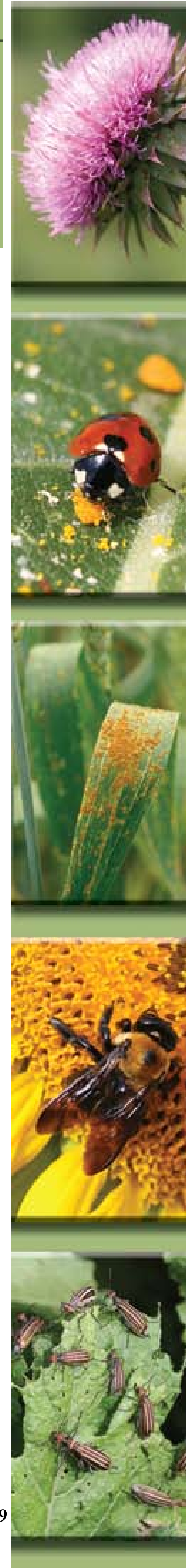
Plant Protection Programs University of Missouri

Integrated Pest & Crop Management



Black Corn Fields

By Laura Sweets

Since the rain from the remnants of Hermine and subsequent rain, many corn fields have taken on a black appearance that is obvious from the road. From a closer perspective, the leaves, stalks and husks appear to be coated with black mold growth. Many of these corn fields had already turned or been turning and the recent spell of wet weather has encouraged the growth of saprophytic or weakly parasitic fungi on the senescing plant tissue giving the fields a black appearance.

It is possible that these sooty molds or secondary fungi could contribute to stalk deterioration or stalk rot. Lodging could become a problem in these fields, especially if there are high winds or strong storms before harvest. These black molds also tend to produce large quantities of spores. It is not uncommon to see dark clouds of spores around combines moving through fields with high levels of black mold or sooty molds.

Black corn occurs when any of a number of saprophytic or weakly parasitic fungi grow on corn plants in the field. *Alternaria*, *Cladosporium*, *Aureobasidium* and other species are frequently found on these discolored or black plants. Since the affected plants may have a sooty appearance these fungi are sometimes called sooty molds. These sooty molds or secondary fungi tend to develop on plants when wet or humid weather occurs as the crop is maturing or if harvest is delayed because of wet weather. Typically these fungi come in on plants that are shaded, undersized, weakened or prematurely ripened and on senescing foliage. Plants that are lodged or that have been stressed by nutrient deficiencies, plant diseases or environmental conditions may be more severely affected. Although many of these fungi produce dark or black mold growth, the color of the mold growth can range for dark or black to olive green or even pink to white.

These secondary fungi tend to develop on senescing plant tissues, primarily leaf, stalk and husk tissue, but under favorable conditions can cause infection of the kernels. Infected kernels might show a black discoloration.

Grain from fields with high levels of sooty molds should be treated with care if it is stored. Grain should be thoroughly cleaned to remove lightweight, damaged or broken and moldy kernels. Grain should be stored at the proper moisture content and temperature and checked on a regular basis during storage.

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Discolored Soybean Seed

By Laura Sweets

This may be a year when soybean seed discoloration is a problem in Missouri. Soybean diseases are one of several factors which can cause discoloration and deterioration of soybean seed. The late season soybean diseases which can lead to discolored soybean seed tend to be favored by wet conditions including frequent rains, heavy dews and high humidity.

When the late season pod and stem diseases occur, maturing plants have a blackish cast and black to gray spots, blotches and streaks may cover stems, branches and pods. The late season diseases lead to increased problems with discolored and damaged soybean seed. Purple seed stain; a general blotchy brown discoloration that might be the result of the Cercospora or Colletotrichum species which cause anthracnose and tipblight; bleeding hilum which can be caused by virus diseases such as soybean mosaic and bean pod mottle; a white mold growth which could be Phomopsis seed decay or secondary fungi entering through pods damaged by insects could all show up in beans this fall. The diseases which contribute to discolored soybean seed are usually favored by wet conditions late in the season. Weather conditions from now through harvest will have a major influence on how severe discoloration and deterioration of soybean seed is this season.

Symptoms of the seed damage which may result from Phomopsis seed decay, purple seed stain, frogeye leaf spot, virus diseases and Colletotrichum anthracnose and tipblight are described below.

Phomopsis seed decay: Phomopsis seed decay results when the fungi which cause pod and stem blight move from the stems and pods onto the seed. Plants infected with pod and stem blight may be stunted and have discolored stems. Black pycnidia or fruiting bodies of the fungi *Phomopsis sojae* or *Phomopsis longicolla* develop on the lower portion of the main stem, branches and pods as plants reach maturity. The pycnidia may be limited to small patches usually near the nodes or may cover dead stems and pods. On stems, the pycnidia are usually arranged in linear rows while on pods they are randomly scattered. Prolonged periods of warm, wet weather during flowering and pod fill favor the development of pod and stem blight. If conditions remain warm and wet, the fungus may grow through the pods and infect the seed. Infected seed is oblong or misshapen and may have a white moldy appearance.

Purple seed stain: *Cercospora kikuchii* can infect soybean seeds, pods, stems and leaves but is most commonly found on the seed. However, during the last several years leaf spot and leaf blight caused by this fungus have been prevalent in parts of the state. Leaf blight occurs 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 entire uppermost trifoliolate leaf and petiole may be blighted and brown. Cercospora leaf spot may develop as a premature yellowing and then blighting of the youngest, upper leaves over large areas of affected fields. Brown lesions or spots are usually evident in the yellowed tissue. In most fields symptoms do not progress down the plants more than one to two nodes. Pods at the uppermost nodes may develop round, reddish purple to reddish brown lesions. Infected seed show a conspicuous discoloration varying 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. Warm, humid weather favors disease development. Yields are usually not reduced but a high percent of seed stain may be evident at harvest.

Frogeye leaf spot: *Cercospora sojina* causes frogeye leaf spot on soybean. Symptoms occur primarily on leaves although the causal fungus may also infect stems, pods and seeds. Lesions are small, circular to somewhat angular spots that develop on the upper leaf surfaces. Initially the spots are dark and water soaked in appearance. As the lesions age they develop a dark reddish-brown border. The center of the lesion becomes light brown to light gray in color. Lesions may merge to kill larger areas of the leaf. Heavily spotted leaves may wither and drop prematurely. Stem lesions usually develop later in the season. Young stem lesions are deep red with a narrow, dark brown to black margin. As the stem lesions age, the centers become brown to smoky gray in color. Lesions on pods are circular to elongate, slightly sunken and reddish brown. The fungus can grow through the pod wall to infect maturing seed. Infected seeds may show discoloration of the seed coat that ranges from small specks to large blotches of light gray to dark gray or brown.

Virus diseases: There are several virus diseases which may occur on soybean in Missouri including bean pod mottle, soybean mosaic and tobacco ringspot or budblight. Of these, soybean mosaic virus and bean pod mottle virus are most likely to cause symptoms on the seed. Seed infected with soybean mosaic or bean pod mottle virus may have a symptom called bleeding hilum. This is a discoloration, usually black or dark in color that bleeds from the hilum down the sides of the seed. The affected area may be quite small and near the hilum or may be quite extensive and cover most of the seed. It is important to keep in mind that bleeding hilum is also a genetic characteristic of certain soybean varieties. The intensity of the discoloration can be influenced by environmental conditions during the growing season.

Colletotrichum anthracnose and tipblight: *Colletotrichum truncatum* and several other *Colletotrichum* species cause anthracnose of soybean. Typically, anthracnose is a late season stem and pod disease of soybean. Symptoms occur on stems, pods and petioles as irregularly shaped, light to dark brown spots, streaks or lesions. Eventually black fungal structures may be evident in these lesions. Anthracnose may also cause a tipblight. The tipblight phase of anthracnose causes a yellowing or browning of the uppermost leaves and pods. The blighted tips may dry up and die prematurely. This fungus may also infect seed. Seed may be smaller than normal and severely infected seed may be a moldy, dark brown in color and shriveled. Anthracnose

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Discolored Soybean Seed *continued from page 128*

is favored by warm, wet weather, and the tipblight phase of anthracnose is most likely to occur after a rainy period.

The incidence and severity of the soybean diseases which cause seed discoloration and deterioration are greatly increased by warm, wet conditions late in the season. For grain crops there are no potential rescue treatments. Fields should be harvested as soon as possible to prevent further seed damage.

Many of the pathogens causing seed discoloration and deterioration can survive on soybean seed. Heavily infected seed, if planted, could produce diseased seedlings resulting in stand problems. Therefore, seed from infected fields should not be saved for planting. If infected seed must be used for planting, it should be thoroughly cleaned, a sample submitted for a germination test (preferably a stress test) and a fungicide seed treatment applied.

Many of the pathogens that cause these diseases may also survive in infested residues left on the soil surface. Thus, crop rotation is an important means of preventing or reducing disease outbreaks. At least one year between soybean crops is recommended. Varieties may differ in their reaction to these various diseases and, if possible, good quality seed of resistant varieties should be planted.

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Updated Listing of Missouri Soil Testing Association Approved Labs

By Manjula Nathan

The Missouri Soil Testing Association (MSTA) Approval Program is designed to assure that results provided by participating public and private labs serving the citizens of Missouri agree with allowable statistical limits. This is accomplished by evaluating the soil testing laboratories in their performance through inter-laboratory sample exchanges and a statistical evaluation of the analytical data. Based on this premise, soil test results from MSTA approved labs will be accepted by the U.S. Department of Agriculture, Farm Service Agency (FSA) and Department of Natural Resources and Conservation Services (NRCS) in federally assisted cost share programs and nutrient management plans in the state of Missouri.

Beginning in 1999, MSTA combined its efforts with the North American Proficiency Testing Program (NAPT). In order to be approved by the Missouri State program, the participating labs should participate in all four quarter exchanges of the NAPT program and submit the MO State data release form each year to the NAPT coordinator. The NAPT coordinator in return sends soil test data from quarterly sample exchanges of the labs participating in MSTA program to the Missouri state coordinator. The MU Soil Testing Lab director serves as the state program coordinator and performs statistical analysis of the data as specified in the MSTA program. If a lab's results fall within the allowable limits, the lab will be placed on the Farm Service Agency's (FSA) list of approved labs. A lab that is not approved may re-apply after six months. An updated listing of Missouri State Approved Soil Testing lab list can be found at: http://soilplantlab.missouri.edu/soil/msta.aspx

List of Missouri State Approved Soil Testing Labs – August 24, 2010

- Custom Lab
  204 C St.
  Golden City, MO 64748
  Telephone: 417-537-8337
  Fax: 417-537-8337

- Delta Soil Testing Lab
  University of Missouri
  PO Box 160
  Portageville, MO 63873
  Telephone: 573-379-5431
  Fax: 573-379-3383

- MU Soil and Plant Testing Lab
  University of Missouri
  23 Mumford Hall
  Columbia, MO 65211
  Telephone: 573-882-3250
  Fax: 573-884-4288

- Perry Agricultural Lab
  PO Box 418
  State Highway 54 East
  Bowling Green, MO 63334
  Telephone: 573-324-2931
  Fax: 573-324-5558

- Ag Source Belmond Labs
  1245 Highway 69 N
  Belmond, IA 50421
  Telephone: 641-444-3384
  Fax: 641-444-4361

- Ag Source Harris Laboratories
  300 Speedway Circle #2
  Lincoln NE 68502
  Tel: 402-476-0300
  Fax: 402-476-0302

- Ag Source Cooperative Services
  106 N. Cecil Street
  PO Box 7
  Bonduel, WI 54107
  Telephone: 715-758-2178
  Fax: 715-758-2620

- A&L Analytical Laboratories, Inc.
  2790 Whitten Road
  Memphis, TN 38133
  Telephone: 901-213-2400
  Fax: 901-213-2440

- A&L Canada Laboratories, Inc.
  2136 Jetstream Road
  London, ON N5V 3P5 Canada
  Telephone: 519-457-2575
  Fax: 519-457-2664

- A&L Great Lakes Laboratory, Inc.
  3505 Conestoga Drive
  Fort Wayne, IN 46808
  Telephone: 260-483-4759
  Fax: 260-483-5274

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Updated Listing of Missouri Soil Testing Association Approved Labs *continued from page 129*

• A&L Heartland Laboratory, Inc.
111 Linn St.
PO Box 455
Atlantic, IA 50022
Telephone: 901-213-2400
Fax: 901-213-2440

• Brookside Lab Inc.
308 S. Main St.
New Knoxville, OH 45871
Telephone: 419-753-2448
Fax: 419-753-2949

• Midwest Laboratories, Inc.
13611 B St.
Omaha, NE 68144-3693
Telephone: 402-334-7770
Fax: 402-334-9121

• Mowers Soil Testing Plus Inc,
117 East Main St.
Toulon, IL 61483-0518
Telephone: 309-286-2761
Fax: 309-286-6251

• Servi-Tech Laboratories
1816 East Wyatt Earp Blvd.
Dodge City, KS 67801
Telephone: 620-227-7123
Fax: 620-227-2047

• Spectrum Analytical
1087 Jamison Road
PO Box 639
Washington Court House, OH 43160
Telephone: 740-335-1562
Fax: 740-335-1104

• Ward Laboratories
4007 Cherry Ave.
PO Box 788
Kearney, NE 68848
Telephone: 308-234-2418
Fax: 308-234-1940

• Waters Agricultural Laboratories, Inc.
257 Newton Highway
PO Box 382
Camilla, GA 31730
Telephone: 229-336-7216
Fax: 229-336-0977

• Waters Agricultural Laboratories, Inc.
2101 Old Calhoun Road
Owensboro, KY 42301
Telephone: 270-685-4039
Fax: 270-685-3989

Note: Approval of soil analysis does not imply approval of fertilizer and limestone recommendations by the individual labs. The approval allows the clients to use the University of Missouri soil fertility recommendations as required by the federal and state agencies for cost share and nutrient management planning programs. In order to use the University of Missouri soil fertility recommendations and get meaningful results, it is recommended that the labs use the soil test procedures required by the MSTA program.

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Weed of the Month: Wild Poinsettia

By Brett Craigmyle and Kevin Bradley

Wild poinsettia (*Euphorbia heterophylla*) is a summer annual weed primarily distributed in the tropical climates of South America but also developing into more of a problem in the southern United States (Jowers et al. 1986; Wilson et al. 1981). In Missouri, we have encountered more of this weed over the past 3 or 4 growing seasons, especially as a weed of soybeans.

Wild poinsettia seedlings have an egg-shaped cotyledon with the first true leaves arranged oppositely from one another (Figure 1). The first true leaves will be lanceolate in outline and are approximately ½ to 3 inches in length. Once these plants mature the leaves can take on a characteristic poinsettia-like growth habit and often have a dark red spot on the upper surface. Both the leaves and stems are hairy and emit a milky sap when broken. The flowers of these plants occur in clusters at the ends of branches and have no distinct petals (Figure 2).

Figure 1. Wild poinsettia seedling

Wild poinsettia is capable of germinating under a range of different light, temperature, pH, soil depth, and moisture conditions (Brecke 1995). Brecke (1995) found that wild poinsettia can withstand soil pH ranges from 2.5 to 10 and is capable of germinating from depths of as much as 6-inches 2 to 3 weeks after planting. Wild poinsettia requires very little moisture for germination and has the opportunity to become established under a variety of growing conditions, both in crop and non-crop environments. Wild poinsettia also exhibits a

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Figure 2. Mature wild poinsettia plants in flower.

high degree of genetic variability. In one study, researchers found only 40% genetic similarity between 40 different populations of wild poinsettia. (Winkler et al. 2003).

Several researchers have demonstrated that wild poinsettia can cause significant yield losses in soybean. Harger and Nester (1980) found that 8 wild poinsettia plants per meter of row reduced soybean yields by as much as 18% when allowed to compete for 8 weeks during the growing season. Season-long competition from this same density of wild poinsettia plants reduced soybean yields by 33%. Similarly, Chemale and Fleck (1982) found that 54 wild poinsettia plants per m2 reduced soybean yields by 50% when allowed to compete for 115 days after soybean emergence.

Based on the literature we have reviewed pertaining to wild poinsettia control with herbicides, it seems that the most effective control of this weed will be achieved with a pre-emergence (PRE) followed by a post-emergence (POST) herbicide program in soybeans. The fairly deep depth of soil from which this weed can germinate can often make PRE herbicides alone ineffective. Some of the more effective PRE soybean herbicides for wild poinsettia include Sencor, Scepter, Valor XLT, and Envive (Willard and Griffin 1993). POST control of wild poinsettia has usually been accomplished with ALS-inhibiting herbicides like Classic or Scepter, with PPO-inhibiting herbicides like Flexstar, Ultra Blazer, or Cobra, or with glyphosate (sold as Roundup and a variety of other trade names). However, when using a POST-only herbicide program approach, repeat treatments will likely be needed in order to prevent yield loss especially when wild poinsettia populations are high (Brecke 1996). Additionally, selection of wild poinsettia plants resistant to ALS-inhibiting herbicides and glyphosate has been documented in Brazil and other South American countries (Heap 2010), so it is important to be on the lookout for this weed as a potential problem species in the future.

References

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Beneficial Fungal Pathogen Active on Soybean Podworms in Missouri

By Wayne Bailey

Soybean podworm (also known as corn earworm) are major pests of soybean in many southern and eastern states and traditionally have been an occasional pest of soybean in Southeast Missouri. In recent years the numbers of soybean podworm larvae in more northern counties of Missouri have gradually increased. This year substantial damage from podworm has been observed in some late-planted soybean fields located in both southeast and southwest Missouri, and in areas surrounding St. Joseph and Chillicothe in northwest Missouri. Although soybean podworm pupae may overwinter in the soil, most larvae come from eggs laid by moths migrating into the state during early spring or from moths produced in the state from first, second, and possibly third generation soybean podworm populations.

Several factors may be responsible for the heavy soybean podworm infestations found in some areas of Missouri this growing season. They include date of planting, wind direction during moth migration, possible prior use of insecticides and fungicides earlier in the growing season, intensity of moth flights, weather/field conditions and possibly factors that are not known. Problems with soybean podworm this summer and fall have been almost exclusively found in soybean fields planted after June 1, 2010. These late fields are most attractive to migrating moths as females prefer to lay eggs in fields where soybean plant canopies remain open. Another factor which helps determining whether infestations of podworm are successful is wind direction during migration and intensity of moth flights. Typically many insects are transported into the state or are moved about the state when winds blow from southern or southwestern directions. Damage to soybean has been substantial in some areas ranging from minor pod damage to 100% destruction of pods in some fields. Fields exhibiting the greatest damage from soybean podworm larval feeding are those that have previously received applications of an insecticide, fungicide, or both during the growing season. Biological agents such as parasites, predators, and beneficial fungal or bacterial pathogens all help to keep soybean podworm numbers low in most years. The early season use of insecticides, such as those applied for webworm, or the application of fungicides for soybean diseases have the potential to reduce these biological agents and may allow for pest populations to flourish under certain field conditions. In recent years numbers of green cloverworm, soybean podworm, and fall armyworm all have generally increased in soybean as well as other Missouri field crops. Although many factors regulate whether an insect population flourishes or declines, larval stages of the above mentioned insect pests are often regulated by beneficial fungal pathogens such as *Numuraea rileyi*. This pathogen causes the larval worms to stop feeding, take a upright posture on a leaf or stem, and turn the insect white to whitish-green as the fungal pathogen kills the insect from within. In some fields dead and dying infected larvae may also be found on the ground within the row.

Although it is unknown which factors are responsible for increasing pest populations in soybean observed during recent years or for the outbreak numbers of soybean podworm found this season, effective pest management decisions are necessary to protect crop yield. In most years it may not make a difference whether a foliage feeder such as green cloverworm is present in high numbers during late season as crop damage is limited.

In contrast, high numbers of pod feeders such as soybean podworm, bean leaf beetle, green stink bug, and grasshoppers may require intensive management to prevent substantially reduction of crop yields.

Additional information is available in University of Missouri Extension Guide Sheet G7110 "Corn Earworm in Missouri".

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Fall Armyworm in Grass Pastures and Alfalfa

By Wayne Bailey

Numerous problems with fall armyworm larvae damaging grass pastures have been received from southwest Missouri. Damage from larvae can be substantial as fall armyworm larval numbers of peak in the fall of the year. Larvae tend to feed on all tender green material which often gives the pasture the appearance of drought. If heavy feeding occurs, grass plants may become severely stunted or killed. Damage may occur on 60 different hosts with tall fescue and orchardgrass being favorite host plants.

Several generations of fall armyworm occur in Missouri each year. Larvae produced in spring and summer tend to be light in color ranging from light green to tan. Larvae produced during fall generations often turn dark to black in color. Both color phases of this insect will possess stripes running the length of the body. Identifying characteristics of the larvae include an inverted Y on the face of the insect, four black spots or bumps found on the top of each segment with those on the last segment of a worm arranged in a square pattern, and three white lines located on the back of the segment located just behind the head capsule. Sometimes the three white lines will extend to additional

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segments. Larvae typically grow through 6 "worm stages" often reaching a length of 1 ¼ to 1 ½ inches.

Damage in grass pastures often "just appears overnight" as growing larvae become large enough to consume substantial amounts of forage in short periods of time. Larvae are especially active both early and late in the day. Scouting is best accomplished during these periods to gain an accurate estimate of larval numbers. The economic threshold for this pest in grass pastures is to treat if 3 or more larvae are present per square foot. Insecticides labeled for use on this pest in grass pastures can be found in the following table. Best control is achieved if 20 gallons or more of water is applied per acre. Be sure to follow all label precautions and restrictions.

Table 1. Insecticides Labeled for the Control of Fall Armyworm in Grass Pastures and Alfalfa

Common Name	*Trade Name*	*Rate of Formulated Material per acre*	*PreHarvest/Grazing Interval*
zeta-cypermethrin	*Mustang Max	3.2 to 4.0 fl oz	0/0
carbaryl	Sevin XLR Plus	1 to 1 1/2 quarts	14/14
lambda-cyhalothrin	*Warrior II	1.28 to 1.92 fl oz	7

*** Designates a restricted use pesticide. Use is restricted to certified applicators only.**
Regardless of the formulation selected, read the label to determine appropriate insecticide rates, directions, precautions and restrictions.

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Adam Leonberger To Be New Director of MU's Plant Diagnostic Clinic

By Laura Sweets

Adam Leonberger will join the Division of Plant Sciences in as the new Plant Diagnostic Clinic Director on November 1, 2010. Adam is currently completing an M.S. Degree in Plant Pathology at Purdue University, where he also completed the B.S. Degree in Plant Biology and Horticultural Production/Marketing in 2008. In addition to his graduate research work he has also served as an intern in Purdue's Plant Diagnostic Clinic for two seasons.

Leonberger's responsibilities at the University of Missouri will include the management of day-to-day operations of the MU Plant Diagnostic Clinic. He will be responsible for receiving plant disease, weed and insect samples for identification, handling phone inquires and walk-in requests for diagnostic assistance, and collaborating with State Extension Specialists to diagnose plant health problems in order to prepare written responses describing the diagnosis and the appropriate management recommendations. Leonberger will also provide plant disease training assistance to the Master Gardener program, Pesticide Applicator Training and other programs as requested by extension colleagues. Additional responsibilities include management of the database for plant disease, insect identification and weed identification, and interfacing with counterparts in the North Central Plant Diagnostic Network. Adam will also represent the Plant Diagnostic Clinic in annual meetings of the North Central Plant Diagnostic Network, part of the National Plant Diagnostic Network, and the American Phytopathological Society.

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IPM Publications available at ppp.missouri.edu/ipm/pubs.htm

Weather Data for the Week Ending September 20, 2010

By Pat Guinan

		Weekly Temperature (ºF)						Monthly Precipitation (in.)		Growing Degree Days‡	
Station	County	Avg. Max.	Avg. Min.	Extreme High	Extreme Low	Mean	Departure from long term avg.	Sept 1-Sept 20	Departure from long term avg.	Accumulated Since Apr. 1	Departure from long term avg.
Corning	Atchison	78	57	92	53	68	+3	1.41	-0.72	3659	+505
St. Joseph	Buchanan	78	59	87	53	68	+3	2.74	-0.16	3555	+394
Brunswick	Carroll	81	62	91	54	70	+4	3.23	+1.11	3690	+482
Albany	Gentry	78	57	89	50	67	+2	2.91	+0.56	3503	+370
Auxvasse	Audrain	81	60	90	50	70	+4	6.54	+4.07	3633	+393
Vandalia	Audrain	82	59	89	48	69	+3	7.70	+4.95	3613	+395
Columbia-Bradford Research and Extension Center	Boone	81	60	89	51	69	+2	4.67	+2.27	3581	+239
Columbia-Sanborn Field	Boone	81	63	90	53	71	+4	4.30	+1.93	3894	+452
Williamsburg	Callaway	81	59	89	48	69	+3	6.54	+3.80	3657	+468
Novelty	Knox	79	58	88	50	68	+3	6.48	+4.09	3409	+267
Linneus	Linn	80	59	89	51	69	+4	4.40	+1.95	3460	+386
Monroe City	Monroe	81	59	89	49	69	+4	6.90	+4.57	3561	+367
Versailles	Morgan	83	63	93	54	72	+5	7.31	+4.76	3913	+511
Green Ridge	Pettis	80	62	89	52	70	+3	7.82	+4.90	3731	+575
Lamar	Barton	84	65	90	59	73	+5	7.71	+4.52	3956	+402
Cook Station	Crawford	83	58	90	52	69	+2	5.81	+3.09	3656	+244
Round Spring	Shannon	83	59	88	55	69	+2	7.03	+4.61	3653	+381
Mountain Grove	Wright	85	62	91	57	71	+4	8.62	+5.91	3773	+521
Delta	Cape Girardeau	86	59	91	54	72	+3	4.94	+2.87	4107	+358
Cardwell	Dunklin	91	62	97	58	75	+4	2.34	+0.38	4472	+420
Clarkton	Dunklin	91	62	97	57	75	+4	1.34	-0.49	4413	+419
Glennonville	Dunklin	89	62	95	57	74	+3	0.89	-0.92	4438	+465
Charleston	Mississippi	87	62	93	56	74	+5	3.65	+1.96	4354	+599
Portageville-Delta Center	Pemiscot	90	63	95	59	76	+5	1.80	-0.28	4579	+578
Portageville-Lee Farm	Pemiscot	90	62	94	56	75	+4	0.72	-1.45	4589	+617
Steele	Pemiscot	93	62	98	57	76	+5	1.01	-1.05	4666	+662

* 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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