

Corn

by Dr. Erick Larson

Agronomy Notes

Corn Residue Management - After harvest, producers face management decisions as they begin preparing fields for next year's crop. Following a corn crop, many Mississippi growers face substantial shock because corn produces far more crop residue (Figure 1) than the traditional staples - cotton and soybeans.

Figure 1. Corn produces substantially more crop residue following harvest than most crops.



Historically, growers perceive this residue as a problem which must be destroyed by fire or tillage. However, crop residue generated in crop rotation systems produces substantial long-term benefits far outweighing any short-term savings accomplished by destroying residue, particularly since our soils are naturally low in organic matter. Kip Cullers, a Missouri farmer who is the current world record holder for soybean yield (139 bu/a) and 2006 National Corn Growers Association yield contest winner (347 bu/a) says when asked about burning, "My opinion is that the soil benefits from the return of both root tissue and above-ground crop residues. We rarely use field burning in our high-yield fields. We do everything we can to maintain or increase the amount of organic matter in our soils." Burning crop residue eliminates a precious opportunity to improve organic matter content and potentially can lead to substantial nutrient loss. Nutrients normally recycled in residue can be lost if either runoff water or wind removes ash from a burned field. This nutrient loss could potentially cost nearly \$70 per acre for phosphate and potash alone, for high-yielding corn. Crop residues improve soil water infiltration, improve soil water holding capability, improve soil tilth and reduce evaporation. In other words, residue recycling can better accomplish the same goals we annually attempt to temporarily fix using deep and/or intensive tillage. Crop residue also

does an invaluable job of soil conservation, particularly reducing soil erosion from runoff water. Furthermore, as fuel (and fertilizer) prices soar, many growers are reconsidering the need to perform costly fall tillage practices. Equipment manufacturers now produce improved planters and planter residue managers specifically designed for use in heavy corn residue (Figure 2).

Figure 2. Planter equipped with residue managers to permit planting through heavy corn residue. (Photo courtesy of Yetter Farm Equipment.)



These equipment improvements have facilitated widespread adoption of reduced tillage systems, allowing growers to realize the benefits crop residue offer. Furthermore, our warm, wet climate in the South encourages microbial activity and rapid organic decomposition, much more than drier, colder regions. This should substantially enhance our ability to utilize reduced tillage systems in this region. Therefore, I would encourage hesitant producers to try new methods and/or minimal tillage on some acres – let mother-nature decompose those stalks over the winter, rather than burning diesel or stalks.



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Wheat

by Dr. Erick Larson

Wheat Varieties – Wheat planting intentions are very high this fall, so book your seed soon. The 2007 MSU Wheat and Oat Variety Trials and a “short list” of wheat varieties which have had superior yields over the past several years are now available on the MSUcares.com website or at your county MSU Extension Service office. Plant characteristics, maturity, straw strength, disease resistance and other helpful information are noted for each variety. Variety evaluation should be based primarily upon yield history (particularly on different soil types or management regimes), plant characteristics (including maturity, straw strength and height) and disease resistance for predominant pathogens in the region. Some have asked about the impact of the Easter freeze event on wheat variety yields and its impact on variety selection for coming seasons. Since the Easter freeze event was an extremely abnormal climatic event, I do not believe its effect should be a primary criterion for variety selection in future seasons. The Easter freeze did severely reduce grain yields of many varieties at our northernmost location at Olive Branch, but that yield reduction was very closely correlated to variety maturity. In other words, earlier-maturing varieties suffered substantial freeze damage and yield reduction, whereas later-maturing varieties avoided major damage. Furthermore, the presence of beards likely did not increase potential freeze damage - many of our early wheat varieties just happen to have beards. The early varieties which are not bearded suffered severe yield loss as well (Figure 1).

Figure 1. This beardless wheat variety was essentially completely sterilized by freeze damage.



The yield loss documented in early varieties does not necessarily mean we need to exclusively plant late-maturing varieties in north Mississippi, as many medium maturing varieties have an outstanding performance record in this region. However, we can do a better job of planting varieties differing in maturity, at a date which will optimize their performance. Early-maturing varieties should be planted during latter stages of suggested planting dates to avoid excessive vegetative development capable of exposing these varieties to substantial freeze damage in the spring.

Preparation for Wheat Planting – Inadequate preparation plagues wheat yield potential perhaps more than any other crop grown in Mississippi. Drainage, field selection/preparation and fertility are extremely important factors governing wheat yields which should be addressed in the fall. Wheat is grown during the rainy season, potentially exposing it to saturated conditions at any time. Optimal water drainage is critical to Mississippi wheat production because extended waterlogging may reduce stands, stunt growth and development, encourage pathogen infection, and reduce nutrient availability. Thus, field selection and soil physical improvements capable of improving drainage, such as multiple surveyed water furrows, raised beds and clean ditches, can enhance wheat yield tremendously. Soil tillage hardpans may also substantially limit yield potential by inhibiting internal drainage. Thus, disruption of soil hardpans with moderate to deep tillage equipment is encouraged, if needed. Although Roundup Ready cropping systems have reduced problems regarding herbicide carryover associated with crop rotation, growers should heed cropping intervals for herbicides used in the previous crop. Growers should keep fields weed-free for several weeks prior to planting to eliminate a “green bridge” for pests. Likewise, growers need to prepare fields now, so they have a smooth, firm, moist seedbed at planting time. Wheat yield potential is extremely dependent upon nutrient availability because it is a very shallow rooted crop grown during the wet season. This makes it nearly impossible for wheat to mine nutrients from the soil profile. Thus, wheat growers need to take soil tests now, so they will know how much phosphorus, potassium, zinc, magnesium and lime are needed to meet crop demand and correct soil pH before planting, or yields will suffer tremendously. Diammonium phosphate (DAP 18-46-0) is an excellent fall fertilizer source, particularly for late-planted wheat, because it supplies both nitrogen and phosphorus, which will promote vigorous growth and advance maturity - essentially serving as a “starter fertilizer.”

Nutrient and Soil Management

by Dr. Larry Oldham

This year's increased corn acreage came about when market conditions changed in late 2006. Current events indicate we will see more winter wheat this year, and possibly a shift to more soybeans next spring. However, as noted, the 2007 crop mix came about well after the 2006 harvest but before Valentine's Day. No matter what will be planted, there is no time like the present to start a regular soil testing program for all crops if you already do not have one.

Unfortunately, many folks still rely on the old wisdom that soybeans do not require fertilizer. Seventy bushels of soybeans per acre use about 76 pounds of phosphate and 220 pounds of potash. The fact is, if fertilizer is needed, soybeans will respond and furthermore, the only way to really know soybean fertilizer needs is by soil testing.

The same is true about soil acidity and lime requirements. Don't guess! Soil Test! It is not a cliché, but when the recommendations are ignored, it is just a formality

Lime applications benefit crop production through:

- Preventing aluminum and/or manganese toxicity,
- Increasing phosphorus and molybdenum availability,
- Improving nitrogen fixation by legume crops,
- Improving the efficiency of applied phosphorus and po-

tassium fertilizers, and Increasing the volume of soil explored by roots.

Lime is expensive, however not liming can be even more expensive when it is really needed. There was an e-mail inquiry over the weekend that turned into an e-mail conversation. A family member was trying to help a relative realize that soils with pH values well below 5, lime requirements above 2 tons, and 10 to 15 bushel soybean yields needed attention to achieve profitable production levels. The soil testing recommendations were clear, but for unknown reasons, the man did not believe in liming. Soil testing is first; following the ensuing recommendations is the second step.

The publication, Agricultural Limestone's Neutralizing Value, was recently revised and is available on the www.MSUcares.com publication page. The current dry conditions are the best time to lime for the 2008 crop. So make the investment now for next year's crops.

We are making plans for the 2008 Crop College over the next few weeks to be held February 12-14. Keep an eye on

<http://msucares.com/crops/college> for registration and program information.

Cotton

by Dr. Darrin Dodds

Crop Condition: The cotton crop in Mississippi is in a wide range of maturities and conditions as we roll into September. The extremely hot and dry weather over the past several weeks has not been beneficial for much of the crop across the state. Archived weather data from Stoneville indicates that the average maximum air temperature for August was 98° and 1.18" of rainfall was received the entire month. Similarly, the average maximum air temperature in Starkville for August was 97° and 1.99" of rainfall was received the entire month. National Agriculture Statistics Service (NASS) data estimates that 68% of the Mississippi cotton crop is in good to excellent condition and 55% of our cotton has an open boll. Last year at this time 57% of the cotton crop had an open boll, the five year average for open bolls for late August is 37%. NASS has estimated cotton yields of 960 pounds per acre for Mississippi and 783 pounds per acre for all cotton producing states combined. Yield projections for Mississippi appear to be very optimistic considering the growing conditions we have faced this year. As always, there are areas of the state with an outstanding cotton crop and there are also areas where the crop does not look so good. I have also observed several fields where the crop looks good from the turnrow; however, upon inspection of the field, there are several fruiting branches void of any fruit. Most of these voids appear in the middle to upper portion of the plant and are most likely due to weather conditions, insects, or a combination of the two. In the words of a very wise man, Dr. Will McCarty, don't ever count on cotton but don't ever count it out. The picker will tell the tale.

Cotton Defoliation Timing: Cotton defoliation has been referred to by many as "black magic" due to the variation in cotton response from year to year due to harvest aid application. In terms of when to apply harvest aids there are several methods that may be employed. Whatever method is used, you should always visually inspect unopened bolls for maturity. Using a sharp knife, cut the uppermost harvestable boll in cross-section, if the seed coat is brown to black (See Figure 1), the seeds are mature and no yield or quality losses should occur from defoliation applications.

Percent Open Boll: Probably the most widely accepted method uses percent open bolls (See Figure 2). 60% open boll is a very common recommendation for making a harvest aid application. Care should be exercised using this method, especially if you are trying to set and harvest a top crop. Often the bolls in the upper portion of the plant are less mature, therefore, it may be beneficial to delay harvest aid application in order to harvest as

many mature bolls as possible. Having said that, do not sacrifice yield or fiber quality waiting for every boll to open.

Node Above Cracked Boll: The node above cracked boll (NACB) method focuses on the unopened fruit on the plant and takes into account potential fruiting gaps. Locate the uppermost first position cracked boll with visible lint, then count the number of mainstem nodes to the uppermost harvestable boll (See Figure 3). Generally, it is safe to begin defoliation at four NACB.

Accumulated Heat Units After Cutout: This method recommends defoliation when 850 heat units, or DD 60s, have been accumulated after cutout (See Figure 4). There are several different viewpoints as to when cutout occurs. Generally speaking, cutout occurs when there are four to five mainstem nodes above the uppermost first position white flower. DD60 is a measure of heat accumulated for plant growth using 60°F as a minimum. The Delta Research and Extension Center website has archived weather data that includes DD60s. These data are available at the following URL address: <http://www.deltaweather.msstate.edu/>.

Determination of the proper harvest aid(s) for a given field is often not as cut and dry as some other decisions may be. Several questions need to be addressed when selecting harvest aids. These may include, but are certainly not limited to: what are my high and low air temperatures, expected time between harvest aid application and rainfall, what kind of activity can I realistically expect from a given harvest aid, what crop will I plant in this field next year (or this fall), and how is my sprayer equipped (i.e. nozzles, output, etc.). Dr. Sandy Stewart, LSU Cotton Specialist, has put together an outstanding cotton defoliation guide that may help selecting the proper harvest aid a little bit easier. It is available on the internet at the following URL address:

http://www.lsuagcenter.com/en/crops_livestock/crops/Cotton/Publications/Cotton+Defoliation+Guidelines+for+Louisiana.htm

Cotton continued...

by Dr. Darrin Dodds

Figure 1. Cross section of cotton bolls.



Figure 2. Determination of percent open bolls.



Count the number of harvestable bolls.

Count the harvestable bolls that are open and closed.

$$\left[\frac{\text{Open bolls}}{\text{Closed bolls}} \right] \times 100$$

Optimal percent open bolls = 60%

This plant = 39% open bolls

Figure 3. Determination of nodes above cracked boll.



Identify uppermost 1st position cracked boll.

Count number of nodes between cracked boll and uppermost harvestable boll.

Optimal = 4

This plant = 6

Inspect uppermost harvestable boll.

Cotton continued...

by Dr. Darrin Dodds

Figure 4. Determination of DD60s after cutout.



Photo Courtesy of Dr. Trey Koger

Physiological maturity (cutout) = 5 nodes above white flower (NAWF).

Calculate daily DD 60s after NAWF = 5.

Accumulated DD60s should be a minimum of 750 degree days.

Optimal 850 – 950.

Complement with other methods.

Forages

by Dr. Rocky Lemus

In Mississippi, one of the greatest expenses for cattle producers is winter feeding costs. One alternative to lower these costs is stockpiling forages. Tall fescue is the most desirable grass to stockpile for late fall and early winter grazing. It allows producers to extend the grazing season well beyond the growing season, reducing the demand of inputs such as hay, silage, and dehydrated forages. Under proper grazing of stockpiled tall fescue, cattle distribute their manure evenly over the pasture, returning nutrients to the soil.

When to Begin Stockpiling Tall Fescue? Two components to consider when stockpiling tall fescue are forage quality and yield. Important management factors affecting the balance between yield and quality of stockpiled fescue are: when to begin stockpiling (last day of grazing or mowing), nitrogen application (date and rate), and the legume composition in the pasture. Stockpiling tall fescue should start from late August to late September. Prior to stockpiling, fields should be mowed or grazed closely and livestock removed from the pasture. Tall fescue should be allowed to accumulate growth until late November or early December when hay feeding usually starts.

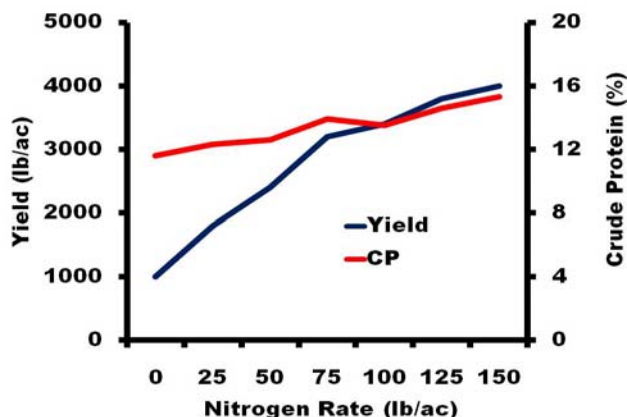


Figure 1. Influence of nitrogen fertilization on yield and protein of stockpiled tall fescue. Source: Johnson and Smith, 2004.

Fertilization—Tall fescue is also very responsive to nitrogen fertilizer (Fig. 1), and high yields can be achieved with timely N application (Fig. 2). Before applying fertilizers, a soil test should be taken to determine the phosphorus, potassium, and liming requirements. Nitrogen may be top-dressed approximately 60-70 days before the end of the growing season at the rate of 40 to 60 lb N/ac along with P_2O_5 and K_2O as indicated by soil test. Applying nitrogen too early may encourage the growth of late summer emerging weeds and subsequently reduce the production of tall fescue. Applying nitrogen too late will reduce the quantity of forage, which is

stockpiled. Early, mid- and late September is optimum time to apply nitrogen to tall fescue. Take into consideration that these management practices may need to be adjusted, depending on the type of livestock operation and location.

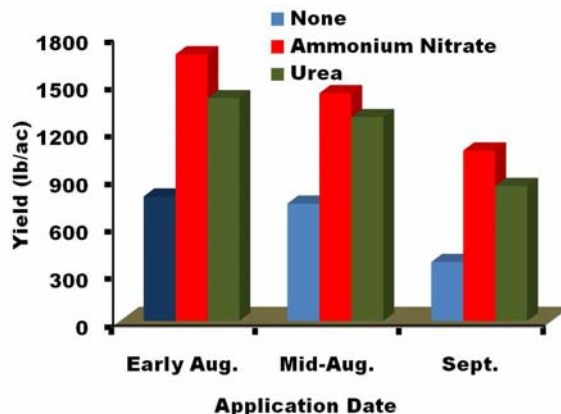


Figure 2. Production efficiency of KY-31 tall fescue at different nitrogen application dates. Source: Murdock, 1982.

Management of Stockpiled Fescue—Grazing management is critical to efficient utilization of the forage. Uncontrolled grazing will waste approximately 50 to 60% of the forage due to trampling and manure deposition on unutilized forage. The best way to utilize stockpiled tall fescue is by strip-grazing. Restricting access to a 3 or 7 day forage supply will increase the number of grazing days. Install a temporary electric fence across the field dividing it so the area to be grazed first has a source of water and minerals. Once the animals have grazed this area off, move the fence back, opening up a new strip. Repeat this system until the entire field has been grazed.

Depending upon when stockpiling is initiated, fertilizer rate and fall rains, it is possible to have 50 to 60 days of available forage depending on livestock daily requirements. Due to the fact that tall fescue holds its quality, producers should graze any crop residues (corn, soybean, cotton, or milo) that might available first in the fall and use tall fescue later in the winter. If there is a difference in length of stockpiling period among pastures, begin grazing the oldest material first before it becomes too deteriorated. If some areas have a significant amount of red clover, graze them early as well because red clover deteriorates more rapidly than tall fescue.

Rice

by Dr. Nathan Buehring

This year the preliminary yield reports have been good to excellent. Most of the yield reports are from 160 to 200+ bu/A. So far, harvest progress has been going smoothly with no major weather concerns.

With the hot temperatures, rice has been drying down quiet rapidly. Majority of the rice was planted in a two to three week window from the first of April to mid-April. Therefore, if the rice continues to dry down fast, it will be hard for the combines to keep up with harvest.

Some of the hybrids (ie XL 723) have had the appearance of being in the 17 to 19% moisture range. However, upon cutting a sample they have been in the 13 to 15% moisture range. This is mainly due to the heading nitrogen application keeping the stalk and leaves greener. If you have hybrids on your farm, I would encourage you walk the fields or cut a sample to get a better idea of the moisture content. To get the most out of you hybrids

on milling, it is better to harvest them at 18% and dry them down in the bin.

To achieve a high quality rice crop, there are some things you can do post-harvest. First, do not leave high moisture rice on a truck more than 24 hours. Also, if you cut a sample with your combine and decide that is to wet to harvest, dump it out. Do not leave it in the combine until the rice is ready to harvest and put it on the truck. Leaving it in the combine will result in stained rice. Second, when drying rice in the bin, avoid using excessive heat (> 90 F) and high volumes of air. Third, avoid putting rice with a moisture difference of 3% together in the same bin. Forth, avoid placing high moisture rice on top of low moisture rice.

Once again, September is Rice Month. The Annual Rice Luncheon sponsored by Delta Rice Promotions will take place September 21, 2007 from 11:00 a.m. to 1:00 p.m. in Cleveland, MS at Delta State University-Walter Sillers Coliseum.

Weed Science

by Dr. John Byrd

Mississippi State University now has an Aquatic Weed Control Specialist that is qualified to answer aquatic weed control questions. For many years, Extension Specialists with no formal and very little practical experience answered aquatic weed control questions for clientele across the state. However, Dr. John Madsen was hired a few years ago to work specifically with aquatic weed control problems. John has a split MAFES/MSUES appointment. Before coming to MSU, John worked with the U.S. Army Corps of Engineers at Vicksburg, then moved back to his home state of Minnesota to teach and do research at Minnesota State University. John's training is in plant ecology and his experience is almost exclusively with aquatic weed management. He has worked extensively over the years with EPA on new aquatic herbicide registrations. He knows aquatic weeds and how to control them. He can be reached at jmadsen@gri.msstate.edu or 662/325-2428.

Arsenal has been taken off the market. Arsenal Powerline is it's replacement. Arsenal Powerline is identical to Arsenal except it contains a nonherbicidal additive to enhance uptake and translocation. Users still have to add nonionic surfactant, methylated seed oil, silicone surfactant or fertilizer/surfactant blends to foliar applications at the same rate as the old formulation. The other big difference with Arsenal Powerline is it can be used for spot applications in pastures and rangeland. Two to 48 oz/A can be used to control a variety of herbaceous and woody weeds and shrubs. Spot treatments cannot exceed more than 1/10 of the area grazed or cut for hay. Applications must not exceed 48 oz per acre per year. Treated areas should not be cut for hay less than 7 days after treatment. If these guidelines are followed, livestock do not need to be removed from treated areas.

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

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