Plant Protection Programs University of Missouri

Integrated Pest & Crop Management

Field Crop Disease Update for May 11, 2009

By Laura Sweets

Wheat

Wheat in the southern regions of the state is heading to flowering while wheat in the central regions of the state is rapidly moving into the heading to flowering stages of growth. As mentioned in last week's newsletter, the opportunity for applying fungicides to wheat is quickly passing. For foliage diseases fungicides are usually applied up to Feeke's growth stage 10.5 and for Fusarium head blight suppression to Feeke's growth stage 10.51. Check individual pesticide labels for pre-harvest intervals or growth stage application restrictions.

There have been some reports of Septoria leaf blotch and a few reports of powdery mildew on susceptible varieties but overall foliage diseases have not been particularly severe nor widespread. Barley yellow dwarf is becoming more common on flag leaves in many fields. These late infections of barley yellow dwarf are less likely to cause high yield losses than fall or spring infections. Symptoms of Fusarium head blight and loose smut tend to show up after flowering so may become evident over the next few weeks.

Corn

Corn planting is still behind normal because of wet conditions. Rports have been coming in related to stand establishment problems. See last week's article on corn seed decay and seedling blights.

Soybean

Soybean planting is also behind normal because of wet conditions. My early planted (April 8 and April 23) soybean seed treatment trials are showing high levels of Phytophthora root rot. At this point it is difficult to predict if the frequent rains will continue or if it might turn hot and dry. If the current weather pattern continues, it increases the risk of Phytophthora root rot developing in production fields. Phytophthora root rot is favored by rain and saturated soil conditions after planting. Seed treatment with products effective against water molds such as Phytophthora and Pythium might be especially prudent this year.

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Planting Date Effects on Corn Yield

By Bill Wiebold

For the past six years we have conducted a corn planting date study at the Bradford Research and Extension Center near Columbia in central Missouri. In each year we select four to six hybrids and plant them on five dates. We attempt to include a late March planting date but spring weather does not always cooperate. The last planting date is in mid-June.

Two planting rate treatments were used. For one treatment (fixed), 26,000 kernels/acre were planted on all planting dates. In the other treatment (thinned), plots were over-planted and thinned to 24,000 plants per acre at the 3-leaf stage. The "fixed" treatment allows us to compare planting dates for emergence. Soil conditions including temperature vary among planting dates and these conditions often affect emergence. The thinned treatment holds stand densities of all plots constant across hybrids and planting dates. Yield data from these plots allow for a better comparison of planting date effects on corn yield.

Table 1 presents the effects of planting dates on corn yield for each year. Each data point is the average of all hybrids. Years differ greatly for yield potential primarily because of precipitation amounts, especially during the critical R1 (silking) stage of development. In general, yields decrease with delayed planting date.

Table 2. Effect of Planting Date on Corn Yield

Average of Five Years; Hybrids Differ by Year; Columbia, MO

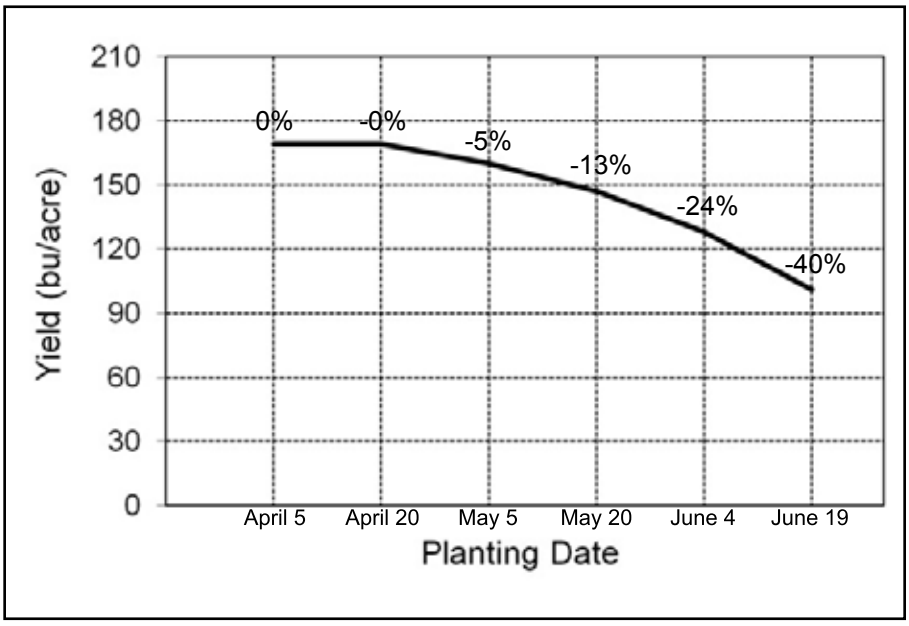

Table 1. Effect of Planting Date on Corn Yield

Average of Six/Five/Four Hybrids; Hybrids Differ by Year
Thinned to 24,000 plants/acre; Columbia, MO

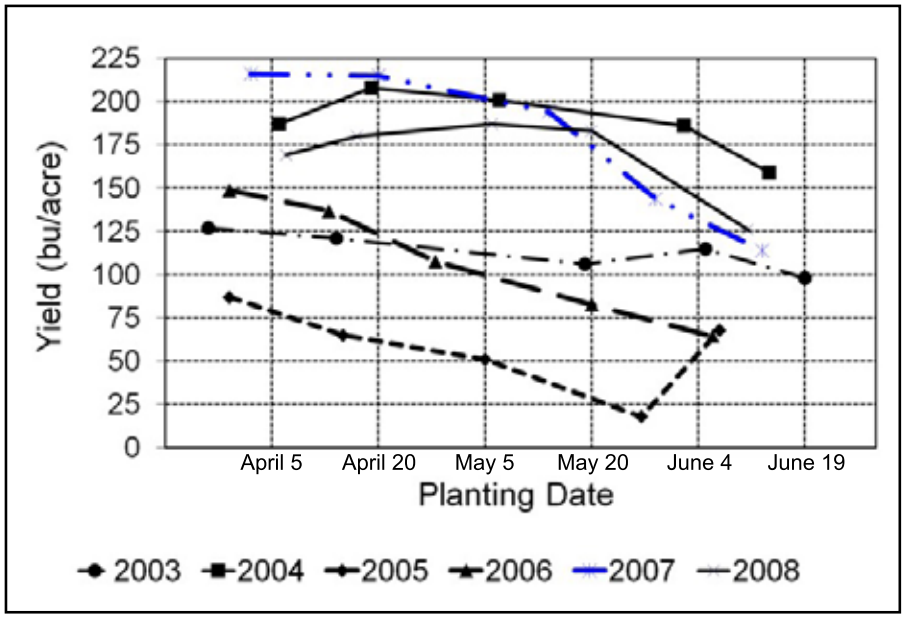

Table 2 presents the data averaged over all years, except 2005. The 2005 data were eliminated because extreme drought resulted in yields that are atypical. Our data indicate, on average, little difference for yield potential of planting dates in April. From May 1 to June 1 corn yields decrease about 25%. Yield loss is much greater if planting date is delayed until mid-June.

However, large differences occur among years for the response of corn yield to planting date. One result of delaying planting is that the silking occurs when weather is warmer and drier. Thus, weather conditions in July and early August can greatly affect yield response to planting date. Yields from the May planting dates in 2008 were relatively high partly because timely precipitation occurred in July and August. Unfortunately, the 2008 weather pattern was not normal.

Spring weather can affect emergence percentage and early seedling vigor. Emergence percentages for the first three planting dates in 2008 were 84, 82, and 82%. Weather during emergence

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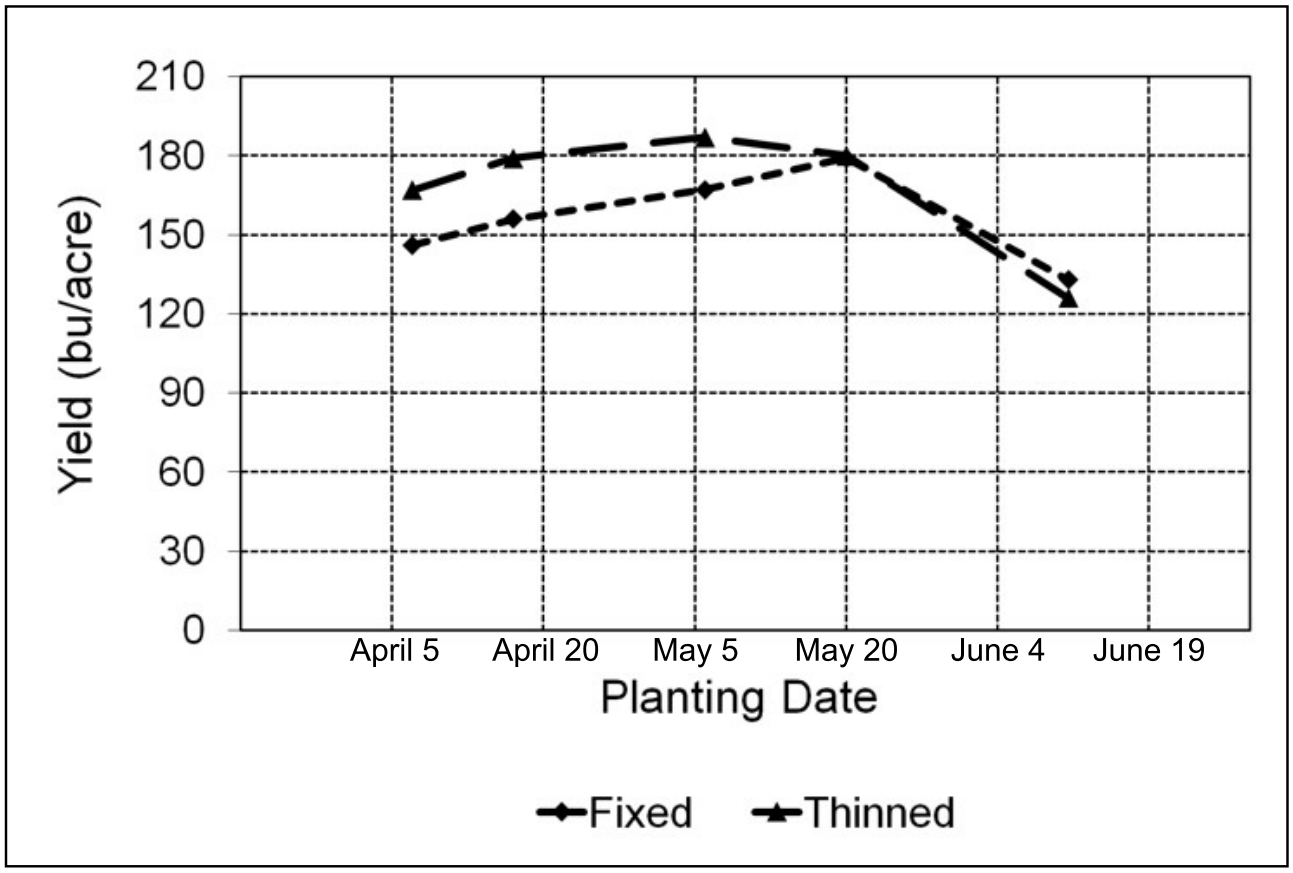
Table 3. Effect of Planting Date on Corn Yield
Average of Four Hybrids - 2008; Columbia, MO



from these planting dates was cool and wet. Table 3 presents yield data from 2008 for both the fixed and the thinned treatments. Because emergence was reduced for early planting dates, the stand densities for the thinned plots were higher than for the fixed plots. This resulted in higher yield. For the last two planting dates, soil conditions improved so that stand densities for the fixed treatment were equal to or slightly higher than the thinned treatment. So, yield was also equal or slightly greater for the fixed treatment.

Unfortunately, spring weather conditions in 2009 are similar to last year. Our data provides some optimism that reasonably high yield can be obtained when corn is planted in mid to late May. However, the yield potential is very strongly dependent on weather conditions in summer. The 2008 data strongly suggest that care must be taken to adjust planting rates to fit soil and weather conditions during stand establishment. Stressful soil conditions means increasing seeding rates, perhaps more than expected, to obtain target stands.

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Bad Things Sometimes Happen to Good Seeds

By Bill Wiebold

As I write this article, an estimate 31% of the expected Missouri corn acreage has been planted. This compares to 21 % in 2008 and 66% for the 5-year average. Frequent precipitation has provided few opportunities to work soil and/or plant corn.

Perhaps even more worrisome is that only 6% of the acreage has emerged and reports of emergence problems are quite common. Although weather conditions are similar to 2008, it appears that corn emergence problems are more severe and more widespread in 2009.

The causes of poor corn emergence can be difficult to assess and are highly dependent on soil conditions near the seed. Seed treatments can be beneficial under these less than optimum conditions. Unfortunately, a number of bad things, including things other than the usual suspects of diseases and insect pests, can happen to high quality seeds.

Newly planted corn seeds absorb water, and this increase in water content turns on all of the life processes of the seed. Unfortunately, water absorption itself can damage the seed if the water is cold. Cold water damages cell membranes, which surround the entire cell and all of the cell organelles. Damaged cell membranes can cause cell death, if the damage is severe. But, perhaps more problematic, is that weakened membranes allow cell contents to leak from the cell. Cell leakage of sugars and proteins is possible even if the membrane damage is not severe enough to cause cell death. These sugars and proteins act as a magnet for insects and pathogens. Cold water imbibition damage is difficult to diagnose because all the damage occurs below ground and the resulting cell leakage stimulates other problems that are more often considered the cause of emergence problems.

The first signs of germination are when the first root and the coleoptile emerge from the seed. The coleoptile is a leaf modified to appear like a tube. It is what we see when we say that corn is "spiking" and the first sign of emergence visible above ground. Both of these structures must rupture the seed coat to emerge. These ruptures tear openings in the seed that allow proteins and sugars to spill into the surrounding soil. These sugars and proteins are food sources for pathogens, and fungi can multiply rapidly as they feed on the leakage. Tears in the seed coat are entry points that allow pathogens and insects to invade the seed.

Life processes require abundant oxygen, so as seeds proceed through germination to emergence, oxygen demand rapidly increases. The amount of oxygen in the soil depends on the amount of pore space. Soil texture

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Bad Things Sometimes Happen to Good Seeds *continued from page 66*

affects total pore space, and soil compaction decreases pore space. Water is stored in the same soil pore spaces as oxygen. More water in a soil means less oxygen. If oxygen supply is limited, actively growing seeds will deplete oxygen to the point where stress occurs. Limited oxygen causes cells to produce toxic compounds that may cause cell and seedling death.

All of these problems probably occur each year, but the effects on corn stands are usually minimal particularly when spring weather conditions improve after planting. The worse combination of conditions is fluctuating soil temperatures and frequent precipitation. Seeds are relatively "safe" if soil conditions prevent germination. The minimum temperature for corn seed germination is usually given as 50F, but slow germination will occur at temperatures in the high 40s. Dry soil does not contain enough water to stimulate germination. If the seed coat has not been damaged during handling, disease pathogens and even most insects will not damage seeds after planting into cold and dry soils.

However, once germination begins it is a race between seedling establishment and the seedling enemies. Fluctuating soil temperatures and water status allow germination to begin, but then slow the process to a point where the germinating seed and the emerging seedling are at a disadvantage.

Once seeds have been planted they are at the mercy of Mother Nature. Protection of the seed with effective seed treatments can help, but will not eliminate all problems leading to poor stands. Delayed planting may be in order, but not much help if soil conditions deteriorate after planting. Reducing activities that compact soil around seeds is important because compaction can reduce root health and delay emergence.

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Missouri State 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). The NAPT coordinator sends soil test data from quarterly sample exchanges of the labs participating in MSTA program to the 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/mstacertified.htm

List of Missouri State Approved Soil Testing Labs

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

- Delta Soil Testing Lab
  University of Missouri
  P.O. 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
  P.O. Box 418
  State Highway 54 East
  Bowling Green, MO 63334
  Telephone: 573-324-2931
  Fax: 573-324-5558

- Alvey Laboratory, Inc.
  1511 East Main St.
  P.O. Box 175
  Belleville, IL 62222

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Missouri State Soil Testing Association Approved Labs *continued from page 68*

Telephone: 618-233-0445
Fax: 618-233-7292

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

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

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

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

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

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

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

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

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

• Ag Source Cooperative Services
106 N. Cecil Street
P.O. Box 788
Bonduel, WI 54107
Telephone: 715-758-2178
Fax: 715-758-2620

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

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

• 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

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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ppp.missouri.edu/pestmonitoring/index.htm

IPM Pest Monitoring Network Update: Spring Pest Alerts

By Steven Kirk

As of May 12th there have been 12 Black Cutworm intensive capture alerts sent out to individuals who have subscribed to our IPM Pest Monitoring BCW Alerts. These have occurred in 6 counties over a period of nearly 4 weeks from April 10th through May 8th with the heaviest infestations located in Knox County in Northeast Missouri followed by Pemiscot County in the Southeast region and Audrain County in the Central region. In addition, there have been 4 True armyworm pest alerts sent to our subscribers due to potentially significant True armyworm (TAW) moth captures in 3 counties over a period of 20 days from April 1st thru April 20th. Barton County has had 2 TAW Pest Alerts, while Pemiscot and Stoddard counties have had one alert each. Although Pest alerts from moth captures in pheromone traps DO NOT indicate that treatment is necessary, it is a valuable tool provided to our subscribers indicating that scouting for potential pests in nearby locations may be in order.

Farmers and pest managers can sign up for Black Cutworm, True Armyworm, Japanese Beetle, European Corn Borer, Corn Earworm and Fall Armyworm Alerts from sites monitored throughout the state. In addition to the insects listed above, we also monitor for Southwestern Corn Borer, Tobacco Budworm, Beet Armyworm and Soybean Looper in the southern and southeastern portions of Missouri. To receive electronic Pest Monitoring Alerts when potentially significant insect captures have been reported, visit our web site at: http://ppp.missouri.edu/pestmonitoring/subscribe.htm. At the site, complete 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.

Table 1. Intensive Captures of Black Cutworm (BCW)

Reported in pheromone traps in the following counties:

County	Trap Location	Intensive Capture Date	Predicted First Cutting
Knox	Novelty	05/08/2009	05/29/2009
Knox	Novelty	05/01/2009	05/22/2009
Knox	Novelty	04/30/2009	05/23/2009
Audrain	Mexico	04/30/2009	05/21/2009
Knox	Novelty	04/27/2009	05/20/2009
Pemiscot	Hayward (Delta Center)	04/24/2009	05/13/2009
Audrain	Mexico	04/24/2009	05/17/2009
Morgan	Versailles	04/22/2009	05/15/2009
Barton	Nashville	04/20/2009	05/12/2009
Callaway	Fulton (west)	04/17/2009	05/10/2009
Pemiscot	Hayward (Delta Center)	04/13/2009	05/05/2009
Pemiscot	Hayward (Delta Center)	04/10/2009	05/04/2009

Table 2. Potentially Significant True Armyworm (TAW) Moth Captures

Reported in pheromone traps in the following counties:

County	Trap Location	Trapping Period (begin)	Trapping Period (end)	Moths Captured
Stoddard	Bloomfield	04/14/2009	04/20/2009	156
Pemiscot	Hayward (Delta Center)	04/08/2009	04/10/2009	58
Barton	Nashville	04/06/2009	04/10/2009	123
Barton	Nashville	04/01/2009	04/06/2009	103

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Weather Data for the Week Ending May 11, 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.	May 1 - May 10	Departure from long term avg.	Accumulated Since Apr. 1	Departure from long term avg.
Corning	Atchison	75	52	85	48	63	+2	0.04	-1.40	264	+74
St. Joseph	Buchanan	72	54	81	47	62	+1	0.17	-1.40	247	+36
Brunswick	Carroll	74	52	84	44	63	+1	0.83	-0.67	272	+44
Albany	Gentry	72	51	82	45	61	0	0.62	-0.96	221	+30
Auxvasse	Audrain	74	53	84	45	62	0	0.78	-0.94	278	+47
Vandalia	Audrain	73	51	81	44	62	+1	0.86	-0.82	270	+61
Columbia-Jefferson Farm	Boone	73	52	82	45	62	-1	1.36	-0.29	283	+21
Columbia-South Farms	Boone	72	52	81	44	62	-1	1.63	-0.02	283	+22
Williamsburg	Callaway	73	52	82	43	62	+1	1.39	-0.28	274	+49
Novelty	Knox	73	51	82	43	61	0	0.54	-1.03	232	+22
Linneus	Linn	73	50	81	42	61	0	0.44	-1.17	240	+38
Monroe City	Monroe	73	51	81	44	62	0	0.73	-0.83	252	+18
Versailles	Morgan	73	54	85	46	63	0	1.65	-0.32	314	+13
Green Ridge	Pettis	72	54	82	45	62	0	0.92	-0.79	281	+47
Lamar	Barton	70	53	82	48	62	-1	3.39	+1.48	301	-1
Cook Station	Crawford	*	*	*	*	*	*	*	*	*	*
Round Spring	Shannon	76	51	87	42	62	0	2.70	+0.89	294	+13
Mountain Grove	Wright	71	52	82	47	61	-1	3.31	+1.56	265	+12
Delta	Cape Girardeau	73	58	81	51	65	0	1.92	+0.14	350	-23
Cardwell	Dunklin	72	60	83	54	66	-1	3.37	+1.59	429	-21
Clarkton	Dunklin	73	58	81	51	65	-2	2.76	+1.40	387	-50
Glennonville	Dunklin	73	58	82	52	66	-1	4.26	+2.88	402	-37
Charleston	Mississippi	72	58	80	53	65	0	4.67	+3.01	376	+9
Portageville-Delta Center	Pemiscot	73	59	82	53	66	-1	3.71	+2.15	429	-10
Portageville-Lee Farm	Pemiscot	*	*	*	*	*	*	*	*	*	*
Steele	Pemiscot	72	60	82	55	66	-1	5.64	+3.84	452	+10

* 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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