provided the control of blackberry/dewberry nor multiflora rose I expected. Lack of rainfall may have contributed to the lack of control. Arsenal controlled the bois d'arc, hackberry, and mock orange, but as of the first of this month, had failed to control multiflora rose.

Regardless of the treatment effectiveness, trees this large still must be manually removed from the fence line to avoid further damage to the integrity of the fence. The best approach is to "do a little along" so the potential is not there for major damage by the removal of trees later on.

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Mississippi State University Extension Service

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