Integrated Pest & Crop Management

Japanese Beetle Adults Emerge Across Missouri

By Wayne Bailey

During the past two weeks Japanese beetle adults began their annual emergence in many Missouri counties. In most areas their numbers will steadily increase through late June when peak numbers will result in damage to many trees, ornamental plants, and fruit and field crops. Adult Japanese beetles typically feed on green silks and tassels in corn, foliage feed on soybean, and damage the foliage and fruit of over 400 flower, shrub, and tree species.

This beetle was first found in the United States in 1916, following its accidental introduction from its native country of Japan. It is thought that grubs of this pest were introduced in pots of iris plants imported into the US prior to the initiation of federal plant and animal inspections in 1918. In Missouri, infestations of Japanese beetles were first found in the urban area of St. Louis in the early 1960's followed by infestations being reported in Kansas City, Columbia, and Springfield. These urban infestations were initially associated with golf courses and plant nurseries where grubs of this pest were again introduced in soil and plants imported from states with earlier infestations. Populations of this pest remained mainly in these urban area until about 10 years ago, when this pest spread into more rural areas of the state. The Japanese beetle in Missouri is still in a colonization stage of population growth with continued dispersal in most counties of the state. At present, most rural areas of Missouri will experience increasing populations of this pest for the next 7 to 10 years and maybe beyond. Beneficial biological pathogens and agents will eventually slow these expanding populations, resulting in annual population fluctuations at levels below peak populations experienced in earlier years.

Japanese beetle adults are approximately 1/2–inch in length, metallic green in color with bronze or copper colored wing covers. A diagnostic characteristic is the presence of twelve white tufts of hair or bristles located around the edge of the shell (five running down each side and two located at the very back end). Without magnification, these structures are seen as white dots. Japanese beetles can be confused with adult green June beetle, but are smaller in size. Adult beetles typically begin emerging from the soil in late May or early June, reach peak numbers in June into early July and then diminish during late July into August. Adults emerge, mate and feed for approximately 60 days. During this time each beetle female typically lays 40 to 60 eggs in groups of 1 to 8 into the soil with larvae emerging in about 2 weeks. Larvae will feed on plant roots and decaying material before overwintering in the soil as 3rd instars (worm or grub stage). The following spring larvae quickly finish development, pupate, and emerge as adult beetles. To this point in 2011, the adult beetles have been slow to emerge due to very cool soil temperatures being experienced earlier this spring. Emergence of Japanese beetle adults is about 1-2 weeks behind schedule, depending on their location in the state.

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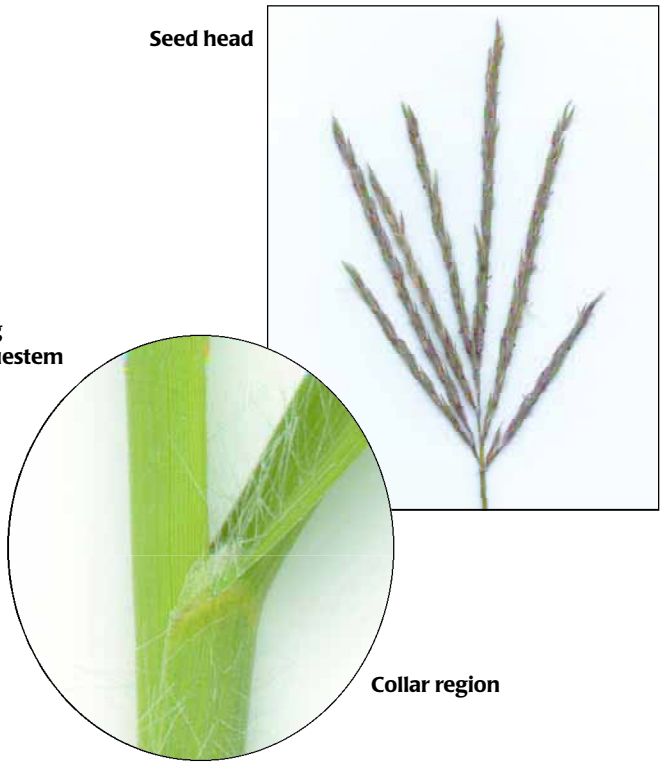
In This Issue

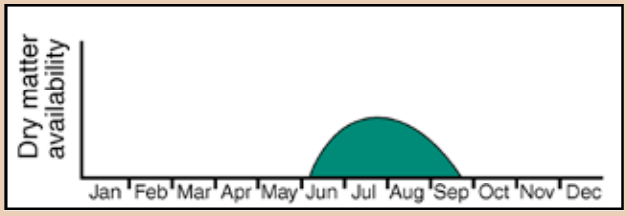
Forage of the Month: Big bluestem (*Andropogon gerardii* Vitman)

By Rob Kallenbach

Big bluestem used to be the dominant grass in the native prairies of Missouri. Today, this perennial warmseason bunchgrass is used for forage and wildlife habitat. Big bluestem grows statewide, and it is currently found on about 1 million acres in Missouri. It produces good quality hay and will persist indefinitely if properly managed. It is both winter- and drought-hardy and does better in poorly drained soils than some other warm-season grasses. It is also compatible with many other forage species. However, it is slow to establish, and thus weeds can make establishment a problem. It works well in a planned grazing system if it is not allowed to become mature before grazing and if a 6-inch or greater stubble height is maintained to encourage regrowth



Origin: North America
Adaptation to Missouri: Statewide
Growth habit: Tall, rhizomatous, perennial bunchgrass.
Blade: Flat, glabrous on bottom, scabrous on top with rough margins. Base of new shoots flattened, lower portion of blade and sheath pubescent.
Sheath: Flattened, often shorter than internodes, glaucous, and purplish.
Ligule: Membranous, sometimes fringed, about 1/10 inch long.
Auricles: Absent.
Seed head: Usually 3 (but up to 7), purplish, spike-like racemes per stem.
Fertilization: 40 to 60 lb N/acre when grass is 3 to 5 inches tall. Phosphorus and potassium to soil test.
Burning management: Every year or two, when new growth is 1 to 2 inches tall.
Timing of production: Produces 70 percent of its growth between June 15 and Aug. 31.
When to begin grazing: When grass is 12 inches tall.
When to cut for hay: Boot stage
Lowest cutting or grazing height: 6 inches
Fall management: Do not hay or graze after Sept. 1.



Yield distribution of big bluestem in Missouri.

Japanese Beetle Adults Emerge Across Missouri

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Feeding damage of adult Japanese beetle is often observed as a lace-like pattern of defoliation of host plant foliage as beetles avoid leaf veins when feeding. Beetles gather high (often in full sunlight) on host plants that exude strong odors. This attracts high numbers of beetles. Tassels and developing silks of corn can be severely damaged by adult feeding, whereas leaf feeding is common on soybean and many other plants. Feeding on corn silks can disrupt pollination and result in substantial yield losses. Foliage feeding on soybean is less damaging, although late planted or double-crop soybean may sustain economic damage if beetle numbers are high. The grub stage of this pest will feed on plant roots of both corn and soybean with most feeding occurring after egg hatch in late June, July and possibly early August. Damage to plant root hairs may result in poor uptake of water and nutrients or be more severe and cause reduced stands through plant mortality.

Economic thresholds for corn and soybean can quickly be reached as these beetles often aggregate on host plants and feed in high numbers. In field corn, an insecticidal treatment is justified if during the silking period an average of 3 or more beetles are present per ear tip, silks have been clipped to ½ inch or less in length, and pollination is less than 50% complete. For soybean insecticide treatment is justified if foliage feeding exceeds 30% prior to bloom and 20% from bloom through pod fill. The following insecticide tables 1 & 2 (pg. 106) are recommended for control of Japanese beetles in field corn and soybean in Missouri.

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INSECTICIDE RECOMMENDATIONS 2011 - FIELD CORN

Table 1

JAPANESE BEETLE Adults - *Popillia japonica Newman*

- *Comments: Treatment of Japanese beetle is justified if 3 or more beetles are present on green silk, silks are eaten to 1/2 inch or less in length, and pollination is less that 50% complete. Japanese beetle may listed under white grub in Table 1. seed treatments and Table 2. transgenic Bt traits.*

Common Name	Trade Name	Rate of formulated material per acre	Placement	REI Hours	Pre-Harvest Intervals Days
esfenvalerate	***Asana XL**	5.8 to 9.6 fl oz	foliage	12	21 (grain)
cyfluthrin	***Baythroid XL**	1.6 to 2.8 fl oz	foliage	12	21 (grain or fodder) 0 (green forage)
bifenthrin	***Brigade 2EC**	2.1 to 6.4 fl oz	foliage	12	30 (grain, fodder, graze)
chlorpyrifos + gamma-cyhalothrin	***Cobalt**	38 to 42 fl oz	foliage	24	21 (grain or ears) 14 (graze or silage haravest)
deltamethrin	***Delta Gold 1.5EC**	1.5 to 1.9 fl oz	foliage	12	21 (grain, fodder) 12 (cut forage or graze)
zeta-cypermethrin + bifenthrin	***Hero**	4.0 to 10.3 fl oz	foliage	12	30 (grain, stover, graze) 60 (forage)
zeta-cypermethrin	***Mustang Max**	2.72 to 4.0 fl oz	foliage	12	30 (grain, stover) 60 (forage)
microencapsulated methyl parathion	***Penncap-M**	2 to 3 pt	forage	48	12 (grain, forage, graze)
carbaryl	**Sevin 4F**	2 to 4 pt	foliage	12	48 (grain or fodder) 14 (harvest or graze forage)
zeta-cypermethrin + chlorpyrifos	***Stallion**	9.25 to 11.75 fl oz	foliage	24	30 (grain) 60(forage)
cyfluthrin	***Tombstone Helios**	1.6 to 2.8 fl oz	foliage	12	21 (grain or fodder), 0 (forage)
lambda-cyhalothrin + chlorantraniliprole	***Volian xpress**	6.0 to 9.0 fl oz	foliage	24	21 day
lambda-cyhalothrin	***Warrior II**	1.28 to 1.92 fl oz	foliage	24	21 (grain), 1 (graze, forage) 21 (treated feed or fodder)

- **Note:** See Table 1 for listing of commercial seed treatments
- See Table 2 for listing of (Bt) trangenic traits.

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

Japanese Beetle Adults Emerge Across Missouri

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INSECTICIDE RECOMMENDATIONS 2011 - SOYBEAN *Table 2*

JAPANESE BEETLE Adults - *Popillia japonica Newman*

- *Comments: Treat when defoliation reaches or exceeds 30% before bloom and 20% between bloom and pod fill. Adults often aggregate on host plant to feed.*

Common Name	Trade Name	Rate of formulated material per acre	Placement	REI Hours	Pre-Harvest Intervals Days
esfenvalerate	***Asana XL**	5.8 to 9.6 fl oz	foliage	12	21 (grain) Do not graze or feed livestock
cyfluthrin	***Baythroid XL**	1.6 to 2.8 fl oz	foliage	12	45 (grain, feeding dry vines) 15 (green forage)
bifenthrin	***Brigade 2EC**	2.1 to 6.4 fl oz	foliage	12	18 (grain)
chlorpyrifos + gamma-cyhalothrin	***Cobalt**	19 to 38 fl oz	foliage	24	30 (grain) Do not graze or feed livestock
lambda-cyhalothrin + thiamethoxam	***Endigo ZC**	3.5 to 4.5 fl oz	foliage	24	30 (grain) Do not graze or feed livestock
zeta-cypermethrin + bifenthrin	***Hero**	4.0 to 10.3 fl oz	foliage	12	21 (grain) Do not graze or feed livestock
Imidacloprid + cyfluthrin	***Leverage 2.7**	3.8 fl oz	foliage	12	45 (grain, feeding dry vines) 15 (green forage)
zeta-cypermethrin	***Mustang Max**	2.8 to 4.0 fl oz	foliage	12	21 (grain) Do not graze or feed livestock
microencapsulated methyl parathion	***Penncap-M**	2 to 3 pt	forage	96	20 (grain)
carbaryl	**Sevin 4F**	1 to 2 pt	foliage	12	21 (dry grain or hay) 14 (graze or forage)
zeta-cypermethrin + chlorpyrifos	***Stallion**	5.0 TO 11.75 fl oz	foliage	24	28 (harvest)
cyfluthrin	***Tombstone Helios**	0.8 to 1.6 fl oz	foliage	12	45 (grain, feeding dry vines) 15 (green forage)
lambda-cyhalothrin	***Warrior II with Zeon**	1.60 to 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. Be sure to follow all directions, precautions and restrictions.

Potato Leafhopper Numbers High in some Alfalfa Fields

By Wayne Bailey

Potato leafhopper adults are greenish-yellow in color, wedge shaped and about 1/8-inch in length. Adult leafhoppers are very mobile and quickly move sideways, jump, or fly when disturbed. This is a native insect that migrates into Missouri each spring from more southern states and Mexico. The potato leafhopper is often transported into the state by early spring storms, especially those that contain hail. Migrating leafhoppers are thought to actively fly into storm fronts and be carried great distances by low level winds (jets) which approach 100 mph in speed. After a storm passes, high numbers of leafhoppers often can be found in the trail of the storms. In Missouri, the potato leafhopper adults generally arrive in early May of each year. The arriving adults may 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 and possible second harvests.

Damage is caused when both adult and nymphal (immature) leafhoppers use their piercing-sucking mouthparts to penetrate alfalfa leaflets and stems. They remove plant juices and often cause yellowing of established plants, stunted plant growth, and mortality of seedling alfalfa. Both forage quality and quantity are

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Potato Leafhopper Numbers High in some Alfalfa Fields

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reduced by this alfalfa pest. Potato leafhoppers typically arrive in Missouri in early May each year, although their arrival in Missouri was delayed in 2011 with peak arrival occurring in early June. Scouting 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. Second and third cutting alfalfa crops are most at risk. Leafhoppers often cause severe plant loss to newly seeded alfalfa stands so monitor these fields often to determine potato leafhopper numbers. At present, potato leafhoppers can readily be found in most alfalfa fields along the western edge of Missouri and in many central and northern Missouri alfalfa fields.

Economic Threshold for Potato Leafhopper in Alfalfa

Alfalfa Stem Length – inches	Ave # PLH/Sweep (traditional variety)	Ave # PLH/Sweep (PLH Resistant Variety)
<3	0.2 (2 in 10 sweeps)	0.6 (6 in 10 sweeps)
6	0.5 (5 in 10 sweeps)	1.5 (15 in 10 sweeps)
8-10	1.0 (1 per sweep)	3.0 (30 in 10 sweeps)
12-14	2.0 (2 per sweep	6.0 (60 in 10 sweeps)

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Recommended Insecticides for Potato Leafhopper Adult and Nymphs in Alfalfa
Insect Pest: Potato Leafhopper

Chemical Name	Trade Name	Rate of formulated material	Preharvest Interval
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	1 to 2 pts/acre	7-14 days
Malathion	numerous products	see specific label	0-7 days
Methyl Parathion	*numerous products	see specific label	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	1.92 to 3.2 fl oz/acre	1 day forage, 7 day hay
Lambda-cyhalothrin	*numerous products	see specific label	1 day forage, 7 day hay

Read and follow all label direction, precautions, and restrictions. * Designated a restricted use product.

Plan Now to Attend the MU Pest Management Field Day on July 7

By Kevin Bradley

The annual Pest Management Field Day will be held this July 7th 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.

Registration 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.

Some of the weed management research topics and trials that will be discussed at this year's field day include: herbicide plus fungicide plus fertilizer combinations in corn; weeds and herbicide programs common in Missouri corn and soybean fields (initial results from a two-year survey); utility of pre-emergence herbicides in soybeans (results from a four-year research project); considerations of future herbicide-resistant crop offerings like dicamba-resistant and 2,4-D resistant soybeans; specific results and recommendations for the control of glyphosate-resistant waterhemp and giant ragweed; movement of herbicide resistance through johnsongrass pollen; and as usual periodic stops along the guided tours to preview new herbicides and herbicide programs that will be available in 2012 and beyond.

Dr. Laura Sweets, state extension plant pathologist, will provide an update on nematode seed treatment products as well as an update on the status of rust diseases in field crops. Dr. Jason Weirich, new extension weed scientist located at the Delta Center, will also discuss the economic advantages of implementing resistant weed management programs.

As usual, after lunch attendees 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 their own. This year we have more than 45 trials and 600 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 5th 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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2011 Crop Injury Diagnostic Clinic

By Bill Wiebold

The 2011 Crop Injury Diagnostic Clinic will be held on July 12 and 13 at the Bradford Research and Extension Center. Sessions include:

A. Agricultural Practices and Environmental Issues – Why Water Quality?

B. Soil Productivity Based on Physical, Chemical, and Biological Properties

C. Corn and Soybean Response to Delayed Planting

D. Toxins in Tall Fescue Hay

E. Herbicide Injury and Symptomology

F. Broadleaf Weed Identification and Impact

G. What Should We Do in the Field Where Grain Production Profits Fade and Soil/Water Quality Problems Emerge?

H. Nitrogen Loss and Rescue N

I. Field Crop Insects

J. Field Crop Diseases

Cost of the two-day clinic is $150 per person. This registration fee includes instruction, reference materials, noon lunches, refreshment breaks and a dinner on the evening of the first day of the clinic. CEU credit has been applied for under the Certified Crop Adviser Program.

Early registration is encouraged because attendance is limited to 80 people. You may register by phone: (573) 884-7945; by mail (4968 Rangeline Road, Columbia, MO 65201-8973); or by fax: (573) 884-5554.

Directions to the Bradford Research & Extension Center: From Highway 63 south of I-70, take the Broadway and Route WW exit. Go east on Route WW for 6.5 miles. Turn right on Rangeline Road (look for the sign), and go south for 2 miles. The Bradford Research & Extension Center is on the right. Look for the Crop Injury Diagnostic Clinic sign at the entrance.

For more information please use the following link: http://aes.missouri.edu/bradford/events/crop-clinic.php

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Missouri Cotton Growers -- Beware of Root-Knot Nematodes

By Allen Wrather

Crop-threatening levels of root-knot nematodes (RKN) are present in several cotton fields in southeast Missouri. The symptoms of RKN injury will initially be visible 6 to 8 weeks after cotton emergence. The symptoms may include yellow-green leaf color, stunting, and these plants may wilt more quickly than healthy plants during hot afternoons. In addition, plants injured by these nematodes will have swollen areas (galls) visible on infected roots 6 to 8 weeks after emergence to harvest. Farmers and consultants should be cautious about diagnosing the cause of yellow-green leaf color and stunting of midseason cotton because other factors such as low soil pH and drought may cause these symptoms. But, only RKN causes galls on roots.

We learned from experiments in southeast Missouri that the best method for detecting the location of yield-robbing RKN in fields is to examine cotton roots for RKN galls soon after harvest. This method was more reliable, more rapid, and less expensive than analysis of soil samples for root-knot nematodes.

Nothing can be done this year to help RKN infected cotton plants. However, cotton farmers can take action to protect their crop against these nematodes in 2012, but their options are limited. There are no cotton varieties highly resistant to these nematodes and crop rotation is not helpful. Growers should consider using a nematicide such as Telone prior to planting, or a seed treatment such as Avicta or Aeris. There are advantages and disadvantages to the use of each of these products.

For more information contact Allen Wrather at the University of Missouri Delta Center (Phone: 573-379-5431, E-mail: wratherj@missouri.edu) or check the Delta Center Web Page (aes.missouri.edu/delta).

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Stinkbug Numbers Elevated in Missouri

By Wayne Bailey

Captures of green stinkbug and the two brown stinkbug species are greatly elevated at this time in 2011. Green stinkbug captures in blacklight traps in Central Missouri are 6-10 times higher than in the past 25 years. Usually green stinkbug will be captured at rates of less than 10 daily, but at present, numbers approaching 60 to 100 have been found daily for the past 2 1/2 weeks. Sweep samples taken from field borders and waterways show that these three species of stinkbugs can be readily found at number much higher than normal.

Both species of brown stinkbug often attack seedling corn, although the numbers of damaged fields reported this spring remain low. Possibly these insects are remaining in field border vegetation, which has remained green following numerous spring rains. Brown stinkbugs can damage corn at the emergence to small seedling stage and again during the time of ear development. Although we probably avoided heavy infestations and damage by brown stinkbug on seedling corn this spring, producers are encouraged to scout fields during ear formation to determine if brown stinkbugs are actively feeding. Stinkbug damage during corn ear development usually occurs when stinkbugs feed on the underside of developing ears where damage from their piercing-sucking mouthparts diminish the expansion of kernels, resulting in "drooping" corn ears.

Green stinkbug generally attacks soybean during the reproductive stages of growth. They damage plants when they repeatedly feed on plant stems, leaflets and pods. This type of heavy feeding during the reproductive stages of plant growth can result in "delayed senescence". Plants with heavy stinkbug feeding remain green for 2 - 3 weeks after plants without heavy feeding have dried for harvest. Green stinkbug populations typically begin on the field edge and spread into the soybean field interior as populations grow through the summer. Producers are encouraged to scout soybean fields on a weekly schedule to determine the presence of stinkbugs and other soybean insect pests.

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Weather Data for the Week Ending June 19, 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 1-19	Departure from long term avg.	Accumulated Since Apr. 1	Departure from long term avg.
Corning	Atchison	85	65	89	61	74	+1	2.87	-0.31	1112	+206
St. Joseph	Buchanan	83	64	86	63	73	0	1.61	-1.96	1058	+146
Brunswick	Carroll	82	65	86	63	73	0	1.66	-1.92	1099	+152
Albany	Gentry	83	64	87	58	73	0	0.44	-2.90	1031	+153
Auxvasse	Audrain	82	63	88	57	73	-1	2.18	-0.92	1108	+151
Vandalia	Audrain	82	63	88	57	72	-2	2.99	+0.12	1064	+150
Columbia-Bradford Research and Extension Center	Boone	82	63	88	59	72	-2	1.40	-1.58	1087	+90
Columbia-Capen Park	Boone	84	62	91	56	72	-2	1.19	-2.06	1098	+58
Columbia-Jefferson Farm and Gardens	Boone	81	64	88	60	73	-1	0.85	-2.17	1118	+119
Columbia-Sanborn Field	Boone	83	65	90	61	74	0	1.15	-2.10	1200	+160
Columbia-South Farms	Boone	81	64	87	60	73	-1	1.02	-2.01	1116	+118
Williamsburg	Callaway	82	63	89	57	72	-1	2.76	-0.43	1116	+193
Novelty	Knox	81	62	85	57	71	-2	4.50	+1.70	964	+54
Linneus	Linn	82	62	86	56	72	0	3.01	-0.48	1011	+130
Monroe City	Monroe	81	63	86	57	72	-2	1.87	-0.82	1037	+90
Versailles	Morgan	85	65	89	63	75	+2	1.30	-1.67	1227	+182
Green Ridge	Pettis	85	65	89	62	75	+2	1.35	-2.38	1136	+162
Lamar	Barton	89	67	92	63	79	+5	2.01	-2.04	1255	+170
Cook Station	Crawford	83	63	88	56	74	+1	1.69	-1.33	1201	+135
Round Spring	Shannon	87	62	90	54	74	+1	1.17	-1.63	1167	+160
Mountain Grove	Wright	85	64	90	57	75	+3	0.20	-2.46	1146	+188
Delta	Cape Girardeau	87	66	94	62	76	-1	3..49	+1.30	1375	+127
Cardwell	Dunklin	90	69	96	63	79	+1	2.66	+0.46	1561	+154
Clarkton	Dunklin	89	67	96	62	79	+1	0.82	-1.55	1505	+135
Glennonville	Dunklin	88	68	94	62	78	0	2.00	-0.01	1496	+131
Charleston	Mississippi	88	66	95	61	77	+1	2.78	+0.34	1434	+187
Portageville-Delta Center	Pemiscot	89	69	96	64	79	+1	2.00	-0.60	1576	+187
Portageville-Lee Farm	Pemiscot	89	68	96	63	79	+1	2.16	-0.21	1567	+192
Steele	Pemiscot	90	71	97	68	80	+2	2.50	-0.33	1618	+217

* 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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