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Because SEVIN[®] carbaryl insecticide helps you get your grounds maintenance program under control. It effectively controls over 119 insects that attack trees, shrubs, ornamentals and turf. It's particularly effective against the damaging gypsy moth. SEVIN is available in a wide variety of formulations — including easy to measure and mix SEVIN SL carbaryl insecticide. And SEVIN is compatible with most miticides, fungicides and other insecticides. So, keep your customers' insects under control, with SEVIN.




Sevin[®]
CARBARYL INSECTICIDE

UNION
CARBIDE

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UNION CARBIDE AGRICULTURAL PRODUCTS COMPANY
P.O. Box 12014, T.W. Alexander Drive
Research Triangle Park, NC 27709

Circle No. 157 on Reader Inquiry Card

White grubs used to laugh at insecticides...



now there's **OFTANOL.** **Heh-heh-heh.**



When it comes to stubborn white grubs, you get the last laugh.

Apply one shot of [®]OFTANOL 5% Granular Insecticide at the recommended rate at the recommended time and it's goodbye, grubs. All season long.

OFTANOL can be applied with either drop or rotary spreaders and, normally, needs no watering in to work. Its low water solubility resists leaching, so OFTANOL is retained in the upper soil profile where it controls grubs on contact.

OFTANOL can also take out existing populations of sod webworm larvae, *Hyperodes* weevil, billbugs, and chinch bugs. Just follow directions on the label.

With its lasting residual action,

OFTANOL requires fewer applications and is more economical than other insecticides.

OFTANOL provides the most ef-

fective control of mole crickets of any product presently registered, but such use is limited to states which have issued Special Local Need registrations. Check with your state extension office.

Ask your turf chemicals distributor for OFTANOL.



OFTANOL is a Reg. TM of the Parent Company of Farbentfabriken Bayer GmbH, Leverkusen.



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Agricultural Chemicals Division
Specialty Products Group
Box 4913, Kansas City, MO 64120

Landscape

ber of generations of a pest are important when providing the service to a client for optimum results and satisfaction.

Pests and control by season

DORMANT PERIOD: This appears to be an ideal time to control insects that survive from season to season in the egg stage or an immature form that can be smothered by the use of a highly refined oil, generally referred to as superior oil and often times called dormant oil. Its mechanism of action is to exclude oxygen to the insect and not damage the plant. However, oils will not control eggs laid in large masses that are engulfed in a protective layer of hair, wax, or other materials or have limited breathing pores.

I. Scales

A. *Armored Scales* — oil controlled or else wait for the crawler stage.

1. Oyster shell — Found on a wide assortment of plants. Characteristic to look like oysters on a branch. Brown and gray scale. Brown has two generations a year which often involves additional sprays in the foliage stage.

2. Cottony Maple Scale — Small immature females on younger wood. Most common on Silver Maple and Linden — One Generation.

3. Obscure Scale on Oak — Often overlooked because it blends in well with the natural bark. Ideally named. One Generation.

4. Pine Needle Scale — Obvious white flecks on needles. More than one generation in many areas makes this scale difficult to control.

5. Euonymus Scale — Obvious white flecks on leaves and not as obvious on the woody tissue. Multiple layers makes control difficult. Multiple generations — female scale resembles oyster shell scale when initially developing.

6. Euonymus Scale (Winged) — A scale on *Euonymus elatus* types

that blends in so well with the natural bark that it is often missed and not recognized until segments of the plant dies.

7. White Peach Scale — A very characteristic growth on stone fruit, lilac and privet. Females are circular, white tinged with lemon yellow center, males are elongated and white. Multiple generations in the south.

8. San Jose Scale — At one time a severe pest problem on many plants. It appears to be on the increase in some areas. Multiple generations exists.

9. European Elm Scale — Primarily on elms. Females are oval, reddish brown and surrounded by a white cottony fringe — One Generation.

10. Camellia scale — Females are elongate, oval and dark brown to almost black in color. They somewhat resemble oyster shell scale. Overlapping generations exist.

11. Juniper scale — White round convex females with yellow center on juniper but arborvitae, incense cedar and cypress attacked — One Generation.

B. *Unarmored or Lecanium scales* — oil control is minimal unless applied at critical stage in life cycle. In general major direction of control is toward the crawler stage of the life cycle, with materials such as acephate, bendiocarb, diazinon, malathion and dimethoate.

1. Fletcher Scale — Common on taxus. Sometimes called Taxus Lecanium. Also on arborvitae and juniper — One Generation. Crawlers occur in July, feed on foliage then on bark.

2. European Lecanium — Found on Ash, Oaks, Pine and fruit trees. Crawlers active in June — feed on leaves. One or two generations.

3. Magnolia Scale — One of the largest scales. Crawlers active in late summer or early fall. One Generation. Sooty mold common due to heavy honey dew formation.

4. Globous scale — A scale of mi-

nor importance but injurious to prunus species.

5. Tulip Tree scale — Large scale that feeds on the bark. Crawlers active in late summer. One Generation.

6. Wax Scale on Euonymus — Scales with thick heavy covering of white wax over their bodies. Common in warm climates on many plants. May have more than one generation. Highly reproductive. Control in crawler stage best.

II. Eggs in Singles or Single Layers

— can be suppressed with superior oils.

1. Fall Canker Worm — Eggs deposited late in the fall and controlled by superior oil. One Generation.

2. Eriophyid Mites (Ash flower gall, Bladder gall mite maple) — Mites or eggs that are found under or around buds where they overwinter. Can be suppressed with superior oils. Pear leaf blister mite, ash flower gall, arborvitae tip dwarf mite, maple bladder gall mite fall in this group. In most cases — One Generation.

3. Aphids — Soft bodied insects that over winter as eggs on specific hosts in northern climate. Oils will help suppress development on treated plants. Rapid build up on other plants often necessitates the need for additional treatments during the growing season.

4. Spider Mites — Species such as spruce spider mite or red mite on apple that overwinter as eggs on the needles or woody tissue can be controlled with oils. This is different from the two spotted mites that over winter as hibernating females in plant duff. Multiple Generations.

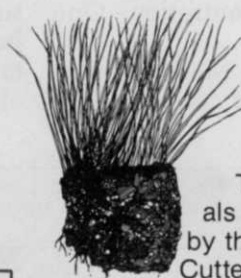
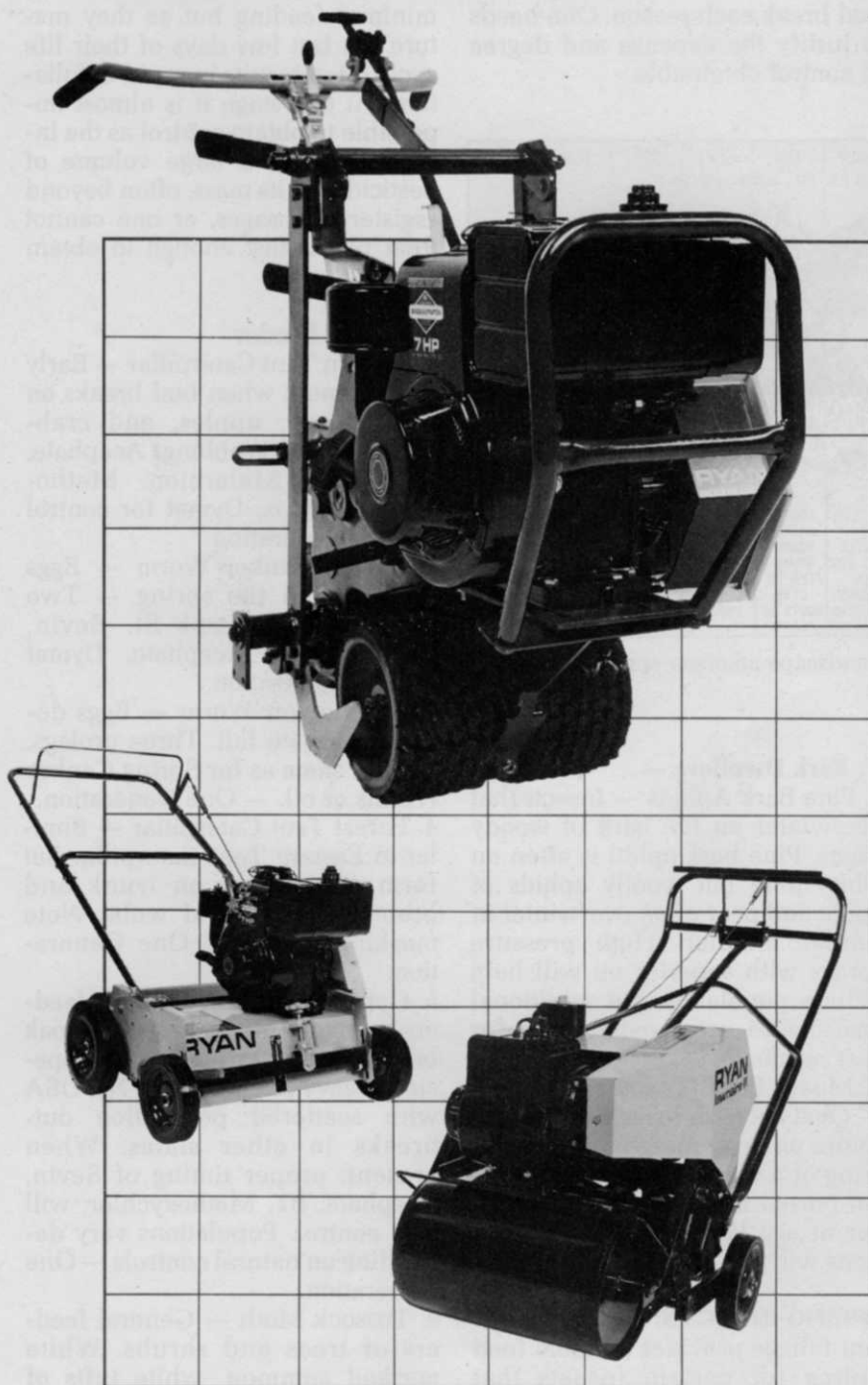
III. Eggs in Masses — cannot be suppressed with superior oils. Control directed to larval stage of life cycle.

1. Spring Canker Worm — Eggs deposited on masses on bark early in the spring.

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Turf-care professionals everywhere swear by their Ryan® Jr. Sod Cutters. "The toughest," they say.

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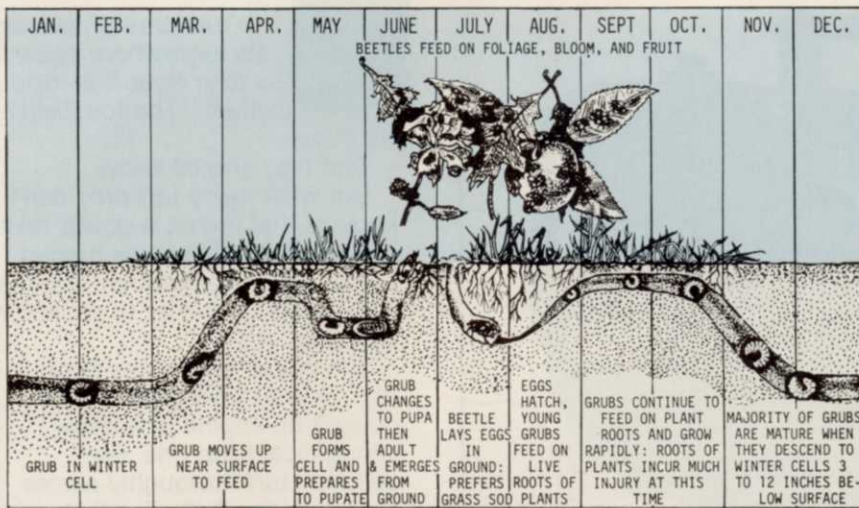
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Landscape

2. Gypsy Moth — Masses of eggs in a felt-like media of insect hairs. One Generation.
3. Eastern Tent Caterpillar — Masses of immature embedded in a varnish like material that is resistant to oil penetration. One Generation.
4. Tussock Moth — Masses of eggs cemented to the old cocoon.

Oak Leaf Gall, Oak Flower Gall) — Many are difficult to control because of unknown or complicated life cycles. The ones that form on new growth and related bud tissue can be suppressed to a degree with superior oil when it is used prior to bud break each season. One needs to justify the expense and degree of control obtainable.

correlate well with plant development and degree day heat-unit accumulation. These spring feeders, when present in large numbers, can cause severe defoliation in a matter of days. The young stages are often unnoticed because of minimal feeding but as they mature the last few days of their life cycle often results in rapid defoliation. At this stage it is almost impossible to obtain control as the insects requires a large volume of pesticide for its mass, often beyond registered dosages, or one cannot treat plants fast enough to obtain control.



Life cycle of the Japanese beetle tells the landscape manager spring soil treatments may reduce summer foliage damage.

IV. Woody Galls — life cycles and timing very important for control.

1. Cooley Gall (Adelgids) — Galls are empty at this stage but the immature are present at base of needles where oils can give a degree of control. But you need to watch for needle color shift with oil. Better to use Sevin, Malathion or Dursban on prime plants, just prior to bud break.
2. Eastern Gall (Adelgids) — Old brown galls are empty at this stage but immature are present at base of needles where oils can give control. Coverage and penetration important. Note Cooley gall controls.
3. Horned Oak Gall — Common on pin oak and other black oaks. Complicated life cycle. Horned oak gall has a two year cycle and oils will give a degree of suppression if used on a regular basis.
4. Miscellaneous Galls (Succulent

V. Bark Dwellers —

1. Pine Bark Aphids — Insects that overwinter on the bark of woody stems. Pine bark aphid is often on white pine but woolly aphids of apple and pear often overwinter in similar manner. High pressure sprays with superior oil will help reduce population but additional insecticides are needed later for best results.
2. Mealy Bugs (Taxus mealy bug) — Oval sluggish insects with short spines on body margins and a covering of a mealy white powder often buried in a mass of cottony fiber at egg laying time. Oil emulsions will aid in control.

SPRING INSECTS: Tender succulent foliage provides an ideal food source for certain insects that hatch with some of first warm weather of spring. This appears to

I. Foliage Feeder

1. Eastern Tent Caterpillar — Early development when bud breaks on wild cherry, apples, and crab-apples. (Note Webbing) Acephate, Bt, Sevin, Malathion, Methoxychlor, Dylox, Dymet for control — One Generation.
2. Spring Canker Worm — Eggs deposited in the spring — Two prolegs — Control Bt, Sevin, Methoxychlor, Acephate, Dymet — One Generation.
3. Fall Canker Worm — Eggs deposited in late fall. Three prolegs. Control same as for Spring Canker Worms or oil. — One Generation.
4. Forest Tent Caterpillar — Similar to Eastern Tent Caterpillar but form silken mat on trunk and branches instead of webs. Note markings on back. One Generation.
5. Gypsy Moth — Voracious feeders on many plants preferring oak but damaging to many other species. Heavy population in NE USA with scattered population outbreaks in other states. When present, proper timing of Sevin, Acephate, BT, Methoxychlor, will give control. Populations vary depending on natural controls — One Generation.
6. Tussock Moth — General feeders of trees and shrubs. White marked common, white tufts of hair. Western Tussock moth a

Continued on page 50



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Bye-Bye

New Rubigan™ spells curtains for
And then some.

Rubigan™ turf fungicide serves notice. Because, after extensive testing, Rubigan has proven to be remarkably effective in evicting unwanted fungi that give any golf course an unfair handicap.

Broad spectrum control.

Dollar spot (even fungicide resistant strains), large brown patch, fusarium blight, stripe smut and pink or gray snow mold—these tenants might as well start thinking about a forwarding address. And if others are lurking in the neighborhood, Rubigan is compatible with most contact or systemic fungicides commonly used on turf.

Preventive and curative action.

Rubigan provides you with the flexibility to manage a disease prevention program and, at slightly higher rates,

provides curative action on dollar spot and large brown patch. More to the point, Rubigan acts as an enforcer that prevents turf diseases from making themselves feel at home on tees, greens and fairways.

Unlikely development of resistance.

Rubigan has a mode of action involving three or more sites of inhibition (a multi-site inhibitor). Years of successful use outside of the U.S., as well as trial usage in the U.S., have shown that susceptible fungi commonly found in turf have not been able to develop resistance to Rubigan.

Longer-lasting control.

Rubigan is a very active, concen-

trated product. Long lasting control allows for longer intervals between spraying. You can reduce the number of application trips and save on fuel and labor costs. What's more, lower use rates mean less storage and lower handling costs.

Rapid leaf penetration.

Rubigan is a foliar-applied, locally systemic fungicide. It's absorbed almost immediately into leaf tissue and isn't susceptible to washoff by rain or irrigation once the spray has dried. While the spray is drying, the active ingredient sets up shop inside the plant where it can't be washed out. Disease protection begins immediately after application.

Excellent turfgrass safety.

No adverse effects or discoloration



Fungi.

Five major turf diseases.

occurs when Rubigan is used at recommended rates. Your university turfgrass research personnel will tell you that Rubigan is as beneficial to your turf as it is destructive for five major turf diseases. For more information on cost-efficient Rubigan, contact your distributor or write: Elanco Products Company, 10 S. Alabama St., Dept. E-455, Indianapolis, Indiana 46285.

Precautions: Applications of RUBIGAN to turfgrass areas containing *Poa annua* (annual bluegrass) may result in the gradual reduction of this species from the turfgrass area. Cumulative dosages of 5 pounds of RUBIGAN 50W per acre or 2 ounces per 1,000 sq. ft. are usually necessary for this response to occur. Turfgrass areas containing *Poa annua* which cannot tolerate its reduction should not be treated with RUBIGAN.

Rubigan. It's spreading.

For best results, always read and follow the label directions.



Rubigan™
(fenarimol, Elanco Products Company)

Circle No. 115 on Reader Inquiry Card

Landscape



Canker worm larvae can defoliate entire trees and then swing to nearby trees on strands of silk.

problem in Mt. States. White marked may have several generations. Most materials listed for previous feeders are effective.

7. Yellow Necked Caterpillar — Yellow and black striped caterpillar with prominent yellow spot just back of the head. Feed in groups and raise head and tip of abdomen when disturbed — One Generation generally. Sevin, Acephate effective.

8. Juniper Web Worm — An insect that may cause severe damage before it is recognized — Reddish brown caterpillar overwinters in the frass on branches. Penetrating sprays of Acephate, Diazinon, Sevin, Dymet in early spring or early fall needed for control. One Generation.

9. Green Stripe Maple Worm - A limited insect on Maple in river bottoms but a major defoliator when present. Two Generations — with the second being most damaging — Sevin, Acephate, Methoxychlor, Dymet.

10. Elm Leaf Beetle — Larvae feed on the lower leaf surface causing them to die and drop prematurely. More than one generation —

Sevin, Methoxychlor, Dymet and Acephate for control.

II. Sawflies and Leaf Miners

1. European — Eggs are deposited in needles in late fall. Look for symptoms on needles to determine potential problem. Use Acephate, Methoxychlor, Sevin in early stages. Other conifer sawflies develop during the summer.

2. Birch Leaf Miner — Small black fly-like wasp present when leaves are 1/2 grown signifies time to apply a protective control. Use Sevin, Diazinon, Acephate, Dimethoate before egg laying. After eggs are deposited, use Acephate or Dimethoate.

3. Arborvitae Leaf Miner — Small green caterpillar with black head that overwinters in mined leaves. Look for holes in Terminal Tissue. Adults are small moths. One Generation. Direct sprays in spring - Acephate

4. Locust Leaf Miner — Many plants skeletonized by adults. Mining occurs on black locust — Two Generations. Limited materials for control. Lindane and Dibrom are listed.

5. Other Sawflies — Skeletonized foliage or consumed foliage. Need to watch for damage as insects are sporadic. Most materials listed will give control.

III. Sucking Insects

1. Aphids — Often present on new growth. Use Malathion, Diazinon, Dymet, Acephate, Bendiocarb. Acephate and Bendiocarb have longer residual but new generations build quickly. Need to watch closely.

2. Spider Mites — Common on evergreens. Need to watch for off-color foliage. Spruce spider mite may be a problem at this time. As weather warms up, two spotted spider mite becomes more common. Kelthane, Malathion, Vendex, Dymet

3. Plant Bugs and Leaf Hopper — Common on honey locust as new

growth unfolds. Sevin, Dymet, Diazinon.

4. Lace Bugs — Found on hackberry, oak, Mt. Ash, Sycamore Elm, Azalea. Wings that appear lace-like due to many veins. Can cause much leaf browning. Several Generations — When severe — Use Malathion, Sevin, Acephate, Dymet, Methoxychlor.

IV. Borers

A. Clear Wing — Early season emergent holes. Use pheromone traps to detect activity. Protect new wood with Dursban or Lindane.

B. Beetle

1. Bronze Birch Borer — Severely damages white birches — Plant vigor is a factor but protection possible with Bendiocarb or Lindane — Timely application needed.

2. Flat Head & Round Head — Enter in wounded or weakened plant tissue. Little to no control once tissue is invaded. Plant vigor is major control.

V. Scale

1. Oyster shell crawlers — The early crawler stages of euonymus, oyster shell, oak kermes, golden oak and pine needle scale can be active at this time so plants should be carefully watched for activity. Acephate, Sevin, Diazinon, Malathion for control - Multiple Generations.

VI. Shoot & Tip Moths

a. Pine Tip shoot moths

b. Mugo pine shoot moth

Several species of shoot and tip moths needed to be treated for at this time of the year. Timing important and local pests need to be checked. Several materials are suggested including Sevin, Acephate, Dymet, Lindane, Bendiocarb and Dimethoate.

SUMMER INSECTS: These insects feed on mature or near mature foliage. Injury at this time may reduce the amount of sugar or carbohy-

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