Plant Protection Programs University of Missouri

Integrated Pest & Crop Management

Sheath Blight Damages Some Missouri Rice Fields

By Allen Wrather

Sheath blight is now present in a few Missouri rice fields, and it is causing some damage to plants. Fortunately, this disease is not spreading rapidly in these fields due to the recent dry weather. However, farmers should scout their rice fields weekly for this disease from internode elongation to beginning bloom or hire someone to do this to determine if their fields should be sprayed with a fungicide. Yield loss may be severe especially for susceptible varieties if this disease persists and eventually attacks the flag leaf and head.

Fungicides should be applied when the disease threshold is reached for the variety growing in the field. Stratego, Gem, Quadris, and Quilt are labeled fungicides for control of this disease. University of Missouri Extension Regional Agronomist can supply information about sheath blight thresholds, or you can call me at the Delta Center. More information about sheath blight identification, control, and thresholds for treatment of fields with fungicides is available at aes.missouri.edu/delta/muguide/mp646.stm

Here's the situation. Sheath blight is caused by a fungus that most often infects rice plants soon after the flood is applied. Sheath blight lesions develop first on the stem near the water line. These lesions are circular to oblong (1 inch long and 0.5 inch wide), with grayish-white centers and purple-brown borders. Infection and spread of the disease is more severe when humidity is high, rain is frequent, and average daily temperatures are around 82° F. As the disease progresses, entire leaves may be killed and the disease may spread to rice heads. Damage due to this disease can range from partial infection of the lower leaves to premature plant death. When this disease is severe, yield and milling quality of kernels can be reduced.

Following these suggested procedures will give rice farmers a better chance to produce high yields and profit in 2009.

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IPM Pest Monitoring Network Update

By Steven Kirk

Monitoring for pest outbreaks is a cornerstone of MU's Integrated Pest Management (IPM) Program. IPM stresses scouting practices rather than calendar-based treatments to detect pests and determine if action is necessary. **MU's IPM Pest Monitoring Network** provides farmers, landowners and pest managers with an up-to-date tally on several economically important insect species captured in pheromone traps throughout Missouri. Although Pest alerts from moth and beetle captures in pheromone traps **DO NOT** indicate that treatment is necessary, they do provide valuable tool to our subscribers indicating that scouting for potential pests in nearby locations may be in order.

Farmers and pest managers can sign up and receive electronic Pest Monitoring Alerts when potentially significant insect captures have been reported. To subscribe to this service, visit our web site at: http://ppp.missouri.edu/pestmonitoring/subscribe.htm.

At the site, fill in the required fields and then mark the boxes next to the insects of interest and click submit. When pest captures reach significant numbers you will automatically be notified via email. This information is provided to help pest managers make sound pest management decisions.

Since the **Japanese Beetle** monitoring season began in early June, there have been over **30 Pest Alerts** sent to our subscribers from June 5th through the July 2nd due to potentially significant beetle captures in pheromone traps. Japanese beetle adults feed on foliage and fruit of up to 400 different hosts, including ornamentals, trees, small fruit, corn and soybean. Beetles often congregate in large numbers to feed. Damage to foliage is often seen as a lace-like pattern on host plant foliage because beetles avoid leaf veins when feeding.

Significant captures have occurred in 10 counties in 5 of Missouri's 7 geographical regions. The heaviest captures have occurred in Ray County located in the west-central region near Camden with over 9,200 beetles captured from June 25th through the 30th and 2,392 captured on July 2nd over 2 days. Springfield in Greene County (SW region) reported nearly 3,950 beetle captures over a 5-day period ending on June 22nd. In Boone County (Central region) at the A.L. Gustin Golf Course located on the University of Missouri campus, over 3030 beetles were captured over a 7-day period on June 26th, and 1,850 were captured on June 29th over 3 days. In Charleston MO, located in Mississippi County (SE region) 2800 beetles were captured on June 23rd over a 7-day period and 1800 were captured on June 25th over 3 days. In addition to the Japanese beetle captures listed above, significant beetle captures in excess of 1,000 have occurred in Ray, Barry, and Scott Counties from June 15th thru the 30th.

Table 1. Japanese Beetle Alerts

Japanese Beetle Captures					
County	***Trap Location***	***Region***	***Trapping Period (Begin)***	***Trapping Period (End)***	***Japanese Beetles Captured***
Ray	Camden	WC	6/25/09	6/30/09	**9210**
Greene	Springfield	SW	6/17/09	6/22/09	**3945**
Boone	MU Campus	C	6/19/09	6/26/09	**3036**
Mississippi	Charleston	SE	6/16/09	6/23/09	**2800**
Ray	Camden	WC	6/30/09	7/2/09	**2392**
Boone	MU Campus	C	6/26/09	6/29/09	**1852**
Mississippi	Charleston	SE	6/23/09	6/25/09	**1800**
Ray	Camden	WC	6/22/09	6/25/09	**1683**
Barry	Aurora	SW	6/18/09	6/30/09	**1600**
Scott	Benton	SE	6/22/09	6/25/09	**1400**
Scott	Benton	SE	6/19/09	6/22/09	**1400**
Scott	Benton	SE	6/17/09	6/19/09	**1200**
Scott	Benton	SE	6/25/09	6/27/09	**1000**
Boone	MU Campus	C	6/12/09	6/19/09	**962**
Mississippi	Charleston	SE	6/5/09	6/16/09	**800**
St. Charles	St. Peters	EC	6/29/09	7/1/09	**677**
Ste. Genevieve	Weingarten	EC	6/26/09	6/29/09	**482**

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County	*Trap Location*	*Region*	*Trapping Period (Begin)*	*Trapping Period (End)*	*Japanese Beetles Captured*
Lawrence	Mt. Vernon	SW	6/22/09	6/24/09	**450**
Lawrence	Mt. Vernon	SW	6/22/09	6/24/09	**450**
Barry	Aurora	SW	6/1/09	6/18/09	**420**
Ray	Camden	WC	6/17/09	6/22/09	**387**
Ste. Genevieve	Weingarten	EC	6/29/09	7/1/09	**364**
Lawrence	Mt. Vernon	SW	6/17/09	6/22/09	**300**
Boone	Wilton	C	6/26/09	6/29/09	**254**
St. Charles	St. Peters	EC	6/22/09	6/24/09	**228**
Boone	South Farm	C	6/26/09	6/29/09	**192**
Ste. Genevieve	Weingarten	EC	6/24/09	6/26/09	**164**
Boone	Wilton	C	6/22/09	6/26/09	**157**
Boone	Wilton	C	6/19/09	6/22/09	**117**
Stoddard	Bloomfield	SE	6/22/09	6/25/09	**115**
Ste. Genevieve	Weingarten	EC	6/19/09	6/22/09	**91**

The 2009 Black Cutworm Monitoring Season came to an end in mid-June. Since the 2009 season began at the end of March we have sent 15 Black Cutworm (BCW) Predicted First Cutting Alerts to our 82 subscribers on our BCW Alert notification list. This year, intensive captures occurred in 7 separate counties in 4 different regions throughout Missouri. The highest infestations occurred in the Northeast region at the Greenly Center in Knox County near Novelty, MO. followed by captures at the Delta Center in Pemiscot County located in the Southeast region of the state.

Table 2. Predicted First Black Cutworm Cutting Alerts

Black Cutworm Cutting Alerts 2009			
County	*Trap Location*	*Intensive Capture Date*	*Predicted FIrst Cutting Date*
Linn	Brookfield	5/26/09	6/10/09
Pemiscot	Hayward (Delta Center)	5/13/09	5/28/09
Knox	Novelty	5/8/09	5/29/09
Knox	Novelty	5/1/09	5/22/09
Knox	Novelty	4/30/09	5/23/09
Audrain	Mexico	4/30/09	5/21/09
Knox	Novelty	4/27/09	5/20/09
Pemiscot	Hayward (Delta Center)	4/24/09	5/13/09
Audrain	Mexico	4/24/09	5/17/09
Morgan	Versailles	4/22/09	5/15/09
Barton	Nashville	4/20/09	5/12/09
Callaway	Fulton (west)	4/17/09	5/10/09
Pemiscot	Hayward (Delta Center)	4/13/09	5/5/09
Pemiscot	Hayward (Delta Center)	4/10/09	5/4/09

In addition to Japanese Beetle and Black Cutworm, **MU's IPM Pest Monitoring Network** also offers **Pest Alerts** for the following insect pests:

- **True Armyworm**
- **European Corn Borer**
- **Southwestern Corn Borer**
- **Corn Earworm**
- **Fall Armyworm**
- **Beet Armyworm**
- **Tobacco Budworm**
- **Soybean Looper**

To view up-to-date tallies of these economically important insect pests captured in pheromone traps throughout Missouri.

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Soybean Disease Update - July 7, 2009

By Laura Sweets

Several different disease problems are beginning to show up in soybean fields throughout the state.

Stunting and yellowing of plants may be the result of Fusarium root rot, Rhizoctonia root rot or Phytophthora root rot. With Fusarium and Rhizoctonia root rot plants may showing yellowing of the lower leaves, general stunting and poor root development but the entire plant may not yet be dead. Fusarium root rot tends to cause a rotting of the main taproot. The taproot may be discolored (ranging from light brown to a dark blackish-brown) and deteriorated. Rhizoctonia tends to cause red to reddish-brown lesions on the stem at or near the soil surface. With Phytophthora root rot the entire plant may have an off-color, wilted appearance. Entire plants may be dead. One key symptom of Phytophthora is the dark-brown discoloration of the main stem from the soil line up the main stem and even out the side branches. At this point in the season there are no control measures that can be taken for these soybean root rot diseases. If weather conditions are stressful, i.e. hot and dry, affected plants may die. If weather conditions are mild with adequate moisture, affected plants may survive but not recover.

Stunted, yellowed or poorly growing plants should also be checked for soybean cyst nematode.

If plants are carefully dug up and soil gently removed from the root system, it may be possible to see the white to yellow bodies of the females on the roots. If SCN is suspected, it would be wise to submit a soil sample for SCN analysis.

Some soybean foliage diseases are also showing up in low levels in parts of the state. Septoria brown spot is occurring but is not as widespread or severe as it has been the last few years. Bacterial blight has been evident in some areas where there have been hail storms or storms with strong wind-driven rains that spread the bacterial pathogen. Bacterial blight lesions tend to be small, black to blackish-brown lesions with a slight yellow to light green halo. One or two samples have shown early symptoms of downy mildew. The upper leaf surfaces have bright yellow, irregular blotches and the downy mildew fungus may be obvious on the lower leaf surface as a purple to gray mold growth. None of the samples submitted thus far have had high levels of any of these foliage diseases.

Finally, A few scattered plants are showing what may be very early symptoms of SDS or sudden death syndrome of soybean. Leaves in the upper to mid canopy are showing yellow, irregular blotches in the interveinal leaf tissue. The few fields in which I have seen these symptoms were planted prior to the wet period the end of April the first of May.

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Glyphosate Tank-Mixes in RR Soybean

By Kevin Bradley

It seems that at this time in the season each year, there are always plenty of calls and questions about glyphosate tank-mix partners in Roundup Ready soybean. One of the first research projects I initiated after arriving at the university had to do with the utility of glyphosate tank-mix partners in Roundup Ready soybean and it seems like in some way we have evaluated glyphosate tank-mix partners every year since. Based on all of this research so far, my answer to the question of using a tank-mix partner with glyphosate falls into two categories:

1.) If you don't think you have glyphosate-resistant weeds present.

If you have a field where the weeds (including waterhemp) have gotten tall and you **DON'T** suspect you have any glyphosate-resistant weeds present, then our research shows that increasing the rate of glyphosate will generally provide as good or better weed control than adding a tank-mix partner to glyphosate in Roundup Ready soybeans. There may be some exceptions to this statement if you are dealing with weeds that have a natural tolerance to glyphosate. For example, a Resource tank-mix can sometimes provide better morningglory control than even a higher-than-normal rate of glyphosate. Also, there are some weeds like Asiatic dayflower and field horsetail that we are probably never going to kill with glyphosate and a tank-mix can often help with these kinds of weed species. For the most part however, our research has shown that if there are no resistant weeds present, our "normal" spectrum of weeds in Missouri will usually be controlled as good or better by a higher rate of glyphosate compared to a standard glyphosate application with a tank-mix partner. Another way of saying it is to take the money you were going to spend on the tank-mix partner and put that money towards a higher rate of glyphosate per acre.

2.) If you suspect you have a glyphosate-resistant weed present.

The other side of the coin is if you suspect that you do have a glyphosate-resistant weed like waterhemp present, then a tank-mix partner can be very beneficial. Increasing the rate of glyphosate in this case will rarely provide better weed control and will almost certainly cost you more money.

In our research with glyphosate-resistant waterhemp (see black bars in graph below), we found that the addition of Ultra Blazer at 1.5 pts/A, Flexstar at 12 fl ozs/A, or Phoenix at 8 fl ozs/A to a standard rate of glyphosate provided from 77 to 85% control of glyphosate-resistant waterhemp six weeks after **treatment. This is compared to only** 22% control of glyphosate-resistant waterhemp that was achieved with a standard rate of glyphosate alone. As you can see from the remainder of the results in this graph, other tank-mix partners like Aim, Butyrac, and Firstrate were highly ineffective on glyphosate-resistant waterhemp. Resource provided

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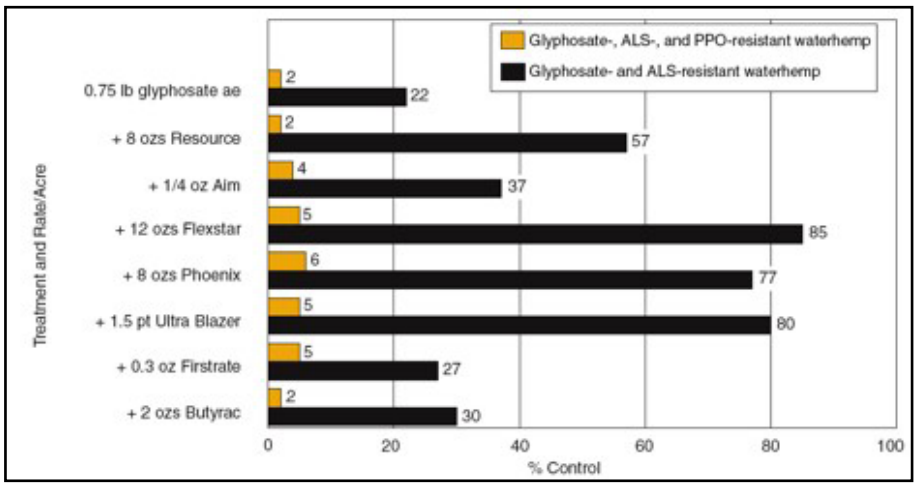
Figure 1. There are few options for controlling tall weeds like waterhemp in soybeans, especially if you suspect them to be resistant to glyphosate.

some control compared to glyphosate alone, but as this graph clearly shows, there are better options for waterhemp control than Resource.

Although all of the research in this graph was conducted prior to the introduction of Cadet onto the marketplace, subsequent studies we have conducted with this herbicide have shown that tank-mixes of this product with glyphosate are also ineffective on glyphosate-resistant waterhemp, or even on glyphosate-susceptible waterhemp that has gotten too tall. The label of this product clearly shows control of ***2-inch*** waterhemp with 0.9 fl ozs of Cadet per acre. This does not translate into control of 24-inch waterhemp with tank-mixes of the same rate!



If you suspect you have other glyphosate-resistant weeds like common or giant ragweed present, then tank-mixes of the PPO-inhibiting herbicides like Ultra Blazer, Flexstar, and Cobra/Phoenix are probably still going to be your best option. Although for the most part Firstrate and some of the other ALS-inhibiting herbicides continue to have good activity on common and giant ragweed in Missouri, these herbicides are also very sensitive to weed height. This means that when the ragweeds get over one foot or so in height, the likelihood of controlling them with these herbicides goes down dramatically.

Finally, as far as tank-mix partners are concerned I think one of the biggest things we need to avoid is the temptation to use a tank-mix partner just because it only adds another $1 or $2 per acre to the total application cost. Also, we should be aware of the potential for antagonism of some of these products with glyphosate. Just because a product appears to control weeds quicker, that doesn't always mean that the product or tank-mix treatment is better. In our research where we have the ability to compare different tank-mix treatments side-by-side, we will often rate a tank-mix treatment higher than a glyphosate-only treatment 3- to 5-days after application. However, when we come back and rate those same treatments 10- to 14-days after application, we will often see no differences in overall weed control between the tank-mixes and the glyphosate-only treatment.

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Visit our Web site at weedscience.missouri.edu

Check for Insect Infestations in Corn and Wheat Stored On-Farm During Summer

By Wayne Bailey

Grain placed in on-farm storage this past fall and stored through the summer months of 2009 should be inspected at regular intervals for the presence of stored grain insect pests. Insect infestations may occur throughout the grain mass, on the upper surface of the grain mass, or in both areas depending on the species of insects infesting the bin. Indian meal moth is the most common insect problem found in the upper twelve inches of the grain mass where larval feeding results in areas of moist, sour smelling grain and thick webbing. If such an infestation occurs and larvae are still active, removal of the damaged grain followed by an insecticide application to the remaining grain surface may be one method of control. Pest strips hung above the grain mass inside the storage structure may help control the moth stage of this common pest.

If an infestation of various flour beetles, grain weevils, or other stored grain beetles is found infesting the grain mass, then immediate use of the grain mass or fumigations are two possible control options. If fumigation is selected, a professional fumigator should be used as the poisonous gases associated with fumigation are extremely dangerous if used improperly. The best option for management of stored grain insect infestation in summer is to immediately use the grain as livestock feed or some other use where the insects do not cause a problem in the end product.

Scouting methods differ by location in the bin. Indian meal moth infestations can generally be seen by observing the top of the grain mass from the roof access door. If no webbing or foul grain odors are found, then it is unlikely that Indian meal moths are present in high numbers. If the grain was properly leveled and treated with an appropriate insecticide after filling of the storage facility the previous fall, it is best not to break or disturb the protective cap of insecticide applied at that time. Some probing of the grain surface from the access door may be necessary to determine level of insect infestations if found. Scouting for stored grain insects in the grain mass can be accomplished by using a grain probe to collect samples through the side access panel. Grain collected should be placed in a glass jar, plastic bag, or some other container through which insects can be seen if they are present in the grain. These containers of grain should be placed in a warm area to allow the grain to warm to at least 60 degrees F or higher in order to stimulate insect activity.

Early summer is a good time to work toward the prevention of stored grain insect infestations in harvested fall grain crops. Sanitation is the main method of preventing unwanted insect infestation in stored grain. Although sanitation around storage facilities is most effective directly following filling of these facilities in the fall, early summer sanitation will also help reduce insect pest numbers later in the year. Removal or elimination of any grain scattered in the area of storage facilities will help reduce later generations of these pests. Several insecticides are labeled for use outside of grain bins, for inside surfaces in empty bins, and for addition to the grain mass at the time of filling the storage structures. All insecticides for stored grain insects have very specific labeled uses so special attention must be given when selecting an insecticide for these various uses. Some insecticides are labeled for wheat only or corn only, whereas others may be labeled for both. Be sure to read and follow all insecticide label instructions, restrictions, and precautions when using insecticides for management of stored grain insect pests.

Moisture in the grain mass is one very important factor which attracts insect pests to these structures. Charles Ellis discussed the aeration and moisture zones in on-farm grain storage facilities in the January 15, 2009 issue of this newsletter (Volume 19, Number 1). Proper aeration of the grain mass to manage moisture and grain mass temperature is essential for good insect control. Note: it often requires a week or more of aeration to move a moisture layer through and out of a grain mass depending on several factors including the volume of air moved, the size of the storage structure, and the temperature of the air being moved into or out of the grain mass.

Color images and additional information concerning proper management of common stored grain insects can be found on the Commercial AG Electronic Bulletin Board at agebb.missouri.edu/storage/pests/insect.htm.

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Plan Now to Attend the MU Pest Management Field Day on July 15th

Kevin Bradley

The annual Pest Management Field Day will be held this July 15th at the Bradford Research and Extension Center near Columbia, Missouri. As in recent years, we have expanded the focus of this field day to include a variety of pest management topics that are of interest to agricultural industry representatives, agrichemical dealers, Extension specialists, and producers throughout Missouri and surrounding states.

Some of the weed management research topics and trials that will be discussed at this year's field day include: options for volunteer corn control in corn and soybeans, new herbicides that will be available in 2010, future herbicide-resistant crop offerings like Optimum GAT corn and soybean, utility of residual herbicides and new herbicide programs approaches in soybeans, and finally an update on the status of glyphosate-resistant weeds in Missouri.

Dr. Kelly Tindall, MU entomologist stationed at the Delta Research Center, will be discussing research on an emerging insect problem in Missouri, the Dectes stem borer. Dr. Wayne Bailey will also be discussing the influence of weather on insect pest populations in Missouri, which has been a big issue with the rainfall we have experienced in recent years.

Dr. Laura Sweets, state extension plant pathologist, will discuss results from a three-year trial pertaining to the management of scab in wheat. Dr. Sweets will also discuss a multi-state trial evaluating the effects of different sources of soybean cyst nematode resistance on field population levels of SCN.

Lastly, our state climatologist, Dr. Pat Guinan, will be providing an overview of the weather monitoring systems in Missouri and the applications of these monitoring systems to producers and pesticide applicators.

The program will begin at 8:30 a.m. and will include guided wagon tours with stops that feature presentation of results and talks by university weed scientists, entomologists, plant pathologists, and agronomists. **There will be a $10 registration fee collected at the time of check-in**. This will cover costs associated with lunch and will provide each attendee with a tour booklet that describes the layout and location of each experiment.

As usual, after lunch you will have the opportunity to view plots that showcase a wide variety of herbicide treatments and weed management systems for use in corn, soybean, or grain sorghum on your own. This year we have more than 80 trials and 950 separate weed management treatments on display at the research and extension center.

For certified crop advisors, 2 CEU credits for the field day are pending. **If you plan on attending the field day, you must pre-register before July 10th by calling 573-884-7945 or by sending an e-mail to chismt@missouri.edu**. The Bradford Research and Extension Center is located 7 miles east of Columbia, off of highway WW. For more complete directions call 573-884-7945 or visit http://aes.missouri.edu/bradford/index.stm.

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Anthracnose of Corn

Laura Sweets

Anthracnose leaf blight, caused by the fungus *Colletotrichum graminicola*, usually occurs early in the season on the lower leaves of young corn plants. Anthracnose lesions tend to be brown, oval to spindle-shaped lesions with yellow to pinkish to reddish-brown borders. Lesions may be 0.2 to 0.6 inch in length. Lesions may merge or coalesce to kill larger areas of leaf tissue. Concentric rings or zones are sometimes apparent within the diseased areas of leaf tissue. Lesions may be concentrated towards the leaf tip (or portion of the leaf that was emerged when rain occurred) giving the leaves a fired appearance that might be mistaken for nutrient deficiency or herbicide injury.

Anthracnose tends to be most common early in the season on the lower leaves of young corn plants. These leaves may be severely affected and yellow and die prematurely. Generally the disease stops at this point because of drier, warmer weather conditions and is not considered a significant problem. Under favorable weather conditions, the fungus may move up the plant causing foliage symptoms on higher leaves. If favorable weather conditions occur mid-season (especially wet), anthracnose may actually move up to the ear leaf. The anthracnose fungus can also cause top dieback and stalk rot later in the season. High temperatures and extended periods of wet weather favor anthracnose. Anthracnose leaf blight is more likely to occur if corn is planted following corn.

There have been several reports of anthracnose leaf blight on young corn plants. In a normal year anthracnose leaf blight in Missouri is not serious and would not warrant a fungicide application. The switch in weather patterns to drier and hotter weather could also restrict continued spread and development of the disease. If the forecast was for frequent rains over the next 7-10 days, the disease could continue to spread in the infected plants resulting in symptoms on leaves higher up in the canopy. The decision to apply a foliar fungicide this early in the season should take into consideration the yield potential of the field, the extended weather forecast, the cost of application, whether weather will permit application now and the possibility that a second application might be necessary later in the season for diseases such as gray leaf spot and southern rust.

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Weather Data for the Week Ending July 6, 2009

By Pat Guinan

Station	County	Weekly Temperature (oF)						Monthly Precipitation (in.)		Growing Degree Days‡	
		Avg. Max.	Avg. Min.	Extreme High	Extreme Low	Mean	Departure from long term avg.	June 1 - June 30	Departure from long term avg.	Accumulated Since Apr. 1	Departure from long term avg.
Corning	Atchison	83	63	88	58	72	-4	5.75	+1.42	1454	+134
St. Joseph	Buchanan	81	64	85	62	72	-4	4.14	-0.59	1399	+66
Brunswick	Carroll	84	63	87	60	73	-3	6.39	+1.48	1480	+115
Albany	Gentry	83	62	88	59	72	-4	7.42	+2.86	1348	+40
Auxvasse	Audrain	83	62	86	60	72	-4	10.14	+5.65	1471	+98
Vandalia	Audrain	83	61	87	58	72	-4	3.44	-1.02	1458	+114
Columbia-Bradford	Boone	*	*	*	*	*	*	*	*	*	*
Columbia-Jefferson Farm	Boone	83	62	85	59	73	-3	6.11	+1.84	1484	+56
Columbia-South Farms	Boone	82	62	85	59	72	-4	6.25	+1.97	1482	+55
Williamsburg	Callaway	83	61	86	59	72	-3	7.35	+2.85	1453	+120
Novelty	Knox	80	61	84	58	70	-5	5.71	+1.77	1300	-26
Linneus	Linn	82	61	86	58	71	-4	5.86	+0.98	1345	+59
Monroe City	Monroe	81	61	86	58	71	-5	2.86	-0.92	1401	+33
Versailles	Morgan	84	64	87	60	74	-2	6.71	+2.43	1573	+106
Green Ridge	Pettis	82	63	86	60	73	-3	8.07	+2.58	1492	+110
Lamar	Barton	83	65	89	59	74	-4	6.53	+0.36	1568	+40
Cook Station	Crawford	83	59	87	55	72	-4	7.33	+3.31	1457	-37
Round Spring	Shannon	87	60	93	56	73	-3	5.85	+2.05	1488	+76
Mountain Grove	Wright	83	61	86	56	72	-3	3.17	-0.86	1432	+61
Delta	Cape Girardeau	86	63	92	61	74	-5	3.19	-0.31	1690	-19
Cardwell	Dunklin	89	69	92	67	79	-2	2.69	-0.82	1923	+33
Clarkton	Dunklin	89	67	93	64	78	-2	2.79	-0.88	1842	-14
Glennonville	Dunklin	88	67	92	63	77	-3	2.67	-0.64	1850	+2
Charleston	Mississippi	87	66	93	64	76	-2	3.63	-0.44	1788	+99
Portageville-Delta Center	Pemiscot	89	69	93	65	79	-1	3.11	-0.80	1925	+62
Portageville-Lee Farm	Pemiscot	90	69	94	66	79	-1	2.35	-1.40	1936	+90
Steele	Pemiscot	90	70	94	67	80	0	5.49	+1.53	1997	+127

* Complete data not available for report

‡Growing degree days are calculated by subtracting a 50 degree (Fahrenheit) base temperature from the average daily temperature. Thus, if the average temperature for the day is 75 degrees, then 25 growing degree days will have been accumulated.

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