Crop Advisory Team
Alert
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Landscape Alert

In this issue

Improved elms for Michigan's urban landscapes

Gerry Adams, Plant Pathology

The loss of many landscape trees in Michigan caused by the emerald ash borer, drought and urban decline problems has emphasized our need for more choices for replanting. The loss of the monocultures of American elms which once graced our streets, followed by loss of our Ash species begs the question; what next, locusts, maples? One can only guess. Certainly, the solution to preventing devastating loss of street trees in the future is to prevent monoculture plantings.

To this end, cities in Michigan are actively planning for a greater diversity of tree species to replace our lost trees and avoid the repeated mistake of monoculture plantings. To meet the new goals, some recommendations suggest that no more than 10 percent of street trees be of one species and no more than 20 percent be of one genus. But a challenge remains; where can we find enough tree species to adequately diversify our landscapes?

Selecting trees from nature and testing them for tolerance to urban conditions is relatively easy and this research is ongoing on MSU's campus where sweet gums, *Corylus* species, and many other trees are being evaluated. Breeding trees known to have good urban tolerance to improve their resistance to problematic diseases and insect pests can be much more difficult. Have you ever wondered what scientists have been doing to bring us new disease and insect resistant American elms, White pines, or green ash? In this article, we will have a look at what has been happening with incorporating resistance to Dutch elm disease (DED) into the elms.

Following the spread of the devastating DED worldwide, early breeding efforts began in the Netherlands. Unfortunately, the fruits of these labors were not sufficiently winter hardy for most of North America, and the cultivars had weak growth habit. They came short of the mighty American elm in stature. In the United States, we had several active tree breeders that worked a life time on improving elms, including Drs. Eugene Smalley from the University of Wisconsin, Denny Townsend from the National Arboretum, and George Ware of the Morton Arboretum. The breeding was complex because it was necessary in most instances to hybridized DED-resistant elms of Asian origin with American or European species. Such hybrids produce mostly severely stunted and unthrifty progeny. However, small percentages of the progeny exhibit the strong growth and suitable horticultural characteristics desired. From this small pool of the resultant hybrid elms that exhibited resistance to DED, further breeding and selection aimed to increase resistance to many common insect pests of elm. Some of these hybrids are crosses between two, three and even four species of *Ulmus*. Their parentage from North America can include three species *Ulmus americana, Ulmus rubra,* and *Ulmus thomasii*. Their parentage from Europe can include *Ulmus glabra* and *Ulmus carpinifolia*; and from Asia *Ulmus parvifolia, Ulmus pumila, Ulmus japonica,* and *Ulmus wilsoniana*. Elm cultivars that possess Asian or European parentage have resistance to the disease Elm yellows or Elm phloem necrosis caused by a leafhopper transmitted phytoplasma. Phytoplasmas are especially small and fragile bacteria

Spring 2008 at MSU Plant Pathology Research Farm.

MSU Elm trials

Cultivar Number	Parentage	Cultivar Name	Source
1	*U. propinqua*	'Emerald Sunshine'	J. Frank Schmidt & Son
2a	*U. parvifolia*	'Emer II' Allee	J. Frank Schmidt & Son
2b	*U. americana*	'Princeton'	Princeton Nurseries
3	*U. carpinifolia X U.parvifolia*	'Frontier'	J. Frank Schmidt & Son
4	*U. glabra X U. carpinifolia X U. pumila*	'Homestead'	J. Frank Schmidt & Son
5	*U. pumila X U. japonica X U. wilsoniana*	'Morton Glossy' Triumph™	J. Frank Schmidt & Son
6	*U. pumila X U. japonica*	'Morton Plainsman' Vanguard™	J. Frank Schmidt & Son
7	*U. japonica X U. wilsoniana*	'Morton Red Tip' Danada Charm™	J. Frank Schmidt & Son
8	*U. carpinifolia X U. pumila X U. wilsoniana*	'Morton Stalwart' Commendation™	J. Frank Schmidt & Son
9	*U. japonica X U. wilsoniana*	'Morton' Accolade™	J. Frank Schmidt & Son
10	*U. pumila X U. japonica*	'New Horizon'	J. Frank Schmidt & Son
11	*U. glabra X U. carpinifolia X U. pumila) X U. wilsoniana*	'Patriot'	J. Frank Schmidt & Son
12	*U. glabra X U. carpinifolia*	'Pioneer'	J. Frank Schmidt & Son
13	*U. wilsoniana*	'Prospector'	J. Frank Schmidt & Son
14	*U. americana*	'Valley Forge'	J. Frank Schmidt & Son

Cultivar Number	Parentage	Cultivar Name	Source
15	*U. americana*	'New Harmony'	Princeton Nurseries
16	*U. americana*	'Jefferson'	The Botany Shop, Inc.
17	*U. americana*	'Lewis & Clark' Prairie Expedition®	Lee Nursery, Inc.
18	*U. parvifolia*	'Athena'® Classic Lacebark Elm	Angel Creek Nursery, Inc.
19	*U. parvifolia*	'Everclear'® Lacebark Elm	Angel Creek Nursery, Inc.

that have lost their cell walls and many genes, and can survive only in plant phloem and in their insect vectors. Elm cultivars that possess parentage of *U. wilsoniana* or *U. japonica* have resistance to elm leaf beetle herbivory.

Ultimately, several new elms were created which matured into spreading, vase-shaped trees, reminiscent of the grand American elms like those evident on the MSU campus. These hybrids include: 'Accolade™,' 'Homestead,' 'Pioneer,' and 'Vanguard™.' The latter is particularly drought tolerant. At MSU, these hybrids are included among the twenty DED-tolerant cultivars that have been planted with five replications for a total of 100 trees. The DED-tolerant cultivars are being evaluated every year to determine how they perform in the Michigan climate. Their horticultural form, growth rate, fall color and other characteristics are recorded. Some cultivars may possess resistance or tolerance to other plant pathogens such as those that cause branch and truck cankers and leaf spots. Additionally, they may possess tolerance to insects that feed in twigs and trunks, and on foliage. Just as important will be whether they may possess resistance breakage during high winds, heavy snows or ice storms.

The MSU elm trial includes a number of special selections of the American elm, *U. americana*, that have proven resistant or tolerant to DED in earlier trials. These cultivars include 'Princeton' discovered around 1920 in New Jersey which may also have some tolerance to feeding by the elm leaf beetle. Dr. Denny Townsend developed the cultivars known as 'Valley Forge' and 'New Harmony' which we have planted. 'Valley Forge' is considered to have greater tolerance to DED than 'New Harmony,' but the latter has the more attractive vase-shaped habit. A triploid *U. americana* known as 'Jefferson' has also been planted. It was discovered by researchers from the National Park Service. 'Jefferson' has tested repeatedly as DED-tolerant in other climates.

The planting and maintenance of the MSU elm trial was sponsored by the Michigan Department of Agriculture.

The planting at MSU is a part of the National Elm Trials, and similar research and teaching plots are planted throughout the United States where willing participants have agreed to maintain them. While the trees at MSU are still rather small, they will remain available for study for many years to come and ultimately many will be planted out into the general campus landscape. We at MSU's Department of Plant Pathology hope that you will have several opportunities to examine these trees in guided tours during local nursery, landscape, urban forestry, master gardener and other plant industry meetings and workshops.

Active breeding of improved elms for disease and insect resistance has vanished from the nation's universities since the 1980s. University administrators failed to support the maintenance of the continuation of the breeding programs and also the existing elms from the life's work of the former generation of University professors. Therefore, the elms at MSU and in the National Elm Trial are part of an attempt to rescue the best products of the older work and get information about these selections out into the nursery trade. Only commercial interest in these elms will ensure their continued propagation and availability.

A listing of the cultivars, their trade names, parentage, and the nurseries that donated the plants is available on the web site for the National Elm Trial established at Colorado State University by Dr. William Jacobi. The table included in this article is reproduced in relation to the MSU trial. Measurements and data recorded yearly at MSU are sent to the Colorado organizers and often posted on the website: http://treehealth.agsci.colostate.edu/research/nationalelmtrial/NationalElmTrial.htm

We gratefully acknowledge the nurseries that donated these plants for the National Elm Trials. **IPM**

Maple anthracnose

Jan Byrne, Diagnostic Services

My phone has been ringing a little more than usual this week with calls about severe leaf spotting on maple, silver maple in particular. The frequent spring rains coincided with leafing out on maples and they are now heavily infected with maple anthracnose. The lesions are very dark in color, so one might confuse the lesions with those caused by tar spot (black tar spot lesions develop in late summer or early fall, so we have that to look forward to). Surprisingly, I am not hearing about or seeing much anthracnose on oak or sycamore.

Anthracnose is a fairly generic disease name, many different plants – vegetables, perennials, annuals, trees, etc. get diseases commonly referred to as anthracnose. When we talk about shade tree anthracnose, we are referring to diseases caused by several different, but related fungi. These pathogens blight foliage and in some cases create cankers on twigs, resulting in dieback. Anthracnose foliar lesions are large, irregularly shaped areas of necrotic tissue along the leaf margins and between the veins. Leaf blighting typically begins on lower branches and spreads upward. With a hand lens, you may be able to see the fungal fruiting bodies along the veins of infected foliage.

Newly emerged foliage is more susceptible to infection. In general, fungicides are not recommended for control of shade tree anthracnose. Large well established trees that are otherwise healthy can withstand the damage without serious long term affects. In time, severely infected plants will push forth a new flush of growth from buds that would otherwise have remained dormant. There are some situations where chemical control is warranted. Some examples are protection of nursery stock, smaller trees or trees that are not well established, or in "show case" areas where for aesthetic reasons it is important to maintain a disease-free tree. Applications of copper-based fungicides, chlorothalonil, thiophanate-methyl, mancozeb, or Spectro will help protect foliage from infection. Refer to the fungicide label for application rates and intervals.

Maple anthracnose.

If you are not inclined to use fungicides to manage this disease, remember that sanitation is also important. High humidity and rain help spread spores to the newly emerging foliage. Fallen leaves should be raked up and removed; spores of the pathogen remain viable on this dead foliage even throughout the winter. **IPM**

Reducing soil pH in landscapes

Bert Cregg, Horticulture and Forestry

Alkaline soil conditions can result in chlorosis (yellowing) in many landscape trees and shrubs. Typically this situation is due to reduced uptake of key nutrient elements as soil pH increases. This commonly occurs with pin oak (reduced iron uptake) and red maples (reduced manganese uptake) and many conifer species. The obvious solution, of course, is to follow the mantra of 'right tree-right place" and avoid planting alkaline sensitive trees on high pH soils. But what if you're dealing with an existing tree that is chronically chlorotic? Lowering soil pH is possible, within limits, and alkaline-induced chlorosis can be reduced by addition of elemental sulfur or ammonium sulfate (see table). Elemental sulfur is available in most garden centers; finding ammonium sulfate may require a trip to a fertilizer co-op.

In looking at the table, there are several key factors that we need to note about reducing pH:

Small pH changes (0.5 pH unit or less) are feasible in many cases. Larger pH changes require exponentially more product to achieve the desired result. If you go back to your high school chemistry, you'll recall that pH is the logarithm of the reciprocal of hydrogen ions in a solution. Don't remember that? Well, put it this way, you'd need to spread three 50 lb bags of ammonium

Amount of elemental sulfur or ammonium sulfate required to reduce carbonate-free soil to a target pH of 6.5 to a 7-inch depth

Elemental sulfur Approx. lbs of product per 1,000 sq ft			
Initial pH	Sand	Loam	Clay
8.5	45	60	70
8	30	35	45
7.5	12	18	23
7	2.5	3.5	7
Ammonium sulfate Approx. lbs of product per 1,000 sq ft			
Initial pH	Sand	Loam	Clay
8.5	120	150	180
8	70	90	120
7.5	30	47	60
7	6	9	18

sulfate over an 11 yd x 11 yd area to reduce the pH of a loam soil by 2 pH units. **Do not try this at home**.

Clay soils are more resistant to change than sandy soils. As we'd expect, clay soils are more chemically active and buffered than sands.

Ammonium sulfate will produce a faster shift than sulfur. Ammonium sulfate will also provide nitrogen which may also result in a faster green-up.

Lastly, and most importantly, the pH reducing effect of both products is transitory. Due to the inherent chemical properties of the parent material, alkaline soils will gradually return to their initial pH. This means soils will likely need re-treatment every two or three years.

Adapted from A & L Labs Fact Sheet No. 28 http://al-gl.com/pdf/factsheets/ALGLFS28_Reducing_Soil_pH_Field_Crops.PDF

So, to summarize, small pH shifts can be achieved by additions of sulfur or ammonium sulfate. Fortunately small reductions in pH can often make a big difference. MSU Extension Educator and Master Gardener Coordinator Mary Wilson notes that she eliminated chlorosis in a red maple in her yard with regular applications of sulfur that have resulted in a pH drop from 7.7 to 7.2. (**Note**: when asked why she planted a red maple at that starting pH, Mary was quick to blame her husband, "He *really* wanted that tree."). **IPM**

Landscape and Turf Diagnostic Tour July 16

Terry McLean, MSU Extension

Genesee is sponsoring a Landscape and Turf Diagnostic tour of the Applewood Estate in Flint, Thursday, July 16, from 6:00-8:00 PM. This hands-on workshop is meant for commercial pesticide applicators, landscape and nursery professionals, and anyone interested in improving their ability to diagnose landscape issues. 2 MDA credits for Commercial Core, Category 3A, Category 3B or Category 6 have been applied for. View the registration brochure online at the Genesee County MSU Extension website: www.msue.msu.edu/genesee. The instructors for the tour are Dr. Dave Smitley, MSU Entomology and John Stone, MSU Pesticide Safety Educator. For more information, please call 810-244-8512. **IPM**

Michigan Garden Plant Tour August 3-14, 2009

Erik Runkle, Horticulture

The sixth annual Michigan Garden Plant Tour is right around the corner: August 3 to 14. Greenhouse growers, landscapers, plant retailers, breeders, nurserymen, and plant enthusiasts are invited to attend this two-week coordinated open house of young plant producers and Michigan State University (MSU). Each young plant producer showcases their plant specialties and product lines in their outdoor gardens. It's a great way to evaluate garden plant performance 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.

Companies are open Monday through Friday during normal business hours, and there is no fee to visit the companies. Participants are asked to contact the sites in advance so that they know you are coming. The MSU Horticulture Gardens are open seven days a week from dawn to dusk. Please visit the Michigan Garden Plant Tour website at www.hrt.msu.edu/planttour or call Sandy Allen at 517-355-5191 ext. 1339 for more information. The website contains highlights of each company's open house, contact information, and interactive maps to help navigate from one location to the next.

In coordination with the Michigan Garden Plant Tour, MSU is hosting the Garden Plant Showcase on Tuesday, August 4. This half-day program features unbiased comparisons of ornamentals in a landscaped setting and an educational program featuring:

- Landscapes for the Future – Plants, People, and Ecosystems (Bob Schutzki)
- Top Trial Performers in 2009 (Chris Noffsinger)
- Favorite Annual and Perennial Plants for the Midwest (Art Cameron)
- Managing Greenhouse Temperature in an Energy-Efficient Manner (Erik Runkle)

The $35 fee per person for the MSU Garden Plant Showcase includes the program, a trial booklet, parking, and lunch. Click here to register. To register, contact Sandy Allen at (517) 355-5191 ext. 1339 or email her at allens@msu.edu. We hope you can join us and your colleagues for this informative and fun event. **IPM**

Yellow hawkweed avoids mowing

Kevin Frank, Crop and Soil Sciences

Last year as I was cruising into work one morning scouting turf weeds at 55 mph, I noticed a trend of some folks mowing around yellow hawkweed as opposed to mowing right over it like almost every other weed that sprouts in turf. In my mind, I thought this must be an odd occurrence that is only happening in my neck of the woods.

However, this year I've noticed this trend spreading as I've not only seen it on the occasional home lawn, but also in traffic medians where the "mowee" has gone to tremendous lengths to mow around the yellow hawkweed infestations. I guess folks are enjoying the yellow flowers for the couple weeks that they'll be around. If you're not familiar with yellow hawkweed, check it out at: www.msuturfweeds.net/details/_/yellow_hawkweed_25/.

In addition to yellow hawkweed, white clover has had a strong flowering presence in turf in the last couple weeks. Last night while mowing my own lawn, I noticed a familiar nemesis now flowering, black medic. One cultural recommendation to help turfgrass compete with both white clover and black medic is to fertilize. If you feel the need to kill either of these weeds before it takes over your entire lawn, products that contain the active ingredient triclopyr will be effective, especially if you can hit them while their flowering. If you can make it through the summer coexisting with these weeds in your lawn, the best time for treatment is in the fall when the weeds are storing carbohydrates in their roots for next year. Herbicide applications in the fall are more readily transported to the roots and effectively kill the weed once and for all. **IPM**

Turf susceptible to drought?

Kevin Frank, Crop and Soil Sciences

It may seem odd to start considering how turf will perform this summer if the rainfall spigot shuts off, but the abundant rainfall this spring in many areas may actually hurt turf when it comes to summer drought stress. The cool-season turfgrasses which grow in Michigan produce the majority of their roots during the spring, and at times the excessive rainfall produced saturated soil conditions. Root elongation would be reduced in areas with saturated soils, and if the turf hasn't grown roots by the time temperatures rise and rainfall diminishes, don't be surprised if turf enters drought stress quickly. **IPM**

Spruce spider mites

Jill O'Donnell, Christmas Tree ICM educator

Spruce spider mites are often a problem on fir and spruce trees, but populations can build up on nearly all Christmas tree species. Spruce spider mites are considered a cool season mite and thrive when daytime temperatures are in the 60's and 70's. We have found mite activity on Fraser and balsam fir. Newly hatched larvae are pinkish in color, but turn dark green or dark red after initial feeding. Growers should keep an eye out for the dark mites or their webbing, especially if you had damage from mites last year. These mites are small, about the size of a period at the end of a sentence. Scout the oldest foliage, near the stem of the tree – that's where the mite populations build up first. Rap foliage over white paper or cardboard on a clipboard. If mites are there, you should see them moving on the paper. If you see a few mites, but damage does not appear to be heavy, give it another seven to ten days and check the trees again. There are several naturally occurring predators that feed on spider mites and you want to give them a chance to do their thing. Predatory mites are the most important predators of spider mites, but are very difficult to see without a microscope. If you check the trees and mites seem to be abundant, especially if you plan to sell trees this year, then you may want to apply a miticide. If you are spraying Christmas trees for spider mites, do everything you can to get good coverage.

Spruce spider mites.

Here is an excellent reference from Pennsylvania on spruce spider mite by Rayanne Lehman http://ento.psu.edu/extension/christmas-trees/information/pest-fact-sheets/Spspidermiteent069.pdf/view **IPM**

Weather news

Jeff Andresen, Agricultural Meteorology and Geography

In the medium-range time frame, forecast guidance calls for some persistence of last week's upper air pattern (troughing across California and the northeastern United States and ridging across the southeastern United States with much of the Great Lakes region under northwesterly flow). However, there are also hints of a gradual transition to another pattern: troughing across the western United States with southwesterly flow and an enhanced stormtrack across the Midwest. This pattern would lead to a much more active weather pattern (i.e. wet, stormy) in Michigan. The latest NOAA Climate Prediction Center **6-10 day outlook**, covering June 10-14, calls for below normal mean temperatures state- and region-wide, and for precipitation totals to range from near normal across northern sections to above normal in the south. During the **8-14 day** period, covering June 13-19, the outlook calls for mean temperatures to range from below normal levels across northern sections of the state to near normal levels across the south, and for above normal precipitation totals statewide. **IPM**

ACTUAL AND PREDICTED DEGREE-DAY
ACCUMULATIONS SINCE MARCH 1 2009 (*)

STATION OR DISTRICT	BASE 42 BE DEGREE-DAYS AS OF 06/04 2008	BY 2009	BY 06/09	BY 06/14	BASE 50 BE DEGREE-DAYS AS OF 06/04 2008	BY 2009	BY 06/09	BY 06/14
WEST UP NORMS**		556	649	739		289	346	402
HOUGHTON	313	361	401	486	106	155	174	218
IRONWOOD	429	526	584	708	182	251	283	354
MARQUETTE	357	400	444	539	142	172	194	242
STEPHENSON	515	537	596	723	237	255	287	359
EAST UP NORMS		434	517	597		191	239	285
CHATHAM	351	387	441	540	156	160	189	242
SSMARIE	428	402	458	561	164	153	180	231
N.W. LP NORMS		653	757	861		340	408	476
BEULAH	673	650	715	857	337	307	346	434
LAKECITY	621	610	671	805	323	295	333	417
PELLSTON	555	479	527	632	268	224	253	317
N.E. LP NORMS		614	716	818		318	384	448
ALPENA	599	549	605	721	291	264	297	366
HTNLAKE	664	642	707	843	340	306	344	424
ROGERCITY	562	568	626	746	259	273	307	379
VANDERBILT	578	555	612	729	292	272	306	377
W. CENT. LP NORMS		756	870	985		412	487	564
FREMONT	740	769	849	987	388	381	431	521
LUDINGTON	633	649	717	833	310	297	336	406
MUSKEGON	743	844	932	1083	368	427	483	583
CENT. LP NORMS		799	919	1038		440	522	603
BIGRAPIDS	700	734	814	956	373	380	432	528
E. CENT. LP NORMS		792	911	1030		433	515	596
SAGINAW	815	809	904	1075	438	405	467	583
STANDISH	635	651	728	865	323	316	364	455
S.W. LP NORMS		921	1047	1176		520	607	697
GRAPIDS	885	965	1050	1206	485	520	575	683
GULLLAKE	1094	1113	1211	1391	648	630	697	827
HOLLAND	846	948	1031	1185	462	506	560	664
SOUTHBEND	959	1079	1174	1348	534	606	670	796
WESTOLIVE	764	861	937	1076	395	453	501	595
S. CENT. LP NORMS		902	1028	1154		509	596	684
ALBION	875	927	1013	1167	480	497	553	660
COLDWATER	850	991	1083	1248	452	545	606	724
LANSING	866	906	990	1141	471	467	520	620
S.E. LP NORMS		879	1003	1129		487	574	661
DETROIT	989	1052	1145	1317	540	563	623	741
FLINT	903	876	954	1097	503	454	502	598
MILFORD	760	832	906	1042	398	424	469	558
MTCLEMENS	834	925	1007	1158	449	484	535	637
ROMEO	811	831	905	1040	422	426	471	561
TIPTON	871	931	1014	1166	465	500	553	658
TOLEDO	965	1059	1153	1326	535	575	636	757

* 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 09:02, 06/05/09

Michigan State University Cooperative Agricultural Weather Service
Cumulative Precipitation Summary For 06/04/2009

STATION	DIST	PRECIPITATION TOTALS SINCE 05/29/2009 (last week) Actual	05/22/2009 (last 2 weeks) Actual	Dev. Norm.	05/08/2009 (last 4 weeks) Actual	Dev. Norm.	04/01/09 (since Apr.1) Actual	Dev. Norm.
HOUGHTON	WU	0.12	0.12	-1.39	0.78	-2.21	3.54	-2.42
IRONWOOD	WU	0.30	1.34	-0.17	2.10	-0.89	5.38	-0.58
MARQUETTE	WU	0.30	1.34	-0.17	2.10	-0.89	5.39	-0.57
STEPHENSON	WU	0.43	3.40	1.89	4.23	1.24	7.49	1.53
CHATHAM	EU	0.20	2.30	1.03	3.40	0.80	6.61	0.85
SSMARIE	EU	0.44	1.71	0.44	3.66	1.06	4.97	-0.79
BEULAH	NWL	0.13	1.74	0.53	2.72	0.38	5.73	0.10
LAKECITY	NWL	0.31	1.96	0.75	3.66	1.32	6.99	1.36
PELLSTON	NWL	0.26	1.18	-0.03	1.95	-0.39	3.45	-2.18
ALPENA	NEL	0.32	1.81	0.66	2.84	0.45	6.06	0.46
HTNLAKE	NEL	0.16	1.23	0.08	2.68	0.29	6.97	1.37
ROGERCITY	NEL	0.29	1.50	0.35	2.58	0.19	6.15	0.55
VANDERBILT	NEL	0.42	1.86	0.71	2.85	0.46	6.49	0.89
FREMONT	WCL	0.09	0.74	-0.55	2.15	-0.39	6.68	0.44
LUDINGTON	WCL	0.05	1.94	0.65	3.56	1.02	7.14	0.90
LUDINGTON	WCL	0.05	1.94	0.65	3.56	1.02	7.14	0.90
MUSKEGON	WCL	0.06	1.01	-0.28	1.63	-0.91	6.43	0.19
BIGRAPIDS	CL	0.20	1.17	-0.14	2.40	-0.18	6.63	0.33
SAGINAW	ECL	0.03	0.51	-0.71	1.52	-0.93	7.41	1.83
STANDISH	ECL	0.09	0.82	-0.40	1.99	-0.46	6.38	0.80
GRAPIDS	SWL	0.06	1.41	0.03	2.62	-0.34	8.11	1.27
GULLLAKE	SWL	0.14	1.44	0.06	2.60	-0.36	7.10	0.26
HOLLAND	SWL	0.23	1.39	0.01	2.89	-0.07	9.83	2.99
SOUTHBEND	SWL	0.71	1.20	-0.18	2.70	-0.26	6.34	-0.50
WESTOLIVE	SWL	0.02	0.84	-0.54	1.78	-1.18	8.39	1.55
ALBION	SCL	0.62	1.80	0.42	3.90	1.00	8.59	2.03
COLDWATER	SCL	0.31	1.36	-0.02	4.17	1.27	8.55	1.99
LANSING	SCL	0.05	2.15	0.77	4.05	1.15	10.60	4.04
DETROIT	SEL	0.24	1.21	-0.12	2.94	0.12	8.14	1.65
FLINT	SEL	0.12	1.22	-0.11	2.52	-0.30	7.97	1.48
MILFORD	SEL	0.16	0.33	-1.00	2.08	-0.74	8.20	1.71
MTCLEMENS	SEL	0.00	0.00	-1.33	0.00	-2.82	0.00	-6.49
ROMEO	SEL	0.16	0.92	-0.41	1.65	-1.17	3.83	-2.66
TIPTON	SEL	0.24	1.75	0.42	3.58	0.76	8.13	1.64
TOLEDO	SEL	0.67	1.73	0.40	2.91	0.09	8.19	1.70

Report generated at 09:02, 06/05/09

Crop Advisory Team Alerts
Integrated Pest Management Program
Michigan State University
B 18 Food Safety & Toxicology Building
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