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Managing insects and related pests of roses



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Texas is well known for roses. In the Tyler region, roses are grown commercially in greenhouses and outdoor nurseries, where field-grown cut flowers, potted miniature roses, bare-root roses for use in landscapes, and potted roses for the garden-center trade are produced. Although several species of roses are native to the state, the rose industry is based primarily on the many exotic rose hybrids available, including antique and shrub roses, which have fewer pest problems. One of the largest antique-rose producers in the nation is located near Brenham, Texas.

Because roses are grown and appreciated primarily for their aesthetic value, the plants--and particularly the blossoms--should be relatively free from pest damage. Rose plants in the landscape need not necessarily be blemish-free, but still should be healthy and add to the plantings' overall beauty.

Many species of insects and mites attack and injure roses. Under certain conditions, roses become particularly susceptible to certain pests. For example, greenhouse-grown roses are more susceptible than field-grown roses to outbreaks of spider mites. Thus, protecting roses from insects and mites requires continual care and substantial knowledge of pests and management alternatives, including pesticides and their use.

Monitoring and identifying pests and their damage

Detecting and identifying pests are the first steps in managing insects attacking roses. Inspect plants regularly for pests and the injury they produce. For example, check the underside of a set number of leaves weekly for such pests as spider mites or aphids. Regular inspections can help growers detect the arrival of new pests or document the abundance of pests over time. In addition, monitoring helps growers time their suppression methods and evaluate their effectiveness better. In greenhouses, yellow sticky cards can be hung over the plant canopy and inspected regularly to indirectly monitor adult populations of many insect pests of roses, such as winged aphids, thrips and whiteflies.

Figure 1. Rose injury caused by thrips.



Correct identification enables growers to choose the best methods to control pests while helping preserve beneficial insects. Not all insects that frequent roses are damaging. Many are incidental; some are pollinators; and others are beneficial natural enemies that feed on harmful species. Insects that attack roses can be divided into two groups according to the way they feed on plants and the damage they cause:

- Sucking insects, which insert their mouth-parts into plant tissue and suck out the juices, sometimes transmitting diseases to roses in the process; and
- Chewing insects, which chew on plant tissue and may damage all or parts of the plant, including roots, stems, leaves, buds and open flowers.

Although spider mites are not insects, the symptoms they produce (stippling, bronzing of leaves) are similar to those of sucking insects. Like spider mites, thrips rupture plant cells and suck out the cell contents. Thrips also often injure expanding flower petals, producing discolored, malformed blooms.

Sucking pests, such as aphids, leafhoppers, scale insects and whiteflies, produce these symptoms:

- Discoloration (yellow or brown) and necrotic (dead) spots on leaves or petals;
- Wilted appearance of plant or plant parts;
- Curled, malformed leaves and petals; and
- Shiny, sticky “honeydew” or black-colored coating of sooty mold.

Chewing pests, such as caterpillars, beetles, grasshoppers and leaf-cutter bees, produce these symptoms:

- Holes in foliage or stems;
- Discolored areas on the surface or margins of leaves or petals;
- Severed stems, leaves or buds or wilting of stem or cane (limb girdling);
- Wilting of plant (root damage by white grubs or other root feeders); and
- Semicircular holes in leaf margins (leaf-cutting bees).

Figure 2. Aphids on a rose.



Common insect and mite pests of roses

Aphids: Many species of aphids or plant lice, including the rose aphid, attack roses. Aphids are small, soft-bodied winged or wingless insects about 1/25 to 1/8 inch long with relatively long legs and antennae. Species vary in color from black, green, yellow to even pinkish. Some aphids lay eggs; others give birth to live young that mature in 7 to 8 days. Because aphids breed continuously, populations grow quickly, especially in cool weather.

Aphids usually live together on buds, the underside of leaves or in the plants' growing tips. They suck out plant sap and excrete a sweet, sticky substance called "honeydew" that collects on leaves and stems. A black fungus called sooty mold grows on honeydew, making it look ugly and reducing photosynthesis. Plants heavily infested with aphids appear wilted. Some aphid species cause leaves to yellow or drop from the plant; other species stunt and curl young leaves. Heavily infested buds may fail to open, be deformed or produce small blossoms (also see Extension publication B-6047, *Aphids in Texas Landscapes*).

Leafhoppers: Leafhopper species are about four times longer than wide. When full grown, they range from 1/4 to 1/2 inch long. Adults vary in color from gray to yellow and green; some species have patterned markings. The immature forms (nymphs) resemble adults but are lighter in color and lack wings. Both adults and nymphs can injure roses. Some species feed on tender stems and leaf petioles; others, such as rose leafhoppers, feed on the underside of leaves, causing whitish stippling. In Texas, leafhoppers attack roses from early spring until late fall.

Scale insects: Several scale insects occasionally attack roses, but the most damaging is rose scale. Small and soft-bodied, scale insects secrete a material that forms a shell or "scale" over the insect itself. Female rose scales are round and dirty white. Males are elongate and snow white. When mature, these insects insert their mouth-parts into the plant tissue and remain there, protected under their scale covering, for their entire life span. Females deposit eggs beneath the old scale covering.

When the eggs hatch, the young, six-legged scale insect "crawlers" disperse throughout the new tissue and attach themselves to the plant. Heavily infested canes may become encrusted in the scales. Scales become most abundant under high humidity and reduced sunlight. They not only spoil the plant's appearance, but also greatly reduce plant vigor (also see Extension publication L-1827, *Scale Insects on Ornamental Plants*).

Whiteflies: Adult whiteflies are small, white, soft-bodied insects. Weak fliers, they resemble tiny snowflakes fluttering about a plant. Immature whiteflies attach to the underside of leaves and resemble scale insects. Both immature and adult forms feed on roses, leaving yellow spots on the leaves. Heavy infestations can cause defoliation. Much like aphids, whiteflies secrete honeydew, causing plants to be covered with a black sooty mold (also see Extension publication L-1299, *Whiteflies*).

Spider mites: Although several species of spider mites attack roses, the most common is the two-spotted spider mite. Mites are tiny, scarcely visible without magnification. Their color varies in shades of yellow, red and green marked with two darker spots on their backs. All developmental stages of spider mites usually live on the underside of the leaves, but may be found elsewhere on heavily infested plants, which they may cover with a fine web. Female mites lay clear, spherical eggs on the underside of leaves. Eggs develop into adults in 5 to 20 days, so populations grow quickly, especially in hot, dry weather.

Spider mites rupture plant cells with their mouthparts and suck the juices, producing feeding punctures that look like tiny light-colored spots, giving leaves a stippled appearance. Leaves of heavily infested plants turn yellow, then brown and eventually fall from the plant (also see Extension publication L-1244, *Destructive Mites in the Home Garden*).

Thrips: Common species on roses include flower thrips, onion thrips and tobacco thrips. Thrips are extremely small, soft-bodied insects less than 1/16-inch long. Some are yellow to golden; others almost black. Females lay eggs in plant tissue. After hatching, immature stages (larvae) develop through several stages, completing their life cycle in about 3 weeks.

Migrating adult populations, particularly in late spring, damage roses most. Thrips feed predominately on pollen, but also attack tender plant tissue, rasping the surface tissue from leaves, buds and petals. Recently injured tissue looks silvery. Heavy infestations result in discolored, deformed growth and blemished, deformed flower petals.

Leaf-feeding beetles: Several species occasionally feed on rose plants, chewing plant tissue from leaves, buds and petals. Rose chafers and June beetles are brown; rose leaf beetles are small and metallic green; and twelve-spotted cucumber beetles are 3/8 inch long and greenish-yellow with black spots.

Caterpillars: Many species of caterpillars, the immature stages of moths, can be incidental pests of roses. Although most feed on leaves voraciously, only a few damage or defoliate plants extensively. Leafrollers are small, pale-green black-headed caterpillars that produce leaf mines when small and later feed inside leaves they have rolled up and tied with silk. Leaf tiers also draw several leaves or parts of leaves together with silk.

Grasshoppers: Several species of grasshoppers feed on rose leaves, buds, flowers and stems. Winged adult grasshoppers are difficult to control in the times of year they migrate to rose plantings from surrounding vegetation where they developed.

Leaf-cutter bees: These solitary bees nest in burrows and hollowed twigs and stems. Adult females cut circular to elongate pieces of

leaves from roses to build walls and partitions of nesting cells where their young develop. Cells are provided with nectar and pollen collected from flowers as food for the larvae.

Indirect pests of roses: Many insects in and around rose plantings should be controlled when they become numerous enough to be a nuisance. These pests rarely injure established rose plants in the landscape and are treated in other Extension publications:

- Red imported fire ants (see B-6043, *Managing Red Imported Fire Ants in Urban Areas* or L-5070, *The Two-Step Method Do-It-Yourself Fire Ant Control*);
- White grubs (see L-1131, *White Grubs in Texas Turfgrass*);
- Snails and slugs (see L-1737, *Snails and Slugs*);
- Centipedes and millipedes (see L-1747, *Centipedes and Millipedes*);
- Crickets (see L-1809, *Crickets*);
- Fungus gnats (see L-2041, *Fungus Gnats*); and
- Springtails (see L-2109, *Springtails*).

Figure 4. A thrips.



Figure 3. A spider mite.



Cultural, non-chemical and biological control

Cultural practices can greatly reduce or eliminate the incidence of insect problems and the need for insecticides. Selecting proper varieties and keeping plants healthy by proper planting and care (watering, fertilization and disease control) can help prevent and reduce pest damage. In addition, the following cultural practices aid in managing pests (also see Extension publications L-866 *Roses: How to Plant* and L-878 *Roses: Summer Care*):

- Maintain clean, closely mowed areas next to the rose garden to help deter grasshoppers, beetles and caterpillars from migrating into the planting.
- Dispose of dead leaves, trash or debris and periodically disrupt landscape timbers or rocks serving as harborage areas to reduce “trash pests” such as pillbugs, sowbugs, centipedes and millipedes, around plantings.
- Prune properly to remove dead canes that can become harborage or nesting sites for insects such as leaf-cutter bees.

High-pressure water sprays via hose-end devices can dislodge mites and other pests from their host plants. These devices produce a

fine, hard spray to the underside of leaves and plant terminals. Begin treatments when pests are first detected and repeat regularly to maintain clean plants. Other mechanical methods of insect control, such as hand destruction or removing insects with a cotton swab, may be used for house plant roses.

Natural enemies may be released into greenhouses, interiorscapes and landscapes to help control insect and mite pests. Releasing natural enemies (predators, parasites and pathogens) to control pests is a type of biological control called augmentation. In this approach, commercially available species are applied in a timely manner to suppress or prevent pest population increases. To make augmentation cost-effective, growers must understand the pests and their natural enemies as well as the operation's economic goals and environment. Although researchers and Extension faculty at The Texas A&M University System are evaluating some of these products, suggestions for their most effective use are still being developed.

Some commercially available biological control agents include:

- **LACEWINGS:** *Chrysoperla carnea* and *C. rufilabris*--predators of **aphids, mealybugs, scales, spider mites, thrips** and **small caterpillars** and many other pest insects.

- **TRUE BUGS:** *Orius* spp.--predator of larval and adult **thrips, mites, aphids** and **whitefly pupae**.

- **MITES:** *Metaseiulus occidentalis*, *Phytoseiulus persimilis*, *Mesoseiulus longipes* (=Phytoseiulus longipes) and *Neoseiulus californicus* (*Amblyseius californicus*)--predatory mites of **spider mites**; *Amblyseius cucumeris*, *Neoseiulus cucumeris* and *Neoseiulus barkeri* --predatory mites of **thrips**; *Galendromus occidentalis* (=Metaseiulus occidentalis)--predatory mite of **spider mites**; and *Hypoaspis miles*--predaceous mite of **shore-fly larvae and thrips pupae** in the soil.

- **WASPS:** *Aphelinus abdominalis*, *Aphidius colemani* and *Aphidius matricariae*--parasitic wasps of **aphids** (such as green peach aphids); *Encarsia formosa* and *Eretmocerus* sp. nr. *californicus*--parasitic wasps of **whiteflies**; and *Trichogramma* spp.--several species of parasitic wasps for **caterpillar eggs**.

- **NEMATODES:** *Heterorhabditis* spp.--predaceous nematodes for **black vine weevil**; *Steinernema carpocapsae*--parasitic nematode of **fungus gnats, grubs, black vine weevils** and **wood borers**; and *Steinernema feltiae*--predaceous nematodes on **sciarid flies** (Sciaridae, dark-winged fungus gnats, root gnats).

Those who use these natural enemies should follow instructions provided by the insectaries or their distributors. The Environmental Protection Agency has exempted these products from the regulations applying to insecticides and microbial insecticide (bacteria, viruses, fungi) products.

Figure 5. Cotton aphid.



Chemical selection and safety

When choosing a pesticide to control insects or mites on roses, look for products with “roses” on the product label. Many products are available; examples are provided in **Table 1**. However, other products with labels that cover roses in general categories such as “shrubs,” “ornamental plants” or “flowering plants” also may be used.

For interiorscape and greenhouse-grown plants, use only products registered for roses located in those usage sites. Otherwise, move plants outdoors to spray. Whenever possible, choose the least toxic, most target-specific products available. Pesticide labels contain the signal words “Danger” (most toxic), “Warning” (less toxic) or “Caution” (least toxic) to indicate the toxicity of the formulated insecticide in the container.

Certain products affect only a small group of pests. For instance, *Bacillus thuringiensis* var. *kurstaki* affects only leaf-feeding caterpillars. Similarly, miticides are generally specific pesticides for mite control.

Used as recommended on the label, pesticides are safe and effective. However, all pesticides are poisonous and, if misused, may harm humans, animals or plants and contribute to environmental pollution. Before using any pesticide, read the label completely. Note any special precautions, such as the necessity of wearing special protective clothing while applying. Follow all safety precautions indicated on the label. Growers wanting to adopt safe practices should:

- Become familiar with a pesticide *before using it*. Know its registered uses, toxicity and the necessary precautions for safe use.

- Select appropriate application equipment for the task at hand. Pesticides sold in hand pump and aerosol containers are useful for house plants or small plantings.
- Keep application equipment clean and assure it is in working condition before mixing and loading any pesticide. Spray soon after mixing the pesticide in water, or use a buffer to neutralize alkaline water. Use other tank additives or mix with other products, e.g., fertilizer, fungicide, spreaders, stickers, only when necessary. Promptly drain and clean equipment after each use.
- Keep all safety equipment, such as face masks, respirators and protective clothing, clean and in *good working order*. Wear all protective clothing specified on the product label and wash contaminated clothing separately.
- Mix pesticides outdoors or in a well-ventilated area. Avoid contact with skin and do not breathe vapors. Diluting the pesticide in water can be the most hazardous part of using a pesticide.
- Apply the correct dosage of pesticide. Using less than the recommended amount may not control the pest. Using more may damage plants or leave excessive residue. Observe the specified times between treatments, lest residue be excessive or plants damaged.
- When applying foliar sprays or dusts, be sure to cover the underside of leaves and other plant parts where target pests live.
- When using a pesticide for the first time, or treating a new variety, cultivar or growth stage such as flowering roses, apply the material to a few plants and observe for plant damage before treating the entire planting. Some rose varieties may be burned by certain chemicals or combinations of chemicals, or by their use under certain conditions such as temperature extremes. Take particular care when using acephate, carbofenthion, chlorpyrifos, diazinon, dichlorvos, dicofol, dimethoate, endosulfan, kinoprene, lindane, malathion, fluvalinate, naled, nicotine, oxthioquinox, propargite, resmethrin or sulfatepp, which have been reported to injure certain cultivars. Refer to the label for reference to susceptible plants.
- In commercial greenhouse and nurseries, heed restricted reentry intervals after applying pesticides.
- Store all pesticides in a secure place away from pets and children. Never store pesticides in unmarked containers. Do not save used pesticide containers. Dispose of the containers as instructed by label directions.

Figure 6. Green peach

aphid.



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Insecticides and Miticides for Rose Pests

Table 1. Examples of insecticides and miticides registered for use on insect and mite pests of roses, 1997.*

| Generic or Active Ingredient | Trade Name(s) | Pest(s) | Remarks |
|-------------------------------------|---|--|---|
| abamectin** | Avid 0.15 EC | spider mites | for ornamentals, foliage plants and other woody ornamentals |
| acephate | Orthene Turf, Tree & Ornamental Spray, WSP, | aphids, fungus gnats, spider mites, scale insects, thrips, | Do not use on roses with open flowers. |

| | | | |
|---|---|--|--|
| | PT 1300 TR Orthene Systemic Insect Control | whiteflies aphids, armyworm, grass-hoppers, leafhoppers, mealybugs, scale insects (crawlers), spider mites (twospotted), thrips, whiteflies | |
| azadirachtin | Azatin XL, Turplex BioInsecticide Safer Brand BioNEEM Multipurpose Concentrate Insecticide & Repellent | aphids, fungus gnats, thrips, whiteflies aphids, beetles, caterpillars, leaf-hoppers, thrips, whiteflies | for trees, shrubs, ornamentals and flowers |
| <i>Bacillus thuringiensis</i> var. <i>kurstaki</i> | Greenlight Dipel Dust | armyworms | for use on flowers and ornamental |
| <i>Bacillus thuringiensis</i> var. <i>israelensis</i> | Gnatrol | fungus gnats | media treatment |
| Beauveria bassiana JW-1 | Naturalis-O | aphids, beetles (cucumber, flea), leaf-feeding caterpillars, leaf-hoppers, mites, thrips, whiteflies | for use on flowering woody ornamentals |
| bendiocarb** | Dycarb 76WP, Turcam, Turcan 2 1/2 G | thrips, scale (listed species' crawlers), springtails, whiteflies (greenhouse) | |
| carbaryl | Chipco Sevin Brand 80WSP, Sevin SL | aphids (rose), armyworms, eriophyid mites, grasshoppers, June and flea beetles, plant bugs, scale insect (crawlers), sowbugs, springtails, thrips | for control of nuisance bees; can be applied to buildings and perimeters; in and around flower beds and ornamental plantings |
| | Sevin Brand Insecticide Liquid (21.3%) | ants, aphids (rose), caterpillars (cutworm, saddled prominent), flea beetles, grasshoppers, June beetles, leafhoppers, mealybug, plant bugs, sowbugs, springtail, thrips, tree hoppers | |
| | Hi-Yield 10% Sevin Dust | aphids (rose), mealybugs, June beetles, scale insects (crawlers) | |
| chlorpyrifos | Dursban 50WP WSP, PT 1325 ME DuraGuard | aphids (rose), beetles (leaf-feeding) caterpillars (armyworms), grasshoppers, fungus gnats, leaf-hoppers, plant bugs, rose chafer, scale insects (crawlers) sowbugs, spider mites, thornbugs, thrips, whiteflies | |
| | Ford's Dursban Insecticide Concentrate, Greenlight Whitefly & Mealybug Spray | | Do not use on rose bushes. |

| Generic or Active Ingredient | Trade Name(s) | Pest(s) | Remarks |
|------------------------------|-----------------------------|---|---------|
| cyfluthrin** | Tempo 20WP | pests registered for shrubs, flowers and foliage plants | |
| diazinon | Diazinon 4E, 500, 50WP WSP, | aphids, flea beetles, fungus gnat | |

| | | | |
|---|---|--|--|
| | KnoxOut GH | larvae, scale insects (crawlers), spider mites, thrips, whiteflies | |
| | Martin's Diazinon 4E Indoor & Outdoor Insecticide | aphids, clover mites, flea beetles, leafhoppers, scale insects (crawlers), thrips, twospotted spider mites, whiteflies | |
| | Greenlight Diazinon 25 Insect Spray | aphids, leafhoppers, mealybugs, whiteflies | |
| dienochlor** | Pentac Aquaflow, WP | mites (two-spotted, European red) | |
| disulfoton | Hi-Yield Di-Syston Granules (2%) | aphids, flea beetles, leafhoppers, scale insects, spider mites, thrips, whiteflies | soil treatment |
| | Ortho RosePride Systemic Rose & Flower Care (1%) | aphids, leafhoppers, spider mites, whiteflies | soil treatment |
| | Ross Systemic Insecticide Root Feeder Refills | | soil treatment |
| dormant oil | Greenlight Plus Dormant Spray and Summer Insect Spray | scale insects (rose), spider mites (red) | |
| fenoxycarb** | PT 2100 Preclude | aphids, thrips, scale insects, whiteflies | |
| horticultural oil | SunSpray Ultrafine Year-Round Pesticidal Oil | aphids, bugs (immature), caterpillars (certain), eriophyid mites, mealybugs, scale insects (immature), spider mites, whiteflies (immature) | |
| imidacloprid** | Merit 75 WSP | aphids, leafhoppers, mealybugs, scale insects, thrips, whiteflies, white grubs | for use on ornamental shrubs and flowers |
| | Marathon 1G | aphids, mealybugs, thrips, whiteflies | for use on flowering and foliage plants |
| insecticidal soap (19.9% potassium salt of fatty acids) | Concern Insect Killing Soap Concentrate | aphids, flea beetles, leafhoppers, mealybugs, spider mites, scale insects (crawlers), thrips, whiteflies | |
| lindane | Protech Lindane Flea, Tick & Chigger Concentrate | aphids, thrips | |
| malathion | 50% Malathion | aphids, leafhoppers, mealybugs, tarnished plant bugs, scale insects, spider mites, thrips, whiteflies | |
| neem oil (clarified hydrophobic extract of neem oil)(90%) | Greenlight Rose Defense | aphids, spider mites, whiteflies | |
| permethrin | Ford's InterCept Insect | aphids, armyworms, | apply before |

| | | | |
|---|--|--|-----------|
| | | mealybugs, | blossom |
| | Control Vegetable, Lawn & Garden Spray Concentrate | scale insects, spider mites, thrips | formation |
| propargite** | Ornamite | (exposed), whiteflies mites (two-spotted, southern red) | |
| pyrethrins (1%) plus piperonyl butoxide | Concern Multipurpose Insect Concentrate | aphids, blister beetles, flea beetles, leafhoppers, whiteflies | |

| Generic or Active Ingredient | Trade Name(s) | Pest(s) | Remarks |
|--|---|--|---|
| pyridaben** | Greenlight Rose & Flower Spray Sanmite | aphids, flea beetles, leafhoppers, whiteflies mites (two-spotted, European red), whiteflies | |
| rotenone | Greenlight Plus Rotenone Insect Dust | aphids | |
| sulfur | HiYield Dusting Wettable Sulfur | mites, thrips | Do not apply oil within two weeks. |
| Combination Ingredients | | | |
| acephate (4%), triforine(0.75%), hexakis (0.75%) | Ortho RosePride Orthenex Insecticide & Disease Control | aphids, mites, leafhoppers | foliar spray |
| acephate (0.25%), resmethrin (0.1%), triforine (0.1%) | Ortho RosePride Orthenex Insect & Disease Control | aphids, mealybugs, saltmarsh caterpillars, scale insects (crawlers), twospotted spider mites, whiteflies, thrips | aerosol |
| acephate (8%), hexakis (0.5%) | Ortho Isotox Insect Killer Formula IV | aphids, mealybugs, mites, scale insects, thrips, whiteflies | |
| carbaryl (5%), metaldehyde (1%) | Greenlight Bug & Snail Bait | armyworms, crickets, earwigs, grasshoppers, sowbugs, pillbugs, snails, slugs | for use in lawns, flowerbeds, ornamental and home vegetable gardens |
| diazinon (4.2%), chlorothalonil (6%) | Fertilome Triple-Action Insecticide-Miticide | aphids, leafhoppers, spider mites, thrips | |
| malathion (4%), methoxychlor (5%), captan (6.8%) | Greenlight Rose & Flower Dust | aphids, beetles (flea, blister), leafhoppers, plant bugs, spider mites, thrips, whiteflies | |
| resmethrin (0.8%), pyrethrins (0.2%) and piperonyl butoxide (0.2%) | Ford's InterCept Insect Control Rose, Flower & Ornamental Spray | aphids, fungus gnats, leafhoppers, plant bugs, red spider mites, thrips, whiteflies | avoid wetting blossoms |
| rotenone (1.1%), pyrethrins (0.8%) | Greenlight Organospray | aphids, flea beetles, fleahopper (garden), leafhoppers, spider mites, thrips, whiteflies (greenhouse) | |
| tetramethrin (0.2%), sumithrin (0.191%) | Ortho Home Defense Home & Garden Insect Killer | aphids, caterpillars, leafrollers, mealybugs, spider mites, whiteflies | |

*Note: Some of the products listed are Restricted Use or for commercial use only and cannot be purchased without a pesticide applicator license. For any insecticide, always refer to the product's label for instructions, registered use sites (outdoor, greenhouse, interiorscape), species controlled and plant species or types on which the material can be safely applied.

** These products are used primarily by commercial rose growers and professional landscape maintenance personnel.

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