Integrated Pest & Crop Management





Mid to Late Season Soybean Diseases

By Laura Sweets

This is normally the time of year when mid to late season soybean diseases may show up in Missouri soybean fields. Symptoms of late season Phytophthora root rot, sudden death syndrome (SDS) and Cercospora leaf spot/blight might be evident in fields. In addition to Phytophthora, SDS and Cercospora, Septoria brown spot could have moved up in the canopy of some fields. Losses from soybean cyst nematode continue to be a problem. This would be a good year to sample fields for SCN. In some years charcoal rot could become a problem. But as much of the state has been under a prolonged period of hot, dry weather, symptoms of SDS may not be as prevalent this season. Plants dying from stress compounded by root systems damaged by Phytophthora, Rhizoctonia or Fusarium root rot may be more common. And in areas in which drought has been severe charcoal rot may be damaging or killing soybean plants.

Yield losses from these various late season diseases will vary depending on when symptoms began to occur, number of plants infected, severity of disease in infected plants and weather conditions from now to harvest. Although it is too late in the season to do much to control these diseases this year, management strategies to prevent or minimize these diseases next season are also given below.

Late Season Phytophthora Root Rot

Wet conditions after planting regardless of planting date increase the likelihood of Phytophthora root rot. Phytophthora may cause seed decay and seedling blight but it can also cause symptoms later in the season as plants move into reproductive stages of growth. Infected older plants show reduced vigor through the growing season or die gradually over the season. Lower leaves may show a yellowing between the veins and along the margins. Upper leaves may yellow. The stems show a characteristic brown discoloration that extends from below the soil line upward and even out the side branches. Eventually the entire plant may wilt and die. Withered leaves remain attached even after the plant dies. Preventive measures are the main means for managing Phytophthora root rot. Select varieties with either race-specific resistance, tolerance or a combination of the two, plant in good seedbed conditions, tile to improve drainage, take steps to reduce compaction, rotate crops and use an appropriate fungicide seed treatment.

Sudden Death Syndrome

Symptoms of sudden death syndrome (SDS), caused by a strain of *Fusarium virguliforme*, may appear several weeks before flowering but are more pronounced after flowering. Foliage symptoms tend to be more pronounced when cool, wet conditions occur during and just after the flowering stages of growth. With the weather this season, foliage symptoms may not be widespread or severe.

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Foliage symptoms begin as scattered yellow blotches in the interveinal leaf tissue. These yellow blotches may increase in size and merge to affect larger areas of leaf tissue. Yellow areas may turn brown but veins remain green giving the leaves a striking appearance. Infected plants may wilt and die prematurely. Severely affected leaflets may drop off the plant leaving the petiole attached or may curl upward and remain attached to the plant. Root systems may show deterioration and discoloration of lateral roots and taproot. When split open, internal tissues of the taproot and stem may show a light gray to light brown discoloration.

Management options for SDS are somewhat limited but should include planting varieties which have performed well where SDS has been a problem, improving drainage in poorly drained fields, avoiding compaction, staggering planting dates, delaying planting until soils are warm and dry, avoiding continuous crop soybean, maintaining good crop vigor, avoiding crop stress including stress from soybean cyst nematode and harvesting fields with SDS in a timely fashion.

Septoria Brown Spot

Septoria brown spot causes small brown spots on the unifoliolate and lower trifoliolate leaves. The individual spots may run together forming irregularly shaped brown blotches on the leaves. Infected leaves may yellow and drop prematurely. Brown spot usually starts on the lower portion of the plant. Under favorable weather conditions (warm, wet weather), the disease may move up through the plant. Brown spot was evident in many Missouri soybean fields earlier this season. But late season rains can trigger a reoccurrence of Septoria brown spot. Symptoms move up through the canopy of soybean plants. Lower leaves may show heavy spotting, yellowing and dropping prematurely. Upper leaves may also show spotting and yellowing. Some fields which have a yellow cast from the road may be showing symptoms of Septoria brown spot rather than SDS.

The fungus which causes this disease, *Septoria glycines*, survives in infested residues left on the soil surface. Fields with continuous soybean production are more likely to show damage. Planting disease-free, good quality seed of resistant varieties, rotating crops with at least one year between soybean crops and maintaining good plant vigor should reduce losses from Septoria brown spot.

Cercospora Leaf Spot and Purple Seed Stain

Cercospora kikuchii can infect soybean seeds, pods, stems and leaves but is most commonly found on the seed. However, this year we are seeing some cases of leaf spot or leaf blight caused by this fungus. Infection is primarily occurring on the uppermost leaves and begins as reddish purple to reddish brown, angular to somewhat circular lesions on the soybean leaves. These lesions may coalesce to kill larger areas of leaf tissue. The uppermost trifoliolate leaf and petiole may be blighted and brown. One striking symptom of this disease may be the premature yellowing and then blighting of the youngest, upper leaves over large areas of affected fields. In most fields, the symptoms have not progressed down the plants more than one to two nodes. Pods at the uppermost node may develop round, reddish purple to reddish brown lesions. This pathogen may also infect seed causing purple seed stain. Infected seed show a conspicuous discoloration ranging in color from pink to pale purple to dark purple. The discoloration may range from small specks to large blotches which cover the entire surface of the seed coat. Temperatures of 82-86°F with extended periods of high humidity favor disease development.

At this point in the season control of Cercospora leaf spot and purple seed stain is not feasible. It is important to remember that since this fungus can infect the seed, seed from heavily infected fields should not be used for seed. If infected seed must be planted, seed lots should be thoroughly cleaned and an appropriate seed treatment fungicide used. Rotating soybean with crops other than legumes will also help reduce Cercospora leaf spot and blight in future soybean crops.

Soybean Cyst Nematode

Symptoms of soybean cyst nematode (SCN) range from no obvious symptoms to subtle differences in plant height and vigor or unexpected decreases in yield to severe stunting and discoloration of plants or dead plants. Foliage symptoms may include a yellowing of leaves from the margin inward or a general yellowing of leaves. But such foliage symptoms are also caused by a number of other factors including root rot diseases, nutrient deficiencies, herbicide injury and compaction, so foliage symptoms should not be used to diagnose SCN. Plants with SCN may have poorly developed root systems, if plants are carefully dug up, females may be evident on the roots. The females appear as tiny (smaller than nitrogen-fixing nodules), whitish to yellow to brownish, lemon-shaped structures on the roots. Symptom expression may be more severe if plants are subjected to other stresses such as moisture stress, nutrient deficiencies, herbicide injury, insect damage or other diseases.

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Mid to Late Season Soybean Diseases

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Charcoal Rot

Symptoms typically begin to develop as plants move into reproductive stages of growth. Infected plants are less vigorous and have smaller leaves. Leaves may turn yellow and wilt. Leaves eventually turn brown and have a dry appearance. The taproot and lower stem develop a silvery gray to light-gray discoloration of the epidermis (outer layer of the soybean stem). The epidermis may flake or shred away from the stem, giving the stems a tattered appearance. Fine black specks or microsclerotia may be evident in tissues below the epidermis and eventually in epidermal tissues. Management options for charcoal rot include rotating crops, maintaining good crop vigor to help reduce losses from charcoal rot and irrigating properly from just before bloom to pod fill.

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Small Grasshoppers Numerous in Many Areas of Missouri

By Wayne Bailey

Reports of grasshopper damage to soybean have been received during the past week. Dry weather and dry-down of grasses in field borders and waterways will force grasshoppers into growing field crops. Economic thresholds and insecticides labeled for grasshopper in most crops and non-cropland areas can be found in a previous newsletter published earlier in 2011. Grasshopper numbers often occur on a 4-5 year cycle and this looks like a peak year for grasshoppers in most areas of Missouri.

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Bacterial Blight Damaging Cotton in Southeast Missouri

By J. Allen Wrather

Symptoms of bacterial blight have been observed on cotton plants in many southeast Missouri fields during the last 14 days. The symptoms are black, angular-shaped spots on leaves. These spots are slightly smaller than a pencil eraser, and many spots may merge to kill large parts of leaves. The lesions are visible on both sides of the leaf but are more pronounced on the upper side. The diseased tissue will remain black, and the infected leaves will defoliate if infection is severe. Currently, most of the disease is on lower leaves. This disease will probably not lower yield if it only damages a few lower leaves, but it will lower yield if it spreads to upper leaves and especially if it spreads to bolls and causes boll rot. I have seen no research results that show this disease can be managed at this stage by treatment of the plants with a bactericide or fungicide. However, farmers can take action to minimize spread of this disease to top leaves and bolls by restricting plant growth through aggressive use of growth regulators. This disease will be worse on rank-growth cotton because the bacteria spread more when leaves are wet due to a combination of high humidity and dew that stays on leaves until late morning. Air circulates well through small plants, 30 inches tall, and this helps lower the humidity in the crop canopy so dew dries more rapidly in the morning.

This disease is caused by bacteria, and it was a problem in many cotton fields in the U.S. until the late 1970's when seed companies began acid delinting seed. This process killed the bacteria survived on the seed. I am not sure why this disease has developed this year. There are rumors that some of the seed companies have changed their delinting process, and the bacterial on seed were not killed. You may contact me for more information.

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The Missouri Corn Stalk Nitrate Test Challenge - 2011

By John Lory

For the third year MU Soil Testing Lab and I will be teaming together to run the Missouri Corn Stalk Nitrate Test Challenge. We will analyze up to 10 samples at the MU lab from any Missouri farm at no cost if you submit the requested information when you submit samples (see data form on page 135). Consultants can submit more than 10 samples as long it is clear that no more than 10 samples come from one farmer. Typical analysis cost for the test is $12 per sample. This free offer is available to the first 500 samples submitted to the lab; visit http:nmplanner.missouri.edu to see if we are still accepting samples under this program.

The Stalk Nitrate Test is a powerful tool to assess how well you managed nitrogen in your corn crop this year. Research from Iowa and other states has calibrated nitrate concentration in the corn stalk with the nitrogen status of the harvested corn crop. Corn stalks with a nitrate-nitrogen concentration between 700 and 2000 parts per million are in the optimal range. Nitrate concentrations above 2000 parts per million are indicative of a crop that had excess nitrogen; nitrate concentrations below 700 parts per million are indicative of plants that had marginal nitrogen supply (250-700 parts per million) or were clearly nitrogen deficient (<250 parts per million).

How to sample fields

• The window of opportunity for collecting samples is from ¼ milk stage to up to three weeks after black layer formation. Corn stalks that have weathered heavy rain events well past black layer formation will yield incorrect results.

• Use a set of hand shears or loppers to remove an eight-inch segment of corn stalk from the corn plant. The top cut should be 14 inches above the ground; the bottom cut six inches above the ground.

• Get a stalk segment from at least 15 randomly selected plants from the field or subfield you are sampling. Do not sample diseased or damaged plants.

• Place the samples in a paper bag for shipping to the lab for analysis. Do not freeze the sample. Samples held more than 24 hours before shipping should be refrigerated.

Send samples to: Attention Stalk Nitrate Test Challenge, 23 Mumford Hall, University of Missouri Soil Testing Lab, Columbia, MO 65211.

Visit the Corn Stalk Nitrate Challenge website at http://nmplanner.missouri.edu/tools/Stalk_Nitrate_Challenge.asp for more information and to download more copies of the reporting form.

What do we do with the collected data?

The primary use of the stalk nitrate test is to give you a post-mortem analysis of how well you managed nitrogen on your corn crop. When we combine your data with information from many different Missouri farms we can get an idea of how efficiently Missouri farmers are using fertilizer nitrogen on corn.

We remove farmer identity information on the sample data form and compile data from all submitted samples into a database. Ultimately we would like to collect this type of data for multiple years from hundreds of Missouri farms so we can demonstrate how efficiently Missouri farmers use fertilizer nitrogen. The Missouri Stalk Nitrate Challenge is hopefully a precursor to a larger voluntary statewide program.

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2011 - Stalk Nitrate Challenge Data Form

Your Name: _____ Your phone # or email address: _____

Your address: _____

Field location (You can get lat/long of a point at http://maps.google.com/ (right click and select "what's here")):

_____

Corn Variety: _____ Planting date: _____

Yield goal: _____ bu/A Actual/expected yield: _____ bu/A

Winter cover/trap crop? (if yes, what crop?): _____

Crop(s) previous year: _____

Source of Nitrogen 1:

Fertilizer type _____ Date of Application: _____

Method of application: _____ Target N rate: _____ lbs/A

If surface applied: Incorporated (yes/no): _____ Days to incorporation: _____

N loss inhibitor used (yes/no) _____ Type used _____

Source of Nitrogen 2 (if needed):

Fertilizer type _____ Date of Application: _____

Method of application: _____ Target N rate: _____ lbs/A

If surface applied: Incorporated (yes/no): _____ Days to incorporation: _____

N loss inhibitor used (yes/no) _____ Type used _____

Source of Nitrogen 3 (if needed):

Fertilizer type _____ Date of Application: _____

Method of application: _____ Target N rate: _____ lbs/A

If surface applied: Incorporated (yes/no): _____ Days to incorporation: _____

N loss inhibitor used (yes/no) _____ Type used _____

Stalk Nitrate Sample Information: Date of sampling: _____

Number of stalks included: _____ Area represented by sample _____ Acres

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No analysis cost for the first 10 samples per Missouri farmer[1] if you provide the requested information and follow the sampling protocol below (cost is typically is $12/sample).

Sample Handling: Sample anytime from ¼ milk line to three weeks after black layer formation. Sample at least **15 stalks** from the sampling area. Select representative plants and do not include heavily diseased or damaged plants. For each plant sampled remove the 8-inch section of stalk from six inches above the ground to 14 inches above the ground. Place the sample in a paper bag (not plastic). *Do not freeze sample.* Refrigerate if samples are shipped more than one day after sampling.

Mail samples plus one data sheet per sample to: Missouri Soil Testing Lab, Attn: Stalk Nitrate Test Challenge, 23 Mumford Hall, University of Missouri, Columbia MO 65211. You must include a completed form with each sample to receive no-cost analysis.

Questions? Contact John Lory (LoryJ@missouri.edu; 573-884-7815).

[1]No cost analysis guaranteed for the first 500 samples received. Visit http://www.nmplanner.missouri.edu to see current analysis count, to print more forms or to see a video on how to take a sample.

Spider Mites Problems in Dry Areas of State

By Wayne Bailey

Spider mite problems in soybean are increasing with the continuation of hot, dry conditions in some areas of Missouri. Two-spotted spider mite populations vary from field to field, ranging from no infestation to economic infestations requiring an insecticide application to reduce numbers in soybean.

Spider mites are small organisms most closely related to chiggers and spiders than to insects. The two-spotted spider mite, *Tetranychus urticae*, is often an economic pest of soybean and to a much lesser extent of corn in Missouri during periods of drought conditions. This pest gets its name from two dark spots on the sides of the abdomen which are visible through the mite's translucent, greenish-yellow, white, orange, or red colored body. Spider mites feed on the underside of soybean leaves and are difficult to detect due to their small size of about 1/60 of an inch. Damage to soybean is thought to be caused by the mites piercing individual plant cells with their mouthparts and then feeding on cell contents. Spider mite injury to soybean initially appears as yellow stipples or spots on soybean plants growing along field margins (where mites often overwinter). As mite populations increase, damage moves across the field as mites infest additional soybean plants. In heavy infestations the yellow stipples are generally followed by the injured foliage turning yellow, then brown/bronze and finally dropping from the plant as leaves senesce or dry. Identification of this pest is best accomplished using at least a 10X magnification lens or by shaking infested leaves over a white paper and watching for the small yellow mites to crawl about the paper after being dislodged from the soybean plant.

Although good thresholds for this pest are not available, treatment of infested fields is recommended if drought conditions exist, stipples are present of soybean leaves, and live mites are present. Generally, infestations of this pest move downwind, so it is necessary to scout the entire field to determine if mites are present in spots or throughout the entire field. If hot and dry conditions persist, the entire field may require treatment even if mite numbers are low in some areas of the field. Soybean maturity will be earlier and shattering of grain will be increased by the presence of economic levels of spider mites. Fields which received rainfall should continue to be scouted as damaging levels of spider mite may redevelop if drought conditions return. Note: Even after spider mites have been killed with an insecticide spray, damage symptoms may continue to worsen for up to a week after this pest has been eliminated.

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SPIDER MITES - *Tetranychus urticae* Koch

Comments: Before pod set, treat when foliage yellowing reaches 20% and mites are present on plants. After pod set, treat when foliage yellowing reaches 10% and mites are present on plants. Spider mite infestations on soybean are often associated with drought conditions.

Common Name	Trade Name	Rate of formulated material per acre	Placement	REI Hours	Pre-Harvest Intervals Days
bifenthrin	***Brigade 2EC**	5.12 to 6.4 fl oz	foliage	12	18 (grain)
chlorpyrifos + gamma-cyhalothrin	***Cobalt**	13 to 26 fl oz	foliage	24	30 (grain) Do not graze or feed livestock
dimethoate	**Dimethoate 4EC**	1 pt	foliage	48	21 (grain)
lambda-cyhalothrin + thiamethoxam	***Endigo ZC** (suppresion only)	4.0 to 4.5 fl oz	foliage	24	30 (grain) Do not graze or feed livestock
zeta-cypermethrin + bifentrhrin	***Hero**	4.0 to 10.3 fl oz	foliage	12	21 (grain) Do not graze or feed livestock
chlorpyrifos	***Lorsban Advanced**	1/2 to 1 pt	foliage	24	28 (grain) Do not graze or feed livestock
chlorpyrifos	***Nufos 4E**	1/2 to 1 pt	foliage	24	28 (grain) Do not graze or feed livestock
lambda-cyhalothrin	***Warrior II with Zeon**	1.92 fl oz	foliage	24	30 (grain) Do not graze or feed livestock

***Designates a restricted-use pesticide. Use is restricted to certified applicators only.**
Read the label to determine appropriated insecticide rates, directions, precautions, and restrictions.

Many of Missouri's Alfalfa Fields Support High Numbers of Potato Leafhoppers

By Wayne Bailey

The potato leafhopper is a pest of alfalfa during growth of second and third alfalfa harvests. At present, numerous potato leafhoppers remain in most alfalfa fields where they may cause severe damage to alfalfa plants. Both quality and quantity of alfalfa can be significantly reduced by this pest. The most common symptom observed is yellowing of established plants called hopperburn. This is caused when adult and nymphal (immature) leafhoppers use their piercing-sucking mouthparts to penetrate alfalfa leaflets and stems. They remove plant juices causing sugars produced during photosynthesis to be held in the upper plant leaflets and stems causing yellowing, stunting, and possible senescence of leaf tissue. Heavy damaged plants may die, especially seedling alfalfa. Alfalfa plants under drought stress are most at risk of plant mortality.

Potato leafhoppers are about 1/8-inch in length, wedge shaped, and lime green to greenish-yellow in color. They are very mobile and quickly move sideways, jump, or fly when disturbed. This insect migrates into Missouri each spring from more southern states and Mexico. Recent numerous spring and early summer storms moving into the state from more southern locations of the US have transported high numbers of adult potato leafhoppers into the state, especially into western and northern counties. In Missouri, potato leafhopper adults generally arrive about May 5th of each year. The arriving adults generally feed initially on several tree species before moving to alfalfa to feed and reproduce. Two to three generations of potato leafhopper are often produced with economic damage generally occurring on alfalfa following removal of first harvest. This year potato leafhopper adults were found in alfalfa about May 10th in central Missouri. Several flights of migrating leafhopper adults along with successful reproduction have resulted in economic infestations of this pest in most areas of Missouri.

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RECOMMENDED INSECTICIDES FOR POTATO LEAFHOPPER ADULT AND NYMPHS IN ALFALFA

Chemical Name	Common Name	Rate of formulated material per acre	Pre-Harvest Intervals Days
Beta-cyfluthrin	***Baythroid XL**	0.8 to 1.6 fl oz/acre	7 days
Chlorpyrifos + gamma cyhalothrin	***Cobalt**	7 to 13 fl oz/acre	7-14 days
Dimethoate	**Dimethoate**	see specific label	10 days
Carbofuran	***Furadan 4F**	1 to 2 pts/acre	14 - 28 days
Chlorpyrifos 4E	***Lorsban 4E** *numerous products	1 to 2 pts/acre see specific labels	7 - 14 days 7 - 14 days
Malathion	numerous products	see specific labels	0 - 7 days
Methyl Parathion	*numerous products	see specific labels	15 days
Zeta-cypermethrin	***Mustang Max**	2.24 to 4.0 fl oz/acre	3 days
Permethrin	*numerous products	see specific label	7 - 14 days
Gamma-cyhalothrin	***Proaxis**	1.92 to 3.2 fl oz/acre	1 day forage 7 day hay
Carbaryl	**Sevin 4F**	1 qt/acre	7 days
Carbaryl	**Sevin XLR Plus**	1 qt/acre	7 days
Zeta-cypermethrin + chlorpyrifos	***Stallion**	5.0 to 11.75 fl oz	7 days
Lambda-cyhalothrin +chlorantraniliprole	***Volian xpress**	5.0 to 8.0 fl oz	1 day forage 7 day hay
Lambda-cyhalothrin	***Warrior II**	0.96 to 1.60 fl oz/acre	1 day forage 7 day hay
Lambda-cyhalothrin	*Numerous products	see specific label	1 day forage 7 day hay

***Designates a restricted-use pesticide. Use is restricted to certified applicators only.**
Read the label to determine appropriated insecticide rates, directions, precautions, and restrictions.

Many of Missouri's Alfalfa Fields Support High Numbers of Potato Leafhoppers

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Scouting for this pest is best accomplished using a 15-inch diameter sweep net. Take 10 pendulum sweeps at five random locations in the field. If the average number of potato leafhopper adult and nymphs per sweep reach or exceed the threshold numbers listed below, treatment is justified. The economic threshold for potato leafhopper in alfalfa depends on the height of the alfalfa and whether the alfalfa is a potato leafhopper resistant variety or a traditional alfalfa variety. It is especially important to determine potato leafhopper numbers after removal of an alfalfa crop by harvesting. Remember that whether a field contains a traditional alfalfa variety or a PLH resistant variety, the economic threshold for alfalfa growth 3-inches or less in height is about 5 times more susceptible to potato leafhopper damage than 8 to 10-inch tall alfalfa. These data indicate that the economic threshold for newly harvested alfalfa plants is an average of 1.0 or more potato leafhoppers per 5 sweeps for a traditional variety or 1.8 leafhoppers or more for PLH resistant varieties per 5 sweeps.

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Economic Threshold for Potato Leafhopper (Adults + Nymphs) in Alfalfa

Alfalfa Stem Length – inches	Ave # PLH/Sweep (traditional variety)	Ave # PLH/Sweep (PLH Resistant Variety)
<3	0.2	0.6
6	0.5	1.5
8-10	1.0	3.0
12-14	2.0	6.0

Soybean Rust Developing Slowly in the United States

By J. Allen Wrather

The current threat of soybean rust in Missouri is extremely low. Soybean rust has only been found on a few kudzu leaves in central Florida and nowhere else in the United States. The slow development and spread of rust in the south and southeast parts of the United States is due to the drought in these areas. I expect rust to develop slowly in these areas until this weather pattern changes. More information about the spread of rust in Missouri and the US is available on the web at www.sbrusa.net or you may contact me, wratherj@missouri.edu, for more information about this.

Missouri farmers and crop consultants may have soybean leaves examined for rust by pathologists at the University of Missouri Plant Diagnostic Clinic. Soybean leaves and a moist paper towel should be sealed in a plastic bag, and these should be sent immediately by express mail to the clinic along with a completed information form. The information form and more instructions about collecting and mailing samples to the clinic are posted at http://plantclinic.missouri.edu. You may also call, 573-882-0623, or email, plantclinic@missouri.edu, the clinic about this and other services they provide. The clinic can also provide diagnosis and management information for other soybean problems including diseases, insects, and weeds. There is a $15 fee for examination of samples submitted to the diagnostic clinic.

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Weather Data for the Week Ending July 31, 2011

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 1-30	Departure from long term avg.	Accumulated Since Apr. 1	Departure from long term avg.
Corning	Atchison	91	75	97	71	83	+7	5.83	+0.80	2375	+359
St. Joseph	Buchanan	92	73	97	70	82	+6	4.66	+0.08	2291	+277
Brunswick	Carroll	91	74	97	72	83	+7	4.95	+0.56	2347	+298
Albany	Gentry	93	73	100	70	83	+7	2.27	-2.77	2252	+271
Auxvasse	Audrain	95	73	101	70	83	+6	1.75	-2.45	2353	+283
Vandalia	Audrain	95	73	99	710	83	+7	3.26	-1.46	2294	+271
Columbia-Bradford Research and Extension Center	Boone	95	73	100	70	83	+6	2.34	-2.09	2336	+208
Columbia-Capen Park	Boone	99	73	104	70	84	+6	1.07	-3.48	2359	+161
Columbia-Jefferson Farm and Gardens	Boone	96	75	102	71	84	+7	1.64	-2.78	2399	+268
Columbia-Sanborn Field	Boone	96	76	102	73	85	+7	1.31	-3.24	2528	+330
Columbia-South Farms	Boone	95	75	101	71	84	+7	1.62	-2.88	2388	+259
Williamsburg	Callaway	95	73	99	71	83	+7	2.64	-1.84	2361	+346
Novelty	Knox	92	74	97	69	82	+6	1.98	-2.43	2142	+142
Linneus	Linn	93	73	99	70	82	+6	3.79	-1.13	2205	+252
Monroe City	Monroe	94	74	99	70	83	+7	1.17	-2.96	2245	+205
Versailles	Morgan	101	75	105	73	87	+9	0.74	-3.64	2575	+398
Green Ridge	Pettis	98	74	103	72	86	+11	1.61	-2.69	2447	+364
Lamar	Barton	98	74	101	70	85	+7	4.63	-0.02	2621	+361
Cook Station	Crawford	96	70	98	68	81	+4	2.74	-0.73	2428	+242
Round Spring	Shannon	96	69	98	67	80	+4	3.40	-0.49	2355	+260
Mountain Grove	Wright	97	71	98	68	82	+5	4.08	-0.09	2390	+344
Delta	Cape Girardeau	94	72	98	69	82	+3	1.69	-1.53	2648	+193
Cardwell	Dunklin	95	74	98	72	83	+3	1.90	-1.87	2916	+240
Clarkton	Dunklin	94	74	98	72	83	+3	1.87	-1.80	2848	+215
Glennonville	Dunklin	93	75	98	74	83	+3	2.74	-0.90	2851	+228
Charleston	Mississippi	94	74	97	72	83	+4	1.26	-2.69	2748	+287
Portageville-Delta Center	Pemiscot	94	75	97	73	84	+4	1.29	-2.15	2946	+293
Portageville-Lee Farm	Pemiscot	93	75	97	73	84	+4	1.96	-1.71	2934	+298
Steele	Pemiscot	94	75	97	73	84	+4	3.51	-0.33	3010	+346

* 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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