

# PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION \$1.50

SEPTEMBER 8, 2005



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## Another Terrible Crabgrass Year

*Stephen Hart, Ph.D., Specialist in Weed Science*

The last five years have been characterized by significant mid/late-season crabgrass infestations in turf which have occurred even if the site was treated with preemergence (PRE) herbicides. This year was particularly bad because of the excessive heat, which stressed cool-season turfgrasses reducing their competitive ability while the crabgrass thrived.

In order for a PRE herbicide to be effective it must be applied prior to crabgrass germination. Our general recommendation for central New Jersey is to apply Pre herbicides around April 15 (applications could be delayed to late-April/early May if irrigation can be used to activate the herbicides) to insure that adequate rainfall is received to activate the herbicides in the soil prior to crabgrass germination. However, the last five springs have all been characterized by below average soil temperatures in April and May, which leads to a delay in the crabgrass germination cycle. From 2001 to 2005, I noticed that significant crabgrass germination did not start until late May in established turfgrass sites. These weather patterns result in an extended crabgrass germination cycle, which may run into late July and August. In many cases, Pre herbicides will not persist long enough to control these later flushes of crabgrass.

The likelihood of mid/late-season crabgrass infestations increases significantly if cool wet springs are followed by cycles of dry and wet weather for two reasons. Dry cycles (and in 2005 combined with excessive heat) thin and weaken the turfgrass stand making it less resistant to crabgrass infestation. Wet cycles stimulate crabgrass germination and leach the herbicide out of the crabgrass germination zone. This year was characterized by a moderate June with good soil moisture, followed by excessive heat and dry cycles in July/August.

The best way to avoid summer infestations of crabgrass is to maintain a dense and vigorous turf and apply split applications of Pre herbicides. Split applications entail applying 50 to 66% of the herbicide in mid-April and a second application in early/mid June as opposed to applying a single application at the full rate in mid-April. Split applications can greatly increase control levels compared to single applications. However, this year was so bad even split applications were providing only 80 to 85% crabgrass control in my research plots in mid-August. Single applications were starting to fail as early as late-June.

SEE CRABGRASS ON PAGE 4

## Diseases of Turfgrass

Bruce B. Clarke, Ph.D., Specialist in Turfgrass Pathology

### Gray Leaf Spot

**Gray leaf spot** has become very apparent on perennial ryegrass throughout the region during the last few weeks. Symptoms start as tiny brown leaf and stem lesions covering 1 to 2 inch patches. In severe cases, the leaves curl and lesions may extend the entire width of the blade. As the disease progresses, patches coalesce into large (one to two feet) areas of blighted turf. Extensive foliar blighting may occur during warm (75-85°F days and 60-65°F nights), wet weather. Newly seeded areas that have been recently fertilized and watered are particularly susceptible to infection. When conditions are conducive to infection, the causal agent (*Pyricularia grisea*), produces abundant one to two-celled, pear-shaped spores (conidia). For best results, avoid high rates of quick release nitrogen sources (during late summer and early fall) and extended periods of leaf wetness (i.e., water in the early morning hours). Fungicide studies conducted in New Jersey, Georgia, Maryland, and Kentucky have shown that Heritage, Insignia, Compass, and thiophanate-methyl (e.g., Cleary 3336) were most effective when applied on a preventive basis every 14 to 28 days beginning in mid to late-July. Chlorothalonil and the DMI fungicides, such as Banner and Bayleton, have also provided effective control when disease pressure was moderate. Combination products containing chlorothalonil and thiophanate-methyl (e.g., ConSyst and Spectro), or chlorothalonil and mancozeb (e.g. Zyban), have also performed well in field trials.

### Stem and Crown Rust

These diseases are prevalent on susceptible Kentucky bluegrass and perennial ryegrass cultivars, respectively, at this time. As rust intensifies, affected turf prematurely yellows and orange pustules called uredia (reproductive structures) appear on leaf blades. To control both stem and crown rust, maintain adequate fertility and soil moisture, and apply Banner, Bayleton, chlorothalonil, Compass, Eagle, Heritage, Insignia or mancozeb per manufacturer's recommendations. □

## Plant Diagnostic Laboratory Highlights

Richard J Buckley, Laboratory Coordinator

### Turfgrass

The official end of summer brought another grueling two weeks for turfgrass. Long term temperature and moisture stress related problems dominate submissions, but we have also had a fair amount of "real" diseases. **Summer patch** samples won the most common disease submitted award. Late season fungicide breakdowns largely due to the lingering summer stress were common. Summer patch was identified on turf samples from Bergen, Burlington, Monmouth, Morris, Union, and Passaic Counties in New Jersey, as well as from several sites in New York, Connecticut, and Pennsylvania. **Anthracnose**, a common partner of summer patch, was diagnosed on golf turf from New Jersey, Pennsylvania, New York, and Virginia. **Gray leaf spot** is another disease of concern at this time. The disease was diagnosed four times last week on northern area golf courses. Ryegrass fairways on golf courses in Staten Island, Morris and Sussex Counties in New Jersey, and just over the river west in Pennsylvania were getting hammered by the disease. Last newsletter I wrote the following: Last but not least, **brown patch** remained very active through the period. The humidity and warm nights finally broke, however, so brown patch should not be as common – a little dollar spot anyone? We saw the last brown patch samples shortly after and did three **dollar spots** this afternoon! The large disparity between daytime highs and nighttime lows (it was 56°F at my house this morning and 84°F this afternoon) causes significant condensation to form in the turf canopy. Free moisture in the turf canopy drives dollar spot epidemics. Furthermore, dollar spot is worse on drought stressed and under fertilized turf. With no rain in sight and summer nitrogen applications running out, it looks like the perfect storm for dollar spot outbreaks. Did you say drought? Lots of **chinch bug** samples showing up suddenly as well. These critters thrive on hot, dry turf areas. Be sure to take a closer look before you assume that the damage you are seeing is all due to heat and drought.

### Ornamentals

Most of the samples submitted to the PDL in late August were from nursery production situations. **Phytophthora crown and root rot** was identified on cherry laurel and rhododendron from Mercer and Somerset Counties, respectively. A Monmouth County nursery submitted several varieties of *Huechera x* diagnosed with **pythium crown and root rot**. **Rhizoctonia crown and root rot** was identified on ajuga from a Middlesex grower. A huge population of **elongate hemlock scale** was found on samples of fir from a Sussex County Christmas tree grower. Fir is not a preferred host of this scale, but they sure seemed to like these trees! **Southern blight**, caused by the fungus *Sclerotium rolfsii*, was diagnosed on apple transplants in a Monmouth County nursery. It is likely that the fungus was imported with the stock. Lastly, **foliar nematodes**, *Aphelenchus spp.*, were found in a *Buddleia* from a Mercer County retail nursery. □

# Landscape IPM Pest Notes

Steven K. Rettke, Ornamental IPM Program Associate

✓ **HERBICIDE DRIFT WOES:** Broadleaf herbicide drift can do significant damage to desirable ornamental plants. Many think that it takes direct application to ornamentals to cause damage, but spray drift in mist or vapor can also cause damage. If applying herbicides, do so early in the morning when there is little or no wind. Avoid spraying when temperatures are over 80°F to avoid volatilization, and use the lowest functional application pressure to make droplets as large as possible. Additionally, spray as far away from desirable plants as possible. The very best way, of course, to avoid herbicide damage is to treat in October, when many broadleaf weeds are most susceptible, when herbicides are typically most effective, and when ornamentals are not as susceptible to damage. (Ref: Z. Reicher, Purdue Univ., *Turf Tips* 6/98)

✓ **TWO SPOTTED SPIDER MITES OVERWINTER AS ADULTS:** They are in the duff around the base of plants or on weeds. This means that there are no eggs overwintering on plants, so therefore, a dormant horticultural oil treatment (for overwintering eggs) will *not* work! Overwintering eggs may be those of other mite species, such as European red mite, spruce mite, or the southern red mite.

✓ **TREE TRANSPLANTING (Fall vs. Spring):** Some trees are best transplanted in the spring, as opposed to the fall. Some tree species fail to adequately regenerate their root systems in the fall. They often have borderline hardiness and are best moved in spring so that they'll have more time to become established before winter. The following is a list of plants that are best not planted now, but be delayed until next spring: fir, birch, hornbeam, hickory, flowering dogwood, common persimmon, beech, ginko, American holly, walnut, golden raintree, golden chaintree, sweetgum, tulip tree, magnolia, blackgum, ironwood, sourwood, poplar, *Prunus* species, golden larch, oak, willow, sassafras, cypress, and hemlock. If these species must be planted in the fall, be sure to allow for extra water at the time of planting and until the ground freezes. (Ref: *Arbor Age*, Jan. 2000)

✓ **COOL SEASON SPIDER MITES:** Plan a dormant oil application on plants affected by these pests this fall. Oil sprays will kill the presently active adults as well as some of the overwintering eggs. Be sure to monitor for mites next season, since where it was a problem in the past it will most likely be a problem again, and the dormant oil application will probably not give 100% control. Remember: Adult spruce mites (which attack conifers) will remain active into December and the overwintering eggs will typically hatch in April of next

year. The two-spotted mites are warm season mites that overwinter as adults under the plant and will not become active again until the weather warms in late May. Dormant oil applications are *not* effective against the two-spotted mites.

✓ **BANDED WOOLLYBEAR CATERPILLAR:** The fall migration of the banded woollybears has begun. Since these yellow, white and brown-banded caterpillars generally feed on grasses and weeds in pastures and meadows, they can only be classified as nuisance pests. Mature caterpillars search for protected spots (under logs or rocks) to spin their cocoons.

Woollybears supposedly have the ability to forecast the harshness of the upcoming winter season. The "old wives tale" implies that the length of the black band foretells how long the cold part of the winter will be, while the brown band predicts how much mild weather will occur. As one might expect, inspecting a number of these critters during any given fall season will undoubtedly reveal a wide variation in the caterpillar markings. You can always show off the one that you would like to believe!

✓ **BIOLOGICAL CONTROLS OF APHIDS:** The flower fly (or syrphid fly) is an insect that many landscapers and arborists have seen, but incorrectly identified as a type of wasp or bee because of their hovering flight and yellow to orange band markings on their abdomen. Although these beneficial insects are predacious only in the larval stage, they are another important group of predators that rival the abilities of lady beetles and lacewings.

The larvae of flower flies are unknown allies to many landscape plant managers. It is rare not to find at least a few of these 1/8-1/4 inch long tan or greenish maggots feeding within an aphid colony. The larvae also have black markings on their bodies and have pointed anterior and blunt posterior ends. These blind larvae will quietly meander over the plant surface methodically grasping one aphid after another. Once this predator spears an aphid with its pointed jaws (their mouthparts consist of 2 retractable hooks), it raises the body up into the air and sucks out the fluid contents. A flower fly larva can destroy aphids in this manner at a rate of one per minute over an extended period of time.

It is also significant to note that flower flies are usually the major predators in the autumn months, since they can function at cooler temperatures than either the lady beetle or lacewing can. Other than aphids, flower fly larvae prey upon leafhoppers, scales, mealybugs and thrips.

✓ **HEMLOCK PESTS:** Elongate hemlock scale (*Fiorinia* scale) (2515-2625 GDD) and hemlock woolly adelgid are two pests of hemlocks which can be controlled this month. The vulnerable second-generation crawler activity of the elongate hemlock scale occurs during September. Furthermore, hemlock woolly adelgid nymphs are still exposed at the base of this year's

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needles and will not cover themselves with the protective white waxy threads until later in the fall. Since drought-stressed trees are often relieved during September with increased rainfall and decreased temperatures, horticultural soaps and oils can often be more safely used now on the sensitive hemlock. The exclusive use of horticultural oil (1-2%) against the hemlock woolly adelgid can give outstanding results. Very good coverage is mandatory on the outer branch tips and both sides of the needles.

✓ **GALL ADELGIDS:** The Eastern Spruce Gall and Cooley Spruce Gall Adelgids both overwinter as immature females and are vulnerable to control treatments during the late months of the year. Remember to target sprays onto only the most recent growth or terminal twigs and buds. It is only at these locations where these adelgids will overwinter. The products of choice are the use of horticultural oils or soaps when good coverage can be achieved and needle color change is not a factor.

✓ **OVERWINTERING LEAFMINERS:** Arborvitae, Boxwood and Holly leafminers all overwinter as live larvae within foliage tissue. Yellow or white lines or blotches indicate the presence of feeding larvae and feeding rates increase during the fall months. Inspect mines for the live larvae and physically remove infested leaves when populations are small. Heavily infested plants can be suppressed with leaf systemic sprays or with root systemics such as imidacloprid (Merit). Adequate soil moisture is required before a soil application.

✓ **REDHEADED PINE SAWFLY:** Primarily a pest of 2 and 3 needle pines, these pests are rarely seen feeding on other conifers. Fully-grown sawfly larvae are 1 inch long with reddish heads and yellowish-white bodies with rows of black spots. Heavy infestations can cause defoliation and may kill small pines. There are two generations per year with the second from August through October.

Pine trees located in stressful sites are most readily prone to attack. When larvae are small, their mouthparts cannot consume the entire needle. This partial feeding causes a few dry, curled, golden brown needles at the tips of branches. Careful observation may uncover brown, oval, 0.25-inch pupal cases attached to a branch. These cocoons are the over-wintering stages of the pine sawfly.

Handpick or prune out small populations of larvae feeding in clusters. Horticultural oils and soaps can control populations when the larvae are young and small, with thorough coverage. When larvae are larger, various residual pesticides can be sprayed, including Conserve. Since the sawflies are not caterpillars, the bacterial insecticide B.t. (*Bacillus thuringensis*) will NOT be effective.

✓ **TERMITES IN MULCH?** Termites have underground colonies and feed on wood, and may be found in mulch. In the past, most entomologists agreed that any termites brought into a site via mulch were workers and not reproductives (queens), and therefore there was little risk of a new colony developing. However, new research

shows that if the mulch contains enough white worker termites, and they are given access to soil, these termites do have the ability to develop into secondary reproductives and establish a new colony!

In light of this, bagged mulch should be stored on pallets off the ground, so termites cannot gain access to the mulch. Termites need ground to wood contact to easily gain access to the wood food source from their underground colony. Likewise, piles of mulch should not be stored directly on the ground. Keep bags of mulch in the sun as well, since termites should not survive high temperatures that build up during the day. Beware of adding too much mulch to the landscape as well (2 to 3 inches is plenty). (Ref: *P.E.S.T. newsletter*, 2 Apr. '01)

✓ **MULCH FACTS:** A handy "rule of thumb" when figuring mulch coverage: One 3 cubic foot bag will cover approximately 18 sq.ft. at a 2 inch depth. Also, a cubic yard of mulch in bulk form will cover approximately 162 sq. feet at a 2-inch depth.

✓ **TREE WRAPPING:** Tree wrapping, or wrapping the trunk of young trees after transplanting, is *not* recommended. In the past, wrapping was done on fall transplants in order to reduce sunscald and frost cracks. However, replicated studies have shown that wraps are not a deterrent to these problems. Wrapping can actually create problems, by reducing photosynthesis (because young stems contain chlorophyll), and increasing potential pest attack from borers and certain diseases. The best benefit from wrapping is protection from chewing rodents. For this purpose, it should be in place only during the dormant season. □

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CRABGRASS FROM PAGE 1

Although split herbicide applications and maintaining a vigorous turf can greatly increase levels of crabgrass control, complete control can rarely be achieved. Frequent, heavy rainfall events in July/August, especially if they follow extended dry periods, greatly reduce the chances of achieving complete control. Turfgrass Professionals must be vigilant during these months to check for breakdown of Pre crabgrass programs and spot treat escapes with postemergence (POST) herbicides if complete control is desired. Seedling crabgrass (untillered) can be effectively controlled with Drive or Acclaim Xtra and Acclaim Xtra can control crabgrass up to 2 to 3 tillers in Kentucky bluegrass. In addition, both herbicides can be tank-mixed with residual herbicides to get through the remainder of the season.

Even with the use of split herbicide applications and timely use of POST herbicides we have appeared to have lost the battle to crabgrass this year. The effectiveness of POST herbicides was also reduced by the excessive heat, and many crabgrass plants were not completely controlled (plants re-grew from the crown) requiring additional applications. Hopefully 2006 will be a better year in the battle against crabgrass. □

# Powdery Mildew in the Nursery and Landscape (What's that white stuff on my peonies this year?)

Ann B. Gould, Ph.D., Specialist in Plant Pathology

Summer is the time for **powdery mildew**, one of the most common diseases of ornamental plants in the nursery and landscape. Powdery mildew is caused by 300 different fungi and the disease occurs on over 7000 flowering plants worldwide. Some of the more common woody hosts of this disease are listed in Table 1. As with many diseases that affect angiosperms, gymnosperms are not affected by this disease.

The powdery mildew species most troublesome to North American flowering plants include *Erysiphe*, *Microsphaera*, *Phyllactinia*, *Podosphaera*, *Sphaerotheca*, and *Uncinula*. Since most of these species are host-specific, development of powdery mildew on one species will not necessarily lead to disease on other hosts nearby<sup>1</sup>.

**Table 1. Some ornamental plants susceptible to powdery mildew**

apple, crabapple	lilac
azalea, rhododendron	<i>Lonicera</i>
ash	lilac
basswood	magnolia
beech	maple
<i>Berberis</i>	monarda
birch	oak
blueberry	phlox
buckeye	<i>Prunus</i> (peach, plum, cherry, apricot)
catalpa	pear
Chinese photinia	peony
chrysanthemum	poplar
cotoneaster	privet
crape myrtle	pyracantha
dahlia	Reiger begonia
delphinium	roses
elm	serviceberry
eucalyptus	spirea
euonymus	smoke-tree
flowering dogwood	snapdragon
gardenia	sycamore
hawthorn	tulip tree
holly	<i>Vaccinium</i>
honeysuckle	viburnum
horse chestnut	walnut
hydrangea snowball	wintercreeper
kalanchoe	willow
<i>Kalmia</i>	wisteria
leucothoe	zinnia
ligustrum	

## Symptoms

As the name suggests, powdery mildew appears as a white to tan superficial growth on the surface of affected leaves and other aerial tissues. Signs of the fungus can first appear as individual spots that coalesce to cover the entire tissue surface. This fungal growth (called a mycelium) produces asexual spores (or conidia) on stalks that permit air currents to pick up the spores and distribute them to other susceptible plants. Young plants and tissues are often more susceptible to this disease.

Powdery mildew fungi are **obligate parasites**. In other words, they must obtain all their food from other living organisms. Powdery mildew fungi obtain nutrients by sending a specialized absorbing structure called a **haustorium** into the cells of the host plant epidermis. Although the fungus does not directly kill the cells it invades, infection does result in a reduction of photosynthesis and an increase in water loss. As a result, the growth rate and aesthetic value of infected plants is reduced. Leaves may be stunted, curled, or twisted, and the new growth, flowers, and buds of highly susceptible plants can be destroyed.

## Disease Cycle

Look for powdery mildew disease in the Northeast during the late spring to early fall months. Powdery mats of fungal mycelia develop on susceptible tissues all growing season, and conidia produced by the fungus are carried by the wind to new hosts. Powdery mildew fungi can overwinter in a characteristic fruiting structure (called a **cleistothecium**) that is the result of a sexual reproductive process. Cleistothecia are dark, tiny spheres (about the size of coarse, ground pepper) that can often be seen on infected tissues later in the growing season. During the spring of the following year, these cleistothecia release spores (called ascospores) that start the infection cycle anew. In warmer climates or in greenhouses, the formation of cleistothecia is never observed, and the disease may persist all year as mycelia and conidia. In other cases, the fungus may enter buds and survive the winter there.

Powdery mildew conidia germinate and penetrate host tissues in about 6 hours, and under favorable conditions, the mycelium develops and new spores are produced within 4 to 6 days. Unlike most fungi, the penetration process can occur in the absence of free water, and high humidity does not necessarily promote disease development. Indeed, in many cases, frequent periods of leaf wetness can reduce the severity of this disease. Although the development of powdery mildew is most rapid during periods of warm weather (80°F day/60°F night), damage due to the disease can be actually more severe at cooler temperatures (70°F day/50°F night).

## Management

To manage powdery mildew in ornamental plantings, improve air movement around plants through

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proper spacing and weed control, and increase the amount of sunlight that reaches foliage. Rake old leaves and prune shoots infected the previous growing season to reduce inoculum. Practices that promote succulent growth, including pruning and nitrogen fertilizing, should be avoided on susceptible hosts. Cultivars of crabapple, dogwood, lilac, and crape myrtle resistant to this disease are available and should be planted whenever possible. Rhododendrons that are very susceptible to powdery mildew include Elizabeth, Virginia Richards, Unique, and the Loderi group; many deciduous azaleas are susceptible as well. Plants that are less susceptible include Nova Zembla, Palestrina, and Vulcan.<sup>2</sup>

Since powdery mildew fungi are associated with the surface of leaves, they are easier to manage with fungicides than other foliar diseases. Compounds labeled for powdery mildew control include azoxystrobin, *Bacillus subtilis*, copper (hydroxide, metallic, salts, sulfate), fenarimol (field and landscape only), hydrogen dioxide, Junction, kresoxim-methyl, Manhandle, myclobutanil, neem oil, paraffinic oil, piperalin (enclosed structures only), potassium bicarbonate, propiconazole, Spectro, sulfur (dusting, elemental, flowable, wettable), SysStar, thiophanate-methyl, trifloxystrobin, triadimefon, triflumizole, and Zyban. Most of these compounds are applied at the first sign of disease; however, consult the label for timing, rates, and appropriate hosts.

<sup>1</sup>D. Michael Benson. 2001. *Powdery Mildew. Pages 57-58 in: Diseases of Woody Ornamentals and Trees in Nurseries.* R. K. Jones and D. Michael Benson, eds. APS Press, St. Paul, MN.

<sup>2</sup>Robson, M. *Powdery mildew on ornamentals and vegetables.* ProIPM, The Green Gardening Program, WSU Cooperative Extension. □

## New RCRC Factsheet

Now available on from your County Cooperative Extension office or the web at [www.rcrc.rutgers.edu](http://www.rcrc.rutgers.edu) is the following new Extension Bulletin:

E300 - "Turfgrass Establishment Procedures for Sports Fields", authored by Dr. James A. Murphy, Extension Specialist in Turfgrass Management and Bradley S. Park, Sports Turf Research and Education Coordinator. This is a nine page publication. □

### Weather Summary for the Week Ending 8 am Monday 9/ 5/ 5

WEATHER STATIONS	RAINFALL			TEMPERATURE				GDD BASE50		MON %FC
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	
BELVIDERE BRIDGE	missing									
CANOE BROOK	missing									
CHARLOTTEBURG	missing									
FLEMINGTON	.10	24.63	-.64	89	54	74.	7	2750	398	63
NEWTON	.26	18.81	-5.71	84	52	70.	6	2545	474	61
FREEHOLD	.19	23.73	-.90	90	54	74.	6	2781	296	61
LONG BRANCH	.13	22.46	-2.52	90	59	75.	6	2766	339	32
NEW BRUNSWICK	.08	23.69	-1.22	92	56	76.	6	2909	290	62
TOMS RIVER	.19	23.91	-1.60	90	55	75.	5	2725	309	33
TRENTON	.01	24.20	.58	89	59	76.	6	2941	225	31
CAPE MAY COURT HOUSE	1.56	24.64	2.58	89	60	75.	4	2550	138	71
DOWNSTOWN	.02	19.81	-3.49	89	57	75.	5	2799	77	44
GLASSBORO	missing									
HAMMONTON	.01	21.74	-2.58	91	58	76.	6	2886	183	20
POMONA	.00	20.52	-1.85	91	58	77.	9	2800	279	23
SEABROOK	.00	22.12	-.18	90	62	77.	7	3105	368	28
SOUTH HARRISON	.95	24.53	.58	88	61	76	NA	2861	NA	NA
*SOME CUMULATIVE VALUES ESTIMATED DUE TO MISSING PAST DATA										
WES KLINE — GDD BASE 40 PINEY HOLLOW										
Last Week* 226 (Ending 8/29/05)										
This Week 243 (Ending 9/5/05)										
* February total base 40 equals 32 units										

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**Pesticide User Responsibility:** Use pesticides safely and follow instructions on labels. The pesticide user is responsible for proper use, storage and disposal, residues on crops, and damage caused by drift. For specific labels, special local-needs label 24(c) registration, or section 18 exemption, contact RCRE in your County.

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