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Landscape Alert

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and nursery

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Maple scorch, wilting and dieback remain a mystery

Gerry Adams, Plant Pathology

We have recently confirmed that this season's unusual and widespread maple problems in Michigan have also appeared widespread in New Jersey. Samples of leaves submitted for testing to MSU and Rutgers University have shown interveinal necrosis or cross-vein and marginal necrosis on the leaves which are typical symptoms of leaf scorch. However, several reports of terminal branch wilting and dieback have led to confusion about the etiology of this disease or disorder. A number of samples have now been tested for the presence of the bacterial pathogen, *Xylella fastidiosa*, which causes bacterial leaf scorch and all have been negative. These samples included Norway, Sugar, and Red maples, plus variegated and 'Red sunset' cultivars. The negative test results were expected because the sudden and widespread occurrence of the scorched and wilting terminal leaves are more characteristic of an abiotic or physiological disorder brought on by unusual climatic conditions, as earlier suggested by Dr. Dave Smitley. The reports from New Jersey also are suggestive of a climate-related disorder.

We hope to put a special effort in confirming or denying whether verticillium wilt is a contributor in some portion of the damaged trees. One reason for this approach is based on the reports and samples of currently dying branches, or branches that were reported as dead only this season. An abiotic scorch is unlikely to lead to branch wilting and dieback, other than some wilting of the most succulent shoots at the very terminus of the branches. Additionally, we need some careful observation on

whether the "dead branches" are actually setting new buds and thus likely to recover fully next year. To continue this diagnosis, we need your help.

Please send in samples of the maple scorch, wilting and dieback that include the leaves attached to an affected branch (say five to 10 inches long). We will help in isolations aimed at recovering *Verticillium* from the vascular systems. Samples can be sent to:

Gerry Adams Lab - MSU
268 Plant Biology
East Lansing, MI 48824

What can you do now?

We can predict that most of these maples will return to a healthy appearance next season if no branches are currently wilting or recently dead. Such information may moderate the homeowners and landscapers immediate concerns. For those experiencing recent branch dieback and wilting, a recommendation of pruning aimed at balancing the foliage to the apparently inadequate root absorption, and removing unsightly dead branches, could not hurt. Such treatment is likely to help the trees recover more quickly in health and esthetic appearance. Currently, we assume that weather conditions that favored the occurrence of this malady will be as rare in future years as our memory of past years and maple disorders. However, if the climate is changing, then only future observations will be informative for predicting correlations of climate and the maple problem. **IPM**



Update on wilting of isolated branches of Norway maples and sugar maples

Dave Smitley, Entomology

Some arborists reported an unusual number of Norway and sugar maples with a few wilting branches or isolated branch dieback in June and early July this year. Many trees have been examined and quite a few samples sent to Diagnostic Services at MSU, examined by myself and Gerry Adams (link his article).

Some samples examined had branch dieback, most likely from 2008, with branches infested with ambrosia beetles (similar to a bark beetle). See Howard Russell's article. Two species of ambrosia beetles, the black stem borer, *Xylosandrus germanus*

and the European shot-hole borer *Anisandrus (=Xyleborus) dispar* have been recovered from these samples. So far these ambrosia beetles appear to have only been found on branches that appeared to have wilted or scorched last year. This is typical of bark beetles and ambrosia beetles being a secondary pest of compromised branches or trees.

So far, we suspect there are multiple causes of the branch scorching, wilting and dieback symptoms observed this spring and early summer. Several arborists and extension educators have commented that it is relatively

easy to find a little branch dieback on maple tree street trees with restricted root systems, poor soil, drought stress, or girdling roots. We hope to receive more samples from maple trees that are examined for Verticillium wilt by scraping bark from the base of wilted branches and trace back to larger branches that feed them until some vascular discoloration is found, and also from trees examined for bark beetle, ambrosia beetle and borers. As more information and samples come in, we will keep you informed of the results of the diagnoses. **IPM**

Ambrosia beetles and maples

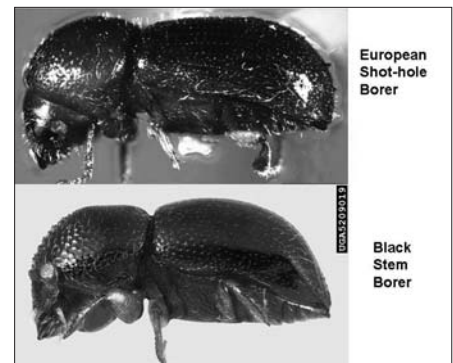
Howard Russell, Diagnostic Services

As a follow up to Dave Smitley and Gerry Adam's articles about the widespread die back of maple trees, this article offers a brief introduction to ambrosia beetles. Ambrosia beetles are closely related to bark beetles. Once upon a time, both were conveniently placed in the family *Scolytidae*, but that all changed a few years back when coleopterists (beetle geeks) decided to place the scolytids with the weevils in the family *Curculionidae*. This was done primarily because the larvae are virtually indistinguishable from each other. It is more or less correct to consider bark and ambrosia beetles as very specialized and highly evolved weevils. Many old time entomologists (like myself) still refer to them as scolytids. More modern thinkers can correctly refer to the group formally known as scolytids as "scolytines." Insect taxonomy or their classification is constantly changing. I can barely keep up.

Ambrosia beetles differ in several ways from bark beetles. There are

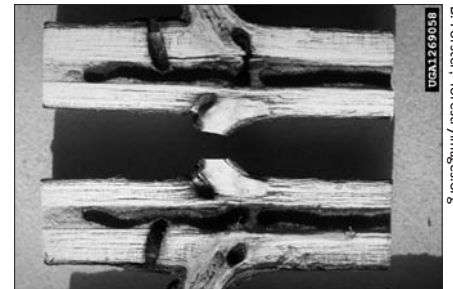
several morphological characteristics that separate them, but most interesting are the differences in their respective biologies. In general, bark beetle larvae develop in intricate galleries they carve out as they feed on the wood just under the bark. Most are secondary invaders of declining trees. They are also attracted to stressed-out trees that are on the verge of declining and will certainly hasten the decline of stressed-out trees when they attack in large numbers. A few bark beetles, like the southern pine bark beetle and the mountain pine bark beetle, *Dendroctonus* spp., are predatory and attack healthy trees. These beetles must kill their host tree in order for their larvae to successfully develop.

Ambrosia beetles and their larvae do not feed on wood per se, but on an "ambrosial" mold-like fungus. The female beetles introduce this fungus into the tunnels as they bore into the sapwood, and sometimes heartwood, of trees, shrubs and logs. The fungus grows on the walls of



Here are the two ambrosia beetles we have recovered from the branch die back samples. Please note that they are very similar in appearance.

Black stem borer photograph by N. Wright, Florida Department of Agriculture and Consumer Services. European shot-hole borer photograph by J.R. Baker & S.B. Bambara, North Carolina State University. Both courtesy of forestryimages.org.



The brood galleries of the European shot-hole borer.

the galleries that the female beetle chews out. The females carry the fungus in specialized structures called mycetangia that are located in various places in and on their bodies. Once the fungus culture is going, eggs are laid and developing larvae feed on the fungus. Female ambrosia beetles develop from fertilized eggs; males develop from unfertilized eggs. Upon completing their development, the males mate with their sisters and their entirely incestuous life cycle begins anew.

Like bark beetles, ambrosia beetles are also attracted to stressed-out and declining trees, which is why we have found ambrosia beetles in many of the samples of branch die back we have looked at this summer. Ambrosia beetles are known to kill branches and, in some cases, trees, when these are subject to mass attack. Branches are killed not by chewing but by the ambrosia fungus clogging up the vascular tissue. I am not at all convinced that the ambrosia beetles we have recovered from die back samples are responsible for their decline. None of the samples have shown what I



An ambrosia beetle pupa in its gallery.

would consider a “mass attack” by the beetles.

The two species of ambrosia we have collected from die back samples were identified as the black stem borer, *Xylosandrus germanus*, and the European shot-hole borer, *Anisandrus (=Xyleborus) dispar*. The black stem borer was first discovered on the East Coast in 1972. Despite its common name, the European shot hole borer is thought by some to be a native species. Recently, the granulate ambrosia beetle, aka Asian ambrosia beetle, *Xylosandrus crassiusculus*, was found in Indiana. This beetle was first discovered in South Carolina in 1975. This invasive beetle is



One sign of an ambrosia beetle attack on a living tree is sap leaking from the entry hole.

reported to be killing sweetgum trees and other southern species along the southern Atlantic coast. Its presence in Indiana is certainly a concern for other states in the Midwest. **IPM**

Heterosporium leaf spot

Jan Byrne, Diagnostic Services

I like to garden in my spare time. My yard is certainly a work in progress; it would never be considered a showcase garden, not even close. Over the past few years, I have taken a bit (ok, a lot) of grief from some of my diagnostic lab colleagues for the insect and weed problems I have been challenged with. But the story has recently changed; my colleagues have been struggling with a few disease problems in their gardens. The most recent problem caused severe leaf spotting/blighting on some family heirloom iris plants. My colleague wasn't happy that he needed my diagnostic expertise.

Upon examining some of the infected iris leaves, I detected the

fungal pathogen *Heterosporium*. *Heterosporium* was previously known as *Didymellina*, so you may know the disease as *Didymellina* leaf spot.

Disease symptoms begin as tiny brown spots with a water-soaked border. As the disease progresses, these develop into irregular spots with grayish centers and dark borders. Over the season, the leaf spots enlarge and coalesce. Leaves begin to die back from the tips and the dieback progresses downward. The disease severity worsens after blooming.

The disease weakens the plants causing less prolific blooming the following year. Several consecutive years of disease can cause plant



Individual lesions on iris foliage.



Severe foliar blighting in my colleague's iris planting.

death. The rhizome forming types of iris (rather than bulb-forming) are generally more susceptible to this disease.

The fungus produces its spores within the foliar lesions. Spores are then splashed to adjacent plants by rain and irrigation water. The disease can easily be introduced on

infected plant material.

Disease control needs to begin with good sanitation. Affected leaves should be pruned back and removed. If disease is severe, broad-spectrum fungicides can be used to protect the remaining foliage. The pathogen overwinters on leaf debris and sporulates in the spring, beginning

the cycle again. At the end of the season, it is especially important to prune back the foliage and remove it from the site. Incidentally, my colleague neglected to do this last fall; he won't make that mistake again! **IPM**

Experience the Michigan Garden Plant Showcase

Erik Runkle, Horticulture, and Thomas Dudek, MSU Extension-Ottawa County

Landscapers, nurserymen, greenhouse growers and plant retailers are invited to participate in the MSU Garden Plant Showcase on Tuesday, August 4. This half-day program features unbiased comparisons of seeded and

vegetative annuals in a landscaped setting and an educational program featuring speakers from the MSU Department of Horticulture.

The \$35 fee per person for the MSU Garden Plant Showcase includes the program, a trial booklet,

parking, and lunch. Click here to register. We hope you can join us and your colleagues for this informative and fun event. While you're on campus, also tour the perennial garden, the rose garden, the landscape arboretum, and several

Tuesday, August 4		
Time	Topic and description	Presenters
8:00	Registration and refreshments	
8:30	Introduction and welcome	Art Cameron and Dan Bulkowski
8:45 – 10:00	Self-guided tours of display gardens. Garden personnel will be on hand for guidance and assistance.	
10:00 – 10:40	Landscapes for the future – plants, people and ecosystems. Landscape Plants are the foundation of our outdoor environment. The diversity of plant species and the multitude of cultivars, hybrids and varieties make for creative and appealing landscape compositions that provide for the enhanced aesthetics of our communities, promote physical and mental health and contribute to environmental quality. We will explore the multifaceted ways that plants contribute to being "Green."	Bob Schutzki
10:40 – 11:00	Top trial performers in 2009. Join Chris, trial manager, as she discusses her favorite and best-performing ornamentals so far this year.	Chris Noffsinger
11:00 – 11:30	Art's top annuals and perennials for Michigan landscapes (and beyond!). Come learn about which plants perform best in the Upper Midwest – with an emphasis on the new, the exciting, and the unique.	Art Cameron
11:30 – 12:00	Managing greenhouse temperature in an energy-efficient manner. Learn how to manipulate temperature on a short- and long-term basis to produce crops on time while reducing the amount of energy you consume for heating.	Erik Runkle
12:00	Lunch (included with registration). Continue self-guided tours at leisure.	

other gardens within a few minutes walk. Please register by July 24 to ensure a lunch. The program is listed below.

You may also be interested in participating in the sixth annual Michigan Garden Plant Tour from August 3 to 14. Growers of

ornamentals are invited to attend this two-week coordinated openhouse of young plant producers and MSU. Each young plant producer showcases their product lines in their outdoor gardens. It's a great way to evaluate garden plant performance of annuals and perennials in a

variety of outdoor settings and in containers. This year, seven leading companies are participating with MSU: C. Raker and Sons, Duwayne's Greenhouses, Four Star Greenhouse, Mast Young Plants, Pell Greenhouses, Walters Gardens, and Zylstra Greenhouses. **IPM**

Turf inquisition at Ag Expo

Kevin Frank, Crop & Soil Sciences

Ag Expo recently wrapped up its 30th year on campus and this year the Crop and Soil Sciences tent was focused on turfgrass. After spending about 12 hours over three days occupying the booth and fielding turfgrass questions from homeowners, farmers and vendors, here are some of the common questions.

Top 5 turf questions from Ag Expo:

1. Have you developed a no-mow, no-nothing turfgrass?

No. We have yet to develop a grass that is always green and doesn't require mowing. Although some folks have an inordinate disdain for mowing their lawn, there are still a group of folks, myself included, that actually enjoy this weekly task as a pleasant diversion from email, texts and cell phones ringing.

2. If I'm worried about grubs this year, when should I apply one of those preventative-type grub control products?

Now is go-time for applying the preventative-type grub control products such as GrubEx. Make sure

to water the product in as it needs to get through the thatch to the soil to be most effective on the grubs.

3. My backyard is essentially a woodlot, why does the turf look so bad?

The next time you're walking through the forest make sure to look at the ground and note how much turfgrass you see. It's not easy to grow turf in complete shade, you might need to consider some selective basal pruning of trees if you really want to have some good looking turf in these environments. Otherwise, manage turf in the shade by watering more lightly and frequently and consider the same for fertilizer. Give the turf a little food every two to three weeks to help it get along in the shade.

4. Will the pinwheels in my lawn keep the moles out?

No, but they may help entertain your dog or cat. There are numerous mole control products from castor oils to poison baits to traps. Tomcat's (which is poison bait) active ingredient talpirid, has been all the buzz for controlling moles in the last

couple years. If you're going to use any poison bait product make sure to read and follow all label directions. Someone that is persistent and patient with trapping can still be a very effective mole control option. Also, keep in mind that if you have a lawn this is near a woodlot it might be an endless pursuit as the moles will move back and forth between the lawn and the woods.

5. I just moved into a house and the soil I'm trying to grow the lawn on seems to be some sort of pottery clay what should I do?

Unless you're interested in starting over and hauling in four to six inches of nice black topsoil, you're going to have to learn to work with what you have. First thing is to get a soil test to find out what you're really dealing with. Some of these soils may be very low in phosphorus and potassium and that's some important information for you to know. A combination of regular fertilizer applications and at least yearly core aeration should help you produce a lawn that has a fighting chance. **IPM**

Christmas tree pest update: Douglas fir needle midge, Cooley spruce gall adelgid and white pine weevil

Jill O'Donnell, Christmas Tree ICM educator

Douglas fir needle midge

The yellow banding from Douglas fir needle midge is becoming more noticeable. I recently looked at a field where the tops

of the trees were yellow from this pest. This midge is relatively new to Michigan. Needle midge adults emerge in the spring and live only a couple of days, just long enough

to mate and lay eggs. The eggs are deposited in groups on newly expanding buds in May. Midge eggs hatch in a couple of days, and the larvae immediately bore into young

needles. Larvae feed in the needles throughout the summer. When they are full grown in the fall, the larvae drop from the needles and spend the winter in the soil beneath infested trees. Damage to Douglas-fir needles from Cooley adelgid feeding or Rhabdocline needlecast may be similar in appearance. One way to tell the difference is that galled needle from Douglas-fir needle midge will appear swollen if viewed from the side.

So far, we have only seen this pest around the Cadillac area. If you think you may have seen damage from this pest in your Douglas-fir,

please contact me at odonne10@msu.edu or (231) 779-9480.

Cooley spruce gall adelgid

Douglas fir growers should be actively scouting the trees near harvest age for Cooley spruce gall adelgid. Check for white, cottony balls dotting the undersides of needles on Douglas-fir. If you look under the cottony material, you will find pale peach-colored eggs or possibly the first emerging nymphs. Eggs will hatch about 1500 to 1600 degree days base 50. In most years, this has been the last part of July to the first part of August. Insecticide

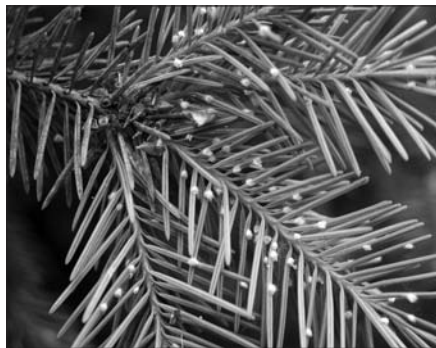
can be applied once these eggs hatch to control nymphs that will overwinter.

White pine weevil

Growers are finding dead or dying leaders on white pine, spruce, Scotch pine and Douglas-fir. If you look closer by peeling back the bark, you will see small, white larvae under the bark or clumps of shaved wood (chip cocoons). This is a good time to prune out and destroy infested leaders. Make sure to remove them from the field. **IPM**



Yellow needle bands from Douglas-fir needle midge.



Cottony masses Cooley on Douglas-fir.



White pine weevil chip cocoon.



Close up of yellow band from Douglas-fir needle midge.



Pale peach eggs form Cooley spruce gall adelgid under the cottony material.



White pine weevil larvae under bark.

Lophodermium needlecast

Dennis Fulbright, Plant Pathology

It's time to think about management of Lophodermium needlecast disease of Scotch and red pine, caused by the fungal pathogen,

Lophodermium seditiosum. The management of this needlecast disease is slightly different than other needlecast diseases found

on Douglas fir and spruce. This disease can kill red pine seedlings and causes browning and massive amounts of needle loss on Scotch

pinus. Scotch pines infected with this disease have needles with brown spots surrounded by yellow margins, yellow needles or brown needles, especially at the bottom of the tree.

If you see *Lophodermium* needlecast on your trees right now, you must remember that what you are seeing is from infection events that took place last summer or fall. Therefore, now is the time to begin managing this disease for next summer. You cannot do anything about the amount of disease you see this year. In fact, the dead needles that are currently falling off the trees this summer (June, July and August) will be providing the inoculum (spores) that will spread throughout the trees in your plantation or

nursery. These spores will infect this year's crop of needles from August to October. Even though you won't see the result of those infection events until next year, the fungus will stay in those healthy looking needles all winter until spring, when, again, those needles will begin the process of yellowing, browning and dropping off. To break this disease cycle, the time to manage this disease is in late July and throughout August, even into fall, if it stays warm and moist.

To initiate control, you must begin now. Look for needle spots and brown foliage on the lower branches of 50 or more trees scattered throughout the plantation.

If ten percent of the trees are infected, consider treating the entire plantation by the first week of August. To reduce *Lophodermium* needlecast, plant long needle Scotch pines that are more resistant such as those from Germany, Belgian, Poland and Czechoslovakia; remove the branches of pine from cut stumps where spores are likely to be produced; and, make sure all the older pines have been removed from windbreaks near nurseries or plantations. These pines can serve as sources of fungal spores. Apply a registered, preventative fungicide three or four times, once every two to three weeks from late July through October. **IPM**

Spruce needle rust disease

Dennis Fulbright, Plant Pathology

Rust fungi represent some of the most advanced fungal species known. Because rusts are complex diseases they can be described in many different ways. You can categorize them by their life cycles, their spore colors, their primary or alternate hosts, or the types of symptoms they cause. Using both symptoms and the conifer host is probably your best bet in identifying the rust diseases of Christmas trees in Michigan. Basically, there are two types of rusts on Michigan Christmas trees; those that cause diseases of stems and twigs and those that cause diseases of needles. An example of needle rust is beginning to show up on spruce trees near water.

Spruce needle rust overwinters on Labrador tea and leather leaf and spores from these alternate hosts

have moved to the spruce trees via wind and rain events and are now infecting spruce trees. In July and August, yellow current-year needles with whitish blisters filled with yellow spores will appear on Colorado blue, black and white spruce. Shedding of infected needles will follow these infection episodes. The alternate hosts, Labrador tea leather leaf are members of the Heath family and are found in bogs and damp thickets. Care should be taken to plant spruce away from wetlands especially the rust susceptible Colorado blue, black and white spruce. Norway spruce is more resistant. Scouting for alternate hosts, roguing infected branches and trees and planting resistant stock can reduce the impact of many of these rust diseases. **IPM**



Spruce needle rust.



Closeup of spruce needle rust blister.

Conifer shipping: Plan ahead to best meet Japanese beetle requirements

Mike Bryan, MI Department of Agriculture Nursery Program Manager

Growers who will be shipping conifers or other nursery stock

as balled and burlapped or containerized stock out of Michigan

should be aware that the trees must meet Japanese beetle requirements

of the destination state. Growers who ship within Michigan or to Ohio, Illinois or Indiana have little to worry about as far as Japanese beetles go, because all of these states are recognized as infested and so there are no Japanese beetle treatment requirements.

Shipments that go beyond the above listed states often require specific treatments or special

inspections to assure that Japanese beetle larvae are not hitchhiking in the soil associated with the roots. The Michigan Department of Agriculture advises growers that they should consult with MDA early on to determine how best to meet the shipping criteria. Growers who wait until the week before shipping will find the options extremely limited or non-existent, and like most last-

minute items, more costly.

Right now is a good time to contact MDA to determine what the requirements will be for shipments made this fall and next spring. MDA advises growers to contact the MDA regional office serving their county to discuss how best to meet shipping requirements. Contact information may be found on the MDA web site at www.michigan.gov/mda. **IPM**

Weather news

Aaron Pollyea, Geography

After a day of precipitation, we'll have more of the same Friday, July 24, as another system moves through the state with the highest amounts occurring overnight Friday into Saturday morning. Precipitation will occur across the state with the highest amounts in the central part of the Lower Peninsula. The rain should taper off Saturday evening. Medium range models suggest another system moving through the state on Tuesday, July 28, with precipitation mainly confined to the southern most areas of the state.

High temperatures on Saturday will be from the high 60's to near 80°F with lows from the mid-50's to the high 60's. On Sunday temperatures will be much the same with highs in the high 60's to near 80°F and lows in the mid-50's to low 60's. Monday will see warmer temperatures across the state with highs in the mid-70's to mid-80's and lows from the mid-50's to the low 60's. Temperatures will cool slightly with clouds and precipitation moving into the state on Tuesday.

The **6 to 10 day** forecast for

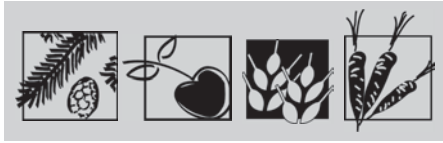
July 29 to August 2 suggests that temperatures will continue to be lower than normal with precipitation chances near normal across the region. The **8 to 14 day** forecast for July 31 through August 6 shows a greater than normal chance for lower than normal temperatures with the greatest chance in the Upper Peninsula. Precipitation will be below normal for the southern part of the Upper Peninsula and the coast line of Lake Michigan. **IPM**

Michigan State University Cooperative Agricultural Weather Service
Cumulative Precipitation Summary For 07/23/2009

STATION OR DISTRICT	BASE 42 BE DEGREE-DAYS		BASE 50 BE DEGREE-DAYS		PRECIPITATION TOTALS SINCE		STATION	DIST	07/17/2009 (Last week)		07/10/2009 (Last 2 weeks)		06/26/2009 (Last 4 weeks)		04/01/09 (since Apr. 1)		
	AS OF 2008	BY 2009	AS OF 2008	BY 2009	Actual	Dev.			Actual	Dev.	Actual	Dev.	Actual	Dev.	Actual	Dev.	Actual
WEST UP NORMS**	1631	1757	1876	997	642	692	1085	1165									
Houghton	1284	1207	1287	1412	695	642	692	770									
Ironwood	1475	1446	1542	1692	852	812	875	974									
Marquette	1409	1285	1371	1504	809	701	755	841									
Stephenson	1734	1588	1694	1858	1067	935	1007	1121									
EAST UP NORMS	1428	1548	1664	819	899	899	975	975									
Chatham	1322	1267	1355	1490	767	689	746	835									
SSMARLE	1467	1325	1417	1558	820	698	756	846									
N. W. LP NORMS	1819	1952	2080	1135	1229	1317	1317	1317									
Beulah	1909	1740	1845	2011	1182	1012	1083	1198									
Lakecity	1792	1610	1707	1861	1104	929	994	1100									
Pellston	1719	1419	1505	1640	1049	808	865	956									
N. E. LP NORMS	1773	1905	2030	1093	1185	1270	1270	1270									
Alpena	1803	1551	1646	1796	1108	890	953	1056									
Htnlake	1883	1634	1734	1892	1170	932	998	1105									
Rogercity	1767	1574	1670	1822	1072	899	982	1066									
Vanderbilt	1749	1505	1597	1742	1078	860	921	1020									
W. CENT. LP NORMS	2006	2147	2281	1277	1379	1474	1474	1474									
Fremont	2005	1919	2035	2198	1261	1142	1225	1340									
Ludington	1799	1670	1771	1912	1087	938	1006	1101									
Muskegon	2039	2080	2205	2382	1272	1273	1366	1494									
CENT. LP NORMS	2084	2226	2361	1343	1446	1542	1542	1542									
Big Rapids	1992	1809	1917	2075	1274	1071	1147	1258									
E. CENT. LP NORMS	2089	2234	2370	1350	1455	1551	1551	1551									
Saginaw	2199	2025	2132	2319	1430	1206	1303	1440									
Standish	1887	1725	1837	1998	1188	1005	1086	1200									
S. W. LP NORMS	2297	2451	2597	1508	1622	1728	1728	1728									
Grapids	2314	2241	2361	2540	1522	1405	1482	1624									
Gulllake	2601	2403	2531	2724	1763	1527	1622	1765									
Holland	2292	2312	2435	2621	1508	1472	1564	1702									
Southbend	2427	2428	2557	2752	1610	1564	1661	1808									
Westlively	2093	2070	2180	2346	1332	1273	1352	1471									
S. CENT. LP NORMS	2260	2412	2554	1485	1597	1700	1700	1700									
Albion	2223	2153	2272	2447	1436	1334	1422	1549									
Coldwater	2228	2272	2398	2583	1438	1435	1529	1667									
Lansing	2263	2131	2249	2422	1476	1301	1386	1511									
S. E. LP NORMS	2247	2400	2546	1470	1583	1689	1689	1689									
Detroit	2494	2375	2503	2698	1653	1494	1589	1733									
Flint	2316	2055	2166	2334	1526	1245	1324	1444									
Millford	2082	1985	2092	2255	1330	1188	1263	1378									
McLemmens	2219	2172	2289	2467	1442	1340	1425	1554									
Romeo	2197	2024	2133	2299	1416	1228	1306	1424									
Tipton	2246	2153	2269	2446	1448	1331	1416	1544									
Toledo	2439	2410	2540	2738	1621	1534	1631	1779									

Report generated at 09:03, 07/24/09

* Since weather data for some agricultural stations are not available prior to April 1st, GDD values for those stations during February and March are estimated with closest available station data.
 ** District normals were calculated as the mean of daily GDD totals at several stations within each district for the period 1951-1980.
 Report generated at 09:03, 07/24/09



Crop Advisory Team Alerts

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