

Crop Advisory Team

Alert



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Landscape Alert

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Starting up the season

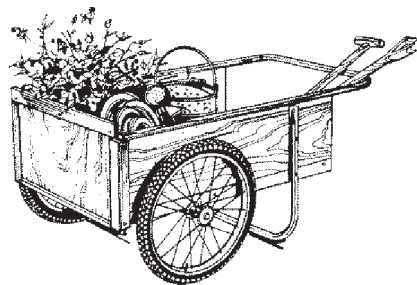
Spring is right around the corner, so it's time to start planning for the upcoming season. Our first issue offers tips on golf course turf management, winter injury to lawns, managing insects in Christmas trees and much more.

We appreciate suggestions from you, our readers. Please feel free to contact Andrea Gooch at (517) 353-4703 or email catalert@msu.edu. Internet readers can also sign up to receive a brief email when we post new issues on the Internet or use our RSS feed. Details are at:

<http://ipmnews.msu.edu/landscape>

We look forward to joining with MSU's faculty and educators to provide you information this season for a growing harvest.

– Joy Landis, editor, and Andrea Gooch, assistant editor.



Winterkill on golf courses

Kevin Frank, Crop and Soil Sciences and Joe Vargas, Jr., Plant Pathology

The past winter was no treat for turfgrass on golf courses in Michigan. Golf courses throughout the state have suffered from what is commonly referred to as winterkill. Winterkill is a general term that is used to define turf loss during the winter. The different types of winterkill include: crown hydration, desiccation, low temperature kill, ice sheets and snow mold. Due to the unpredictability of environmental factors, and differences in other factors such as drainage, the occurrence of winterkill on golf courses is variable and can vary greatly between golf courses and even across the same golf course. The most common type of winterkill seen this year is from crown hydration injury and ice sheets trapping toxic gases.

Crown hydration injury and ice sheets

Many annual bluegrass (*Poa annua*)

greens and fairways suffered winterkill from crown hydration injury. The problem occurs in late winter, when day time temperatures become warm enough that the annual bluegrass plant begins to take up water (hydrate). During these thaw/freeze events, ice crystal formation can occur in the crown of the plant. Ice crystal formation will rupture the plant cells and ultimately cause the plant to die. However, there are other factors involved that we don't understand. There is plenty of moisture in the entire green following snow melt, but the turf only dies where there is standing water. This is an area we need to research when funds become available.

Ice sheets that do not allow gases to escape can also result in the turf dying. There are two toxic gases principally responsible for this buildup, butanol

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($\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$) and ethyl butyrate ($\text{CH}_3\text{CH}_2\text{CH}_2\text{CO}_2\text{CH}_2\text{CH}_3$). As the ice sheet melts away, the area damaged closely mirrors where the ice was present. Often times if the ice is mechanically removed a foul odor caused by these gases is present.

Desiccation

Winter desiccation is the death of leaves or plants by drying during winter when the plant is either dormant or semi-dormant. Desiccation injury is usually greatest on exposed or elevated sites and areas where surface runoff is great. This was not a serious problem this year.

Steps in recovery

Reestablishing turfgrass in damaged areas can be very challenging in the spring due to cool, cloudy conditions that often persist. Depending on the extent of damage, either seeding or sodding can be

used to facilitate recovery. In areas where the turf was killed in a manner that there are well-defined margins between dead and living turf, it may be feasible to strip dead turf and sod the area. In areas where the kill was more scattered, it may be easier to seed the area.

Seeding can be difficult, especially on damaged areas of greens. Inter-seeding creeping bentgrass into dead areas on the greens has given mixed results. The best results with inter-seeding have occurred when the low mow, high density type creeping bentgrasses, such as the Penn A and G series or T-1 and Alpha bentgrasses, have been used. Several methods may be used to reseed damaged areas. Verticutting followed by seeding, using a slit-seeder, or using tools like the job-saver aerator attachment, can all be successful. The inter-

seeding process should continue on a weekly basis until the damaged area has been completely recovered. On greens that are predominantly annual bluegrass, often it is better to scratch the surface of the dead areas to allow the annual bluegrass to germinate and fill in the voids. Keys to success for renovating winterkilled areas are to divert traffic from newly seeded areas, apply a starter type fertilizer regularly using either a granular or foliar product, and syringe the turf in these areas to ensure that the seedbed or sod is moist throughout the establishment period. Although it is unpopular with golfers, in some situations it may be necessary to close and cover the greens to speed recovery or at least divert traffic from damaged areas of greens to facilitate recovery. **IPM**

Matted lawns and snow mold injury

Kevin Frank, Crop and Soil Sciences

Coming out of winter it is typical that some lawns may have snow mold injury and overall there are certainly areas where the turf is very matted. In most cases, the snow mold has probably not killed the turf but has simply killed the leaf tissue. The two options for dealing

with snow mold or matted lawns are to either use a leaf rake to remove the dead leaf tissue and open up the canopy to allow the new growth to sprout through or to go back inside and sit down and let the grass poke through on its own. Option one will probably get the grass back growing

a little quicker and will help you knock off the rust from your raking skills. Be patient this time of year, as the soil warms the turf will start to grow. Until we get some real soil warming the turf, your lawn may seem very slow to recover from any damage from the winter. **IPM**

West Olive weather station now has polyhouse degree day accumulations

Thomas Dudek, Senior Extension Horticulture and Marketing Educator

Nursery growers in West Michigan will benefit from a new degree day accumulation table from the MSU's Enviro-weather program for the West Olive (Ottawa County) weather station that is housed at Northland Farms. The table shows both the growing degree day (GDD) accumulations outside as well as GDD accumulations inside the polyhouse at this location.

Nursery growers have requested the new GDD accumulator to help them intensify insect scouting in poly houses since temperatures accumulate more rapidly in the early spring under poly and allow insect activity to develop faster. To access this data for the West Olive (Ottawa County) station on the Enviro-weather web site visit: www.enviroweather.msu.edu. **IPM**

The screenshot shows the Enviro-weather website interface. At the top, there are navigation links for Home, News, About us, Join our supporters, Station, Current - West Olive, and Weather. Below this is the station name 'West Olive, Michigan' and a description: 'Weather-based pest, natural resource, and production management tools'. There are tabs for Tools, Field, Fruit, Trees, Turfgrass, Vegetables, Landscape & Nursery, and Advanced weather. The main content area is divided into sections: 'Models and other resources' (with links for Christmas trees, Other evergreens, Deciduous plants, Pest Management, and a circled link for 'Polyhouse temperatures and degree days'), 'Latest observations' (showing current temperature, humidity, wind, and cloud cover), and 'Weather observations and summaries' (listing temperature and rainfall summary, overnight temperature below freezing, soil conditions, current degree-day maps, average degree-day summary, degree-day accumulations for region, and degree-day comparisons for 5 years at this station). There is also a 'Water-use tools' section and a 'Station sponsors' list including Northland Farms, Project GREEN, and MSU Outreach.

Polyhouse degree day link on the station's page.

Blue spruce needle cast disease

Dennis Fulbright, Plant Pathology

Blue spruce in Michigan suffers from a serious needle casting disease caused by the fungus *Rhizosphaera*. Well-timed sprays in the spring will normally suppress *Rhizosphaera* to non-detectable levels in the population of trees. However, in some plantations needle casting symptoms still occur after sprays (Photos 1 and 2). The casting needles turn purple or brown, die and drop off the stems. In many of these sprayed plantations another fungus called *Stigmina* may be found infecting needles. We still do not know for sure if this fungus is completely responsible for these symptoms after spraying for *Rhizosphaera*. It could be that you have not completely managed *Rhizosphaera*. Because *Stigmina* is



Photos 1 and 2, needle casting problems on trees sprayed with chlorothalonil-based fungicides are still severe.

so new, we still do not know much about this fungus, but we do know what controls *Rhizosphaera*.

If you still have needle-casting problems even though you have been using chlorothalonil-based fungicides, we ask you to consider spraying for needle casting disease management again, one month after your first spray. Therefore, if you put your first spray on the trees May 15 and a second spray on May 25, we ask you to consider spraying June 15 (four weeks after the first spray) to ensure your coverage is complete.

We have also noticed that *Stigmina* this new needle infecting fungus is frequently found on the north side of the trees, in high density plantings, and on wet ground. In other words, when the needles stay wet there is a greater chance of *Stigmina* infecting the needles. To help manage *Stigmina*, consider better air drainage, greater planting distance between trees and better site selection (Photo 3). To help you save money, time and the environment, it is important to



Photo 3 shows the southern exposure of trees in the plantation. To get better management, try providing better air drainage and spraying one month after your first spray is applied.

monitor for the amount of needle cast in your plantings before initiating a spray program. To determine if your trees warrant chemical management, look for signs of fungal fruiting bodies on the needles. These fruiting bodies are producing the spores that will infect the new needles as they break bud. With a hand lens, scan the discolored needles. For *Rhizosphaeria* of spruce, randomly select 20 or more trees scattered around the plantation, and remove three sample branches from each tree. Examine the white rows of stomata on two-year-old needles and if half of the branches have dark fruiting bodies on more than 10 percent of the needles, consider treating the entire plantation. Needle casting disease of spruce is currently managed with fungicides after the new growth has expanded to 0.5 to 2.0 inches in length, typically in May. Again, if you apply fungicides for needle cast disease, we ask you to make one of those applications one month after your first application. **IPM**

Oh, those early insects

Jill O'Donnell, Christmas Tree ICM educator

With the warmer March temperatures, many of the early insects are starting to wake up and begin rocking and rolling. Looking at growing degree information on

[Enviro-weather](#) it appears that in some areas we are about normal and other about a week or two ahead of schedule.

Zimmerman pine moth is an

insect that can be a real problem if you have Scotch and Austrian pines. This insect overwinters as a tiny caterpillar and bores under the bark early in the spring. It will tunnel

under the bark for several weeks during the summer causing large soft masses of pitch to flow from the tree. Zimmerman pine moth larvae usually bore into large branches or more commonly, into the stem of the tree, often right at the branch whorls. The tunneling can kill branches, and tree stems may break off above the wound.

If you plan to use an insecticide to control this pest, the insecticide must be on the bark as the caterpillar bores in ([25-100 GDD50](#)) otherwise, it will be well protected under the bark for the rest of its life cycle. In addition to applying the insecticide early, it is also important to adequately cover the bark of the stem and large branches. If you are unable to get good coverage, then spraying will not be effective. If you don't see any boring dust, larvae have probably not become active and you still have time to treat. If you do see the boring dust, it may be too late for sprays to do much good. With this pest it is better to be early than too late.

Also, we have found that trees attacked the previous year were more likely to be attacked again. This means you need to look for

heavily infested, individual trees. Cut and destroy those trees by chipping or burning them as early in the season as possible. That should help remove the most attractive trees from the field and will kill the developing larvae.

White pine weevil is another insect that becomes active early in the growing season on warm spring days. Over-wintering adults move from the litter to the treetops to mate and lay eggs. When we have used the weevil traps, we usually catch our first weevils around [35 GDD50](#). Controlling this pest involves applying a registered pesticide to control the egg-laying adults. The adult weevil makes a small round feeding puncture on the terminal lead. You may see a little resin oozing out of the holes, but otherwise you won't notice the feeding. However, every time a female weevil feeds, she lays an egg or two in the feeding hole. Over a few weeks, a single weevil may lay up to 200 eggs on the terminal. The eggs will hatch in a couple of weeks and larvae will bore into the terminal. They feed in the cambium area, just under the bark. Make sure to thoroughly cover the leader and

the upper part of the tree. Then in the growing season when you see leaders beginning to die, clip them out and remove them from the field.

Scouting is important

Take time now to walk through your fields and examine your trees carefully. What sorts of insect damage are left from last year? Bronzing foliage from spider mites? Do you see galls on your spruce trees? Did white pine weevil kill the terminal leaders of some of your pine or spruce trees? How do the needles of your Douglas fir trees look – are they curled or bent from Cooley adelgid? Maybe you see little white pine needle scales or maybe black sooty mold on your Scotch pine needles. Don't forget to look at the stems of your trees. Big pitch globs on the stem usually mean that Zimmerman pine moth is present.

Good scouting is one of the most important parts of integrated pest management (IPM). It helps you get a jump on insect pests that may cause you problems this year, tells you if the problem is located in one spot or generally across the field, and whether the damage is enough to require treatment. **IPM**

Tomato and potato late blight

Willie Kirk, Plant Pathology

In 2009, the disease known as late blight affected many tomato and potato crops throughout the northern states. The disease was thought to have started in tomato transplants. This is a new strain of the pathogen not previously reported in the United States. The disease is an oomycete similar to downy mildew of many herbaceous species and is known as *Phytophthora infestans*. The new genotype is known as US-22 and causes late blight on tomatoes and potatoes. The pathogen can only survive in live tissue such as potato tubers and does not overwinter

on tomato debris. In years when we have had a serious late blight epidemic, it is often followed by sporadic outbreaks in following years. The source in following years is usually potato tubers that have survived the winter in fields; known as volunteer tubers.

Once the disease has taken hold of the plant, there is very little that can be done to halt its progress to other plants other than destruction of the affected plants. Here is some information on the disease and some tips for growers for 2010.

- The new strain of this disease can

infect and kill plants within 10 days.

- The disease can spread from tomato to potato plants and to surrounding gardens and commercial fields. The spores of this disease can be carried in the air.
- In the past, losses of potatoes due to late blight have caused farming businesses to close throughout Michigan.

What can you do?

Tomatoes and potatoes

- Plant transplants and potato seed with a certification label obtained

from a reputable dealer.

- Do not use home-saved tomato or potato seed.
- Discard transplants that have discolored areas with white, threadlike growth and potato seed that have blemishes or appear to have sunken or purpled in areas on the surface.
- Leave adequate space between transplants and seed tubers to allow maximum airflow for the growing plant.
- Fungicides are available for small growers and gardeners that can prevent the disease from spreading between plants and crops. Such products are Daconil or Manzate (home gardeners) or an alternative would be Echo 720 (farmers).
- Water plants in the evening to allow a drying period during the day.
- Fungicides should be applied every seven days or as directed on the label. Apply in water at a rate of 50 gal/A.
- Copper fungicides are less effective than those mentioned



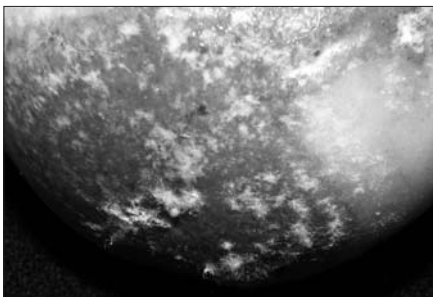
Late blight on green tomato fruit.

above but will help on plants that are not infected (can mix coppers with Daconil/Echo).

- If symptoms develop (see images) pull up the diseased plant from the roots, place in a plastic bag, seal the bag and dispose of the bag without reopening it. The spores of this disease can be carried in the air.
- Check plants daily and dispose of diseased plants immediately.
- Destroy affected plants with Reglone or other like product (farmers) if removal is not possible.
- Leave diseased tubers and waste tomatoes on the surface of the ground to freeze over winter.

Potatoes

- Allow potato sprouts on seed to grow to about 1/2 inch before you plant.
- Do not plant seed tubers into cold, wet soils.
- Plant the seed tubers at a maximum depth of three inches and then increase hill size after emergence when plants are at



Late blight on ripe tomato fruit.

least six inches tall but do not recover plants.

- After harvest, check tubers regularly as infected tubers can quickly decompose. Discard infected tubers in a sealed plastic bag.

Professional/commercial growers have difficulty growing disease-free crops. Please help to maintain businesses and jobs in your area by following the above guidelines.

The Michigan Department of Agriculture has the authority to declare an area a nuisance and to eliminate the source of late blight inoculum in order to prevent the spread of disease to farmer's crops.

For further assistance, contact your local MSU Extension office. **IPM**



Late blight stem lesion on tomato.



Late blight foliar lesion on tomato.

Late blight help information for 2010

Willie Kirk, Plant pathology

In 2010 there will be several sources for help in the fight against late blight in potatoes and tomatoes. Daily update of risk will be available from May 1 at <http://potatodiseases.org> and from the 2010 Potato Blight Hotlines sponsored by Syngenta. Toll-free hotlines are available

24/7 and provide vital disease information, weather patterns, recommended control measures and disease infection confirmations.

New to the hotlines this year are options for text messaging and Twitter notifications. Follow [@SyngentaSpuds](#) on Twitter for

blight hotline updates and the latest Syngenta potato news. Text the state-specific keyword to 97063 to receive text messages when the hotlines in your area have been updated. The potato blight hotlines are available by calling: Michigan: 1-888-379-9012; text BLIGHTMI to 97063.

For more information and a listing of the hotline numbers, text messaging information and Twitter

handle, please visit: www.potatoes.farmassist.com. **IPM**

Michigan Nut Growers Association meeting April 10

The spring meeting of the Michigan Nut Growers Association is scheduled for Saturday, April 10 beginning at 9:00 AM. This will be followed by the annual meeting of

the Midwest Nut Producers Council (a chestnut industry group) starting at 2:30 PM. Both meetings will be held in the main lecture hall of Farrall Hall (Ag Engineering

building) on the MSU campus. For more information go to www.michigannutgrowers.org or call Professor Dennis Fulbright at 517-353-4506. **IPM**

Michigan State University Cooperative Agricultural Weather Service
Cumulative Precipitation Summary For 03/25/2010

STATION	DIST	03/19/2010 (last week)				03/12/2010 (last 2 weeks)				02/26/2010 (last 4 weeks)				Actual	Dev. Norm.	04/01/10 (since Apr. 1)
		Actual	Dev.	Norm.	Dev.	Actual	Dev.	Norm.	Dev.	Actual	Dev.	Norm.				
Houghton	WU	0.00	0.13	-0.83	0.55	-1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ironwood	WU	0.00	0.13	-0.83	0.55	-1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Marquette	WU	0.00	0.34	-0.62	0.96	-0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stephenson	WU	0.00	0.08	-0.79	0.50	-1.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chatham	EU	0.03	0.05	-0.82	0.11	-1.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSMarie	EU	0.00	0.00	-0.75	1.00	-0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Beulah	NWL	0.00	0.05	-0.70	0.80	-0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lakecity	NWL	0.00	0.00	-0.75	0.04	-1.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pellston	NWL	0.00	0.28	-0.54	0.47	-1.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alpena	NEL	0.00	0.13	-0.69	0.66	-1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Htnlake	NEL	0.00	0.13	-0.69	0.48	-1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rogercity	NEL	0.00	0.19	-0.63	0.46	-1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vanderbilt	NEL	0.01	0.06	-0.89	1.16	-0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fremont	WCL	0.04	0.08	-0.87	1.28	-0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W. CENT. LP NORMS	WCL	0.00	0.08	-0.87	1.28	-0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ludington	WCL	0.00	0.04	-0.91	1.16	-0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Muskegon	WCL	0.04	0.04	-0.91	1.16	-0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CENT. LP NORMS	WCL	0.00	0.04	-0.91	1.16	-0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Big Rapids	CL	0.05	0.22	-0.69	0.40	-1.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Saginaw	ECL	0.01	0.12	-0.80	0.66	-1.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standish	ECL	0.03	0.22	-0.70	0.33	-1.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grapids	SWL	0.30	0.32	-0.81	1.43	-0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gulllake	SWL	0.10	0.89	-0.24	1.16	-0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Holland	SWL	0.02	0.04	-1.09	1.13	-0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southbend	SWL	0.18	0.63	-0.50	1.74	-0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Westolive	SWL	0.16	0.17	-0.96	1.13	-0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Albion	SCL	0.02	0.26	-0.78	0.73	-1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coldwater	SCL	0.23	0.58	-0.46	0.78	-1.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lansing	SCL	0.16	0.22	-0.82	0.53	-1.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Detroit	SEL	0.24	0.62	-0.45	0.95	-1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flint	SEL	0.14	0.21	-0.86	0.53	-1.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Milford	SEL	0.21	0.57	-0.50	0.94	-1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
McClemens	SEL	0.00	0.00	-1.07	1.06	-1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Romeo	SEL	0.25	0.84	-0.23	1.06	-1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tipton	SEL	0.35	0.78	-0.29	1.64	-0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Toledo	SEL	1.22	1.78	0.71	2.20	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Report generated at 09:12, 03/26/10

ACTUAL AND PREDICTED DEGREE-DAY ACCUMULATIONS SINCE MARCH 1 2010 (*)

STATION OR DISTRICT	BASE 42 BE DEGREE-DAYS		BY		BASE 50 BE DEGREE-DAYS		BY	
	AS OF 2009	03/25 2010	03/30	04/04	AS OF 2009	03/25 2010	03/30	04/04
WEST UP NORMS**	7	12	18	0	0	0	0	1
Houghton	0	37	37	0	8	8	8	8
Ironwood	0	52	52	0	13	13	13	13
Marquette	0	44	44	0	6	6	6	6
Stephenson	0	74	74	0	29	29	29	29
EAST UP NORMS	0	1	5	0	0	0	0	0
Chatham	0	54	54	0	11	11	11	11
SSMarie	0	74	74	0	20	20	20	20
N. W. LP NORMS	13	22	31	0	3	3	3	6
Beulah	0	91	95	0	26	26	26	26
Lakecity	0	77	80	0	23	23	23	23
Pellston	0	49	49	0	10	10	10	10
N. E. LP NORMS	10	18	24	0	3	3	3	4
Alpena	0	59	59	0	16	16	16	16
Htnlake	0	68	68	0	20	20	20	20
Rogercity	0	36	36	0	6	6	6	6
Vanderbilt	0	60	60	0	16	16	16	16
W. CENT. LP NORMS	21	34	49	4	9	9	9	15
Fremont	0	89	93	0	26	26	26	26
Ludington	0	74	77	0	18	18	18	18
Muskegon	0	87	91	0	20	20	20	20
CENT. LP NORMS	22	37	52	2	8	8	8	15
Big Rapids	0	78	82	0	27	27	27	27
E. CENT. LP NORMS	25	39	55	3	9	9	9	15
Saginaw	0	75	79	0	26	26	26	26
Standish	0	81	86	0	30	30	30	30
S. W. LP NORMS	44	62	85	15	23	23	23	32
Grapids	0	96	102	0	27	27	27	27
Gulllake	0	114	121	0	40	40	40	40
Holland	0	118	125	0	33	33	33	33
Southbend	0	117	124	0	35	35	35	35
Westolive	0	94	100	0	23	23	23	23
S. CENT. LP NORMS	40	58	79	15	22	22	22	30
Albion	0	99	104	0	35	35	35	35
Coldwater	0	102	107	0	31	31	31	31
Lansing	0	97	102	0	30	30	30	30
S. E. LP NORMS	36	53	72	11	18	18	18	26
Detroit	0	113	119	0	41	41	41	41
Flint	0	88	93	0	29	29	29	29
Milford	0	86	91	0	29	29	29	29
McClemens	0	87	92	0	28	28	28	28
Romeo	0	87	92	0	29	29	29	29
Tipton	0	94	99	0	35	35	35	35
Toledo	0	99	104	0	37	37	37	37

* 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 09:12, 03/26/10



Crop Advisory Team Alerts

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