July 2008

Mississippi State University Extension Service

Agronomy Notes

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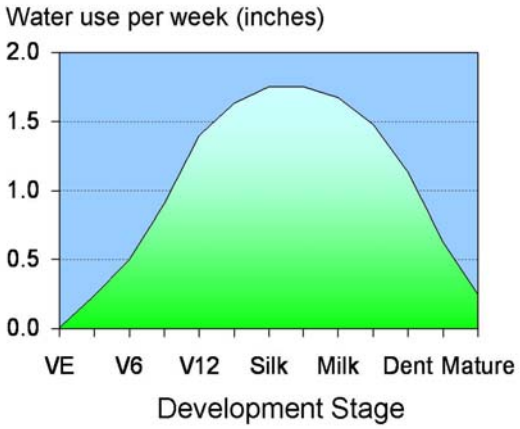
Corn

by Dr. Erick Larson

Will rainfall help? – Dryland corn which did successfully pollinate and still has green leaves will definitely benefit from substantial rainfall in early July. Rainfall obviously will also be a tremendous benefit for irrigators, which were generally spoiled by plentiful rain last July, allowing them to forego late season irrigation. Corn will generally respond to July moisture because it will not reach physiological maturity (black layer) until late-July or substantially later, depending upon planting date and latitude. Kernel number is generally determined by the milk stage (roasting ear) about 20 days after pollination. Severe drought stress has already limited this vital yield component in many areas or pollination may have failed to some extent. However, corn will continue to fill seed weight normally well into July to August, depending upon crop maturity. Moisture will also substantially help maintain plant health, including stalk strength, and grain quality. If substantial rainfall does not come, severe drought will accelerate maturity of stricken fields, as plants sacrifice energy reserves in vegetative parts in desperate attempt to fill grain. Thus, many fields will likely senesce or die prematurely.

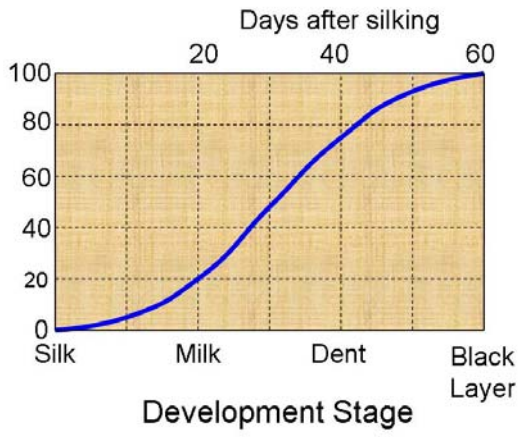
Reduced water demand – Corn moisture requirement will steadily drop from a peak of 1.5-1.75 inches per week at the dough stage (four weeks post tassel) to an inch or less per week after dent. However, high evaporation rates during late July generally often counterbalance the reduced water use by corn plants to some degree. Thus, insufficient irrigation water and/or slight delays can quickly reduce yield potential and evaporate profitability. Most importantly, growers should continue supplying irrigation water until the kernels reach physiological maturity. Furrow irrigation intervals may be extended to adjust for reduced corn water use during late growth stages. Pivot irrigation systems can also adjust for decreasing water use during the late growth stages by reducing total water output without reducing irrigation frequency.

Figure 1. Corn seasonal water use.



Irrigation termination – A common irrigation error is terminating irrigation before physiological maturity (black layer) occurs. Most Mississippi-grown corn will not likely reach physiological maturity until mid-July or later, depending upon the latitude and planting date. Premature irrigation termination will accelerate maturity, prohibiting kernels from reaching their full potential size and weight. Although kernels appear somewhat mature and corn water use begins declining at the dent stage, this is far too early to terminate irrigation. Potential kernel weight is only about 75% complete at the dent stage (Figure 1). Thus, termination of irrigation at the dent stage can reduce grain yields as much as 15-20% when hot, dry conditions persist. Early irrigation termination will also likely reduce stalk strength and promote lodging, because plants will cannibalize energy from vegetative organs to fill kernels when they are stressed.

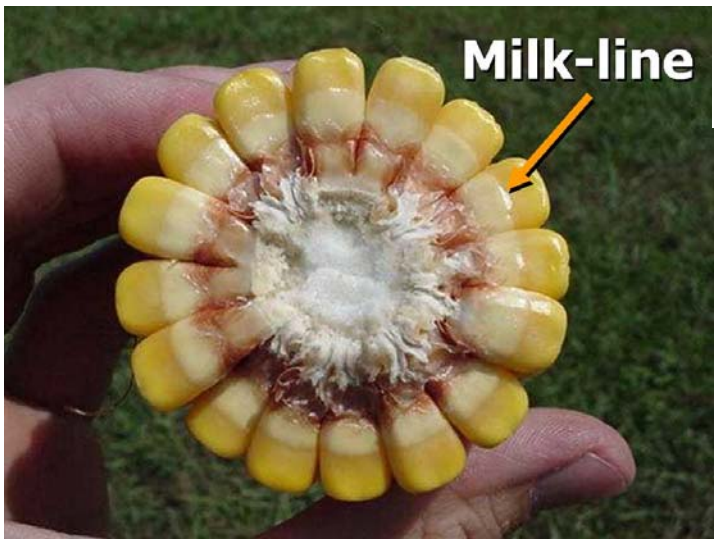
Figure 2. Corn grain weight accumulation during reproductive growth stages.



Corn and Grain Sorghum continued... by Dr. Erick Larson

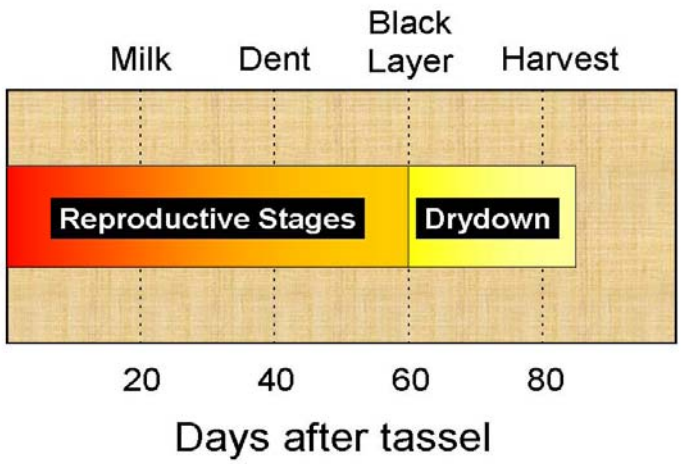
Check the milk-line - The most reliable method for corn producers to monitor kernel maturity for irrigation scheduling purposes is to observe progression of the milk-line between dent stage and black-layer. The milk-line is more relevant than the black-layer, because it indicates when physiological maturity will occur, before the black layer forms. The milk-line is the borderline between the bright, clear yellow color of the hard seed coat outside the hard starch layer, compared to the milky, dull yellow color of the soft seed coat adjacent the dough layer (Figure 2). To observe the milk line, break a corn ear in half and observe the cross-section of the top half of the ear (the flat side of kernels opposite the embryo). If this color difference is not plainly visible, you can find it by pressing your fingernail into the soft, doughy seed, starting at the kernel base and repeating this procedure progressively toward the tip, until you feel the hard starch layer.

Figure 3. Photo showing a cross-section of an ear of corn with the milk-line advanced half-way down the kernels. This corn is about 10 days from physiological maturity and needs moisture to fill seed weight during this period.



Corn kernel maturation - Hard starch develops initially at the outside tip of the kernel and this transition and shrinkage associated with moisture loss causes the dent to form. This hard starch development gradually progresses towards the kernel base as kernels mature. It generally takes about 20 days for the milk-line to progress from the kernel tip, down to the base, where the black-layer forms (Figure 4). Growers can use this guideline to estimate the approximate maturity date. For instance, if the milk-line is half-way down the kernels, it will take about another 10 days to reach physiological maturity. Thus, the field needs supplemental irrigation water to supply moisture for 10 more days.

Figure 4. Normal sequence of corn reproductive development stages and grain moisture dry-down as corn approaches harvest.



Grain sorghum irrigation - Although grain sorghum is very drought tolerant, it will respond well to supplemental irrigation during droughty conditions. These characteristics make grain sorghum well suited for limited irrigation. Grain sorghum is most dependent upon moisture around the boot stage. The boot stage is characterized by the head swelling inside the flag leaf sheath, immediately prior to heading. Grain sorghum water use is maximized from rapid vegetative growth stages through the soft dough stage. Water use during this time typically peaks at about 1.5 inches per week. Water use rapidly declines after the soft dough stage – which is normally about two weeks after half-bloom. A furrow irrigation application just prior to the boot stage, followed by another at bloom (if needed) should provide nearly the entire grain sorghum yield potential of full irrigation. Center pivot irrigation systems however typically require numerous applications since total water volume is only about one-third that of a single furrow irrigation event. Irrigation beyond soft dough stage is not generally necessary, because crop water use is rapidly declining and sorghum's inherent drought tolerance.

Forages
by Dr. Rocky Lemus

Small farming operations are becoming more popular as the amount of land available for large livestock enterprises and row crops is reduced by urban sprawl. Small ruminant livestock systems such as goats and sheep fit well with small farm operations. Forages, whether are grazed or hayed, supply the major source of nutrition and a critical component to small farm enterprises to maintain sustainability. Many of these small farm owners are either newcomers to farming or people living in urban areas and see them as “hobby” farms. There is a critical need to educate them on the basic agricultural practices and forage utilization for this type of livestock management.

The grazing habits of sheep and goats differ from traditional livestock production and they can be incorporated into the grazing systems for cattle and horses. Goats tend to browse more while sheep tend to graze. Goats are efficiently used in pasture utilization controlling brush and weed, but they need higher quality forage than cattle because they cannot digest cellulose.

Pasture Management and Forage Selection - Sheep and goats offer an alternative to utilizing forage and vegetation which is otherwise "wasted” (Figure 1). In a pasture situation goats are "top down" grazers, consuming only the best parts of a wide range of grasses, legumes, and browse plants. Browse plants include brush, shrubs, trees, and vines with woody stems. This behavior results in uniform grazing and favors a first grazer-last grazer system using a goat flock as the first group and cattle as the last group. This management is most appropriate with lactating does or growing kids. The quality of feed offered is usually most directly related to the age or stage of growth at the time of grazing. Sheep do very well grazing annual cool-season forages like oats, annual ryegrass, winter wheat, or triticale. Annuals forages can be ready to graze approximately six weeks after seeding. Feeding some hay for the first week before grazing annual cool-season grasses provides fiber and reduces scouring. Portable cross fencing to restrict sheep to small paddocks will reduce trampling. Creep gates can be used to give lambs access to areas separate from the ewes.

Feed is the single largest cost associated with raising small ruminants, typically accounting from 60 to 65% of total production costs. Pastures /forages are the cheapest feed sources for both sheep and goat production. Therefore, they should use them to the fullest extent. Establish a grazing system using both cool-season species such as tall fescue and warm season grasses such as bermudagrass, bahiagrass, and dallisgrass in mixture with legumes (white, red clover, or alsike clover). For winter feeding, planting small grains (wheat, rye, oats and barley) and annual ryegrass in combination with crimson clover or arrow leaf clover reduces feed cost and the need for stored forage. The addition of forage legumes to grazing or haying systems provides additional protein, energy, and palatability to the feed produced. Further, legumes add nitrogen to the soil for grasses to utilize and assist in filling in the grass sward to inhibit weed growth. The selection of the "best" grass/legume system must consider both the adaptability of a particular type of forage to a specific site and soil, the nutritional needs of the animals, and the management goals of the producer.

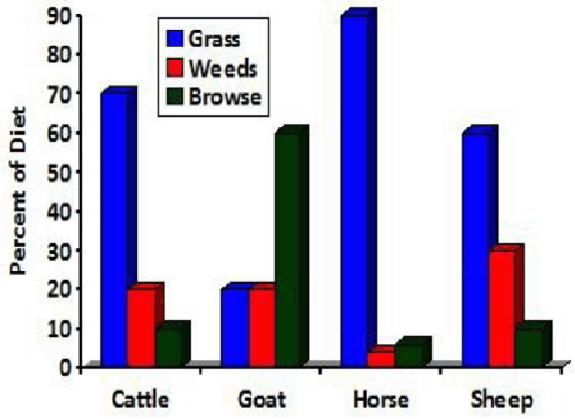


Figure 1. Dietary preference of different livestock species. Source: AnPeischel, 2005.

Legumes such as alfalfa, clover, and lespedeza tend to be higher in protein, vitamins, and minerals (especially calcium) than grass hays. The energy, as well as protein content, depends upon the maturity of the forage when it is being grazed for forage. Maintaining an adequate grazing height is important because these small ruminants eat in layers from top of the plant to the bottom. Pasture height and biomass will greatly affect intake, quality, and nutritional status of sheep and goats. Several studies have shown that intake by goats decline when forage availability is below 1000 to 1200 lb of dry matter per acre because the animal cannot get a “mouthful” with each bite. Overgrazing the pasture not only affects animal intake but also affects forage recovery time because the remaining leaf area for photosynthesis is minimal.

Managed grazing with sheep and goats usually results in a substantial increase in vegetative cover by favorable grass and legume species while reducing or eliminating unwanted shrub species. Since goats, cattle, and sheep prefer different forages, in many pasture situa-tions these species do not compete for the same food. Therefore, they can be managed quite suc-cessfully in a multispecies grazing system, allow-ing the land to be used more fully and generate more income. Some studies have shown that land grazed by both goats and cattle returns 25% more than land grazed only by cattle. Adding sheep and goats to a grazing system will have weed control benefits. Goats will eat such weeds, therefore decreasing the need for commercial herbicides or mowing.

Forages continued...
by Dr. Rocky Lemus

Sheep make efficient harvesters of forage crops. However, one of the biggest challenges of grazing sheep is the economical and effective control of internal parasites. *Sericea lespedeza* is a legume that grows in low fertility and acid soils and it has been associated with parasite control. *Sericea lespedeza* is a high-tannin forage that has been scientifically proven to reduce parasite loads in sheep and goats. Sheep and goats may need time to adjust to grazing *sericea*. Cattle will graze *sericea* if it is not too mature. Producers should not rely on *sericea* as the sole method for controlling internal parasites, but could be used as part of the parasite/deworming program in small ruminants.

Understanding the nutritional needs of goats and sheep is important in developing a forage program (**Table 1**). Sheep and goats must consume a more concentrated diet than cattle because their digestive tract size is smaller relative to their maintenance energy needs. Average meat goats require about 10-14% crude protein and 60-65% TDN (on a dry matter basis) in the total diet. Pasture, forbs, and browse are usually the primary and most economical source of nutrients for sheep and goats (**Table 2**). In most cases, pasture is all small ruminants need to meet their nutritional requirements since they tend to be high in energy and protein when it is in a vegetative state. Rotating the pastures to keep plants in a vegetative state is important since palatability and digestibility decline as the plants mature. During the early part of the grazing season, browse (woody plants, vines and brush) and forbs (weeds) tend to be higher in protein and energy than ordinary pasture. Sheep are excellent weed eaters. Goats are generally considered a browse-consuming species and they have the unique ability to select plants when they are at their most nutritious state.

Small ruminants (goats and sheep) should have access to clean, fresh water at all times in the pasture. A mature animal will consume between ¾ to 1 ½ gallons of water per day and water intake increase greatly during late gestation and during lactation of small ruminant. Water requirements also increase substantially when ambient temperatures rise above 70 °F and decline with very cold environmental temperatures.

Summary - There is not just one type of pasture than can or even should, be used. It is good to have a diversity of cool- and warm-season grasses to minimize hay need. This is not to say that different plant species do not each have their own specific advantages and disadvantages. Maintain low stocking rates and graze sheep and goats with cattle, or in a rotation with cattle or horses. Provide tannin-rich forages, such as *sericea lespedeza*. The role of goats and sheep as biological control agents will become increasingly important in pastures in the future due to elevated costs of other control methods such as mechanical cutting and herbicide application, where energy utilization is an issue.

Table 1. Nutritional requirements for various classes of sheep and goats:

Livestock	Total Feed Intake (lb/day)[1]	Crude Protein (%)	Energy (TND) (%)
Sheep			
Maintenance (154 lb mature ewe)	2.6	9.6	57.6
Late Gestation (180 – 225% lamb crop expected)	4.0	11.2	66.7
Lactation			
Single	5.5	13.3	65.0
Twins	6.2	14.8	65.0
Early Weaned Lambs (66 lbs) Moderate to High Growth	2.5	14.5	75.8
Lamb Finishing (88 lbs)/4-7 mo	3.5	11.7	77.1
Yearlings (110 lbs)	2.5	9.1	57.6
Goats			
Bucks (80 – 120 lbs)	5.0	11.0	60.0
Dry Doe	4.5	10.0	55.0
Late Gestation	4.5	11.0	60.0
Lactation			
Avg. Milk	4.5	11.0	60.0
High Milk	5.0	14.0	65.0
Weanling (60 lb)	2.0	14.0	68.0
Yearling	3.0	12.0	65.0

[1]90% Dry Matter Basis
Source: National Research Council, 2007.

Table 2. Nutritional content of various forages and browse plants commonly used for grazing sheep and goats.

Forage Type	Crude Protein (%)	Energy (TND) (%)
Hay		
Poor Hay	8	50
Grass Hay	12	58
Mixed Hay	15	50
Legume Hay	18	62
Pasture		
Alfalfa	18	62
Bahiagrass	8	51
Bermudagrass	10	55
Chicory	15	65
Clover Pasture	25	69
Cowpea	16	64
Kudzu	14	55
Mature Pasture	8	50
Millet (pearl)	27	63
Rye	16	69
Sudangrass	16	70
Switchgrass	10	61
Tall Fescue	12	62
Vetch (common)	19	59
Wheat	24	66
Browse Species		
Broomsedge	7	50
Brush	16	72
Curled Dock	13	74
Honeysuckle	13	69
Hackberry	14	41
Juniper (leaves)	6	64
Oak Skin	13	65
Mulberry (leaves)	21	72
Sumac	13	77

Source: National Research Council, 2007.

Soybeans
by Dr. Trey Koger

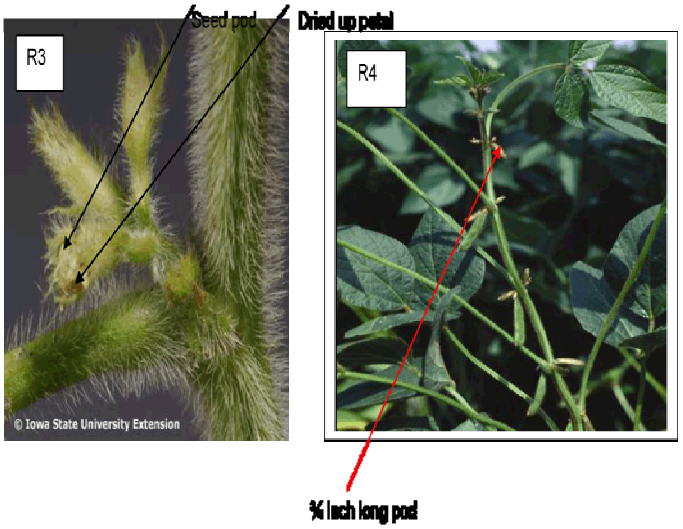
With much of our April planted full season crop approaching the critical stage for fungicide applications, we felt it timely to discuss the factors that determine when to apply a fungicide and recommendations for product selection. Before we go any further several key points need mentioning. First, we have found **no soybean rust in Mississippi to this point.** We have been actively monitoring sentinel plots, kudzu, and commercial soybean fields throughout the state on a weekly basis. We are looking throughout the state and concentrating the majority of our efforts in the southern part of the state, where we have historically found it first. Second, the hot and dry conditions most of us are experiencing are not favorable for soybean rust development and / or spread. However, if we do find soybean rust in Mississippi or neighboring states in areas adjacent to our soybean production, we will let you know immediately (soybean rust hotline 1-866-641-1847). Thirdly, if we do find soybean rust in Mississippi and decide to make fungicide application recommendations for management of soybean rust, this recommendation will come directly from myself, Tom, and Dan. I am happy to say, similar to the past several years that we are just a few weeks away from being out of the woods on our April planted full season crop. If we get a few more weeks down the road and we have not found soybean rust at an extensive level, and right now it appears this is going to be the case, we will be far enough along that we shouldn't have to be concerned with managing soybean rust in our April planted full season crop. We will have to get a little further down the road before we know whether or not we will have to manage soybean rust in our double cropped soybean, late May through July planted, and replanted acres. Time and weather will be the deciding factors on these late planted acres. We will continue to thoroughly monitor for soybean rust as we are right now throughout the remainder of the year.

The remainder of this newsletter focuses on fungicide application timing and product selection **in the absence of soybean rust.** Fungicide application timing is based on several key factors.

1. Irrigated or non-irrigated acres. Based on extensive data collected over several years, wide range of environments, weather patterns, maturity groups, soil types, planting dates, and crop rotations, a timely application of a strobilurin fungicide (Quadris or Headline) is recommended on irrigated soybean acres. The return on applying a fungicide is likely to be greater for a monoculture soybean system (soybean year after year) or a soybean / rice rotation. However, even though the return may not be as great, the return is still positive when soybean is grown in rotation with corn or cotton, especially on irrigated acres. This is especially true this year with high soybean prices and the greater potential for a higher return on your investment. As far as non-irrigated acres, the decision to apply a fungicide is more dependant upon the weather conditions at the critical time of reproductive development on the plant. Current weather conditions are not favorable for development of common foliar diseases such as frogeye leaf spot, anthracnose, brown spot, aerial web blight (particularly in shaded areas and especially in the southwestern MS counties), and pod and stem blight. If the current weather conditions continue we are less likely to see an economic return from a fungicide application on non-irrigated acres. One thing to keep in mind, however, this crop is quite a bit later than those of the past several years and the weather conditions can change quickly resulting in conditions favorable for disease development. The decision to apply a fungicide on non-irrigated acres should be made based on the condition of the crop and the weather conditions when the crop reaches the R3 to R4 reproductive growth stages.

2. Plant development. In order to get the most protection of plant tissue and return on our investment, a foliar fungicide application should be applied to plants that have as much vegetative growth as possible when the plants are in R3 to R4 reproductive growth stages. These reproductive growth stages were covered in last week's newsletter, and are discussed again in this newsletter.

R3: Beginning pods: pods are 3/16 inch in length at one of the four uppermost nodes. This occurs soon after the bloom dries up and falls off leaving the small pod inside the sepals. See figure 2 below. *R4: Pod development:* Pod ¾ in length located at one of the four uppermost nodes. See below.



In order to protect as much vegetation as possible, it is important to allow the plant to develop as many nodes as possible prior to reaching the R3 to R4 growth stage. This years' crop is different from past years in that soybean plants are reaching reproductive growth stages with less vegetative growth due to later planting and dry conditions. Soybean plant development is based on night duration. With later planting, the nights are shorter and the plant signals reproductive development earlier in its life cycle. It is also important that an indeterminate group four soybean will be in the R3 reproductive growth stage for several weeks.

Soybeans continued...
by Dr. Trey Koger

As the plant continues to produce new nodes (top growth) new flowers continue to develop simultaneously at the top nodes and progress from flowering to pod development from the top of the plant downward. So it is common for an indeterminate variety to be at R3 one week and revert back to R2 to R3 the next week and back to R3 the following week. This cycle can occur several times, especially with timely rains or irrigation. Be mindful that it is better to apply a fungicide to a soybean plant with 16 nodes at the R3 reproductive growth stage than a plant with 14 nodes in the R3 growth stage. The more vegetation present at time of fungicide application the more protected the plant is from foliar diseases. Vegetation that develops after fungicide application is not protected from disease development.

The following table provides information on how many total nodes can be expected from maturity group four and five soybean plants. Total number of nodes is dependant upon variety, planting date, soil type, and environmental conditions such as rainfall or irrigated vs. non-irrigated conditions. These data were compiled over several years of research conducted at the Delta Research and Extension Center.

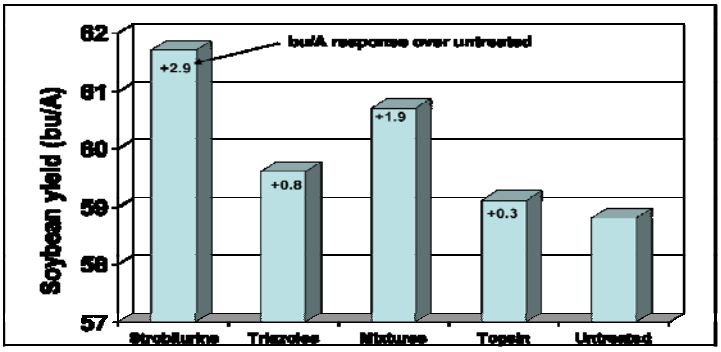
Maturity group	range in number of nodes
Three	14-18
Four	16-20
Five	18-22

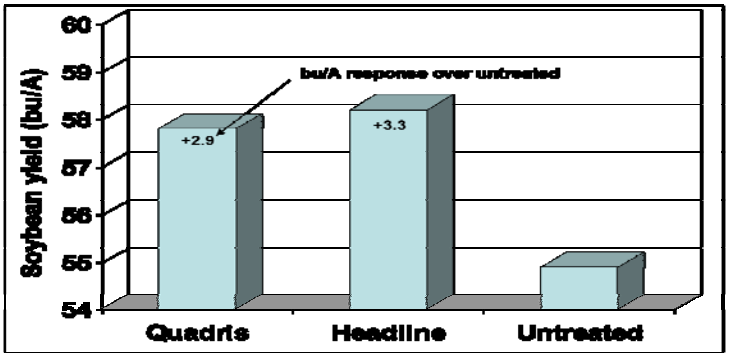
3. Weather conditions. Decision to apply a fungicide should be based on weather conditions at the time of R3 to R4 stage of development. Holding off on applying a fungicide application for another week is advised under the current hot and dry conditions. This allows the plant to produce more vegetative growth that can be protected, get more residual activity from the fungicide longer into the season once the fungicide is applied, and likely allow insect numbers to build a little more (if not at threshold already) so that if an insecticide is applied along with the fungicide we get more return from our investment of applying an insecticide. Keep in mind, a soybean plant produces a new node about every 5 days, so holding off that fungicide application for a few more days allows that plant to produce more vegetation to be protected by the fungicide when applied. If weather conditions were cooler and wetter, disease development would be more prolific and we would recommend applying fungicides when the plant reached the initial R3 stage of development. However, under these hot and dry conditions, we can hold off on applying the fungicide a little bit later between R3 and R4, and allow the plant to obtain more vegetative growth.

4. Insect thresholds. With increases in application cost, many producers are looking to combine pesticides, such as insecticides and fungicides, to save money. In some cases this will be warranted and some it will not. By simply scouting the field with a sweepnet, you can quickly determine whether or not it will be necessary to add an insecticide. Insect numbers can influence timing of fungicide application in some situations. In many cases, an insecticide is tank-mixed with a fungicide application to control insects as well as common foliar diseases with a single pass across the field. Insect numbers below threshold coupled with hot, dry conditions can warrant the delay of a timely fungicide application in order to allow insect numbers to get closer to threshold levels and provide plant protection from foliar diseases longer into the growing season once a fungicide + insecticide tank-mix is applied.

With respect to timing of fungicide application and product selection, we rely on an extensive data set compiled by Dr. Dan Poston (Delta Research and Extension Center) and other MSU scientists. This comprehensive data set (44 locations) has been compiled over several years (2004-2007; wet and dry), maturity groups, planting dates, soil types, and crop rotations. This data has shown in the absence of soybean rust an application of a strobilurin fungicide such as Quadris or Headline, at the R3 to R4 growth stage, provides the greatest yield increase and most consistent return on investment.

The following tables show these results . The first table compares strobilurin (Quadris and Headline), triazoles (Tilt, Folicur, Domark and Laredo), mixtures of strobilurin + triazoles (Quilt and Stratego) and untreated soybean. The second table shows comparisons of the strobilurin fungicides - Quadris and Headline. Yield responses were often higher for continuous soybean and soybean/rice cropping systems.





Soybeans continued...
by Dr. Trey Koger

Product selection: The following recommendations are for control of diseases and for soybean grown in the absence of soybean rust. Product selection, especially this year, should be based on product availability, price, and crop production system. Supplies of several key products, especially Quadris and Headline, are extremely tight. Additional recommendations are listed here in case Quadris or Headline is not available or in short supply. Again, in the absence of soybean rust, Quadris or Headline (strobilurins) are the products of choice for yield enhancement in our soybean production system. In addition, the following recommendations are based on the fact that we have found no soybean rust in MS and thus are not recommending the use of triazole only or strobilurin + triazole mixture fungicides. Mixtures containing strobilurin fungicides such as Quilt and Stratego can be used to replace of Quadris and Headline if these two products are not available. In the event soybean rust develops and we feel our soybean crop is at risk, fungicide recommendations (mixtures or triazole only fungicides) will be made available at that time.

1.Quadris or Headline: These two products can be interchanged with one another. Quadris is the preferred product in a soybean/rice rotation due to it having excellent activity on aerial web blight. Headline is the preferred product in a continuous soybean, or soybean/corn, soybean/cotton rotation, or for a soybean variety that is extremely susceptible to frogeye leaf spot due to Headline having slightly better activity on this disease. These are the preferred situations where I would place these two products, but overall they are very similar in disease control and can be interchanged with one another with only slight differences in activity on our common soybean diseases.

Use rates for both products: Labeled rate = 6 fl. ounces/acre. In hot and dry summers, it will likely be difficult to differentiate 4 and 6 ounce/acre rates with respect to disease control and yield responses. However, weather conditions are always subject to change quickly leading to potential better responses from the labeled rate of 6 ounces/acre. Decision to use sub-labeled rates is discretionary and the labeled rate for each product is 6 ounces/acre.

Adjuvants: A nonionic surfactant at 0.25% v/v can be applied with a fungicide. It is recommended a surfactant be applied with Quadris.

2. Quadris + Dimilin or Headline + Dimilin: Dimilin at 2 fl. Ounces/acre can be applied with Quadris or Headline to control grasshoppers, greenclover worms, and velvetbean caterpilliars which can sometimes cause extensive leaf feeding defoliation. Dimilin has also been shown to provide some suppression of frogeye leaf spot. Quadris or Headline should be applied at a labeled rate when applied with Dimilin.

3. Quadris + Topsin or Headline + Topsin: If Quadris or Headline supplies are short and their supplies need to be stretched over more acres, Topsin can be tank-mixed with either Quadris or Headline. Topsin has activity on frogeye leaf spot, brown spot, and pod and stem blight, but should **not** be used as a stand alone product. In cases where supplies don't allow the labeled rates of Quadris or Headline to be applied over all treated acres, Topsin 4.5 FL at 14 fl. Ounces/acre per acre can be tank-mixed with Quadris or Headline. A treatment that has performed very well is Quadris or Headline at a sub-labeled rate of 3 fl. Ounces/acre + Topsin at 14 fl. Onces/acre. This tank-mix treatment cannot recommended as a replacement for labeled rates of Quadris or Headline and should only be used when supplies of Quadris and Headline are limited and don't allow labeled rates of Quadris or Headline to be applied over all treated acres.

Other products

Quilt or Stratego: Mixtures of strobilurin and triazole fungicides. Both products contain less strobilurin fungicides than what is recommended or applied when using a strobilurin-only fungicide. These two products can be used if Quadris or Headline are not available.

Use rates for both products: Quilt at 14 fl. ounces/acre (contains 4 ounces/acre Quadris). Stratego at 10 fl. ounces/acre (contains 2.5 fl. ounces/acre of Gem).

Adjuvants: No adjuvant needed.

Domark: Our best performing triazole-alone fungicide. It has both preventative and curative activity, meaning that it will control diseases present at time of application as well as provide residual activity on diseases not yet infecting the plant. Strobilurin fungicides (Quadris and Headline) provide only preventative disease control (i.e. disease that has not yet infected the plant). Domark has similar activity as Quadris and Headline on several of our most problematic foliar diseases. Domark has excellent activity on frogeye leaf spot.

Use rates for both products: 4-5 fl. ounces/acre.

Adjuvants: No adjuvant needed.

Cotton
by Dr. Darrin Dodds

USDA Planting Intentions Report: On June 30, the USDA released the 2008 planting intentions report. According to the report, U.S. cotton producers are expected to plant 9 million acres of cotton in 2008. However, inclement weather may result in substantial discrepancies between planted acres and harvested acres. Texas is predicted to plant 4.7 million acres of cotton in 2008; however, up to 1 million acres of the Texas crop may fail due to weather. Harvested acreage could potentially be in the 7.8 to 8 million acre range. Cotton acreage in Mississippi is projected to be 367,000 acres.

Monitoring Cotton Growth: There are several methods that can be used to monitor the growth and development of a cotton plant. Internode elongation is one method that may be used. The internode is the portion of the cotton stem located between two nodes. Internode elongation tends to be heavily influenced by environmental and plant conditions. As a general rule, the following internode lengths can be used to determine the current activity of a cotton plant: 1.5 to 2 inches – indicates some type of stress present during node development; 2 to 3 inches – normal vegetative development; 3 to 5 inches – favorable growth conditions, potential for rank growth is present. The uppermost fully mature internode is usually located between the fourth and fifth nodes down from the terminal. However, it may be beneficial to monitor internode length between the third and fourth nodes as well. If the internode length between the third and fourth nodes is longer than that between the fourth and fifth nodes, this may be an indication that the plant is adding excessive vegetative growth and increased application rates of a plant growth regulator may be necessary. Additionally, if internode length continues to increase after bloom, this may be an indication that the fruit load on the plant is not adequate to slow down plant growth. A plant growth regulator application may be warranted in this situation.

Average length of the top five internodes may be used to monitor cotton growth as well. Generally, the top five nodes are the ones undergoing rapid elongation. Essentially, the average length of the top five internodes is the same as height to node ratio on the top five nodes. In order to calculate the average length of the top five internodes, you need to measure the length (in inches) of the five uppermost nodes and divide this number by five. However, because the average length of the top five internodes only takes into account the top five nodes, it is essential to count nodes and measure lengths correctly. This method is probably most useful from one week before flowering to two weeks after flowering. Generally, vegetative growth becomes depressed due to boll loading after this time.

Height to node ratio (HNR) is another method that may be used to monitor cotton growth and development. In order to calculate HNR you must measure the height (in inches) from the cotyledons to the terminal. You must then count the total number of nodes present on the plant. The cotyledons are not included in this count and the youngest node with a subtending leaf that is smaller than the size of a quarter is not included. To determine the HNR, divide the plant height (in inches) by the total number of nodes. Generally, younger cotton will have a smaller HNR as node development and internode elongation are limited by cooler temperatures and smaller leaves. With a proper fruit load, blooming cotton will have decreased internode length and therefore, a reduced HNR. A low HNR indicates low vigor and some type of management action may be needed to increase vigor. A high HNR indicates more vigorous growth.

Peanuts
by Mr. Mike Howell

This year's crop is starting off better than the previous 2 years. Peanuts were planted in a timely manner, and have received adequate rainfall in most areas. Acreage is up again this year to around 25,000 acres, with the biggest expansion in the northeast portion of the state.

Weed control should be top priority at this point. We need to get these fields cleaned up as soon as possible then get out before blooming begins. Herbicide applications made after bloom initiation tend to cause blooms to abort.

Growers should also be getting ready for fungicide applications. Traditionally, growers stick to a strict spray schedule for diseases, but recent data indicates that this may not be the best approach, especially in new production areas. Growers that follow the Prescription Rx plan developed by the University of Georgia have shown increased profits and reduced inputs compared to the full fungicide approach. This approach takes into account production history, weather conditions, variety, and several other factors to make a better prediction about risk of disease in a field. Keep in mind that this is for leaf spot diseases. Growers still need to make white mold applications.

Insects are usually not a problem in peanuts until late in the season. This year is shaping up to be different. There have already been several fields treated for foliage feeding caterpillars, and they can be found in low levels in most every field. I have had several calls about adding an insecticide to a herbicide application or fungicide application. This is fine if insects are at threshold levels. However, if insects are still below threshold, we want to delay these applications as long as possible. We don't want to harm our beneficial populations and risk flaring an outbreak of spider mites. Also, keep in mind that we now have a label for Intrepid in peanuts. This product will work well against many of the foliage feeders, but is weak on the bud/bollworm complex.

Three cornered alfalfa hoppers also are beginning to build. There is not much data on this insect in peanuts, but most scientists agree that they are causing yield loss. Currently there are research plot across the state designed to evaluate this pest and help get an idea on thresholds and application timings. Currently, the best approach we have is to monitor this pest and where the damage is occurring. If damage begins to interfere with pegging, then an insecticide application may be justified.

There are several meetings upcoming that will be of interest to peanut growers. The Farm Bureau Peanut Commodity Conference will be on July 8. This meeting will be in Lucedale at 10 AM, but will also be available on video conference. Contact your local extension office to register for the video conference. We are also planning a production tour in Georgia for July 21-23. We will visit the National Peanut Lab, research plots at the Sunbelt Ag Expo, and several growers in the area.

Rice

by Dr. Nathan Buehring

Rice over the past month has matured quite rapidly. As a whole, our rice crop would rate fair to excellent. This year's rice crop has a wide range of growth stages. Rice has recently emerged in some areas and there some rice that is approaching the boot stage. I would estimate 25% of the acres were planted before April 15th, 50% was planted between April 15th and May 15th, and 25% was planted after May 15th. This is drastically different from last year where 75% of the rice acres were planted before April 15th. As a whole, the crop looks good; however, the lateness in the crop is of concern.

During the last week of June, sheath blight pressure has increased. Favorable conditions for sheath blight are highs in the 85 to 90 F range with high humidity throughout the day. Under humid conditions, it can take until after mid-day to get the rice plants dry from dew. This disease thrives under high moisture conditions and does not take much time to move all the way up the plant. Under low humidity conditions, sheath blight can be seen underneath the canopy, but it will not move up the plant as fast due to the top portion of the canopy drying off quickly in the morning. If you have not sprayed a fungicide on your rice crop, I would monitor your crop closely to determine if a fungicide application will be necessary.

Over the past month I have been seeing rice stinkbugs scattered across the field in non-headed rice. I am not sure what this means for rice stinkbug pressure this year. Corn and grain sorghum can serve as a host for the rice stinkbug. With a substantial amount of these two crops this year, we could see high rice stinkbug numbers in the rice. As the rice begins to head, I would monitor it closely for stinkbugs, especially on early headed rice.

When scouting for rice stinkbugs, I would sample early in the morning (before 10:00 am) or late in the evening (after 5:00 pm). Rice stinkbugs move lower in the canopy during the hot part of the day, which would lower your sample numbers. Our threshold is 5 rice stinkbugs per 10 sweeps for the first two weeks of heading and 10 rice stinkbugs per 10 sweeps for the second two weeks of heading. Four pyrethroid insecticides are currently labeled and recommended for rice stinkbug control: Karate Z (1 gallon/50 to 80 Acres), Mustang Max (1 gallon/32 to 48 Acres), Prolex (1 gallon/62 to 100 Acres), and Proaxis (1 gallon/25 to 40 Acres).

The Annual Delta Research and Extension Center Field Day will be on July 17th. Registration will begin at 7:30 AM at the Charlie Capps Center. The field day will conclude at noon with lunch provided.

Mississippi Farm Bureau is hosting its Summer Rice Policy Meeting in Cleveland on Friday, July 18th at the Bolivar County Extension Auditorium Building beginning at 10:00 AM and concluding around noon. Lunch is provided, and the meeting is open to all rice growers in the state.

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

Mississippi State University Extension Service

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