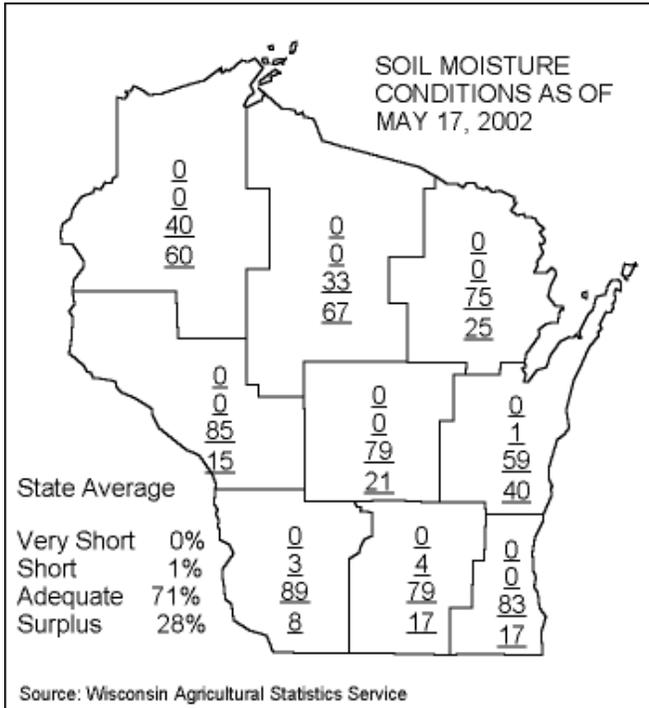


# Cooperative Pest Survey Bulletin

## Agricultural Resource Management

Bureau of Plant Industry

WI Department of Agriculture, Trade & Consumer Protection, PO Box 8911, Madison, WI 53708-8911 Phone: 1-800-462-2803 Fax: 608-224-4656 Web: Wisconsin.gov

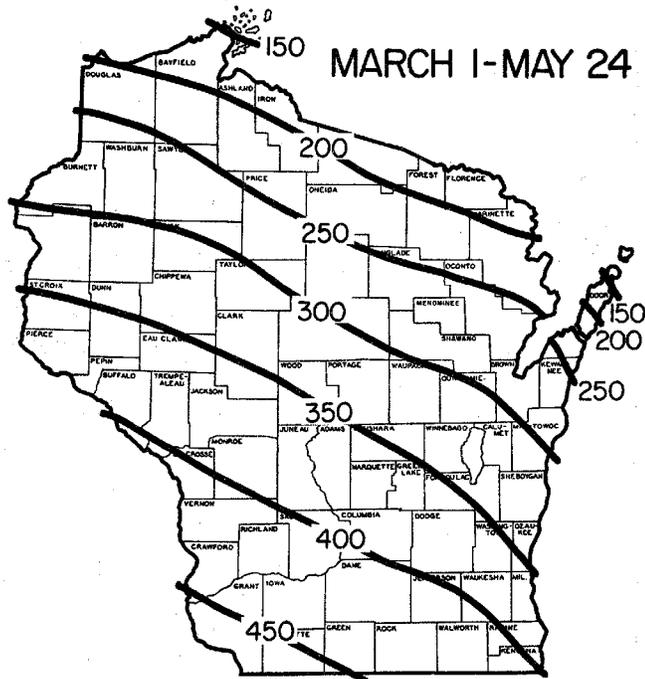


### WEATHER AND PESTS

Temperatures were 8 to 10 degrees below average this past week. Several counties reported frost damage on emerging plants and shoots. Cold temperatures and wet conditions are delaying crop growth, and some counties are reporting yellowing of crops. Strawberries are in bloom in Pierce and Waupaca Cos.

Growing degree days from March 1 through May 22 were:

| Site                 | 2001 GDD* | Normal GDD | Base GDD | Base 48 | Base 40 |
|----------------------|-----------|------------|----------|---------|---------|
| <b>SOUTHWEST</b>     |           |            |          |         |         |
| Dubuque, IA          | 337       | 503        | 381      | 335     | 703     |
| Lone Rock            | 308       | 453        | 341      | 292     | 644     |
| <b>SOUTHCENTRAL</b>  |           |            |          |         |         |
| Beloit               | 322       | 521        | 348      | 295     | 686     |
| Madison              | 289       | 450        | 338      | 276     | 618     |
| Sullivan             | 298       | 477        | 318      | 273     | 645     |
| Juneau               | 278       | 459        | 290      | 274     | 601     |
| <b>SOUTHEAST</b>     |           |            |          |         |         |
| Waukesha             | 271       | 427        | 312      | 239     | 594     |
| Hartford             | 259       | 420        | 285      | 248     | 566     |
| Racine               | 249       | 381        | 306      | 219     | 543     |
| Milwaukee            | 234       | 364        | 297      | 225     | 521     |
| <b>EAST CENTRAL</b>  |           |            |          |         |         |
| Appleton             | 208       | 370        | 252      | 202     | 482     |
| Green Bay            | 162       | 318        | 223      | 157     | 413     |
| <b>CENTRAL</b>       |           |            |          |         |         |
| Big Flats            | 269       | 399        | 284      | 247     | 560     |
| Hancock              | 257       | 397        | 277      | 237     | 543     |
| Port Edwards         | 229       | 360        | 275      | 208     | 493     |
| <b>WEST CENTRAL</b>  |           |            |          |         |         |
| LaCrosse             | 307       | 440        | 318      | 279     | 630     |
| Eau Claire           | 241       | 383        | 275      | 225     | 511     |
| <b>NORTHWEST</b>     |           |            |          |         |         |
| Cumberland           | 180       | 340        | 235      | 160     | 405     |
| Bayfield             | 98        | 230        | 109      | 80      | 257     |
| <b>NORTH CENTRAL</b> |           |            |          |         |         |
| Wausau               | 181       | 316        | 236      | 168     | 416     |
| Medford              | 156       | 310        | 229      | 141     | 370     |
| <b>NORTHEAST</b>     |           |            |          |         |         |
| Crivitz              | 136       | 295        | 180      | 125     | 356     |
| Crandon              | 135       | 296        | 172      | 117     | 326     |



Historical Average Growing Degree-Days Accumulated Since March 1. (Wisconsin Agricultural Statistics Service)

GDD (Growing Degree-Days) are synonymous with degree-days above modified base 50°F, with no low temperature below 50°F or above 86°F used in calculation. See map for Historical Average Growing Degree Days.

**ALERTS**

**Gypsy moth**- Now is the time to be treating, or preparing to treat for this pest. Caterpillars should be treated just after hatch, when they are in the first or second instar. In this issue we have included a phenology model website (see **WEBSITE OF THE WEEK**) to help you determine the best time to spray for your area, and a chemical treatment guide (see page 47). The Cooperative gypsy moth program began treating sites with Btk throughout eastern and central Wisconsin, which means low-flying planes and early morning wake up calls for some folks (see **STATE/FEDERAL PROGRAMS**). For more information call the hotline at 1-800-642-MOTH or visit our website at <http://www.datcp.state.wi.us> and type "gypsy moth" into the search box.

**CORN**

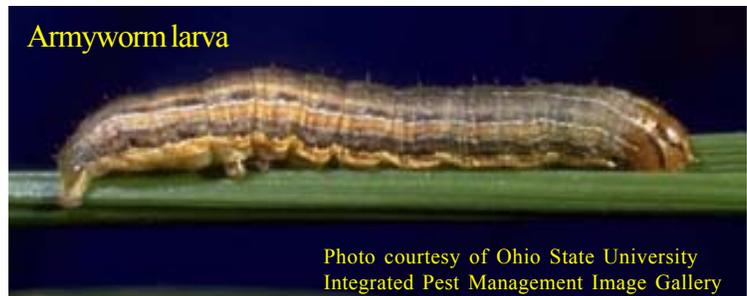
**Black cutworm** – With seedling corn emerging, now's the time to begin scouting for **black cutworm** damage. Females moths are especially attracted to grassy, weedy, no-till and reduced tillage fields. Young larvae feed near the soil surface, but as they develop and increase in size, they burrow deeper into the soil and cut plants below the soil surface. Plants cut above the growing point typically recover; however, plants severed below the growing point die. Late-planted crops are more susceptible than those planted earlier in the season. Below are some **thresholds for black cutworms in vegetable crops**:

- beans                2 larvae/foot of row
- potatoes           4 larvae/foot of row
- sweet corn        >5% of plants damaged
- leafy greens      >3% of stand affected

Growers are encouraged to begin scouting as soon as seedlings emerge. During the 10-14 days following emergence corn is most susceptible to injury. Holes in leaves, wilted plants, and plants cut at ground level are all indicators of a **black cutworm** infestation. Weed control is an effective way to lessen the risk for **black cutworm** problems. Soil



insecticides as a preventative practice are not recommended. When thresholds are exceeded, spot treatment may be beneficial. Consult UWEX publication A3422 for pesticide recommendations.



**Armyworm** – Moths were not as numerous in black light traps this week compared to previous weeks. Trap counts near Janesville declined from 824 between May 2 and 8, to 150 last week, to 46 moths this week. Low counts of 14 and 7 moths per trap were also recorded from sites near Mazomanie and Manitowoc.

**FORAGES**

**Alfalfa weevil** – Harvest is underway throughout southern Wisconsin and regrowth will need to be monitored closely in

upcoming days. Sweep net counts ranged from 0.4 to 1.9 larvae per sweep in counties surveyed in the southwest. Most of the larvae collected were 1<sup>st</sup> and 2<sup>nd</sup> instar.

The larger 3<sup>rd</sup> and 4<sup>th</sup> instar larvae tend to be the most destructive, and in many of the fields

| Guide to Black Cutworm Development And Damage in Corn |                               |        |        |        |  |
|---|-------------------------------|--------|--------|--------|--|
| Potential number of plants that may be cut            |                               |        |        |        |  |
| Larval instar   | Approximate days left to feed | 1 leaf | 2 leaf | 3 leaf |  |
| 4   | 25                            | 4      | 3      | 1      |  |
| 5   | 21                            | 4      | 3      | 1      |  |
| 6   | 14                            | 4      | 3      | 1      |  |
| 7   | 5                             | 1      | 1      | 1      |  |

University of Wisconsin-Extension  
Field Crop Scouting Manual

surveyed this week, the larvae can be expected to reach these developmental stages in the next few days, at the same time stubble is regrowing and highly vulnerable. Fields that were harvested earlier this week should be checked to determine whether regrowth is progressing at a normal rate or if **alfalfa weevil** feeding is delaying development.

**Meadow spittlebug** – Nymphs and their spittle masses can be readily seen in southern Wisconsin alfalfa fields. Counts of 6-14 per 25 sweeps were found in the fields surveyed.

**Meadow spittlebugs** are common in alfalfa, but rarely cause economic damage. Sample 20 stems in each of 5 areas. Control should be considered when an average of one nymph/stem is observed.



**Alfalfa caterpillar** – Low numbers of 4<sup>th</sup> and 5<sup>th</sup> instar larvae were swept from Dane, Green and Rock Co. alfalfa fields this week. **Alfalfa caterpillars** are smooth, dark green in color, and have a small white longitudinal stripe on each side. Mature larvae are approximately 1.5 inches in length. These caterpillars rarely cause economic damage, but in the event that counts exceed 10+ larvae per sweep, control should be considered.

**Imported cabbageworm** – Butterflies are active in several locations throughout the southern portion of the state. In Wisconsin, these yellowish-white butterflies typically emerge in late-April and early May. Mated females seek favorable sites for egg laying, frequently selecting early-season cole crops. Producers should scout for yellow, bullet-shaped eggs that are laid singly on the undersides of leaves in early spring. The larvae, which are light green with a faint yellow, longitudinal stripe, feed for about 15 days, then pupate for about 10 days before emerging as adults. Larvae directly damage cole crops by feeding on leaves and can present quality problems when found on the produce. Natural predators often effectively reduce populations later in the season, but insecticide treatment may be necessary early on. Hand picking larvae is also effective when feasible. *Bacillus thuringiensis* (Bt), a naturally-occurring soil bacteria, is also an effective and organic alternative for control.

**Frost damage**- Alfalfa in northern 2/3 of Marinette Co. has lower leaf percentage due to frost and leaf diseases. (UWEX)

## SMALL GRAIN

**English grain aphid** – Wingless forms were present in all of the grain fields surveyed, but at low levels. Sweep net counts ranged from 5-13 adults per 25 sweeps.

**Cereal leaf beetle** – Adults were observed in Rock, Green and Dane Co. winter wheat fields. Populations are low at this time.

## VEGETABLES

### Pumpkin, squash and cucumber fields needed for a survey of *Phytophthora blight* in Wisconsin

The DATCP Pest Survey is looking for fields of vine crops around the state to survey for the presence of **Phytophthora blight** during the 2002 growing season. **Phytophthora blight** (caused by *Phytophthora capsici*) is a growing problem for pumpkin and cucumber producers around the Midwest, with losses in some Illinois fields approaching 100% in the past several years. Symptoms of the blight include rapid wilting of individual plants, vascular browning, rapidly-enlarging watersoaked lesions on fruit, becoming covered by white fungal growth; and rapid fruit collapse. Other hosts of the pathogen include pepper, tomato, eggplant, melon and carrot.

We're hoping to find enough fields around the state to assess the distribution of the disease. Fields for inclusion in the survey need not be large, but should be more than a farmstead pumpkin patch. If you're willing to open your field for an occasional visit, please call 1-800-462-2803 or email [adrian.barta@datcp.state.wi.us](mailto:adrian.barta@datcp.state.wi.us)

## HUMANS AND ANIMALS

**European earwig** – Adults were observed in Dane Co. this week. **Earwigs** are easily identifiable by the pincer-like appendages on the end of their abdomens. **Earwigs** are in many ways beneficial, but more often they present problems for homeowners and gardeners. Some of their favorite food



plants include marigolds, dahlias, hostas, lettuce and potatoes. **Earwigs** are nocturnal feeders that typically hide in dark, shaded, moist spaces during the daytime such as under boards or firewood, and beneath organic mulches spread around plants. Phil Pellitteri, UW-Extension Entomologist recommends trapping earwigs using rolled up newspapers or old tuna fish cans baited with fish or vegetable oil. These traps should be placed near problem areas and checked each morning. Shake the insects into a pail of hot, soapy water to kill them. For further control recommendations, consult UWEX publication A3640 *Controlling Earwigs*.

**Black flies** – High numbers were reported from Juneau Co. Black flies typically become abundant when there is good stream flow that move a lot of food downstream to the essentially stationary larvae.

**Larder beetle adults**- These have been noted in households in Columbia Co. Adult **larder beetles** (*Dermestes lardarius*) are 1/3 inch black beetles with a broad, pale tan, black spotted band across the front portion of the wing covers. The reddish brown larvae are densely covered with short and long hairs, and two curved spines on the top of the tail end. Both adults and larvae feed on high protein food sources including; cured and spoiled meats, dried fish, high protein pet food, dead insects such as cluster flies and boxelder bugs, furs, feathers, leather, cheeses, dead rodents and birds in chimneys or wall partitions, and even rat or mouse poison baits. Removing high-protein food sources is the best way to rid your home of these pests. Close relatives of the larder beetle are used to clean the flesh from skeletons used in museums. (UWEX, partially from UW-Extension file X1051)

**Deer ticks**- These pests have been noted in Bayfield, Columbia, and Dodge Cos. Very few **wood ticks** have been seen this year.

#### FOREST, SHADE TREE, ORNAMENTALS AND TURF

**Aphids** – Impatiens, peppers and spirea had moderate to heavy numbers of **aphids** at a nursery dealer in Jefferson Co.

**Bagworm**- This unique pest was found in trace amounts on juniper at a nursery dealer in Ozaukee Co.

**Eastern tent caterpillar**- This native Wisconsin foliage eater is commonly mistaken for gypsy moth. See **STATE/FEDERAL PROGRAMS** for more information.

**Fletcher scale** – Trace amounts were found on yews at a nursery dealer in Columbia Co.

**Spider mite** – Daylilies and shrub roses at a Barron Co. nursery dealer had light amounts of damage from **twospotted spider mites**.

#### Western flower thrips adult (Photo by L. Lindquist, OARDC)

**Thrips** – Light amounts of damage were found on impatiens, hibiscus and assorted perennials at nursery dealers in Barron, Calumet and Jefferson Cos.



**Thrips injury on petunia, an indicator plant for WFT and virus** (Photo by L. Lindquist, OARDC)

**Western flower thrips** (WFT), *Frankliniella occidentalis*- These small insects are likely the most serious pest of greenhouse crops in the world. WFT have spread throughout the horticulture industry on plugs, cuttings, and small plants. Because of WFT's small size (1/16 inch) and tendency to remain hidden in flower buds, they are difficult to detect before severe feeding damage is evident. WFT causes damage to greenhouse crop in several manners: feeding damage, laying eggs on the plant, and indirectly by acting as vectors for tospoviruses. (UWEX from Extension X-file)

**Whiteflies** – Small numbers of **whiteflies** were observed fluttering around veronica plants at a nursery dealer in Barron Co.

**Willow leaf beetle** – Large numbers of larvae were observed feeding on globe navajo willow at a nursery dealer in Jefferson Co.

**Botrytis** – Light amounts of damage was seen on impatiens,

New Guinea impatiens, marigolds and mini roses at nursery dealers in Calumet, Jefferson and Ozaukee Cos.

**Gymnosporangium rust**- Trace amounts of swollen fruiting bodies were found on juniper at a nursery dealer in Ozaukee Co.

**Leaf streak** – Daylilies from a nursery in Iowa Co. were found to be infected with *Collecephalus hemerocalli*, the causal organism of **leaf streak**.

**“Mystery fungus associated with spruce”** – Three samples of Colorado spruce tested positive for this yet to be named fungus from Manitowoc nursery dealers. The origin of one of the samples was a state of Oregon nursery. Colorado spruce at nursery dealers in Calumet, Door and Ozaukee Cos. also had symptoms typical of this malady.

**Pear leaf blister mite**- Heavy Pear leaf blister mite activity has been reported from Dane, Portage and Milwaukee Cos. so far. Some are predicting a heavy year for **Eriophyids**.

**Powdery mildew** – Symptoms were just starting to appear on roses and columbine at nursery dealers in Ozaukee and Washington Cos.

**Septoria leaf spot** – Leaf spots were becoming noticeable on goldflame spirea at a Washington Co. nursery dealer and on variegated dogwood at a nursery dealer in Calumet Co.

**Red spot** – Peonies at a Washington Co nursery dealer had light amounts of leaf spotting from this fungal disease.

**Rose mosaic virus complex** – A few roses at nursery dealers in Barron, Calumet, Columbia Jefferson, Ozaukee, Vilas and Washington Cos. were found infected with this virus complex.

**Rust** – Moderate amounts of **rust** were found on hollyhocks at a nursery dealer in Calumet Co.

**Viburnum borer**- Damage and dieback was noted in plants from Dane, Fond du Lac and Outagamie Cos.

**Virus** – An unidentified **virus** on bleeding heart was found at nursery dealers in Barron and Marathon Cos.

**Oak tatters**- This condition affects primarily the white oak group, and has been found throughout the midwest in the past several decades. Oak leaves appear tattered or lacy. Damage is first noted in spring when leaves emerge. Trees expend extra energy replacing these damaged leaves, and this makes them more susceptible to pests that may attack later in the growing season. With our cool spring, keep this condition in mind when attempting to diagnose oak leaf damage.

**Frost damage**- A number of large, established trees all over

the state are not leafed out or are poorly leafed out. Heavy frost damage occurred in northern and central Green Co., mostly on the red oaks and to a lesser extent on the white oak group. The cold temperature of the past two or three days have killed back the red oak leaves (and flowers). The “dormant” buds are beginning to swell, but the leaves that had expanded beyond the bud area are “burnt back black” by the heavy frost. No frost injury noted in western Dane Co. **(DNR and UWEX in part)**

## STATE/FEDERAL PROGRAMS

**Gypsy moth**- On Monday, May 20th, the Cooperative gypsy moth program treated 8,893 acres in Columbia Co. with Btk. The next day we sprayed 1,625 acres in the Milwaukee area and on Wednesday we sprayed 1,020 acres in the Green Bay area. We have received calls from homeowners who are mistaking the white cottony webs of **eastern tent caterpillar** for **gypsy moth**. **Gypsy moth** caterpillars sometimes hang on a “thread” similar to the dragline spiders have, but they do not spin webs.



Eastern tent caterpillar

## FRUIT

**Apple Scab**—This year’s remarkably extended flowering period finally came to an end this week as several **scab** monitoring cooperators reached petal fall. In keeping with the long stretch of cool weather came several nights of frost.

Preliminary reports indicate that there will probably be some crop loss in Door Co. Elsewhere in the state, reports suggest that little damage was done, despite temperatures that dipped into the upper 20s. The possibility of flower damage will complicate the always-difficult thinning decisions.

Obviously, the cool week did little to move the cumulative degree days much towards the end of the primary **scab** season (910 GDD base 32 from Mac green tip).

**Freeze damage to fruit buds – (We ran this at the beginning of the month, little expecting that we’d need to visit it again near the end of May.)** The low temperatures of the last two weeks and reports of substantial frost damage in southwestern Michigan have brought up concerns about the susceptibility of flower buds to freezing. The temperature at which a given amount of damage will occur changes as the tree development stage changes—the critical temperature to kill 90% of buds at half-inch green is 15 F°, while 90% kill occurs at only 25 F°, if the buds are at pink. An excellent guide to critical temperatures for apples, pear, and stone fruits is contained in the back of the Commercial Tree Fruit Spray Guide (Ext. Pub. A3314, available from your county agent or UW Extension Publications). Another good source of critical temperatures is <http://www.msue.msu.edu/vanburen/crittemp.htm> (contains good photos of development stages). The UW pamphlet “Fruit and Frost” (<http://www.uwex.edu/ces/wihort/gardenfacts/XFruitFrost.pdf>) provides a good overview of the topic. More on the situation in Michigan is available at [http://www.msue.msu.edu/ipm/CAT02\\_frt/F04-30-02.htm#1](http://www.msue.msu.edu/ipm/CAT02_frt/F04-30-02.htm#1) (damage information from Dr. Teryl Roper, UWEX)

Photo location: <http://www.umass.edu/fruitadvisor/clements/frostfreeze.html>

| Apple Development   |           |               |                          |                          |                   |
|---------------------|-----------|---------------|--------------------------|--------------------------|-------------------|
| Orchard             | green tip | latest report | accumulated GDD(base32)* | last week’s GDD(base32)* | development stage |
| Racine              | 4/15      | 5/20          | 658                      | 631                      | 90% petal fall    |
| Prairie du Chien    | 4/15      | 5/22          | 740                      | 592                      | 3 days ppf        |
| Fond du Lac         | 4/15      | 5/20          | 672                      | 648                      | full bloom        |
| Sheboygan           | 4/15      | 5/21          | 548                      | 527                      | 75% bloom         |
| Pierce              | 4/17      | 5/21          | 468                      | 317                      | still pink        |
| Door                | 4/20      | 5/21          | 348                      | 178                      | tight cluster     |
| *from Mac green tip |           |               |                          |                          |                   |

Apple Insect Trapping Results

| County          | City | Date      | STLM | RBLR | CM  | OBLR |
|-----------------|------|-----------|------|------|-----|------|
| Grant Co.       |      |           | 0    | 0    | 0   |      |
| Sinsinawa       |      | 5/14-5/21 |      |      |     |      |
| Richland Co.    |      |           |      |      |     |      |
| Hill Point      |      | 5/14-5/20 | 35   | 3    | 0   | 0    |
| Crawford Co.    |      |           |      |      |     |      |
| Gays Mills-W2   |      | 5/13-5/20 | 0    | 8    | 0   | 0    |
| Dane Co.        |      |           |      |      |     |      |
| Deerfield       |      | 5/14-5/21 | 7    | 0    | 0   | 0    |
| Green Co.       |      |           |      |      |     |      |
| Brodhead        |      | 5/16-6/22 | 24   | 6    | 0   |      |
| Pierce Co.      |      |           |      |      |     |      |
| Beldenville     |      | 5/13-5/20 | 2    | 1    | 0   |      |
| Spring Valley   |      | 5/14-5/22 | 615  | 41   | 0   |      |
| Trempealeau Co. |      |           |      |      |     |      |
| Galesville      |      | 5/13-5/20 | 700  | 0    | 0   | 0    |
| Fond du Lac Co. |      |           |      |      |     |      |
| Malone          |      | 5/13-5/20 |      | 0    | 0   | 1.5  |
| Adams Co.       |      |           |      |      |     |      |
| Oxford          |      | 5/13-5/20 | 410  | 24   | 0   | 0    |
| Marquette Co    |      |           |      |      |     |      |
| Montello        |      | 5/13-5/20 | 120  | 13   | 0   | 0    |
|                 |      | 5/6-5/13  | 334  | 65   | 10  | 0    |
| Sheboygan Co.   |      |           |      |      |     |      |
| Plymouth        |      | 5/16-5/22 | 18   |      | 0   |      |
| Ozaukee Co.     |      |           |      |      |     |      |
| Mequon          |      | 5/14-5/20 | 390  | 3    | 0.5 |      |
| Racine Co.      |      |           |      |      |     |      |
| Rochester       |      | 5/16-5/23 | 102  | 1    | 0   | 0    |
| Brown Co.       |      |           |      |      |     |      |



**Pesticides registered for use on gypsy moths**

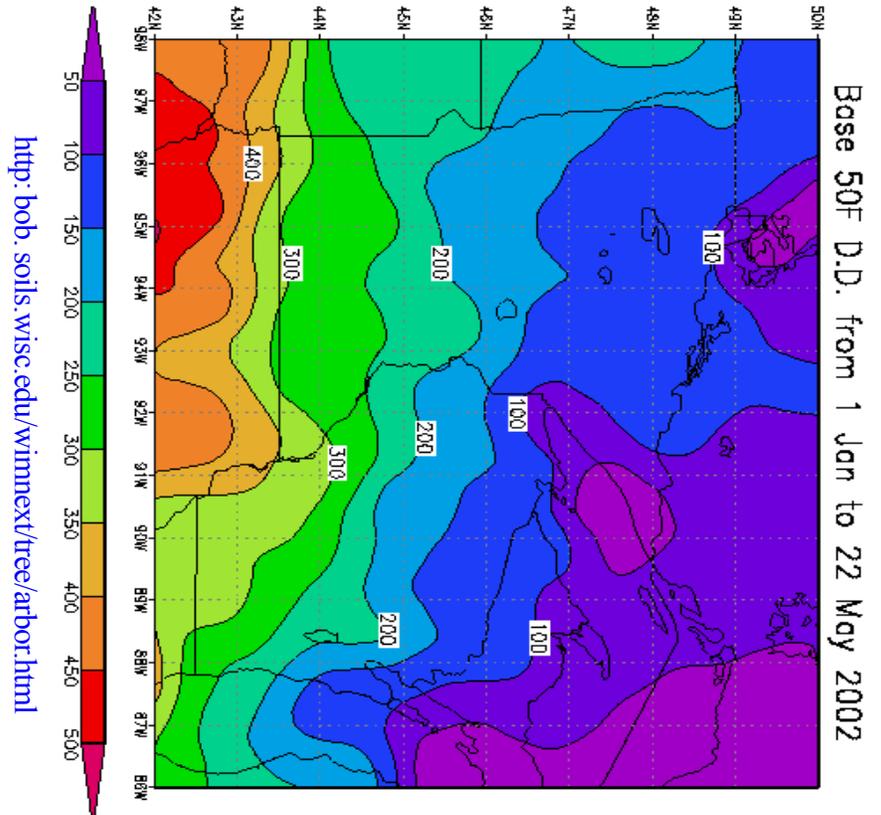
| active ingredient                           | timing                |                      |                     | length of activity | toxicity to nontarget organisms   | speed of kill | attributes       |          | notes  |
|---|-----------------------|----------------------|---------------------|--------------------|---|---------------|------------------|----------|--|
|   | egg hatch* to mid-May | late May to mid-June | August to mid-April |                    |   |               | mode of toxicity | ingested |  |
| acophate                                    | ■                     | ■                    |                     | 10-21 days         | low—vertebrates<br>high—insects, especially honeybees   | hours         | ■                | ■        | low cost, strong odor, may be injected by arborist to target only organisms feeding on tree                  |
| azadirachtin (neem)                         | ■                     | ■                    |                     | 14-21 days         | high—fish, aquatic insects  | days          | ■                | ■        | a plant seed extract that functions as an insect growth regulator, most effective against young caterpillars |
| Bacillus thuringiensis subsp. kurstaki (Bt) | ■                     |                      |                     | 7-10 days          | nontoxic—all other insects, fish, vertebrates<br>high—all caterpillars feeding during active period | days          | ■                | ■        | naturally occurring soil bacterium; must be applied to young caterpillars                                    |
| bifenthrin                                  | ■                     | ■                    |                     | 7-10 days          | low—most vertebrates, honeybees<br>high—fish, insects   | immediate     | ■                | ■        | low application rate   |
| carbaryl                                    | ■                     | ■                    |                     | 3-10 days          | moderate—vertebrates<br>high—fish, insects  | hours         | ■                | ■        | low cost   |
| cyfluthrin                                  | ■                     | ■                    |                     | 7-10 days          | low—most vertebrates, honeybees<br>high—fish, other insects   | immediate     | ■                | ■        | low application rate   |
| deltamethrin                                | ■                     | ■                    |                     | 7-14 days          | low—most vertebrates, honeybees<br>high—fish, other insects   | immediate     | ■                | ■        | low application rate   |
| diflubenzuron                               | ■                     | ■                    |                     | all season         | nontoxic—vertebrates, honeybees<br>high—caterpillars, other immature insects                        | days          | ■                | ■        | insect growth regulator, most effective on young caterpillars  |
| Golden Pest Spray Oil                       |                       |                      | ■                   | N/A                | nontoxic—vertebrates, other insects   | days          | ■                | ■        | only affects egg masses; must be applied before egg hatch  |
| insecticidal soap                           | ■                     |                      |                     | less than 24 hours | nontoxic  | hours         | ■                | ■        | must be applied directly to caterpillars, more effective on young caterpillars                               |
| lambda-cyhalothrin                          | ■                     | ■                    |                     | 7-10 days          | low—most vertebrates, honeybees<br>high—fish, other insects   | immediate     | ■                | ■        | low application rate; available only to professional applicators   |
| permethrin                                  | ■                     | ■                    |                     | 7-10 days          | low—most vertebrates, honeybees<br>high—fish, other insects   | immediate     | ■                | ■        | low application rate; multiple applications may cause rite problems  |
| spinosad                                    | ■                     |                      |                     | 7-14 days          | low—fish, birds, wildlife   | hours         | ■                | ■        | naturally occurring soil bacterium; must be applied to young caterpillars                                    |
| tobufenzebulo                               | ■                     | ■                    |                     | all season         | nontoxic—vertebrates, honeybees<br>high—caterpillars, other immature insects                        | days          | ■                | ■        | insect growth regulator, most effective on young caterpillars; available only to professional applicators    |

\*Consult your regional gypsy moth suppression coordinator or county Extension agent to learn when gypsy moth egg hatch occurs in your area.



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Permit No. 110



### Website of the Week

<http://emily.soils.wisc.edu/wimnext/gypsy/gypsmoth.html>

The gypsy moth phenology model. Crucial for effective gypsy moth treatment. Use the GMPHEN model to predict the timing for gypsy moth and host development. This model simulates gypsy moth (*Lymantria dispar*) egg hatch, larval and pupal development, and budbreak and leaf expansion for six eastern hardwoods.