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Insect and Mite Control on Woody Ornamentals and Herbaceous Perennials

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Insect and Mite Control on Woody Ornamentals and Herbaceous Perennials

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Cover Photos

Hover Fly adult on Aster Flower, an Important Aphid Predator.

(insert) Lilac/Ash Borer Adult.

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Insect and Mite Control on Woody Ornamentals and Herbaceous Perennials

Introduction

Attractive, vital landscape plants contribute significantly to real estate values. On the other hand, poorly maintained landscapes may become a liability, especially if trees or their parts fail and cause property or bodily injury. This realization, coupled with increased leisure time to enjoy our yards and more discretionary income for landscaping and landscape maintenance have contributed to dramatic increases in the demand for nursery products and competent service personnel. At the same time, concerns for environmental quality and safe use of pesticides require that plant health care activities, including pest control, provide quality plants without creating adverse side effects. This is the challenge for anyone dealing with plant propagation, production, or maintenance.

The nursery industry produces a diverse array of plant materials for landscape use. In many cases, these plants are native to North America and are not seriously damaged by insects or mites on native sites. However, when these same plants are grown under nursery conditions or in a landscape, native arthropods sometimes become pests. Although we do not know precisely why this occurs, it is undoubtedly related to site factors that create instability in plant-insect relationships. Either the effectiveness of natural enemies, including other arthropods and microorganisms, that normally minimize reproductive success is reduced, or the plants become stressed so that they are more attractive or susceptible to opportunistic colonizers. Perhaps both regulating mechanisms commonly breakdown when plants are grown on non-native sites, especially under stressful conditions like those found in the urban forest.

Of course, many pests that damage landscape plants were introduced in the absence of natural enemies that normally limit their exploitation. Japanese beetle, black vine weevil, and gypsy moth are examples of exotic insects that have become extremely common and damaging in North America. Although major efforts have been made to introduce parasites and predators of some introduced pests, they must usually be controlled with pesticidal sprays when their density threatens plant vitality. In any case, potentially damaging arthropods are common on landscape plants.

Since most of us take plants for granted or at least fail to inspect them periodically, insects and mites commonly cause damage before their presence is detected. This chronic lack of vigilance often results in plant damage and causes unnecessary use of large amounts of pesticides. Scheduled plant inspections and use of spot-spraying to control small but building infestations of pest species is a superior way to minimize damage from arthropods.

This bulletin has been prepared to inform users about the insect and mite pests that commonly attack landscape plants, when these pests are most vulnerable to control measures, and currently available control options. The following narrative is included to help plant producers and landscape management practitioners understand the basic principles involved in making responsible and effective pest control decisions.

Making Decisions About Pest Control

Arthropod presence on a valuable plant does not necessarily mean that an effort should be made to eliminate it. If the plants are in nursery production and if the organism is an acknowledged pest species, then it should be controlled as soon as it becomes vulnerable to an efficient control tactic. However, the arthropod might be a beneficial species or a pest species at a low enough density on a landscape plant that control is not necessary. Several factors are considered sequentially to determine the need for indirect or direct action.

Accurate Identification

The first step when an arthropod is detected is to determine its identity. Many insects found on landscape plants are transients or beneficials, part of the natural community that helps keep pest species at low levels. It is extremely important to conserve beneficial arthropods like ladybird beetles, green lacewings, and parasitic wasps, by using pesticides only when they are needed. County agents, extension specialists located at land grant universities, and landscape maintenance personnel can help identify common arthropods, both pests and non-pests.

Once an insect or mite has been identified as a pest species, its biology and seasonal life history can be obtained to determine how and where it feeds, damage symptoms, number of generations it completes each year, the kinds of plants it infests, stage(s) and time(s) when it is vulnerable to control tactics, and current control options. All of this information is then used to determine the best strategy for dealing with the pest. (see INSECT & MITE MANAGEMENT ALTERNATIVES - The Control Options)

Degree of Infestation

Until a certain number of insects is present on a plant, control measures are not needed. It's not always easy to know when there are enough insects present to justify control measures. One thousand caterpillars eating leaves might completely defoliate a tree in two weeks, whereas that same number of aphids would hardly be noted. Yet 1,000 aphids today may become 100,000 in a month. This may be more than a plant could tolerate.

It is especially difficult to say how many insects should be present on ornamental plants before we should spray. Plants established and growing well in the landscape may be able to tolerate more pests than poorly growing plants. Likewise, some home owners expect no pests while others don't even notice anything until extreme damage has already been done. Of course, nurseries are a different problem. State and federal regulations, as well as purchaser demands, require that plant stock for sale be "pest free." This places rather difficult standards for the final product to be sold. Experience tells us that certain pests must be controlled at the first sign of their presence because they will likely increase in numbers and cause considerable damage. With some pests and on certain plants, we will want to watch the infestation closely and treat only if the injury gets progressively worse.

What Happens If Nothing Is Done?

In some cases, doing nothing is the best course of action because predators, parasites, and other factors take over and the pests soon disappear. Most established deciduous trees can be completely defoliated without any apparent permanent harm to them, but defoliation may weaken younger or newly transplanted trees and most shrubs until they die or become susceptible and attractive to other injurious pests.

Doing nothing may result in the beauty of a plant being destroyed or a pest becoming numerous enough to make a general nuisance of itself. In the case of a heavy borer or scale infestation, doing nothing could result in the death of a plant, regardless of its age or size.

Is Spraying Cost Effective?

The cost of having a tree or shrub sprayed one or more times may help a person to make up his/her mind quickly about what to do. It often requires at least two applications of an insecticide/miticide to clean up an infestation. Small trees and shrubs can be sprayed by the homeowner at much less expense. Tall trees may require a sprayer capable of developing as much as 500 pounds of pressure to force the spray to the top of the trees. This undoubtedly must be done by a commercial operator.

From what we have said so far, you probably realize that a person confronted with a pest problem may need some help to know just how serious the problem is and what needs to be done about it.

Where to Get Help

The Ohio State University Extension has offices throughout the state. In these offices, personnel are available to help you with your pest problems. Take the specimen to your local county OSU Extension office where they can determine if the sample needs to be submitted to The Plant and Pest Diagnostic Clinic in Columbus, OH. Be sure to provide as much information about the problem as possible. This helps specialists evaluate the problem and prescribe a recommendation.

The Plant and Pest Diagnostic Clinic charges a nominal fee for specimen identification. Your county office has proper forms and fee schedules.

Importance of Early Pest Detection

Because the number and kinds of ornamental pests vary from year to year and even from month to month in any one year, you never know what pest problems you can expect or how severe they will be. So to prevent a pest from slipping in and becoming established on a plant without being noticed, visually inspect plants at least two or three times during the growing season. This may only involve a general inspection of the plants to see that there isn't a loss of color or that the leaves are not being eaten. Turn over a few leaves to see if there are any pests on them. Remember, some insects feed only at night and hide during the daytime. Early detection of a pest provides time to get the problem corrected before the plant suffers permanent injury.

Insect and Mite Management Alternatives Integrated Pest Management

Pest Management versus Pest Eradication

Managing insects and mites which attack our urban ornamental plants has generally relied on the use of pesticides. Whether this is good or bad is beyond the scope of this discussion, but we must ask whether alternative controls are available. Before we can consider the alternatives, we should review our current concept of pest management. Pest management as opposed to "eradication" implies that some pests will always be around. It is the goal of pest management to keep the pest populations down to a level where damage is not overly evident. In field crops, this has generally be termed an economic threshold level. In urban ornamentals, the aesthetic threshold level (the population of a pest which causes noticeable, unacceptable visual damage) is the term to be used.

Integrated Pest Management (IPM) - A Definition

Another common term used is **integrated pest** management (IPM) which is the selection, integration, and implementation of pest control (biological, chemical or cultural) based on predicted economic, ecological, and sociological consequences. In other words, when we use a pest control we must consider the cost both to the ecosystem and human society. Using the IPM approach, three important concepts must be accepted:

- 1. No **single** pest control method will be successful. All of the control options biological, chemical and cultural must be used.
- 2. **Monitoring** (sampling) of the pest is constantly needed in order to evaluate the status (not present, present but not causing aesthetic damage, present and causing aesthetic damage, etc.) of a pest population.
- 3. Therefore, mere presence of a pest is not a reason to justify action for control.

There has been considerable misunderstanding about IPM, IPM control options and the underlying concepts. Perhaps a look at what IPM is or IPM is not will aid our understanding of these concepts.

What IPM is Not:

- 1. IPM is not a biological control program though biological control is a useful option. However, biological control is only one of the options. We also have to consider chemical and cultural controls.
- 2. IPM is not an organic program though organic materials can certainly be used if they do not create economic, environmental or sociological problems.
- 3. IPM is not a pesticide free program because the chemical control tactic may be warranted. Generally, IPM programs have reduced chemical controls (pesticides) but not eliminated them. It is not necessarily the goal of an IPM program to reduce or eliminate pesticides.
- 4. IPM is not the least or most expensive method of pest management. Usually, the cost of pest control remains close to original costs. Monitoring and sampling costs are traded for scheduled pesticide applications.

What IPM Is

- 1. IPM is a decision making process. Each plant, each year and each habitat is slightly different and programmed controls will not address these differences. Thus, monitoring must be performed and decisions must be made.
- 2. IPM is a system of pest management decisions based on ecological, economic and sociological values.
- 3. IPM is a process of pest monitoring and sampling. We must know the status of a pest and whether it really needs a control action or not.
- 4. IPM is a process which considers all of the control options.

Monitoring

Monitoring pest activity and population levels is the key to successful IPM. Unfortunately, most feel that monitoring must be a complicated and time consuming process where someone must constantly watch each and every plant. This is simply not true. Monitoring of pests in nurseries and landscapes can be done in a multitude of ways - from visual inspection to using temperature-dependent (degree-day) developmental models. Another method of solving the seemingly impossible task of monitoring pests in complex settings is the concept of KEY PLANTS and KEY PESTS:

- 1. **Key Plants** are trees, shrubs and flowers which are known to have perennial pest problems. As an example, birch trees always get leafminers, aphids and borers while red oaks rarely get significant pests.
- 2. Key Pests are those which cause significant damage or may kill trees, shrubs or perennial flowers. These key pests often have special times (windows of opportunity) that they are susceptible to controls. Aphids or galls in oaks are rarely significant enough to warrant controls while peach tree borers in ornamental plums need special attention.

The Control Options

As mentioned above, IPM uses three general control options - biological, chemical and cultural controls. These are our alternatives and we must understand the benefits and limitations of each option. Since we are dealing with omamental landscape plants, most of the pest problems are a direct result of poor horticultural maintenance. In other words, plants placed in urban habitats or pushed during nursery production and are not suitably adapted are the ones most likely to be severely attacked by pests. Therefore, let us look at the cultural control option first.

Cultural Controls

The cultural control option should be our first consideration as an alternative in landscape tree and shrub IPM. Cultural controls in field crops have generally included sanitation, crop rotation, tillage, host plant resistance/tolerance, mechanical/physical destruction and quarantine. If we look at these techniques, we may wonder how these relate to ornamentals in nurseries or landscapes. Though we use different terms, these techniques are commonly used and need to be emphasized more.

- 1. Sanitation helps remove inoculum or hiding areas of pests. Pruning, raking of leaves and destruction of heavily infested plant stock are sanitation techniques useful on our urban landscapes and nurseries.
- 2. Crop Rotation is generally used in field crops (i.e. corn rotated with soybean) but should be considered for ornamental tree and shrub production. Many

nurserymen rotate growing areas by planting different types of stock after a rotation. This seems to help reduce attacks by borers and root infesting diseases. We also need to realize that most trees and shrubs in urban landscapes are limited by space which reduces their vigor with time. Therefore, if a plant has begun to reach its limitations, it should be replaced with a smaller, better suited one.

- 3. **Thilage** in field crops exposes resting pests and breaks up the soil for better air and water movement. In ornamental trees and shrubs, aeration and mulching are analogous.
- 4. Host Resistance uses plants which are less susceptible to pest attack (tolerance) or produce actual toxins (antibiosis) which kill or stop pest growth. Examples of trees and shrubs are well known though poorly utilized. In fact, most insects and diseases which are currently problems can be permanently eliminated with the use of resistant plants. For people concerned with the use of pesticides this is a major option to be considered.
- 5. Mechanical/Physical techniques are as simple as crushing the pest under foot to using large industrial vacuum sweepers to suck up pests. In our landscape plantings, we need to constantly remind ourselves that simple pruning or crushing of pests is preferable to chemical spraying. We are all guilty of spraying an entire juniper hedge for bagworms when only three or four bags were seen which could have been easily picked off and crushed. Likewise, we tend to "Rambo" spray tent caterpillars in the spring when we could just reach in, roll up the nest with the caterpillars inside and dispose of the mess in a bag.
- 6. Quarantine is a legal method of restricting movement of contaminated plant material. Unfortunately, this technique is rarely effective even though we know that most pest problems arrive on infested plant material. Therefore, we should pay special attention to new plantings which may have pests and plant stresses developed from the transplanting process.
- 7. Good Horticulture is one of the simple but commonly ignored methods of pest management. In other words, a "healthy" plant can generally fend for itself against insects, mites and diseases. Therefore, one of the most important control alternatives that we can use is tending to the proper needs of landscape plants. We need to match the correct trees and shrubs to the typical alkaline, hardpan clay soils of our landscapes. To not do so causes plant stress which allows pests to gain the upper hand.

Chemical Controls

Probably our second most useful control option in ornamental plant IPM is chemical control. Unfortunately, we have over used and misused this option so that most citizens are beginning to cast a weary eye to its use. Chemical control to most people means pesticides though other chemicals such as attractants and pheromones are increasing important in our IPM practice. Even if pesticides are our principal weapon, we need to understand that not all pesticides are created equal. In IPM, we want to use the ideal pesticide - a material that only kills the target pest. Unfortunately, we don't have these "silver bullets." Most of the pesticides which are currently used have short residual life spans (this reduces accumulation in the environment), are more selective (this reduces the chance of killing nontarget animals), and are used at lower rates (this reduces the total chemical "load" used). Because of these characteristics, we need to be able to better target our applications in order to achieve satisfactory control.

Another general public misconception about pesticides is that "natural" pesticides are better than "synthetic" pesticides. IPM does not make this distinction. Using pesticides in IPM is evaluated on economic, ecological and sociological impacts together. In other words there are "natural" botanical insecticides (i.e. nicotine sulfate with an $LD_{50}=55$ and a known carcinogen) which are much more toxic and have more adverse effects than some "synthetic" organic insecticides (i.e. acephate with an $LD_{50}=866$). In short, chemical controls used in IPM should be selected on their total attributes.

By knowing that we do not have "ideal" pesticides, whether natural or synthetic, we must use great caution to limit their adverse effects. Generally, this means that we should only **target sprays** to those individual plants or blocks which need it - **not cover sprays**. General cover sprays (spraying everything in the landscape or nursery whether needed or not) tend to cause several problems.

Cover sprays often tip the balance of control in favor of the pest. As incredible as this seems, cover sprays usually kill beneficial insects and mites (predators and parasites) better than they kill pests! Since pests usually have good reproductive ability, they "rebound" faster than their natural controls. This causes what we call **pest resurgence** and **secondary pest outbreak**.

Cover sprays tend to cause development of resistance. Pests and potential pests often develop resistance to pesticides when they are under constant pressure from a specific pesticide. In other words, a few insects on a plant may not be causing significant damage, but if we constantly spray these insects we are forcing them to develop resistance. Then, when they reach damaging levels our pesticide is no longer effective.

A more recently identified problem with general cover sprays of pesticides has been identified to be enhanced degradation. Since most of our current pesticides are organic compounds (i.e., containing carbon, hydrogen and oxygen), microbes are able to use the chemicals as foods or nutrients. Generally these microbes are beneficial in aiding in the removal of these pesticides from the environment. However, when constantly "feed" through general cover sprays, these microbes "learn" to "eat" these pesticides more rapidly than normal. In summary, if we are going to use the chemical control option, we need to use target sprays only when needed.

The chemical control option should be considered a limited resource. As with all limited or scarce resources, we need to conserve what we have. Many of the chemical companies are no longer developing traditional pesticides. The cost of discovery, development and registration are simply too costly. Therefore, we must conserve what we have and guard carefully the few new products which become available.

Most people think that chemical control merely means pesticides. The chemical control option also contains repellents, attractants and pheromones, and desiccants. It is easiest to discuss these by their chemistry and activity:

- A. Pesticides are chemicals which directly kill the pest.
 - 1. **Inorganics** are pesticides without carbon which can be natural earth minerals or man-made compounds. Examples are:
 - a. **Boric Acid** used for cockroach control, not registered for landscapes.
 - b. Diatomaceous Earth glass like remains of single celled organisms, diatoms, which scratch insect cuticle or puncture gut cells. Acts mainly as a desiccant and is rarely useful in landscapes unless combined with an insecticide like pyrethrin.
 - c. Sulfur an ancient control for insects and mites.
 - d. Sodium Fluoaluminate (=Kryocide, Cryolite) an earth mineral (or man made) which forms sharp glass-like particles which puncture insect gut cells if ingested. Since it is a stomach poison, it does not adversely affect beneficial predators and parasites. Good only against leaf feeding caterpillars, sawflies and beetles.
 - e. Mercury, Lead, Arsinates metal compounds used in the past for insect control which are now generally considered too dangerous to use.
 - 2. Oils are petroleum or plant based hydrocarbon chains which have insecticidal activity. Toxicity appears to be caused by suffocation and/or membrane disruption. Examples are:
 - a. Summer Oil a highly refined mineral oil used on green plants at a 0.5-2.0% rate.
 - b. **Dormant Oil** a slightly less refined mineral oil or summer oil used at a 2.0-4.0% rate when plants are in winter dormancy. When used in winter, has minimal adverse affect on beneficial insects.

- c. Citrus Oil raw oil or separate constituents (e.g, d-Limonene) which have insecticidal properties at low dosages. Usually combined with other insecticides such as soaps.
- 3. Fatty Acid Salts or Soaps are man made hydrocarbons using an ion, usually potassium or sodium, to join together fatty acid chains. Fatty acid chains containing 6 to 10 carbons have insecticidal properties. Insecticidal soaps apparently disrupt cell membranes. Soaps tend to be very good at controlling soft bodied insects such as aphids, mealybugs, soft scales, caterpillars, beetle larvae and spider mites.
- 4. Microbial Toxins are molecules produced by bacteria, fungi, protozoa and other microbes which are toxic. Toxins like Bt endotoxin are relatively low in toxicity to mammals while botulism toxin is one of the most toxic molecules known. These toxins are used by extracting the microbe or using whole organisms. Examples are:
 - a. **Bacillus thuringiensis** (Bt) a bacterial product containing both endotoxins and spores which are active on a variety of insects. See Biological Control below.
 - b. Avermectin-B (=Abamectins, Avid) a powerful toxin (LD50 = 10mg/kg) derived from *Streptomyces* fermentation.
 - c. Chitin (=Clandosan) is the chemical which makes up the exoskeleton of arthropods (insects, crustaceans, etc) and nematodes. By adding chitin to the soil, microbes produce toxins (ammonia) and/or produce digestive enzymes which destroy the cuticle of insect and nematode pests. Field results in landscapes have not been consistent in efficacy.
- 5. Botanicals are plant extracts, usually alkaloids, which have insecticidal properties. Most people believe that since these are "natural" products, they are "safer" than other pesticides. Many of these chemicals have not been fully tested and many have striking adverse affects on mammals. Many cause severe allergic reactions (i.e. pyrethrin and sabadilla), have high toxicity (nicotine), or are even suspected carcinogens (nicotine). Examples are:
 - a. **Pyrethrin** $(LD_{so}=200)$ is derived from a specific species of chrysanthemum originally grown in Iran. The natural product is mainly an irritant to insects and is usually mixed with piperonyl butoxide (PBO) or rotenone to provide better kill of insects. Some people are very allergic to the compounds.
 - b. Rotenone (=Cubé, Derris)(LD₅₀=132) is an alkaloid from roots of a tropical plant. Highly

toxic to fish, and it was used originally by South American indians to collect fish from lakes and rivers. Very toxic to pigs.

- c. Sabadilla (LD₅₀=2500-4000) is an alkaloid derived from a lily seed from South America. Though having low dermal toxicity, it is a powerful irritant which if inhaled can cause severe circulatory and respiratory failure. In spite of some magazine articles, this product is only registered for vegetable pests.
- d. Nicotine $(LD_{50}=55)$ is an alkaloid derived from tobacco which high toxicity and is a suspected carcinogen.
- e. Neem (Azadirachtin, BioNeem, Margosan-O)(LD50 >3000) is an interesting botanical derived from an Asian tree grown in India. Neem is used as a general cleaning chemical and is found in tooth paste. It seems to act as a systemic with repellent and growth regulator effects on insects and mites.
- f. Ryania $(LD_{50}=750)$ is an alkaloid from a tropical tree with rather high oral toxicity. The oral LD_{50} to dogs is 150 mg/kg. It is only registered for some vegetable crops.
- 6. Synthetic Organics are man made compounds containing carbon and are usually synthesized from petroleum products. This is the group most people refer to when they mention pesticide. Because of the diversity and number of materials in this group no attempt will be made to cover these compounds.
 - a. Organochlorines (=Chlorinated hydrocarbons) are organics which usually have long residual life spans in the environment. This quality has caused most to be banned because they end up in the food chain or cause damage to non-target organisms.
 - b. **Organophosphates** usually have short residual life spans. They are often stated as being related to nerve gas. Compounds in this group range from category 1 to 3 in toxicity and are generally neurotoxins.
 - c. Carbamates may have long or short residual life spans and range from category 1 to 3 in toxicity. Most are neurotoxins.
 - d. **Pyrethroids** are synthetics which look and act like the botanical, pyrethrins. They range from category 1 to 3 in toxicity though most are in categories 2 and 3.
 - e. Insect Growth Regulators (IGR) are synthetic chemicals which look and act like insect hormones. They are often metabolism modifying organophosphates and carbamates with very low toxicities to mammals or other

non-target animals.

- B. Repellents are compounds, both natural and synthetic which cause a pest to stop feeding or move away. Most are used as products applied to skin or clothing to repel mosquitoes and ticks.
- C. Attractants and Pheromones are compounds which attract a pest thinking that the compound is food or another of the species (aggregation and sex pheromones). Most of the compounds in this group have not been used effectively to reduce pests but are used in traps to sample pest activity. Examples are:
 - 1. Geraniol/Eugenol is the attractant "floral scent" used in Japanese beetle traps. These traps do not reduce beetle damage or grub populations. In fact, evidence exists that plants near traps may sustain more damage.
 - 2. **Disparlure** is the sex pheromone attractant for gypsy moth males. It is a powerful sampling tool but has not been successful in disrupting mating.
 - 3. Clearwing Moth Borer Pheromones is a mix of sex pheromones attractive to several borers such as the dogwood, lilac/ash, rhododendron and peach tree borers. These traps allow for precise timing of larval controls.
 - 4. Pine Tip Moth Pheromones are sex pheromones for various pine tip moths. These traps determine the starting point for degree-day models for predicting larval control windows.
- D. Desiccants are materials which cause the insect pests to loose water faster than they can replace it. Since insects are very small, this water loss is rapidly lethal. Unfortunately, most desiccants must be kept dry so outside usage is limited. Examples are:
 - 1. Silica Gel is the same drying agent used in packing or flower drying and can be ground to a powder to dust onto insects.
 - 2. **Diatomaceous Earth** acts like a desiccant when dusted on the exterior of insects. The sharp edges of this product abrades away the thin wax waterproofing coat on the exoskeleton of insects.

Biological Controls

Biological control is using **parasites**, **predators** and **pathogens** (diseases) to control pests. We have to realize that in the urban landscape and nursery, there is a multitude of beneficial insects and mites which can prey on pests. In many cases, these naturally occurring beneficials will do a good job of controlling the pests if we do not disturb the system too much. As stated above, we usually disrupt this system by over using pesticides which kill the beneficials better than the pests. On the other hand there are occasions where we can actually increase these biological controls. The classical way to implement biological controls is through introductions, conservation and augmentation.

- A. Introductions of exotic parasites, predators or diseases are made when foreign pests become established. This is an attempt to create some of the checks and balances found where these pests are naturally controlled. Occasionally, foreign biological controls are found which may better control native pests.
- B. Conservation is using other control tactics, usually pesticides, so that they have the least adverse affect on predators and parasites. It can also be the providing of habitat or food needed by biological controls to improve their survival. In the urban landscape or nursery we can use targeted sprays to those specific plants where pests are getting the upper hand. We can also plant flowers which provide necator and pollen to feed the adults of many of the parasitic insects.
- C. Augmentation is usually the rearing and release of biological control agents. Unfortunately, this technique is usually expensive and we must use those biological controls which fit into the definition of a "good" biological control.

What is meant by a "good" biological control? Not all predators, parasites and pathogens are useful in their ability to be used in pest management. Useful ones have the following characteristics:

- A. High Reproductive Potential they must be able to keep up with the high reproduction of the pests.
- B. Good Mobility they must be able to search out the pests or come into contact with the pests.
- C. Host Specific they should not be generalists which may adversely affect other, sometimes beneficial, organisms.
- D. Persistent they should remain when pest populations become low and carry over from season to season.
- E. Easily Reared or Encouraged this will allow them to be inexpensive and competitive with other controls.
- F. Tolerant of Other Controls in order to fit into a true IPM system, they need to be tolerant of cultural and chemical controls if used.

In order to illustrate these concepts, let's look at a preying mantis versus a lady beetle. The preying mantis has one generation per year, eats anything in sight (including each other and other beneficials), usually ignores the small insects such a aphids, mites and scales, often doesn't survive the summer to lay another egg case and is very sensitive to any pesticide. Therefore, preying mantids **do not** qualify as a useful biological control. On the other hand, lady beetles have many generations per year, they only eat a narrow range of pests (usually they are aphid, mite or scale specialists), usually overwinter well and can often withstand some of the softer pesticides, especially soaps and oils. Therefore, lady beetles easily qualify as a useful biological control.

Unfortunately, we often think that we have to actively introduce predators and parasites in our urban landscapes. Since most of these animals already exist, we merely have to be able to recognize them and avoid using cover sprays of pesticides.

Predators which you should learn about are:

- A. Lady Beetles are commonly sold as adults and are useful control agents if properly handled. The adults need to be fed some honey (to resemble aphid honeydew) in a cage (to suppress a strong migration urge) before release in the garden. Larvae are often mistaken for pests because they look like leaf beetle larvae or some other pests (e.g., the "mealybug destroyer" lady beetle larva looks like a mealybug).
- B. Green Lacewings are not to be confused with the pest, lace bug. The larvae feed on aphids, scales and mites. Eggs are purchased and sprinkled where small pests are noted to be active. The larvae must search for the pests because they do not have wings.
- C. Ground and Rove Beetles are active predators present in most soil/turf habitats. Both the adults and larvae feed on a wide variety of pests but are highly intolerant of pesticides.
- D. Syrphid Flies (=Hover Flies) are very common yellow and black flies which have voracious larvae (maggots) which eat aphids.

Parasites are insects (often called parasitoids) with larvae which feed on the inside of their host, usually killing or sterilizing it. Some common parasites which you should learn about are:

- A. Trichogramma Wasps (=Egg Parasite Wasps) are microscopic (usually less than 0.5mm long) and lay their eggs in the eggs of other insects. They are usually very host specific and generally limited to butterfly or moth (caterpillar) pests.
- B. Ichneumonid and Brachonid Wasps are small wasps which commonly attack caterpillars and aphids. The larvae usually emerge from the dying host and spin small white or yellow cocoons.
- C. Tachiniid Flies are generally medium to large flies which lay eggs on caterpillars or various leaf feeding beetles. The eggs hatch into maggots which feed on and eventually kill the host insect.

Pathogens are simply a variety of diseases which kill insects. They are usually bacteria, virus, fungi and protozoa. Insect pathogens are fairly ideal in that they are very host specific. They are also very non-infective to vertebrates. Examples are:

- A. Bacteria have been the easiest of the pathogens to utilize because they can often be reared "in vitro" (in artificial culture) and form spores fairly resistant to adverse environments. Examples are:
 - 1. **Bacillus thuringiensis** (Bt) has several strains which produce toxins lethal to various insect groups (and are thus technically a chemical control). The most common types are:
 - a. Bt 'Kurstaki' which affects only young caterpillars.
 - b. Bt 'Israelensis' which affects aquatic fly larvae such as mosquitos and black flies.
 - c. Bt 'Tenebrionis' which affects some leaf feeding beetles.
 - 2. Bacillus popilliae (= white grub milky disease) has one strain available which kills Japanese beetle grubs. Other strains have been identified which kill other species of grubs but these strains are not commercially available.
- B. Fungi have been identified but are difficult to utilize because the spores are easily dried out or need high moisture and/or water to germinate. Examples are:
 - 1. *Beauveria* spp. have been identified infecting a wide variety of insects including bugs and beetles. A commercial strain is available in Europe for Colorado potato beetle control.
 - 2. *Metarhizium* spp. have been identified infecting numerous soil insects including white grubs. No commercial strains are available in the United States.
- C. Viruses are common pathogens of insects but are one of the most difficult to use because they require living insects to grow. Recent development of insect tissue culture has allowed for rearing of some of the virus strains but the only commercial product is **Nuclearpolyhedrosis Virus** (NPV) - for gypsy moth control under the trade name of Gypcheck[™]
- D. Entomopathogenic Nematodes are a group of tiny parasitic roundworms which carry a bacterium lethal to insects. Once the nematode gains entry into an insect it regurgitates the bacterium which paralyzes and kills the insect. The nematode then feeds on the reproducing bacteria. The most commonly mentioned species are:
 - 1. Steinernema carpocapsae which has several strains

good at attacking insects which live in the upper soil or on the soil surface. BiosafeTM, ExhibitTM and ScanmaskTM are commercial preparations.

2. *Heterorhabditis* spp. are better at attacking insects which live deeper in the soil. This group can also bore through the insect cuticle.

In summary, there are multiple alternative control methods which can be used in the urban landscape. The concept if integrated pest management provides a framework in which to use all of the alternatives in a systematic fashion. Of most importance is the idea that we must monitor for pest problems and then select the best targeted control available.

Factors Critical To Pesticide Performance

Application Timing

Pest control should be initiated only after the pest has been identified accurately and its presence threatens either the aesthetic quality or the vitality of the plant. If a decision has been made to use a pesticide, timing of the application must coincide with a stage of the pest that is vulnerable to the application.

Many pests, including borers, armored scales and gall formers can be contacted with pesticidal sprays for only a short time during the growing season. For example, armored scales can be controlled best by attacking the newly hatched nymphs (called crawlers) are active or have recently settled on their host. Borer sprays must be applied either before egg laying begins (e.g., bronze birch borer and other flatheaded borers) or before egg hatch (e.g., dogwood borer and other clearwing moths borers). Pesticide applications at any other time during the life cycle of these pests will be ineffective and should not be implemented.

Understanding Pest Life Cycles and Movement

Many insects and mites complete only one life cycle (=generation) each year. A single, well-timed, thoroughly covering spray with an effective pesticide should provide season-long control. Other pests, including aphids, mites and some scales and bark beetles complete two or more generations each year. These pests may require more than one spray during the growing season.

Most adult insects have wings and can fly. After spraying, new insects may fly in and reinfest a plant making it appear that the insecticide applied didn't perform well. For this reason, repeated applications are needed to protect some plants from incoming insects.

Selecting the Correct Insecticide/Miticide

Although many insecticides/miticides are effective against a number of different kinds of pests, it is always important to choose a product that has been proven to provide excellent results against the pest you are trying to control. General purpose sprays and pesticides are not the best approach to pest control. Instead, consult the tables in this bulletin and choose a product that has been rigorously evaluated for its effectiveness against your target pest. Then, use it according to directions on the container label, using only the amount specified. Do not use adjuvants (i.e. spreaders and stickers) unless specified on the label.

Weather-Related Problems

Sprays should always be applied to dry foliage and bark when rain is not expected for several hours. However, as long as sprayed surfaces dry before rainfall occurs, reapplication is usually unnecessary. Sprayed plants should be monitored in five to seven days to determine treatment effects, especially if rain occurs soon after the application. If the treatment was not effective, and if the pest is still in a vulnerable stage, the application should be repeated. It is a good policy to spray when the temperature is between 50 and 90°F (10-32°C). Many pesticides are less effective below this range, and some products may cause plant damage above the upper limit.

Storage Life of Pesticides

Many insecticides/miticides may tend to lose their killing power over a period of time, once they have been opened. This process may be speeded up with improper handling and improper storage. Therefore, it is always best to buy only the amount of insecticide/miticide you expect to use in one season.

Pesticides can be used from one year to the next. Remaining product should be stored in a safe, dry place that does not experience freezing or extremely high temperatures. Refer to the label for specific instructions on long term storage.

Pest Resistance

Resistance is a general term which, in the broad sense, means pests that were previously killed by a pesticide have produced offspring that are no longer killed by it. To illustrate, let's suppose that an insecticide is applied and that it kills 95% of the insects in a population which contact it, but there are 5% of the insects which received the same dosage but survived the treatment. This 5% is considered resistant to the insecticide. They live to produce another generation, and this generation, having had resistant parents, passes on to its offspring the resistance factor. Most likely there will be a greater number of the new individuals carrying resistance to the insecticide compared to the first treated population. As repeated insecticide applications are made and more generations produced, it is only a matter of time before the majority of the insects in question will survive the insecticidal application. A possible explanation is that the insecticide has acted as a selecting agent, killing those members of a population which are susceptible to the chemical and leaving those which are resistant. Survivors breed and produce subsequent resistant generations. Resistance develops fastest in insects which have high rates of reproduction. This is another reason why pesticides should be used only when and where necessary to prevent damage to valuable landscape plants.

Understand Insecticides/Miticides Before Using Them

Most people know little about pesticides, yet they play a very important role in food production and personal wellbeing. Even though they are important products, we must not forget that they are poisons and may present serious dangers if not stored and used properly. The best place to learn about a pesticide that you intend to buy and use is the label printed on the container. This is a legal document that contains information developed by scientists, government regulators and suppliers over a period of several years. By following timing recommendations listed in this bulletin and on the pesticide label, you can achieve results equally good as those of the scientists that rigorously tested the product.

How Poisonous Are Insecticides/Miticides?

All insecticides and miticides are poisons. However, some are much more toxic than others. The pesticide container issues a precaution statement that indicates just how toxic the product is. For example, a skull and crossbones indicates that the most highly toxic materials. In most cases, these products should not be purchased, stored or used by those untrained in pesticide usage. Most of these products also will state "RESTRICTED USE PRODUCT," which means that only certified applicators may purchase or apply these products. County OSU Extension offices can supply pesticide certification information.

The toxicity of all pesticides is measured by a term called LD_{50} . LD stands for Lethal Dose, or the amount of material that causes mortality of, in this case 50% of the pest population tested. Most LD_{50} studies are conducted with mice, rats or rabbits under laboratory conditions. Since these animals and humans are warm blooded mammals that share biochemical processes, scientists extrapolate from these tests to predict just how toxic products might be to humans. In any case, LD_{50} is a relative measure of toxicity. We must remember that many individuals in a population will be sensitive to the product at a level well below the LD_{50} .

Pesticide Formulations

Insecticides and miticides may be purchased in forms such as dusts, wettable powders, liquid concentrates, flowables, granules, oil emulsions, aerosol sprays, baits and fumigants. Here are some good and bad points of these formulations.

Dusts are dry mixtures of insecticides with inert powders such as organic flours, minerals, talc, or clay. The dusts are composed of fine particles, about 250 to 350 mesh. They are usually sold in strengths of 0.5-10% and are applied in the form purchased. Dusts can be used on almost any surface without harming it, but visible dust will usually create an unsightly appearance. Due to their small particle size, dusts will float in air and are easily blown away during application. They generally leave an effective residue as long as they remain dry, but when they get moist, they may cake and become ineffective. However, a slight amount of moisture on a plant may actually aid in the distribution and adherence of the dust to the treated surface. Dusts are of little use in treating large trees.

Liquid concentrates are high concentrations of the "pure" pesticide dissolved in a solvent. Other materials are added to the concentrate to make the pesticide mix with water. Liquid concentrates are sold in strengths of about 18 to 75%. Because they are concentrates, it takes only a small amount mixed in water to make an effective spray. A disadvantage of liquid concentrates is that they may cause plant injury under certain weather conditions because of the solvents they contain.

Wettable powders are usually made by impregnating an inert powder with an insecticide or by grinding a dry pesticide into a powder and then adding a wetting agent so that the powder particles can be suspended in water. Sprays made with wettable powders must be constantly agitated to prevent the large particles from settling to the bottom of the sprayer. Because the water used as a carrier of the powder during application evaporates, most of the insecticide is left as a residue. However, the powder itself is quite visible and this residue may be undesirable. Wettable powders are sold in strengths from 15 to 80%. As they are not formulated with solvents, they are preferred over liquid concentrates for use on plants which may be injured by solvents. However, during mixing, wettable powders have a tendency to drift or blow about. This problem is often addressed by bagging in water dispursable packets or granulating into dry flowables.

Flowables are finely ground pesticide particles suspended in a liquid, usually water based, carrier. They have the same characteristics as wettable powders but are easier to handle during mixing.

Granules commonly contain from 1 to 20% of the insecticide impregnated onto highly absorptive materials like clays, limestone, corn cob or nut hull pieces or even fertilizer particles ranging in size from 30 to 60 mesh. Granules are heavy. This minimizes drift and prevents undue loss of insecticide and undesirable contamination of areas bordering those being treated. Granules are used mainly for ground treatment and not on foliage.

Oil emulsions contain an insecticide mixed in a highly refined oil and are used primarily for the control of household pests like cockroaches or wood borers. These formulations are sold in strengths from 4 to 5% in low-pressure, atomizer-type applicators. These oil solutions should never be used on plants because the oil will kill living plant tissue.

Aerosol sprays usually contain a mixture of several insecticides in a pressurized can. Most of them contain only

a small percentage of insecticide and are designed for small jobs. Until recently, aerosol sprays were used mainly for killing flying pests in the house. Today, many of the aerosols can be applied to rose bushes and other outdoor plants. They are not practical for large scale use on ornamental plants because they are rather expensive for the amount of insecticide contained.

Baits contain a food substance attractive to the insects, along with an effective stomach poison. Formulations are available for use both inside and outside the house. In general, they need to be applied at several intervals to be most effective.

Funigants may be purchased in solid or aerosol forms and are generally used in closed areas where a lethal concentration of the poison can be built up in the air. Funigants are of limited value for use on ornamental plants, unless they are grown in enclosed greenhouses or polyhouses.

Systemic Insecticides/Miticides

A systemic insecticide/miticide is one that is absorbed by plant tissue and translocated by the movement of sap from the area treated to additional parts of the plant. Systemics are effective against many different kinds of sucking and chewing insects as well as mites. When absorbed by the plant, they actually become a temporary part of it, and as the plant grows the systemic is distributed to foliage and other growing areas. This built-in poison may continue to be a toxic meal to various pests for several weeks.

One of the advantages of systemics is that when a plant is growing rapidly, even the new growth is being protected by the insecticide. Depending on application method, another good aspect of systemics is that they have little or no direct affect on beneficial insects which prey on the destructive pests feeding on the plant tissue. Also, systemics in a plant are not subject to breakdown by environmental factors such as rain, wind, temperature, and sunlight, at least not as readily as externally applied materials. Systemics cannot be used on all kinds of plants because they may burn foliage.

Systemics are available in granular and liquid concentrate formulations. Granules may be broadcast, used as a side-dressing, or incorporated in the soil at planting time. Liquids may be injected into the soil, watered onto the surface of the ground, painted or sprayed on the bark, sprayed on the foliage, or injected into tree trunks.

How to Protect Yourself when Using Pesticides

Many pest problems cannot be solved without using pesticides. These materials are poisons and must be used accordingly. If we must use pesticides, let's acquaint ourselves with some general precautions which will help us to use them safely.

General Precautions

- 1. Read the label. This is the first rule of safety in using any pesticide read the label and follow the directions and precautions printed on it.
- 2. Store pesticides in closed, well-labeled containers where children or pets cannot reach them. Do not store them under the sink, in the pantry, or in the medicine cabinet. Do not store them near food of any kind.
- 3. Store application equipment as you do pesticides out of the reach of children or pets.
- 4. Do not save or reuse empty pesticide containers. Dispose of containers promptly as directed on the label.
- 5. Do not apply more pesticide than the label recommends. Overdosage is wasteful and may be dangerous.
- 6. If you use poisoned bait to control rats, mice, or other pests, either indoors or outdoors, place it where children or pets cannot find it.
- 7. When opening a container of liquid pesticide, keep your face away from, and to one side of, the cap or lid.
- 8. Mix or prepare dusts or sprays outdoors or in a well-ventilated room.
- 9. In handling any pesticide, avoid contact with the skin. Do not get pesticide near your mouth, eyes, or nose.
- 10. If pesticide gets in your eyes, flush the eyes with water for 5 minutes; get medical attention.
- 11. Never smoke, eat, or drink while handling a pesticide. After finishing the work, wash exposed skin surfaces with soap and water.
- 12. If you spill pesticide on your clothing, launder the clothing before wearing it again.
- 13. If you become ill during or shortly after using a pesticide, call a physician immediately. From the container label, read to him the names of the active chemical ingredients; follow his instructions for first-aid treatment.
- 14. Poison information centers are located throughout the state and are on call 24 hours a day. In an emergency, you could call the center closest to you, but it is preferable to let your doctor consult the center. Most telephone 911 systems can contact poison information centers directly.

Honey Bee Protection

Honey bees are important pollinators of plants and every effort possible should be made to reduce bee losses from pesticide poisoning. Do not apply pesticides during the bloom period when bees are likely to be most active on the plants.

Precautions for Avoiding Plant Injury

- 1. Do not apply liquid concentrates when the temperature is above 85°F (30°C). [Do not apply any spray when the temperature is above 90°F (32°C).] Wettable powder formulations are less likely to cause injury.
- 2. Do not apply dormant oil sprays if the temperature is below 40°F (4°C) or where there is danger of the temperature falling much below this in the 24-hour period.
- 3. Do not apply horticultural, summer oils when the temperature is 80°F (27°C) or above and high humidity reduces the chance of the spray drying within an hour after the application.
- 4. Use only the amounts of insecticide/miticide indicated on the current pesticide label.
- Continuous agitation of the spray tank is necessary to prevent spray materials from settling out. Recycle contents of long spray hoses into the spray tank if enough time has elapsed between sprayings for the mix to separate.
- 6. Clean out sprayer after use.
- Never use a sprayer that has contained a weed killer (herbicide) to perform other pest control activities.

Insecticide/Miticide Application Equipment

Small Trees and Shrubs

Much of the success or failure of an insecticide/miticide application depends on the kind of equipment used.

Hose-end sprayers are small sprayers that are screwed onto the end of an ordinary garden hose. The spray container varies in size from a half pint to one quart and will deliver from 1 to 15 gallons of spray when the contents are emptied. Insecticide is added to the sprayer on the basis of so many tablespoonfuls per gallon of spray delivered. The sprayers are put in operation by turning on the water and placing a thumb or other device over a small hole in the top of the lid. The insecticide is drawn from the container and mixed with the hose water as the water flows out the nozzle. One of the major disadvantages of this type sprayer is that wettable powder often plugs the nozzles. A big advantage is the constant pressure; you need no pumping to maintain pressure to deliver the spray.

Compressed air sprayers include metal or plastic tanks that vary in size from 1 to 3 gallons. Air is pumped inside the sprayer with a plunger on the tank. The spray is delivered through an attached hose with a hand shut-off valve and a nozzle tip. Disadvantages of this type sprayer are that it must be pumped frequently to maintain pressure, the tank must be transported, the nozzle tips are of the low-volume type, a relatively long time is required to empty the tank, and tanks rust unless they are made of stainless steel or plastic. In spite of these disadvantages, compressed air sprayers are useful for many smaller pest control jobs in and around the landscape.

Knap-Sac sprayers are compressed air sprayers which vary in size from 3 to 5 gallons and are strapped onto one's back. A handle pump is attached and is pumped continuously at a slow pace. The pumping builds up a pressure in the tank and allows the spray to be delivered through a hose and nozzle tip at an even, steady rate. It, too, is equipped with a hand shut-off valve. This type of sprayer is suited for spraying fairly large areas. Disadvantages are that the sprayers are expensive; loaded with water, they're quite heavy; and they must be pumped-up to maintain pressure. However, a stainless steel knap-sac sprayer should last many years and handle any spray job in the garden and around the landscape, except large tree spraying.

Wheelbarrow sprayers are manually or motor operated hydraulic sprayers mounted on a frame with 1 or 2 wheels. They generally have a capacity of 12 or more gallons. The motorless type sprayer usually requires one person to operate the pump and another to direct the spray stream. Wheelbarrow sprayers are more expensive but are suited for bigger jobs.

Large Trees

The equipment mentioned so far is used primarily for small jobs and would not be practical for large tree spraying. The following equipment is for large tree spraying. Mist blowers deliver concentrated insecticide to trees by means of a high volume, high velocity air stream. The insecticide is diluted primarily in air rather than in water. Spraying with a mist blower requires an experienced operator. Plant injury or poor distribution of the spray on the tree may result from an improperly operated machine.

Hydraulic sprayers are satisfactory for tree and shrub spraying and have been in use for a long time. Hydraulic machines deliver high gallonage, high pressure sprays. The spray is delivered through a specialized spray gun attached to a pressure hose. This is one of the most common type of sprayer used in controlling pests of shade trees.

Buying Equipment

Before buying a piece of spray equipment, keep in mind the size of the job to be done, kind of performance desired, kinds and amounts of insecticides to be used, amount of water needed per spraying, the size of the plants to be treated, and amount of money to be spent. If you explain these facts to a spray equipment dealer, they will be able to recommend the correct piece of equipment for the job. Remember that a piece of equipment is no better than what it costs or the person who uses it, and all equipment must be serviced and cleaned frequently.

Accessory Equipment -- Measuring equipment is necessary to measure accurately the required amounts of insecticides, thus ensuring better pest control results and less plant injury. This equipment includes a 1-quart measuring cup and a set of measuring spoons. They should be kept separate from those used in the home or work place and should be marked in some way to indicate they are for pesticide measurements only.

Introduction

In the previous chapter, we discussed the Integrated Pest Management process and the control options available. Recent interest in alternatives to traditional synthetic pesticides has resulted in numerous products containing botanicals, oils, soaps and microbial materials.

These alternative products often do not act in the same manner as traditional pesticides and the user must understand when these products can be used effectively and what special conditions must be met in order to be successful.

Oils

Oils are petroleum or plant based hydrocarbon chains which have insecticidal/miticidal activity.

The use of oil to kill insects and mites has been known to work since the 1700s. However, the early use of oil usually resulted in killing the plants as well as the insects. Oil came into widespread use to control insects and mites after oil refining techniques were developed which would free the petroleum oils of unsaturated hydrocarbons, acids, and highly volatile elements. Oil is effective against insects and mites because it suffocates or causes cell membrane destruction of the pests that it hits as well as their eggs. Another advantage of oil is that no pest has been known to become resistant to its killing action.

At least three different types of oil are used for pest control: petroleum, summer or horticultural oil, petroleum dormant oil and citrus oil.

Petroleum summer or **horticultural oil** is a lighter weight oil applied during the active growth of a plant, when green plant foliage is present.

The **dormant oil** is usually defined as a heavier weight oil applied in spring prior to bud break or in the fall after leaf drop.

Citrus oil is usually added to other pesticide formulations such as soaps and botanical pesticides.

What makes the identification of oils confusing is the fact that summer oils can be used as dormant oils. However, do not use a dormant oil as a summer oil. The simplest method for identifying oils is to **READ THE LABEL**. If the label only mentions usage on dormant plants, it is a dormant oil. On the other hand, if the label mentions using the oil on green, leafy plants during the growing season, it is a summer oil.

If you don't want to rely only on the label instructions,

there are three oil factor which you need to evaluate: 1. oil volatility, 2. oil viscosity, and 3. the unsulfonated residue rating.

Volatility is measured by the distillation temperature. This is the temperature that the oil comes out of heated crude oil at the refinery. A low distillation temperature produces a light oil. A high distillation temperature produces a heavy oil. The lighter oils evaporate faster and thus have less of a chance to cause plant damage (phytotoxicity). The heavy oils may coat the plant and either smother the leaves or destroy some of the cells. The result is phytotoxicity. The distillation temperature is probably the most important number to look for on the label.

Volatility and Oil Usage

Primary Use	Dosage per 100 Gallons				
Summer	1.5-3 gal.				
Summer/Dormant	1.5-2gal/Summer 3-4 gal/Dormant				
Dormant	2-4 gal.				
	Primary Use Summer Summer/Dormant Dormant				

Viscosity is the flow rate or thickness of an oil. It is measured by the time it takes a volume of the oil to flow through a small funnel opening. The label may say that the oil is a 60 second or 100 second oil. In the past, a lot of emphasis was placed on getting an 80 second oil or better. We feel that the volatility rating is more important.

The unsulfonated residue (UR) rating is an index of the quantity of oil free from unsaturated hydrocarbons. Look for oils with a minimum UR of 92%. Some oils are as high as 99% free.

Some of the better oils, especially summer oils, have distillation temperatures of 412° F and UR = 96%.

Even with the best oils, phytotoxicity is always possible. However, this is the same as with standard insecticides! The following guidelines are recommended by most users and manufacturers of dormant and summer oils:

- 1. Do not apply the oils when the temperature is below 40°F (4.4°C) or above 100°F (37.8°C). If low humidity is accompanying the high temperature, oils have less of a chance of causing damage.
- 2. Do not apply oils if rain is a possibility or if the plant tissues are wet. The leaves must be dry and the oil must have a chance to evaporate.

- 3. Avoid spraying or getting drift on oil sensitive plants.
- 4. Apply the oil according to the label rates. Always go light, not heavy.
- 5. When using dormant oils or high rates of horticultural oils, do not spray when plant buds are fully open and shoot elongation is occurring.
- 6. Do not spray plants when the humidity is expected to remain above 90% for 36 to 48 hours.
- 7. Leaf drop in the fall is not a reliable method for determining plant dormancy. It is better to wait until after several light frosts.
- 8. Oil sensitive plants are: maples, hickories, black walnut, cryptomera, smoketree and many azaleas.
- 9. Plants tending towards oil sensitivity are: beech, Japanese holly, redbud, Savin junipers, Photinia, spruces and Douglas-fir.

Most of the oil labels contain a list of plants which are sensitive or tend towards sensitivity. Read them carefully. Most problems occur when oils are simply sprayed on everything in the landscape.

As with all pesticides, use oils only where needed. They do not need to be used as general cover sprays. Plants which have a history aphid, scale and mite problems are the best ones to target.

Soaps - Fatty Acid Salts

Soaps are made from fats reacted with a strong lye to form potassium or sodium salts of the fatty acid components. Fatty acid chains containing 6-10 carbon atoms have insecticidal/miticidal activity. These soaps, often called insecticidal soaps, apparently disrupt the respiratory systems and disrupt cell membranes.

Currently available soap products usually contain soaps derived from plant fats and oils. These are often considered "organic" in origin and are considered usable by most organic gardeners.

Mammalian toxicity: Insecticidal soaps have the same general mammalian toxicity traits of any soap or detergent. Contact with mucus membranes, such as eyes or mouth, may cause temporary irritation or a burning sensation. Ingestion may cause vomiting and general gastric upset, but this normally results in no serious consequences. Some insecticidal soap concentrates contain up to 30% ethyl alcohol which can cause intoxication at doses above several ounces; however, vomiting is likely to clear most of the alcohol from the system before it is fully absorbed.

Some insecticidal soap products contain additional insecticidal compounds such as pyrethrins or citrus oils. These alterations change the overall toxicity levels.

Uses: Insecticidal soaps are used as contact pesticides

to control a wide variety of insects and mites. Generally, soft bodied insects such as aphids, caterpillars, scale crawlers, leafhopper nymphs, mealybugs, thrips and whiteflies are the best targets. However, some products claim efficacy against Japanese beetle and flea beetle adults.

Soaps are commonly used in more environmentally sensitive areas such as around houses, in interiorscapes and where organic pesticides are requested.

Caution: Common household soaps and detergents have insecticidal properties when applied as 1-2% solutions in water. However, these compounds are not registered for this purpose and plant injury may occur.

Botanical Insecticides

These are pesticides derived or extracted from plants or plant parts. For control of ornamental insects and mites, pyrethrins, rotenone and neem (azadiractins) products are currently registered.

Pyrethrins

Pyrethrins are six related compounds extracted from dried flowers of the pyrethrum daisy, *Chrysanthemum cinerariaefolium*. When the ground up flower itself is used, the product is called a pyrethrum. Most products use pyrethrins combined with man-made synergists, usually PBO or MGK 264. These synergistic compounds increase the killing power of pyrethrins. Natural pyrethrum and pyrethrins are highly irritating to insect nervous systems and they cause quick "knockdown." However, many insects are able to break down the pyrethrins before death occurs and soon recover. The synergists help stop this break down.

Mammalian Toxicity: Pyrethrins are low in mammalian toxicity, with the oral LD_{50} between 1,200 and 1,500. However, cats are highly susceptible to poisoning from pyrethrins. When ingested, pyrethrins are usually broken down by stomach acids before absorption can occur. Pyrethrins are general irritants and repeated contact may cause skin irritation or allergic reactions.

Uses: Pyrethrins are contact poisons with extremely short residual activity. Exposure to sunlight, air and moisture will degrade them within hours. Pyrethrins are generally mixed with a synergist and rotenone to provide better action against a wider variety of pests.

Rotenone

Rotenone is an alkaloid toxin extracted from the roots of two tropical legumes, *Lonchocarpus* from South America and *Derris* from Asia. Most of the current rotenone comes from Peru where it is often referred to as cubé root. "Cubé extracts" may appear on the label.

Rotenone is extracted with acetone or ether and the concentrate is used to make products. Some products simply

use the powdered root.

Rotenone disrupts cellular respiration and death is relatively slow compared to most nerve toxins. Rotenone is extremely toxic to fish and is used as a fish poison by South American indians or in water management programs. It is also synergized by PBO or MGK 264.

Mammalian Toxicity: Rotenone varies considerably in mammalian LD_{50} values (60-1,500) depending on the carrier used. Most ingested rotenone is detoxified efficiently via liver enzymes. Rotenone is more toxic by inhalation than by ingestion. High exposure may cause nausea, vomiting, muscle tremors and rapid breathing. Contact with rotenone may cause skin irritation and inflammation of mucous membranes.

Uses: Rotenone is a broad-spectrum contact and stomach poison that is most useful against leaf-feeding beetles and caterpillars. Rotenone degrades rapidly when exposed to air and sunlight. Alkaline materials, such as soaps, also speed rotenone degradation. Rotenone is usually mixed with Pyrethrins to provide longer lasting residual and better killing power.

Neem

Neem oil is an extract from the neem tree, *Azadirachta indica*, which is grown in tropical and subtropical climates. The most commonly used compound is azadirachtin, a complex chemical which acts as an insect feeding deterrent and growth regulator.

Azadirachtin can be extracted from much of the neem tree, but most comes from oil pressed from seeds and seed kernels.

When neem is applied to a plant it serves as a repellent, but if it is ingested, the compound affects insect egg laying and growth.

Mammalian Toxicity: Neem is very low in toxicity and has an LD_{so} near 13,000. It rarely causes any irritation to the skin or mucous membranes. It has been used in India and Asia as a cleaner, disinfectant and medicinal.

Uses: Currently registered products for ornamental pest control claim activity against a variety of sucking and chewing insects. Recent field trials have not confirmed significant repellency activity. However, good control of insects can be achieved if the insects are exposed while they are actively growing immatures - nymphs and larvae. Action can be slow because the insect often has to go through a molt or two.

Microbial Insecticides

Microbial insecticides are toxins derived from various bacteria and fungi. The most highly developed group of compounds are derived from the common bacterium, Bacillus thruingiensis, or "Bt" for short. The many different strains of this bacterium produce a variety of crystalline protein-like toxins which commonly have toxic activity against certain insect groups.

A second group of compounds have been derived from the soil fungal actinomycete, *Streptomyces avermitilis*. This fungus produces a variety of toxins which are called avermeetins. Commercial pesticides derived from this group include ivermeetin and abameetin.

BT's

Bacillus thruingiensis is a common bacterium found in soils around the world. Scientists have known for a long time that strains of this bacterium produced crystalline protein toxins which had insecticidal activity. However, it wasn't until the late 1960's that fermentation technology was developed which allowed for the large scale rearing of this bacterium and extraction of the toxin.

Though several strains of the bacterium were known to be toxic to insects, the most widely developed materials were derived from *B.t.* variety '*kurstaki*'. The toxins derived from this variety are toxic only to the larvae (caterpillars) of butterflies and moths. Products with ornamental labels are: BactospeneTM, BiobitTM, Caterpillar AttackTM, DipelTM, Larvo-BtTM, ThuricideTM, VictoryTM and others.

In the early 1980's, another strain, *B.t.* var. '*israelensis*' was developed which has activity against the larvae of certain flies, especially mosquitoes. These products are not effective against the dipterous leafminers of ornamental.

In the late 1980's, the third strain, *B.t.* var. 'tenebrionis' (=B.t. var. 'san diego') was developed which has activity against certain beetle larvae. The elm leaf beetle has been the most common ornamental pest target. Products with ornamental labels are: M-OneTM and Trident IITM.

Apparently, Bt crystalline toxins attack the cell membranes of the gut lining. This causes the insect to stop feeding as soon as it ingests the Bt product and death often occurs several days after gut bacteria have invaded the insect body cavity. In order to get maximum efficacy out of Bt products, it should be targeted towards the younger larvae which have less well developed gut linings.

Mammalian Toxicity: Bt toxins are considered relatively non-toxic to mammals and other animals. Some formulations may have carriers which can cause eye irritation, but this is not caused by the Bt toxin.

Uses: Bt's are useful alternatives to standard pesticides where caterpillars and beetle larvae are a problem. Unfortunately, most of the Bt products are not very effective once the larvae have exceeded half of their growth. Therefore, continuous monitoring of caterpillar or elm leaf beetle populations must be performed in order to target applications correctly. Where reinfestations regularly occur, as in the elm leaf beetle, several applications may be necessary to achieve satisfactory control.

Entomopathogenic Nematodes

Nematodes are commonly called roundworms. They comprise a very large and diverse group which include general scavengers, predators, plant infesting and animal infesting species. A certain group of nematodes attack insects by entering the insect gut or body, regurgitating a lethal bacterium and reproducing in the insect cadaver. These are called entomopathogenic. These nematodes have a mobile, infective juvenile (the J3 stage) which is microscopic and can be sprayed through conventional equipment. These infective juveniles are quite resistant to many chemicals but they can not withstand rapid drying or prolonged contact with sunlight.

There are numerous species which belong to the genera *Steinernema* or *Heterorhabditis*. Both steinernemid and heterorhabditid nematodes have been found in native soils. However, many of the strains currently marketed and under development have come from foreign countries.

Up to the early 1980s, attempts to use these nematodes as biological controls were rarely successful. The nematodes are weakly persistent and rearing sufficient numbers to work was costly.

In the 1980s, several companies developed large scale rearing techniques, often using large scale fermentation technology. This allowed for the production of nematodes in sufficient quantity to be commercially useful.

Because the nematodes are considered animals rather than microbial agents, they are considered by the U.S. EPA to not require pesticide registration.

Mammalian Toxicity: Entomopathogenic nematodes are noninfective to mammals, birds, fish or other animals except certain insect groups. Some of the residues from nematode production or formulation materials may cause eye irritation, so eye protection during mixing may be in order. Field studies have also indicated that the nematodes rarely come into contact with beneficial insects and mites.

Uses: Since entomopathogenic nematodes are exempt from U.S. EPA registration, caution must be taken when evaluating supplier claims of efficacy. Current research indicates that the nematodes have been useful in reducing black vine weevil larval populations, especially in containerized plants. Other studies have indicated activity against certain borers (when the J3s are applied to borer holes or frass), leafminers and soil inhabiting pests.

The infective juveniles are applied at 1×10^6 to 2×10^9 J3s to the acre. Because they are living organisms, they must be applied so as not to expose them to direct sunlight for any length of time and they must be allowed to contact moist surfaces so as not to dry rapidly.

Detection and Monitoring of Insects and Mites on Woody Ornamentals and Herbaceous Perennials

Introduction

Integrated Pest Management usually has an emphasis on the selection and use of the three control options - chemical, biological and cultural. However, even though a control option may be selected one still has to determine when to use the control. Therefore, monitoring pest populations (as well as the biological controls) becomes central to determining when controls are to be used.

Pest monitoring is simply using those techniques and tools that allow the pest manager to determine when and if control action is needed.

Preventive Pesticide Applications

Unfortunately, many pest managers simply apply a pesticide for control of anticipated insect and mite pests through regularly scheduled "programs." These applications may be called "preventive-," "round-" or "calendar-" timed applications.

Though there are numerous reasons stated for making preventive applications which seem appropriate, there are certain problems associated with this strategy: 1. a damaging pest population may not have occurred and therefore the pesticide application was not needed, leading to questions of environmental concern; 2. unnecessary pesticide applications may encourage development of pest resistance or accelerated pesticide degradation, and the usefulness of the pesticide may be lost; 3. merely having the pesticide in the tank or on the fertilizer granule increases the chance of pesticide misapplication; 4. making a pesticide application, whether needed or not, reduces the professional status of the manager/applicator because no effort was made to see if the pest was actually present.

Occasionally, preventive pesticide applications are warranted. Where pests are certain to occur (because of previous monitoring or predictive models indicate that a major pest outbreak will occur) or where pests under quarantine are present, preventive pesticide applications may be more effective than applications made after the pest has

become active. Some pests, like borers and leafminers, are more difficult to manage after the larvae have entered the host plant. Therefore, preventive applications of pesticides to "protect" the plant from invasion is preferable. Some recently developed insecticides with sustained residual ability or those with insect growth regulator action are often more effective when used as preventives.

Reactive Pesticide Applications

On the other hand, many pests are not expected and applications are made after some damage has been detected. These applications are best termed "reactive" treatments. These applications are usually made because a damaging pest population was missed. Problems associated with making reactive applications are: 1. since poor sampling or monitoring was used, damage has occurred and people are upset; 2. damaging or noticeable pest populations may be more difficult to control; 3. if the preventive application didn't work, additional applications may be necessary to control the pest.

Alternative Tools and Strategies for Timing of Controls

Alternative strategies for timing of controls are available and should be used in order to reduce the problems associated with preventive and reactive pesticide applications. Active monitoring and sampling of pest populations is the heart of all integrated pest management programs. Before proper controls can be applied, one needs to know if a pest is present and if its population or potential population will cause significant damage. Unfortunately, in plant nurseries, where no pests can be allow on the plants prior to being sold, the mere presence of pests warrant pest management.

The single best monitoring device is the traditional visual inspection. However, because many of the pests or their eggs can be very tiny, a 10-15X magnification hand lens is essential when performing visual inspections. In fact, low cost dissecting microscopes (15-45X) should be obtained by persons making many inspections. These microscopes can also help determine if small mites or scales have been killed after a pesticide application. To assist in visual inspections, one should also have a strong, non-folding utility knife (for checking under loose bark or splitting stems), good pruning sheers (to remove pieces of branches or splitting stems), a spade (for digging around plant roots) and several plastic bags (for taking samples back to the microscope or for mailing to a laboratory for identification).

In addition to visual inspection, several other trapping and sampling tools are useful for monitoring of insects and mites on trees, shrubs and perennials:



2. **Pitfall Traps** are cups or cans sunk into the soil or turf near ornamental plants to capture crawling insects



such as black vine weevil adults. The 16 to 20 oz. plastic cups used for cold drinks make ideal pitfall traps. These are easily installed in the ground using a 4.25-inch golf course cup cutter. Pull a soil or turf plug to the depth of the plastic cup. Obviously, a pitfall trap should not be used in areas where people may twist an ankle, but they can be used next to flower beds or under a tree.

- 3. Light Traps which use "black lights" attract and capture the adults of many moth, beetle and bug pests. Use of black light traps is not for the novice since hundreds of different species of insects can be caught in one night. However, nursery and landscape managers join local IPM groups which run a light trap in an area and report insect activity.
- Pheromone Traps contain the sex and/or attractant chemicals used by clearwing moth borers, pine tip moths, Japanese beetles and other pests. These can be used, like light traps, to determine specific insect activity periods.
- 5. Trap Logs are often used to capture the adults of various wood boring beetles, especially bark beetles. Freshly cut pieces of host tree trunks or limbs are placed in plantations where the pest is suspected to be active. The trap logs are inspected periodically to see if the adults have moved to their oviposition sites so that treatments can be properly timed. Occasionally enough traps logs are used to attract the majority of pest insects for egg laying. After egg laying but before the larvae mature, these trap logs are burned or chipped, thereby destroying the pests.

Host Phenology Models are developed by monitoring *plant* (the host) activity compared to various *pest* activities. The flowering times of various trees and shrubs are commonly used to time applications of various insecticides. This technique is best used by keeping a yearly record of plant and pest activities. For example, if you find that pine needle scale crawlers appear at the same time that horse

chestnuts bloom, then horse chestnut bloom can be your "trigger" for applying controls for the pine needle scale in your area.

Weather-Mediated Predictive (Degree-Day) Models are developed by monitoring weather parameters [usually temperature, as Degree-Days (DD)] and comparing these to insect or mite activity. Though these models help determine better timing of controls, they still do not answer the question of whether the pests are present in sufficient numbers to cause damage or warrant controls. Models have been developed and published for a variety of ornamental insect and mite pests. However, one should carefully keep

local records of temperature and pest activity in order to better calibrate published targets. For example, a published DD target for pine needle scale first generation of crawlers is 298-488 DDbase50°F. If you find that the local pine needle scale crawlers are active from 350-500 DD, then you should modify the chart to reflect this later emergence pattern. See information below.

Pest Mapping is simply good record keeping. Most insect and mite pests require specific plants and weather or habitat conditions in order to build to damaging populations. Generally, trees, shrubs or perennials which have had insect or mite problems in the recent past are the most likely in need of attention. In short, if a damaging pest population occurred last year, the probability is much higher that the same thing will occur again. Keeping a useful record of pest occurrence is pest mapping.

Likewise, certain plants appear to be prone to certain pests. Little leaf lindens will certainly be defoliated if Japanese beetles are in the area. European birch is usually attacked by birch leafminers every year and, eventually, will come under lethal attack by the bronze birch borer. These plants are **KEY PLANTS**. Pest mapping for landscape management firms should be performed by making a plant survey of the customer's property in order to determine what key plants are present. These plants should then be placed on a master routing schedule for inspection and treatment at the appropriate time.

Degree-Days: Their Calculation and Use in Management of Turf and Tree/Shrub Pests

Reason for Using Degree-Days

Degree-Days (DD) are a method of accounting for heat units. Power companies use cooling degree-days and heating degree-days to calculate how much energy a customer needs to cool or heat a house. Plants and animals which do not regulate internal temperatures (often called "cold blooded") vary in their physiological development, or metabolism according to what temperature they are subjected to. In short, these organisms develop rapidly at warm temperatures and slowly at cool temperatures. Therefore, we can treat plants and animals like a house, the more energy (heat) added the faster things happen. Conversely, the cooler (less energy) the organism the slower it develops. If this rate of development related to temperature can be determined, a prediction of insect and/or plant development or activity can be made.

Using DD as a predictor takes into account cool vs warm weather. Calendar scheduling of controls will usually be too early or too late unless the year is an "average year".

1

Insect Light Trap





Temperature Thresholds

Fortunately, most plants and animals develop within a specific range of temperatures. If the organism drops below a certain temperature, called the **lower threshold**, no development occurs (see Figure 1). Above this lower threshold, the rate of development increases with temperature in an almost straight-line fashion. Most organisms also have an **upper threshold** temperature at which development begins to deteriorate because of heat shock. If the organism's





Figure 1

temperature rises too far above this threshold, it will die. In nature, most insects and plants find habitats which have temperatures above the lower threshold for sufficient time to complete a generation of development, but rarely exceed the upper threshold temperature.

Several field crops and ornamental plants are occasionally grown outside their original habitats. Corn plants shut down their development above 86° F and Balsam fir tends to stop development above 90° F. Unfortunately, most state crop reporting services are based on corn DD models which have the relatively low upper threshold of 86° F. Most insect pests and other trees and shrubs do not stop development until temperatures reach $100-110^{\circ}$ F.

In reviewing DD thresholds for many insects and plants, several lower thresholds seem to be common. Most soil dwelling insects and some cool season plants (i.e. conifers, maples) seem to have lower thresholds of 40° F (5° C) or 45° F (7° C). Most above ground feeding insects (turfgrass surface feeders and most tree/shrub scales and caterpillars) seem to have a lower threshold of 50° F (10° C).

For all practical purposes, associating insect activity and plant phenology with $50^{\circ}F$ degree-days (DD₅₀) is generally satisfactory.

Methods of DD Calculation

There are many methods for calculating DD. The easiest method is to use the average temperature method (see Figure 2). This method calculates the day's DD units by subtracting the average daily temperature from the threshold.

The following table illustrates this technique with several daily temperatures.

Table 1. DD_{50} units for days with varying maximum and minimum temperatures.

Example	Max T	Min T	Ave T	DD ₅₀
1	50	30	40	01
2	60	40	50	0 ²
3	70	40	55	5
4	75	55	65	15

¹/ If the average temperature is below the threshold a 0 is used never negative units.

 2 / If the average temperature is equal to the threshold a 0 is used.







Many state reporting services use a sine wave calculation (see Figure 3) or a small time-unit calculation. The sine wave method assumes that the rise and fall of daily temperatures approximates a sine wave pattern. This method also allows for the accumulation of those units of heat energy in a day when the temperature was above the threshold. In example 2 above, the temperature was above $50^{\circ}F$ for part of the day and the insects were developing. The average method estimated that no activity occurred while the sine method would have estimated about 0.3 DD₅₀ units for that day.





The small time-unit calculations, are continuous temperature monitors which read the temperature every few minutes and use that fraction of a day to calculate the DD.

In retrospect, use caution when looking at DD reports. You need to know what thresholds were used (especially if a low upper threshold is in effect) and the method of calculation (ave, sine, etc.).

Conversion of Degree Day Units

Changing from DD-Centigrade (°C) to DD-Fahrenheit (°F) is very easy using the following formulae:

 $DD^{\circ}C = DD^{\circ}F \times 5/9$

 $DD^{\circ}F = DD^{\circ}C \ge 9/5$

Note that $(\pm 32^\circ)$ is not used in this conversion.

Converting between Ave-DD and Sine-DD is a bit more complicated and should be done with care. Each geographic location usually has a constant which can be added or subtracted for this conversion. This constant is determined by calculating Ave-DD and Sine-DD using 30-year average temperatures.

If you need to convert between average and sine DDs, you should probably seek the assistance of a crop consultant or extension agent.

Determining Degree-Day Targets for Pests

There are four methods generally used to determine DDpest activity association: 1. growth chamber studies; 2. field data using regression analysis; 3. field data using lowest coefficient of variation (CV) analysis; and 4. experienced guess-trial and error using average yearly temperatures.

The first three methods generally require special equipment, complicated calculations and detailed data bases. The "experienced guess" technique makes use of past experience to form a rough target DD. This target is then modified yearly ("trial and error") as new information is gathered using actual DD calculations.

To use the experienced guess technique, obtain an annual weather summary from NOAA (National Oceanic and Atmospheric Administration, National Climatic Data Center, Federal Building, Ashville, NC 28801) and calculate the AveDD₅₀ using the normal maximum and minimum temperatures.

Chart the cumulative DD_{50} for each day from April 1 through August. See the following example:

Charting Cumulative Degree-Days (DD) - Pest Activity, an example.

Date	DD ₅₀	Pest Activity
 •		
May 1	143	
May 2	150	Ŧ
May 3	158	1
May 4	166	т
May 5	175	Lilac Borer
May 6	183	Adults
May 7	192	Holly Leaf Miner
May 8	201	Adults
May 9	210	- I I
May 10	220	
May 11	230	
May 12	240	
May 13	250	Pine Needle Scale
May 14	261	Crawlers
May 15	272	
May 16	284	
May 17	296	
May 18	308	
May 19	320	
May 20	332	l
May 21	341	
May 22	353	
-		

Let's say that you remember that you usually see pine needle scale crawlers in the third week of May, holy leaf miner adults in the first and second week of May, and likac borrss in your pheromote traps in the first three weeks of May. Your tarset DDs would then be 250-332, 143-261, and 143 to 332, respectively.

The next season you accumulate actual DDs₁₀ and you notice that the pinn needle scale crawlers were active from 290 to 340 DDs. This indicates that the prediction should be shifted slightly to more DD_a units.

Degree-day Targets for Ornamental Plant Pests

In 1988, Warren lettuson of Cornell University produced one of the most comprehensive lists of insects and unites that attack trees and strutus and associated degree-day (DD) activity periods. These DD periods were not developed using inspectus observations and model development. They were developed by taking yearly notes of insect and mite activities. These notes were then compared to DD charts for those same years and a range of DDs (base 50°F) were recorded.

The original list of insects and mites has been reduced to those which are of importance to Ohio operations.

Table 1. Common names, scientific names of insects and degree days (DD₁₆) affecting ornamental plants.

Growing Degree Days							
Common Name	Scientific Name	min (max)	min2	max2	min3	max3
Achide		,	120	135	250		
Firs hark herties	Scalutur en Kolumanteur en		120	155			
Elongate bemine't scale	Piorinta arterna	7	120	360	700	7515	2625
Elitoncan red mits	Panonychus nimt	2	58	240	210		2027
Golden ook soole	Asteriolocanium variolosum	7	121	802	1266		
Kermes out scales	Allokarmes an	7	91	798	917		
Oak leaffier	Crostia staticurautora	7	35				
Ovstensbell scale	l ensteantes vier	÷	91	363	707		
Sparce spider mite	Oligonachus anunoute	7	121	192	363	2375	2806
Taxus meelshee	Domicoccus wistoriae	7	91	246	AIR		
White one aphid	Cinara strahi	7	(2)	123	246	1947	2273
Toliptres scale	Toumevella lirtodendet	12	121	2032	2629		
Cooley serve rail addred	Address coolevi-on some	22	92	1500	1775		
Juniper scale	Condennis (uniperi	22	148	707	1260		
Magnolin scale	Neolecontra carnyparyon	22	91	246	448	2155	2800
Pine back adelpid	Pines straht	22	58	58	618		
Sance bud scale	Physickermes niceou	22	121	912	1388		
European sine shoot moth	Rivacionia buoliana	34	121				
Evonymus scale	Unavois evonumi	35	120	533	820		
European fruit locanium	Parthenolecanium cornt	35	145	1255	1645		
Fletcher scale	Parthenoleconium fletcheri	35	148	1029	1388	2515	2800
Hemiock scale	Aberallants thecae	35	121	1388	2154		
Balsam twig aphid	Mindarus abietinus	58	120				
Homovieousi plant bug	Diaphnocoris chlorionis	58	246				
Maple bladdergall mite	Vasates avadripeda	58	148	98	155		
Pine tortoise scale	Toumevella parvicornis	58	148	6]\$	1050		
Eastern tent esterniflar	Malacozoma americanum	90	190				
Gypsy moth	Lomaniria dispar	90	448				
Cooley spruce gall adelgid	Adelges cooleyi - on fir	120	190	1500	1775		
Nantucket pine tip moth	Rhypeionia frustrana	121	448	1514	1917		
Woolly larch adelgid	Adalges laries	121	192				
Zimmermen pine moth	Diogetria simmermani	121	246	912	1917	1917	2154
Black vine weevil	Ottorhynchus micatus	148	400			-	
Cankerworms (inch worms)	-	148	290				
Dogwood borer	Synanthedon southa	148	700				
Lilac borer	Podosesia syringae	148	299				
Birch leafminer	Fenura pusilla	190	290	530	700		
	-						

			Grov	ving Degree Da	ys		
Common Name	Scientific Name	min l	max l	min2	max2	min3	max3
Holly leafminer	Phytomyza ilicis	192	290	246	448		
Honeylocust pod gall midge	Dasineura gleditschiae	192	229				
Imported willow leaf beetle	Plagiodera versicolora	192	448				
Larch sawfly	Pristophora erichsonii	192	299				
Linden looper	Erannis tiltaris	192	363				
Native holly leafminer	Phytomyza ilicicola	192	298	1029	1266		
Rhododendron borer	Synanthedon rhododendri	192	298	533	707		
Rhododendron gall midge	Clinodiplosis rhododendri	192	363				
Lace bugs	Corythuca sp.	239	363	1266	1544		
Arborvitae leafminers	Argyresthia sp.	245	360	533	700	1700	2100
Boxwood psyllid	Psylia buxi	290	440				
Locust leafminer	Odontota dorsalis	298	533	1029	1388		
Pine needle scale	Chionaspis pinifoliae	298	448	1388	191 7		
Elm leaf beetle	Xanthogaleruca luteola	363	912				
Elm leaf miner	Fenusa ulmi	363	530				
Larch casebearer	Coleophora laricella	363	618	2375	2805		
Twospotted spider mite	Tetranychus urticae	363	618				
Bronze birch borer	Agrilus anxius	440	800				
Azalea whitefly	Pealius azaleae	448	700	1250	1500	2032	2150
Boxwood leafminer	Monarthropalpus buxi	448	700				
Lace bugs	Stephanitis sp.	448	618	802	1029		
Mountain ash sawfly	Pristiphora geniculata	448	707				
Oak skeletonizer	Bucculatrix ainsliella	448	707	1798	2155		
Spruce needle miner	Endothenia albolineane	448	802				
Greenstriped mapleworm	Dryocampa rubicunda	533	1645				
Bagworm	Thyridopteryx ephemeraeformis	600	900				
Cottony maple scale	Pulvinaria innumerabilis	802	1265				
Oak spider mite	Oligonvchus bicolor	802	1266				
Roundheaded apple tree borer	Saverda candida	802	1029	1514	1798		
Honeylocust mite	Eotetranychus multidigituli	912	1514				
European elm scale	Gossvoaria spuria	1029	1388				
Japanese beetle	Popillia iaponica	1029	2154				
Walnut caterpillar	Datana integerrima	1029	1514				
Dogwood sawfly	Macremphytus tarsatus	1151	1500				
Tuliptree aphid	Macrosinhum liriodendri	1151	1514	191 7	2033		
Fall webworm	Hyphantria cunea	1266	1795				
Maple trumpet skeletonizer	Epinotia aceriella	1388	2032				
Twobanded Japanese weevit	Callirhopalus bifasciatus	1644	2271				
Locust borer	Megacyllene robiniae	2271	2805				

Table 1 cont'd. Common names, scientific names of insects and degree days (DD₅₀) affecting ornamental plants.

Growing Degree Days (GDD) = average cumulative degree days with a threshold of 50° F.

Min1-Max1, etc. = range of GDD during which pest is susceptible to control. If more than one range of numbers appear, multiple generations and/or control periods are expected.

Degree Day Accumulation Chart

Year____

Date	Max Temp	Min Temp	<u>Max T + Min T</u> 2	DD ₁₀ (Ave T)-50	Comulative DD ₅₀
		<u> </u>			
			· · · · · · · · · · · · · · · · · · ·		
			<u> </u>		
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	·····	<u>}</u>			

Remember, a negative number should be changed to a 0 for the day.

Host/Pest Guide to Insects & Mites Attacking Ornamentals

The following is a list of the hosts & their pests that are covered in this bulletin.

AJUGA Twospotted spider mits

ALDER European alder leafminer (Hymenopierous) Woolly alder aphid

ARBORVITAE

Aphids Arborvitae leafininer (Lepidopterous) Bagworn Fletcher Scale Spruce spider mite Tip dwarf mite (Eriophyid) Twospotted spider mite

ASH Aphid

Aphid Ash flowengall mite (Eriophyid) Ash savdlies Banded ash elearwing Elm spanworm Fall webworm Fall webworm Flatheaded apple tree borer Forest tent caterpiliar Leafhoppers Leafhoppers Leafholter Lilac (Ash) borer May/June beetles Oystershell scale Plant/seaf bugs Putnam scale Scurfy scale

AZALEA Azalea bark seale Azalea lace bug Azalea leafminer (Lepidopterous) Azalea mite (Eriophyid) Azalea whitefly Black vine weevil Rhododendron borer Southern red mite

BALD CYPRESS Bagworm Bald-cypress mite (Eriophyid) Japaness beetle

BARBERRY Barberry sphid Barberry looper (Barberry caterpillar) Barberry scale Barberry webwarm

BIRCH

Aphid Bagworm Birch besdgall mite (Eziophyid) Birch leafminer (Hymenopterove) Bronze birch borer Fall vebworm Forest tent eaterpiller Gypsy moth Japanese beetle Leafhopper Oyatershell scale Spiny witch hazel gall sphid

BITTERSWEET Euonymuu scale

BOXELDER Boxelder bug

BOXWOOD

Boxwood leafminer (Dipterous) Boxwood spider mite Boxwood psyllid European fruit Jocanium scale

BUCKTHORN (TALLHEDGE) Bagworm Japanese boetle

CATALPA Catalpa sphinx Japanese beetle

CHESTNUT Asistic cak wervil Japanese beetle Leathoppers

CHRYSANTHEMUM Aphida Boet armyworm. Cabbage looper Corn earworm Leafinoppera Leafininer (Dipterous) Oranivorous leafoiller Twopotted upider mite Thripa Whitefly

COLUMBINE Leafminer (Dipterous) Sawfly

COTONEASTER Aphids Hawthorn lace bug Leathoppers Pear alug (sawfly) San Jose scale Twospotted spider mites Webworn

CRAPEMYRTLE Aphide

DAY LILY Aphids Slugs Thrips Twospotted spider mite

DEUTZIA Aphide Lilac leafminer (Lepidopterous)

DOGWOOD Dogwood bater Dogwood chub gall midge Leathopper Oysternheil scale Red-headed fles beetle

DOUGLAS-FIR Aphida Bagwarm Cooley spruce gall adelgid

ELM Bark beetles (native) Cankerworms Bim leaf beetle Elm leafininer (Hymenopierons) Buropean elm soale ELM (cont'd) Fall webwarm Japanese beetle Leafhoppers Woolly aphid

EUONYMUS Aphide Begworm Black vine weevil Euonymus scale Leafhoppers Twospotted Spider mites Winged euonymus scale

FICUS (Cuban Lourel) Thrips

FIRS Bagwonn Balsam twig aphid Balsam woolly adelgid Spruce spider mite Pales weevil Pales weedle scale

PIRETHORN Aphide Black vine weevil Hawthem lace bug

PLOWERING FRUIT TREES Aphida Bagwnm Borers, flatheaded Clearwing borers Eastern tent caterpillar Fall webwarm **Japanese** beetle Leathoppers Lesser peach tree borer Peach tree borer Pear slug (sawfly) Pear psylla Scales Spider mites Spring cankerworm Woolly aphids

FORSYTHIA Red-headed flea beetle Spider mites

GOLDEN RAINTREE Leafhoppers

HACKBERRY Hackberry nipplegall psyllid Lace buga Putnam scale

HAWTHORN Aphids Bagworm Eastern test caterpillar European red mite Fall caskerworm Fall webworm Fall webworm Fall webworm Japanese beetle Lace bag Leathopper Leatiminer (Hymenopteroue) Oystershell scale Poar sitg (sawfly) Souffy scale Terrapin scale

HEMLOCK

Bagvorm Black vine weevil Hemlock looper Hemlock asale Hemlock rust nuite (Eriophyid) Pine needle seale Spruce spider mite Strawberry root weevil Thrips

HICKORY Caterpillars Elm spanworm Hickory petiole gall adelgid Hickory shuckworm

HOLLY Black vine weevil Holly bud moth Holly leafminer (Dipterous) Southern red mite

HONEY LOCUST Begworm Cottony maple scale Honey locust spider mite Honey locust plant bug Heney locust pod gall midge Honey locust scale Honey locust scale Honey locust stant mite Leafhoppens Mimosa webworm Oystemhell scale

HONEYSUCK LE Aphids Honeysuckle leafminer (Lepidopterous) Spider mites Tatacicae aphid

HORNBEAM Begworn Leafhoppen

HOSTA Shaga Twospotted spider mite

INKBERRY Inkberry leafminer (Dipterous) Southern red mite

IRIS Iris borer

IVY Aphids Japanese beetle Leafhoppers Scale

JUNIPER Bagworm Juniper midge Juniper esals Juniper webworm Spruse spider mite Tip dwarf mite (Eriophyid)

LARCH Bagworm Larch casebearer Woolly larch aphid

Host/Pest Guide to Insects & Mites Attacking Ornamentals (cont'd)

LELAC Fall webworm Lilao (=Ash) borer Lilao leafininer (Lepidopterous) Oystemheil soale

LINDEN Aphide Begwarm Basrwood lace bugs Cottory maple scale Fall and spring cankerworms Fall webworms Japmese beetle Linden leaf beetles South scale

LOCUST (BLACK) Lecust barer Lecust leafhopper Lecust leafininer (Coleopterous)

MAGNOLIA Lesfininer (Colcopterous) Magnolis scale Yellow poplar wesvil

MAHONIA Barbeny aphid Barbeny looper (Barbeny catenpillar) Barbeny webwona

MAPLE Aphida Bagworm Borers (bark beetles & flathcaded) Cottony maple scale Erenium mites (Eriophyid) Fall cankerworm Fall webworm Forest tent caterpillar Greenstriped maple worm Japanese beetle Leafhoppers Leconium acales Maple bladdergall mite (Eriophyid) Maple petiole borer Maple shoot moths Oystembell scale Spider mites Spring cankerworm

MOCK ORANGE Aphids Leafminers

MOUNTAIN ASH European red mite Fall webworms Japanese beetle Lace bugs Mountain ash sawfly Woelly aphids

MOUNTAIN LAUREL Azalea bark scale Azalea leafminer (Lepidopterous) Lace bug Rhododendron berer OAK Aphide Asiatie oak weevil Bagwonn Room Clearwing borer in pin oak Elm spanwonn Fall webworms Forest tent esterpillar Galla (Hymenopterous) Golden oak scale Gypsy meth Japanese beetle Leathoppers Leafminers (Lepidopterous) Lecanium scale May/June beetles Oak kermes scale Oak lace bug Obsoure oak soale Orangestriped oak worm Pin oak sawfly Skeletonizers (Lepidopterous) Spider mitee Spring cankerworms Tent caterpillars Twig pruner Twolined chestnut borer

PACHYSANDRA Euonymus scale Oystershell scale Twospotted spider mite

PHLOX Twospotted spider mite

PIERIS (Japanese Andremeda) Andromoda laco bug Southern red mite

PINE

Allegheny mound ant Aphida Bagworm Bark beetles Black pine leaf scale Eastern pineshoot borer Eriophyid mite European pine shoot moth Nantucket pine tip moth Northern pine weevil Pales weevil Pine back adolgid Pine needle midge Pine modile scale Pine mot collar weevil Pine tortoise scale Pine tube moth Pine webworm Smilling Spittlebug Spruce spider mite White pine woevil Zimmmerman pine moth

POPLAR Forest tent enterpillar Oystembell scale Poplar tent-maker PRIMROSE Twospotted spider mite

PRIVET Privet rust mite (Eriophyid) Privet thrips White peach scale

PYRACANTHA (See Firethern)

REDBUD Fall webworm Leafhoppers Redbud leaftier Thombugs

RHODODENDRON Azalea bark soale Black vine weevil Rhododendron borer Rhododendron lace bug Southern red mite

ROSE

Aphidu Japanese beetle Leafniners Omniversus leafroller Rose chafer Rose midge Spider mites Theine

SERVICEBERRY (Amelanchier) Aphids Hawhom lace bug Japanese beetle Pear slug (sawlly)

SPIREA. Aphide Spirea leaftier

SPRUCE Aphids Black vine weevil Bagwarm Balsam twig aphid Cooley spruce gall adelgid Eastern spruce gall adelgid Pine needle scale Sawflies Spruce budworm Spruce budworm Spruce budworm Spruce apider mite White pine weevil

SWEET GUM Bagworm Fall webworm Forest tent catepillar Leafminer Sweet gum pitmaking scale Sweet gum leaftier Twospotted spider mite SYCAMORE Aphids Bagworm Fall webworm Japanese beetle Leaffolder Leafholpers Sycamore lace bug Terrapin scale Whitemarked tuccosk moth

TULIP TREE

Lesfminer (Coleopterous) Tulip spot gall midge (Thecodeplosis liriodendri) Tulip tree sphid Tulip tree asale Yellow poplar weevil

VIBURNUM Aphids Spider mites

WALNUT Aphids European red mite Fall webworm Leathoppers Twospotted spider mite Walaut caterpillar Walaut petiole gall mite

WILLOW Aphids Bagworm Borers (beetle) Fall webworm Leaf beetles Oysterahell scale Poplar tentmaker Saylies Spider mites Tent caterpillars

WISTERIA Leafhoppers

YEW (Texas) Black vine weevil Fletcher scale Mealybug Taxas bad mite

YUCCA Aphida Scales

Seasonal Appearance of Pests and Normal Time Frame to Apply Control Measur

Normal Time Frame to Apply Control Measures The following information serves as a guide to help you know the approximate time when control measures can be implemented. Consult the text for more detailed instructions and information:

Dormant - Before Growth Starts

 Host	Pest
 Aborvitas	tip dwarf mite, Fletcher scale, spider mites
Ash	ash flower gall mite, sourfy scale, oystembell scale
Bittensweet	eucoymus scale
Cotoneaster	San Jose scale
Douglas fir	Cooley spruce gall adelgid
Elm	Buropean elm scale, Putnam scale, scurfy scale, San Jose scale
Enonymus	enouymus scale, winged everymus scale
Fir	pine needle scale
Flowering fruit trees	mites, San Jose scale, scurfy scale, terrapin scale, uphida
Hackberry	Putnam scale
Hawthorn	tempin scale, European red mite
Hemlock	Hembock scale, pine needle scale, Fiorinis scale
Juniper	Juniper scale, tip dwarf mite, spider mites
Lileo	oystendell scale
Linden	cottony maple scale
Maple	tempin scale, cottany maple scale, Putnam scale, systembell scale, scurfy scale, locanium scale
Oak	golden oak scale, kennes scales, obscure oak scale, lecanium scale
Pine	pine bark adelgid, pine needle scale
Poplar	oystembell scale
Spruce	spruce spider mite, spruce gull adelgid
Sweet gum	sweet gun pit-making scale
Tulip tree	tulip tree scale
Willow	oyatershell scale
Yew (Taxie)	Fletcher scale, mealybuga

After Growth Starts

Bitset Pert Havdgern woolly apple sphid, havdown kerininer Shade trees eakter spitse aproce spider nils, processing for its processing for its pror its pror its processing for its pror its processing for its p		April (early)		May (early) cout'd	<u></u>	May (mid) cont'd
Add Spruce	Hest	Pert	Hawthorn	woolly apple aphid,	Shade trees	canicerworms
Add Main (Moret gain multis) Heulook spece spiker mile, hendok zeals Sveetguan Greet more trait eining/like Price Dasky spiker store, hendok zeals Synamore heo brag Synamore heo brag Synamore heo brag Spraw Construction spiker spiker mile, hendok zeals Synamore heo brag Synamore heo brag Spraw Construction spiker spiker mile, hendok zeals Synamore heo brag Synamore heo brag Spraw Construction spiker spiker mile, hendok zeals Synamore heo brag Synamore heo brag Construction spiker spiker Construction spiker spiker Mayb Kate spiker spiker Marg (faids) Construction spiker spiker Construction spiker spiker Marg (faids) Marg (faids) Marg (faids) Construction spiker spiker Prin Spraw Spraw Spraw Spraw Spraw Marg (faids) Proverspiker spiker Marg (faids) Proverspiker spiker spiker Marg (faids) Proverspiker spiker spiker Spraw Spraw <td>4.1</td> <td></td> <td></td> <td>hawthorn leafminer</td> <td>Spruce</td> <td>spruce spider mite</td>	4.1			hawthorn leafminer	Spruce	spruce spider mite
Choog state of gal a backging prime Descressing prime Sprease prime Sprease Spr	Ann *Denster Co	Ren Hower gan mite	Hemiock	spruce spider mite, hemlook seale,	Sweetzum	forest tent esterpillar
Prince Pack Wardy, Rottikerin genos späl sköglå, Graves Janiger seaten sprase späl sköglå, Graves, genos späle nuke, seaten sprase späl sköglå, Graves, genos späle nuke, social sköglå (Concelly spiki rottik, Colornada Janiger seaten sprase späle sköglå, Graves, genos späle nuke, social sköglå (Concelly spiki rottik, Colornada Varv (Taxue) analytegr Mark Konvey, social sköglå (Concelly rottik, Colornada Convertise status, Colornada Mage convertise status, Colornada Mage convertise status, colornada Mage convertise status, colornada Arbevite status, rottik, Colornada Arbevite status, rottik, Colornada Arbevite status, rottik, Colornada Arbevite status, rottik, Colornada Arbevite status, rottik, Colornada Arbevite status, rottik, Colornada Arbevite status, rottik, rotti	*Liougias-In	Cooley sprace gall adeiged		pine needle scale, fiorinia scale	Sycamore	sycamore lace bug
Sprace Limitmum pine menh Maple reside profile Maple Sprace extra sprace split of mile, rock back, (Nervy, rock back, market sprace split of male, rock back, (Nervy, rock back, market split of male, split of male, split of male, rock back, (Nervy, rock back, market split of male, maple back back back back back provide backback of market split of market split rock Maple Maple Mountain and market split rock back from spring frank (nervy provide backback of market market split rock Mountain and sprace backback of market sprace and split rock Maple Maple Maple Provering frait tree integr to the provering frait tree provering frait tree proveri	Pino	Pales weevil, Northern pine weevil,	Juniper	juniper webworm	Yew (Taxas)	mealybugs
Spiritie eastern spritte galt solgid, spritte forest first exterpilize workly spritte May (take) (Newwy, rod. black, Cooley spritte galt solgid form spritte galted gift of Douglas fir case to controlled form spritte galted gift of Douglas fir case to controlled form spritte galted gift of Douglas fir case to controlled form spritte galted gift of Douglas fir case to controlled form spritte galted gift of Douglas fir case to controlled form spritte galted gift of Douglas fir case to controlled form spritter were galted gift of Douglas fir case to controlled form spritter were galted gift of Douglas fir case to controlled form spritter were galted gift of Douglas fir case to controlled form spritter were galted gift of Douglas fir case to controlled form spritter were galted gift of Douglas fir case to controlled form spritter were galted gift of Douglas fir case to controlled form spritter were galted gift of Douglas fir case to controlled form spritter were galted gift of Douglas fir eastern test starpillar April (mid / forest test starpillar forest starpillar Advecting first trees forest starpillar Advecting forest starpillar Advecting forest starpillar File browerig first trees fir first fore in mach garrow exvit, Priste wervit, printer wervit, priste wervit, printer mathematical wervit wervit, printer wervit, priste wervit, p	-	Zimmernun pine meih	Maple	eriophyid mite, maple shoot moths,	. ,	
(Norwy), arguing speet male, Cooley groups gol adegid. Tooley groups gol adegid. Cooley groups gol adegid. Theore, cooley adegid. T	Spruce	castem spruce gall adeigid,	•	forest tent caterpillar		May (late)
rdd. Black, Lowidy sprace gal adelgid, aproce ade description aproce and the sprace adely aproce adely sprace gal adelgid of Douglas-fir on to controlled from spring structures is above 60° F. April (noid) Flowering firtit tree eastern test esterpiller April (noid) Flowering firtit tree eastern test esterpiller Spruce Doubsen the spring	(Norway,	spruce apager mate,	Mountain ash	woolly aphid		
Validity, Cookerson project accode manage provide accode manage <	rod. black,	Cooley sprice gal adeigid,	Oak	forest tent esterpillar	Arborvitac	arborvitae leafminer, soruce spider
 Pine spring fung gala do Longitals at reals extention again group of all when straining fung gala do Longitals at reals extention again group of the straining fung tree of the straining fung tree straining straining fung tree strain fung exception and straining fung tree strain fung exception and straining fung tree straining fung	white, Colorado	spruce needle miner		gypry moth	•••	mite
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April (nide) moth, pine medic astal/a Elm fluthended apple two bores, white-marked assock moth compy assoch pod gall midge juniper verbrorm huniper juniper wervil, white pine verbrorm huniper juniper see of assock moth compy assoch pod gall midge juniper verbrorm white pine verbrorm huniper juniper see of assock moth compy assoch pod gall midge juniper verbrorm huniper juniper see of assock moth compy assoch pod gall midge juniper verbrorm white pine verbrorm huniper juniper see of assock moth compy assoch pod gall midge juniper verbrorm huniper juniper see of assock setter huniper juniper see verbrorm huniper juniper seable her huniper huniper juniper see verbrorm huniper hun				Zimmerman pine moth, pine tube	Bittenweet	
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Juniper janiper velveoram	Honey locust	honey locust pod gall midge	•	woolly latch sphid, nine needle scale	Flowering finit trees	flatheaded apple tree bornr. Putnam
Pine white pine weevil, pine weevil, Pines weevil, Pales	Juniper	juniper webworm	Sweetzum	forest tent caterpillar		acale
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lukberry inkberry leafminer Hackberry iace bugs terms output terms output Maple maple bladder gall mite marker wervil Hackberry iace bugs orange-striped oak worm Pine northern pine weevil, Pales weevil Holly holly leafminer Pashysandra eucoymas scale, May/Tune beetles, Spruce (Calorado) eriophyid mite, spruce spider mite Hawthorn hawthorn holly leafminer Pashysandra eucoymas scale, May/Tune beetles, May (carly) Holly holly leafminer Pine andromeda lace bug Arborvitae atborvitae leafminer May leafminer May leafminer Pine spruce spider mite, eriophyid mite Arborvitae atborvitae leafminer Oak lace bugs Serviceberry hawthorn lace bug Arborvitae atborvitae storvitae Serviceberry hawthorn lace bug sould compare scale white-marked tunsock moth, sourfy Ash forest tent caterpillar Oak lace bugs Serviceberry hawthorn lace bug sould compare scale Birch forest tent caterpillar Oak lace bugs Sycamore sycamore syca	Flowering fruit trees	eastern tent exterpillar	Flowering fruit trees	castem tent externillar	~=	cleaning borger golden oak scale, oak
Maple maple bladder gall mite Hawthern	Inkberry	inkberry leafminer	Hackberry	ince hum		kormes seals. May/June beetles.
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Arborvitae atborvitae atborvitae atborvitae atborvitae atborvitae Ash forest text caterpillar Oak lace bugs, oak kermes soalo, golden Shade trees white-marked tussook moth, sourfy Biroh forest text caterpillar oak soale, forest text caterpillar soale Biroh forest text caterpillar Pieris andromeda lace bug Sysamore sysamore lace bug Boxwood boxwood leafminer, boxwood psyllio Pine pine bark adelgid, spittebug, Willow scale Elm woolly apple sphid eriophyid mite Yew (Taxus) meetybugs Fir balaam twig aphid Poplar forest text caterpillar Yew (Taxus) meetybugs Flowering fruit trees castern text caterpillar, lessor poscharee borer Serviceborry hawdhorn lace bug How bore, lace bugs			Mountain ash	loce biox	Serviceberry	have been been been been been been been be
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Birch forest tent caterpillar Pieris andromeda lace bug Syvamore syvamore lace bug Boxwood boxwood leafminer, boxwood psyllid Pine pine bark adelgid, spittlebug, Willow scale Elm woolly spple sphid eniophyid mite Yew (Taxus) mealybugs Fir balaam twig sphid Poplar forest tent caterpillar Flowering fruit trees castern tent caterpillar, Rhododendron rhododendron borer, lace bug Hackberry hackberry nipple splid Serviceberry hawdhorn lace bug	Ash	forest tent caterpillar		oak soule, forest test asternillar		anale
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Flowering fruit trees eastern tent esterpillar, Rhododendron rhododendron borer, lace bugs lessor peachtree borer Serviceberry havdhorn lace bug	Fiz	balsam twig sphid	Poplar	forest test asterniller		
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Hackberry hackberry nipple gall prvläd	•	lessor peachtree borer	Serviceherry	handharn has has		
	Hackberry	hackberry nipple gall pryllid	over the point?	THE CONTRACT OF AND		

Seasonal Appearance of Pests and Normal Time Frame to Apply Control Measures-(continued)-

					· · · · · · · · · · · · · · · · · · ·
	June (early)		June (late) cont'd		
Hest	Pest	Flowering fruit trees	San Jose scale, bagwonns, peach tree	Hemiosk	August (eeny)
Arborvitae	approce spider mite.	Hemlock	notice spider mite because black	Honey locust	mimora webanem
Ash	ovstershell scale, like (=ash) borer.	TRUINGE	vine weevil	Juniper	iminer tin midee
	fail webwarm, elm spanworm	Hombean	bazwonns	Oak	oak skeletonizers
Azalea	lace bugs, shododendron borer, azalea	by	Japanese beetle	Tulip tree	tulip tree scale
	whitefly,	Juniper	begwonns, juniper scale	Yew (Taxus)	black vine weevil
Birch	bronze birch borer, oystershell scale	Larch	bigworms		
Bittenwoot	cuonymus scale	Linden	linden leaf beetles, Japanese beetle,		August (mld)
Boxwood	boxwood leafminer, locanium scale		bagworms		
Dogwood	dogwood borer	Maple	bagworms, locanium scale	Honey locust	nimosa webworm
Douglas-itr	bigwonne	Oak	bagworms	Mimosa	mimosa webworm
Encolitation	euonymus scale, winged suonymus		pine tortonie scale, bagworms	Pine	aphid, pine webworm
There a line finite survey	PCRES	Knogodenaron	black vine weevie		
Howevering must need	terrapin scale, (peach, pittin, apricor)	Shade trees	Digworms, icainoppers		August (late)
Hemiock	evenes anider mite	Serve	sentre mide mite emme sende		
Hickory	elm soanvorm	optione	miner	Ash	banded ash clearwing
Honevnickie	bonevnickle leafminer	Walnut	valout catemiliac	Magnolia	magnoits scale
Juniper	juniner tip dwarf mite, juniper scale,	Willow	herving		
	spruce spider mite	Yew (Taxas)	Fletcher scale, black vine waevil		
Lilao	oystembell scale, lilao borer			·	Souther how (confu)
Magnolia	yellow poplar weevit	· · ·			Schreitingt (catià)
Maple	oystemhell scale, green-striped maple		July (early)	Arhonites	Eletcher scale
-	WOITE			LUCINI	locust hoter
Mountain ash	Buropean red mite, jace bugs	Arborvitae	begworms	Magnalia	magnoila scale
Mountain laurel	azalea leafminer, lace bug	Евопутив	bagworms	Maple	cottony maple scale
Oak	golden oak scale, oak kermes scale,	Fo	bagwonus	Pine	nine root collar weevil
	orange-striped oak worm, elm	Flowering fruit trees	flatheaded borer, San Jose scale, lesser	Sweet our	sweet our pit-making scale
	spanwonn.	•	peach tree bores (peach, plum, apricot),		B==- k
Pachysandra	oysterahell scale, euonymus scale		begworms		Sentember (mid)
Pierie	andromeda lace hug	Hemlock	begworms		
Pin oak	May bectles	Honey locust	mimora webworm	Juniper	juniper tip midge
Poplar	oystorzhell seale, suonymus scale	Juniper	begworms	Spruce	spruce gall adelgids
Khododendron	azalos whilelly, azalos jestminer,	Linden	begworms	-	
M	mododendron borer	Locust	locust leafminer		September (late)
Sende trees	terrapin sease, seamoppen	Maple	flatheaded borer, oottony maple scale,		(through October)
Dalia trac	zpruce sproce mass	N.C	pelinours		(
Yesy (Taxa)	meshdum	MIIII043		Juniper	juniper webworm
Willow	overteerbell seale		hameloed apple tree borer, bigworns	Pine	Pales weevil (adults)
TO BARY OF	Cystement of the court	Fins Siliting angels	orthogen and the barry series		
	June (mid)	Stret maple	controlly interface scale, suggesting		
		Very (Tayne)	space our search black wine weavil		
Arborvitac	bagworm, black vine weevil				
Aah	cim spanworm		July (mid)		
Azalea	azalos bark scale, black vine worvil				
Birch	bronze birch borer	Arborvitac	Fletcher scale, bagworms		
Flowering fruit trees	flathcaded apple tree borer, wooly	Buonyman	cuonymus scale, bagworms		
	apple aphid	Flowering fruit trees	San Jose scale, bagwonns		
Hemlock	strawberry root weevil	Hemlock	hemlock scale, pine needle scale,		
Hickory	elm spenworm		bagworma		
Juniper	juniper tip midge, juniper scale	Honey locust	mimosa webworn		
Linden	webwomme	Linden	cottony maple scale, begworms		
Maplo	and a spire tree noter, tecanitin	Oak	Haineaded apple tree borer, bagworms		
0. 4	ark skoletonizen. Marsfirme haetler	P1000	pme tube moth, pme webworm,		
	flatheaded angle tree house learning	Sibres	ottomumente socie terre		
	scale, phy stationers	Surver mapte	one needle scele		
Pine	European pine shoot moth. Nantucket	Walnut	valuut estemillar		
	pine tip moth	Yew (Terrer)	black vine wervil. Fletcher scale		
Rhododendron	azalea bark scale, black vine weevil		NAME TARE TRUTCH, I DOUBLE BUBLE		
Sprace	spruce needle miner, spruce spider		July (late)		
-	mite				
Sweet gum	sweet gum pit-making scale	Bacherry	bacherry webwarms		
Sycamore	sycamore iace bug	Bittersweet	euonymus scale		
Walent	fall webworm	Euonymus	enonymus scale, winged enonymus		
Yew (Taxus)	black vine weevil		scale		
		Flowering fruit trees	San Jose scale		
	June (late)	Honey locust	mimosa webworm		
		Maple	cottony maple scale		
Arborvitae	arborvitae leafminer, bagworms, black	Oak	kermes scale		
	vine weevil, Fletcher scale	Pina	pine tortoise scale, Pales, northern		
			pine and white pine weevil adults		
Azalea	oystershell scale	Yew (Taxus)	black vine weevil, mealybugs, Fletcher		
Bald-oypress	begworms		scale		
Buch Design	orch leanning, branze birch borer				
Buckmorn .	Dagwoff225				
Colonante-	General the second states and the second states are second states and the second states are second state				
Contraction The	Ann 2008 Sunto, Dista Vine Webvil				
rei	OR WOLLS, OSSUE VIED WOOVIE				

Micro-Injection of Systemic Insecticides into Trees

Systemic insecticides, used as foliar sprays, soil drenches and granular applications to trees for control of a number of important pests, are not new.

Several companies have been developing various methods of injecting these same systemic insecticides directly into the trunk of trees to allow the vascular transport system to distribute the pesticide throughout the plant.

Mauget System -

The J. J. Mauget Company, P.O. Box 3422, Burbank, CA 91504 provides a micro-injection system which uses prepacked plastic containers which can be compressed to provide internal pressure. An 11/64-inch drill bit is used to make holes in the Some of these injection systems use 3/8-inch to ½-inch holes for injecting or implanting capsules. Recent evidence indicates that these larger diameter holes may not heal rapidly on some species of trees. Therefore, these techniques should probably be avoided.

Other injection systems use much smaller injection holes, "micro-injection," which seem to heal more rapidly. The following two systems are nationally available:

tree trunk and a microinjector tube is inserted. The compressed container is then attached and the pesticide is injected into the tree vascular system. Mauget provides the following two products:

	Inject-A-Cide B	
	(Contains Bidrin)	
Host	Pest	
	sphick	
	lesthopper	
Birch	sphids	
	bronze birch borer	
	gypsy moth	
	birch leafininer	
Flowering	eastern teut caterpillar	
erabapple		
(Nonerop)		
Dogwood	dogwood twig borer	
Elme	sphède	
	European eim scale	
	eim leaf beetle	
Black gum	gypry moth	
Hackberry	nipple gall psyllid	
	hackberry psyllid	
Linden	aphida.	
Locust	aphide	
	leathopper	
Maples	spinicie	
(non-crop)	gypey moth	
<u></u>		
Uake	spince gouty and oak gail wasps	
	gypey moth	
	obscure scale	
	pit-making scale	
	(American plum borer)	
Pines	European pine sawfly	
	pine spittlebug	
	spider mites	
Flowering	lesser peachtree berer	
stone finits		
(Non crop)		
Sycamore	sycamore borer	
(Plane tree)	(American plum barer)	
Willow	aphids	
	-	

Inject-A-Cide
(Contains Melasystox-R)

Host	Pest		
Cedars	back beetle		
Cottonwoods	aphida		
Cypress	bark beetles		
	mites		
Douglas-fir	cone motha		
	engraver bestle		
Elms	elm leafbeatle		
Juniper	bark beetle		
Pines	engraver beetle (5 spined)		
(Except pinon)	engraver beetle (Monterey)		
	flathead borer		
	red turpentine boetle		
	black turpentine beetle		
	mites		
	Nantucket pine tip moth		
	pine needle aphid		
	pine needle scale		
Redwood	bark beetle		
	miter		
	needie scale		
Spruce	adelgida		
Walnuts and pecans	aphida		
(Non bearing)	mites		

ARBOR_x System -

The Tree Technology Systems, Inc., 1014 Rein Road, Cheektowaga, NY 14225 has developed a micro-injection system which uses prepacked plastic containers which can be compressed to provide internal pressure. A 3/16-inch drill bit

Dendrex (Contains Acephate)

Host	Pest
Trees	aphick
and Shruba	begworme
(except flowering	birch leafminer
crabapple,	boxelder bugs
see below)	bronze birch borer
	budwurms
	cankerworms
	casébearer
	condWorms.
	Douglas-fir tussock moth
	eim leaf beetle larvae
	gypty moth larvee
	Japanese beetle
	lace bugs
	leafroilers
	Nantucket pine tip moth larvae
	pine needle miner
	root weevil adults
	sevilies
	scale crawlers
	thrips
	whiteflies
	Zinunerman pine moth
Flowering	aphide
erabapples	tent esterpillars
	Icafrollers

is used to make holes in the tree trunk and a tip with container is inserted. A tap with a mallet seats the tip and compresses the container.

Harpoon
(Contains Metasystox-R)

Host	Pest
Codaza	bark beetle
Cottomwoods	ephide
Сургеан	bark beetles mites
Douglas-fir	cone mothe ongraver bestle
Elmas -	elm leafbectie
uniper	bark bostlo
Pines (Except pinon)	engraver beetle (5 spined) engraver beetle (Monterey) flathead borer red turpentine beetle black turpentine beetle mites Nantucket pine tip moth pine needle sphid pine needle scale
Rodwood	back bootles mites needle scale
Spruce	adelgida
Walnuts and Pecans (non-bearing)	aphide mites

IMPORTANT NOTICE

ADDR AT A ALTA IN THE ALLAR The Listing of Products & Periodes There has been no attempt in hits ballets to list the register positive on the hasis of most effectives loss effective. We do not have effectiveness generations and the positive hard and have decided to its then by the hair of energy of effectiveness.

Table 1. GENERAL PESTS

		Labelled	Fermulation	Amount To Add To:
Pest	When to Treat	Pesticide	You Buy	100 Gal. Water
ATTERNA .	These selects ophicits filter appear with instance values.	Astro	3254480	4-Filmt.
	and al.	Auto BC	0.263 D. (p.) BC	13-26 m. (mm+ny taly)
		Lingung	0.3580	2.5-5 pc
		Cattery t SD	SKD	N/A. (Deckel applies only)
	and the second state of sample states and states	Catal d	JA AJ D	
		Cartage L	545. T.W	3. b. install shift girt
	Note: Do not use Displace on time, estimation, biblious or	Colline 1	S.B. Aul. BC	110
	يتهمنسيو	Othing	I BANK BC	1.6
		Dentises.	208 112	13 m.
	Maine: Do-goi con Thiotica, Cantonioli or Pianov -a, Main.	Distante 3014 Distante 22	183 T.W.	115
	tinte: Daget an suge of grants in the Subscript subs	(Spericariaite)	26.80	i qi. temeri yime eshi
		Decision 42 L AUGHO	MAN GILL BC	
	Nature Research the Maintainer, Contribut, Maintainer,	09-99-900		2 m /100 m 8
	highwayeliber Spery or State Type Land Spery on Data or Chinase alan			Strain; 3.73-7.1 grante. in initial
		Dentes, Taxi	A Real DC	1 05-
		Durating SORICP	141 W.B	0.9 B.
		Durbes JB	Bagel BC	7 pr
		Dankag	0.5 Doigail, BC	2.4
		Dywurb	70 8 70 9	12.30 es. Campel agains calle
		Concerns and the	NA NE	The second second second
		Construe 1002	164 10	1 Andrew Charles and the set of t
		Garbian 20.	The PC	1.12
		Lotor IV	ASS BC	3.125 m.
		Linden 215	1-65 B-444 BC	1 p.
		Material co. 37	A. S. B. B.C.	1.52 pt.
		Malattice 37 Malattice	1 B. Qel. BC	h.>p.
		Manpanine April	SPC+SPCARE EC	3.75 pt./http:
		Norman Law	The set of the	1-12-00/000 bit for Classify (96)
		March 2754	No. We	15T Orminger and 0
			758 88	120
		Manymer-RI Olla decement into AL	2 INJUL BC TERNATIVE PRODUCT	i-1.5 vs./mih traik Gazatia (rai) bijet ady) Tib
		Olis, Includeral, response two ALTERNATIVE PRODUCTS:		
		Other	75% æ	0.33 8.
		Outana	N44.9C	7.125 gl.
		Otheran Bally	AND ALL A	WA USER PLUE ROY
		Penting (RC	diama in	8.5 st. #Chainteau trans cath?
		Parathine SE	Canad. BC	0.21 pt. #Chairman mean mint
		Perolation X Apple	Parine BC	ն է թե. (տարտար տածր)
		Party 462	A BARE BC	h en desceri apiete estat
		Plane .	Station B.	0.67 ef. (menor matri
		Summer (+ PP-/) Unit	1	
		Next Server (Carlow Annual Server) Next Server + Type (Carlow Annual Server) Next Server (Carlow Annual Server)		
		March Spany	2 In.+ L4 IN.had. EC	13.
		Real of Wo	9.42% WP	244.10
		Service of	4 B. & C. P	n ge. (named aphide only)
		Serie Liquid	2 R. quil. P	3 ge. faanael ophide colys
		Martin, M/W	JUN WE	2 m. (called épidel écip) 1 3 Min. (called
		Serie 3 Dan 3% D 1-1,29 (k.1995 op.).		
		Tele Ten	1.95 F	fitter.
		Table: HORT	105	14-12 m.
		Terro 1	2 had SC	1.5 m
		Tellen 1997	395 149	1.746.
		Biolog 2717	404 H.W	I D. Lansey mit/1
		Triana 181	3 B.Q.L BC	0.67 gL (namely stdg)
		Teres to	168 W	24 m. immel spick obj?
		Types L	rander auf	lanand making more)

 Pect	When to Treat	Labelled Pesticide	Formulation Von Bur	Amount To Add To: 100 Cal. Water
 2 404	Trana W LICAL		ran buy	1V0 (781, 7781¢1
RACHORM	Teast other heavours are totally should rold heas	di atan	3.3 lb (ex) EC	498
DAGHURM	(dee CATERPILLARS)	Certary SD	5.2 D./gal. EC	4-8 (). 02, M/A
	(AL CALLEDOWN)	Carbaryl 10D	10 % D	N/A
		Carbaryl 4L	A lb /est. F	1 m.
		Carbaryl SOWP	50% WP	2 10.
		Cvibion	S lb./mail. EC	2 nt.
		Cythian 8	8 lb./gal. BC	1.25 pt.
		Decathion	20% WP	1.3 02.
		Diazinon 50W	50% WP	L ID.
		Diazinon 2E & 25%		
		(Spectracide)	25% EC	L qt.
		Diazinon 4E & AG500	4B./gal. EC	í pL
		Dursban Turf	4 b./gal. EC	8 oz.
		Dursban SOWSP	50% WSP	0.5 lb.
		Dursban tE	1 b./gal EC	2 pt.
		Dersben	0.5 Ib./gal. EC	2 qt.
		Dycarb	76% WP	12-20 cz.
		Dylax	80% SP	20-30 of.
		Ficam W	76% WP	11 ce.
		Inotax IV	8.5% EC	4.69 gL
		Malathion 50	4.4 lb./gal. EC	1.5 gL
		Malathion 57	5 Ib./ga. BC	2 pL
		Malathion	-	-
		Methonychilor Spray	2 lb. +2 lb./gal. EC	2.5 pl./acre
		Mavrik	2 Ib./gal. F	5-10 cz.
		Neemisis	0.3% EC	2.5-5 pt.
		Orthene	75% SP	0.33 16.
		Orthene	9.4% EC	4.69 qt.
		Orthenex Spray	Accesol	N/A (certain plants only)
		Pageant DF	50% DF	0.5 Tb.
		Parathion 8 Aqua	8 lb./gal. EC	0.5 pt. (nursery only)
		Pounce 3.2EC	3.2 lb./gal. EC	4-8 oz./acre (nursery only)
		Pounce 25WP	25% WP	6.4-12.8 oz./acre (sursery only)
		Pounce WSB	24.7% WP	1-2 packets (=0.1-0.2 lb.ai./100 gal.)(minsery only)
		Protol 80SP	80% SP	20-30 oz.
		Scimitar WP	9.52% WP	2.4-4.8 oz.
		Sevimol	4 Ib./gal. F	l qt.
		Sevin 5 Dust	5% D	1-1.25 lb./1000 sq.ft.
		Sevin Liquid	2 Ib./gal. F	2 qt.
		Sevin 50W	50% WP	2 16.
		Taistar T&O	7.9% F	8-40 oz.
		Talstar 10WP	10 % WP	6.4-32 oz.
		Tempo 2	2 B./gal, BC	1 02.
		Tempo 20WP	20% WP	1.3 oz.
		Turcan	76% WP	11 cz.
 BLACK VINE WERVIL	Trant foliage at 3-4 week intervals from early May	Astro	3.2 lb./mal. BC	4-8 fl. cz.
(Adulta)	through August or until no living shifts are found.	Dumban Turf	4 lb./esL EC	l pl.
	Complete coverage of plants is essential for control.	Duraban 50WSP	50% WSP	1 lb.
		Dycarb	76% WP	12-20 ot.
		Ficam W	76% WP	21 oz.
		Guibion 2S	2 lb./gal. EC	1.5-2 pt.
		Lankax IV	8.5% EC	4.69 at.
		Mavrik Aquaflow	2 lb./gal. F	6.4-10 oz.
		Orthene	75% SP	1.0 m.
		Orthene	9.4% EC	4.69 at.
		Oxamvi 10G	10% G	(certain container plants only)(see label)
		Parent DF	50% DF	1 lb.
		Seimitar WP	9.52% WP	2.4-4.8 02.
		Talatar 10WP	10% WP	6.4-32 oz.
		Turcum	76% WP	5-16 ca.
(Larvae)		Puridan 4F	4 lb./gal F	1-2 fl. oz. (nursery containers only)
-		Oxamyl 100	10% G	(certain container plants only)(see label)
		Steinemena carpocapsae	(see ALTERNATIVE PR	(ODUCTS)
		Turcam	76% WP	see label for instructions
 CANKERWORMS,	Treat when larvae are small, usually mid-May.	"Bt" (karstaki) (see AL'	TERNATIVE PRODUCTS	S)
FALL AND SPRING	(see CATERFILLARS)	Carbary) SD	5% D	N/A
		Carbary1 10D	10% D	N/A
		Carbaryl 4L	4 ib./gal. F	L pt.
		Carbary1 50WP	50% WP	2 lb.
		Decathion	20% WP	1.3 ot.
		Dumban Turf	4 Ib./gal. EC	8 cz.
		Dumban 50WSP	50% WSP	0.5 b .
		Dycarb	76% WP	12-20 oz.
		Fican W	76% WP	11 cz.
		Imidan 70-WSB	70% WP	0.75-1 lb.
		Isotax IV	8.5% EC	4.69 qt.
		Malathion	A. B. (A. B. () - 3.5	1.0 -
		Methoxychilor Spray	2 m. +2 m./gal. BC	1-2 qi.
		Marlate 50	50% WP	2-3 Ib.
		Methoxychior 25	2 BL/GAL EC	4-3 QL
		Methoxyclalor 2EC	2 BL/gat. EC	4-3 qt.
		Orthene	9.4% EC	4.09 QR.
		Unitede Deserved D.D.	75% 8F	U. 33-U. 60 ID.
		rageau DF	2076 DF	U.3 10.
		resurvy 4EC	e multant RC	rde (man of this)

Table 1. GENERAL PESTS-(Continued)
			T_1.00	T2 • •*	
	D 4		Labelled	rormulation	Amount To Add To:
	rest	when to Treat	resticide	You Buy	100 Gal. Water
	CANKERWORMS		Resmethrin BC26	2 lb./gat. EC	I pt. (named plants only)
	(cant'd)		Rockland Shade Tree	2 IN ±1 1 IN 6-1 EC	1.1 at
			Seimitar WP	2.10. + 1.1 10./gai. (5	2-3 qt. 2.4-4.8 ct.
			Sevimol	4 lb./gal. F	l at.
			Sevin Liquid	2 lb./gal. F	2 qt.
			Sevin 50W	50% WP	2 Ib.
			Taistar T&O	7.9% F	8-40 oz.
			Tabtar IOWP	10% WP	6.4-32 oz.
			Tempo 20WP	2 tot/gat. gc	13.02
			Turcam	76% WP	11 oz.
	CATERPILLARS	Trest when larvae are small	Astro	3.2 lb/gal BC	4-8 fl.cz.
			"Bt" (mestaki) (san AT	U.379EU TERNATIVE PRODUCT	2.3-3 pc. TS)
			Decathion	20% WP	1.3 02.
			Mareosan-O	0.3%EC	2,5-5 pt.
			Mavrik Aquation	2 lb./gal. F	4-10 cz.
			Oils, dormant (see AL.	TERNATIVE PRODUCT	S)
			Oils, horicultural, sum	mer (see ALTERNATIVI	E PRODUCTS)
			Pytellarin (+PBO) (see	ALTERNATIVE PRODU	UCTS)
			Scienciter WD	a soc WD	
			Scene (feity acid salts)	(see ALTERNATIVE PR	ODUCTS)
			Tempo 2	2 lb./eal. EC	1 02.
			Tempo 20WP	20% WP	1.3 oz.
	EASTERN TENT	Eggs hatch about the time buds break in the spring.	"Bi" (kurstaki) (see AL	TERNATIVE PRODUCT	(3)
	CATERPILLAR	Best time to treat is when the past week are noticed. Appry	Carolityi 4L Cadarad 50320	4 ID./gal. F So of 137D	1 pr. 5 Th
		(are CATERPILLARS)	Catolity Jowe	5 Ib. (eal. EC.	2 ni.
			Cythion 8	8 lb./gal. EC	1.25 pt.
			Diazinen 50WP	50% WP	3 lb.
			Diazinon 2E & 25%		
			(Spectracide)	25% EC	3 qt.
			Diazimon 4E & AG500	4lb./gal_ BC	3 pt.
			Duraban Turf	4 [b./ga], EC	8 02. 0 6 th
			Dursten JE	JUNG WALF LING AND TRAT	0.3 LD, 7 mi
			Dumban		2 pt.
			Dycarb	76% WP	12-20 oz.
			Imidan-70WSB	70% WP	0.75-1 lb.
			Ficam W	76% WP	3 02.
			Isotax IV	8.5% EC	4.69 ct.
			Malathion 57	5 lb./gal. EC	2 pl.
			Malathion		
			Methoxychior Spray	2 ID. +2 ID./gal. EC	1-2 gt.
			Magaze 20	2 th Anni EC	2·3 m
			Orthene	9.4% EC	4.69 at.
			Orthene	75% SP	0.33 lb.
			Pageaux DF	50% DF	0.5 Ib.
			Rockland Shade Tree		
			Insect Spray	2 [b. +].1 Ib./gal. BC	2-3 qt. (named plants only)
			Scimitar WP	9.32% WP	2.4-4.8 cz.
			Service & Deast	10./gal. 1'	եր, 1,1-25 Մի /1000 թ. Ք
			Sevin Limit	2 ib./mail. F	2 aL
			Sevin 50W	50% WP	2 lb.
			Taistar T&O	7.9% F	8-40 cz.
			Taistar 10WP	10 % WP	6.4-32 cz.
			Turcam	76% WP	3 cz.
	PIDOPDAN DED	This 'many season' with should be instant bits the	4 MD+		· · · · · · · · · · · · · · · · · · ·
	MITS	inter warm season mus sizes of treated into the	ANU: Distinct fow	56% WP	1.16.
	MILLS.	overwinter as east on the host. These eyes can be	Diazinon 4E & AG500	4D./sal. EC	1 04
		treated with dormant cils.	Henygon 50-WP	50 % WP	1-2 cz. (nursery only)
		(see SPIDER MITES)			
		Trans when were find service with to the	Calure 1 41	Alla fact E	1
	FALL WEBWORM	steen when were next appear, when it about June for the first sensetion and Anexat for the second	Carbaryl 4L Carbaryl 50WP	4 10./gal. P 5046 WP	2 th.
		(see CATERPILLARS)	Cyron 2E	2 lb./eat. EC	2 at.
		····	Diazinon 50W	50% WP	3 26.
			Diazinon 2E	-	
			(Spectracide)	25% BC	3 qt.
			Diazinon 4E & AG500	4lb./gal. EC	3 pt.
			Darsben Turf	4 B./gal. BC	8 cz.
			Dursten SOWSP	505 WSP	0.0 Ib.
			Dursten Dursten	0.5 lb./gal. EC	2 pt.
			Dyent	76% WP	12-20 @.
			Dykw 80SP	80% SP	20-30 oz.
			Ficam W	76 % WP	бuz,
			laoton IV	8.5% EC	4.69 qt.
			Malathion	·	
			Methorychior Spray	2 ib. +2 ib./gal. EC	1-2 qt.
			Margosap-O	0.3% EC	2.3-3 pl.
			MINING .	a kongali P	J~10 US.

		<u> </u>	Labelled	Formulation	Amount To Add To-
	Pest	When to Treat	Pesticide	You Buy	100 Gal. Water
	FALL WEBWORM		Methoxychior	50% WP	1-2 Љ.
	(cont'd)		Neemisis	0.3% BC	2.5-5 pt.
			Orthene	75% SP	0.67 lb.
			Orthene	9.4% BC	4.69 gt.
			Uninche Descent D/P	3% A 607 DE	N/A
			Pagean DP Destroy AEC	JUTE DIP 4 Th And DIP	0.3 pp.
			Protol 80SP	80% SP	20-30 oz.
			Scimitar WP	9.52% WP	2.4-4.8 02
			Sevimol	4 Ib./gal. F	l qt.
			Sevin 50W	50% WP	2 Bb.
			Tablar TAO	1.9% F	8-40 cz.
			Thisiar IUWP	10% WP	6.4-32 02.
		· · · · · · · · · · · · · · · · · · ·			
	FOREST TENT	Treat when larvac are seen in early to mid-May.	Carbary14L	4 lb./gal. F	1 pL
	CATERPILLAR	(see CATERPILLARS)	Carbary 150WP	50% WP	2 lb.
			Cythics	5 Ib./gal. BC	2 pt.
			Cythian 8	8 Ib./gal. EC	1.23 pt.
			Disting JOW	2076 W.F	3 10,
			(Spectracide)	25 C DC	3 al
			Diazinon 4E & AG500	4 b./eal. EC	to.
			Dimilin 4L	4 b./gal. BC	I-4 oz./scre
			Dimilin 25W	25% WP	2-8 oz.
			Dumban Turf	4 lb./gal. EC	8 cz.
			Dumban 50WSP	50 % WSP	0.5 lb.
			Isotox IV	8.5% EC	4.69 qt,
			Malathica 37 Malathica	5 fb./gal. EC	2 pl.
			Methanychior Spray	2 III +2 III /eal IBC	1-2 al
			Mariate 50	50% WP	2-3 lb.
			Methocychior 2BC	2 b./gal. EC	2-3 of.
			Orthene	9.4% EC	4.69 qt.
			Orthene	75% SP	0.33 b.
			Pageani DP	50% DF	0.5 lb.
			Peatroy 4BC	4 Ib./gal. BC	l gt.
			Rockland Shade Tree		 . .
			Insect Spray	2 Ib. +1.1 Ib./gal. EC	2-3 qt. (named trees only)
			Semilar WP	9.32% WP	2.4-4.8 02.
			Sevin 1 inuid	4 ID./gal. P	1 yu Rat
			Sevin 50W	50% WP	2 16.
			Talstar T&O	7.95 F	8-40 oz.
			Talstar 10WP	10% WP	6.4-32 oz.
	GYPSY MOTH	Treat when young layvae are present and all cags	Aphid-Mile Atlack	25% solution	3.9 gal.
		have hatched, usually early May.	Bioneem	0.3SEC	2.5-5 pl.
		(see CATERPILLARS)	"Bt" (kurstaki)	various	VATION
			Carbaryi 4L	4 Ib./gal. P	1 pc.
			Carbaryl 50WP	50% WP	2 \$6.
			Decainion Dimitio di	20% WP	1.3 0Z. 0.5.2 cz. /seco
			Dimile 25W	4 100 gal 100	
			Dumban Turi	4 D./gal. BC	1 pt.
			Dumban SOWSP	50 % WSP	1 🚯.
			Ficam W	76% WP	4 ož. (egg mass spray)
			Ficam W	76% WP	3 oz. (larval spray)
			miden TOXNER	70% WF 70% WP	2.5 m. (tree trank spray) 0.7% i ik
			Index IV	N74 WE 8.55 BC	0.75=110. 4.69 mi
			Kryocide	96% WP	25-50 lb./acre
			Melathion		
			Methoxychior Spray	2 lb, +2 lb./gal. EC	1+2 qi.
			Margosan-O	0.3 SEC	2.5-5 pt.
			Methoxychior 25	2 h./gal. BC	2-3 ql.
			Orthene	9.4% EC	4.0¥ GR. 0.61 B.
			Of the second DE	1379 SP 4056 DP	0.07 BA
			Respectation EC26	2 ih./gal. EC	1 pt. (named plants only)
			Rockland Shade Tree		· · · · · · · · · · · · · · · · · · ·
			Insect Spray	2 B. +1.1 Ib./gal. BC	2-3 qt. (ouk, muple, elm, linden, pine only)
			Scimitar WP	9.52% WP	2.4-4.8 02.
			Sevimol	4 lb./gal. F	0.75-1 qt.
			Sevin 50W	30% WP	2 BD.
			Jaisiar 1800 Talatan 1887	1.970 P	6-40 02. 5 4 27 cm
			Termo?	2 Ma. /gal 1217	0
			Tempo 20WP	20% WP	1.3 02.
			Turcam	76% WP	4 oz. (cgg mass spray)
			Turcam	76% WP	3 oz. (larval spray)
			Turcam	76% WP	2.5 lb. (tree trunk spray)

	Part .	When to Trank	Levelet Periode	Formalution You Bay	Amount To Add Te: 180 Col. Water
	ATANEN BETTER	() wat when most ap or altifactional follogie is any		3.2 Mart BC	+16.m.
	(Market Berline	and region to second.	Cuttery 100	55 D	N/A
		Refer Donas me Savia 3 Dast en Romas hy er	Criteri H.	a la kal F	ter.
		Yaginia apagar.	Carbon Solle	505 WP	2.
			Cyclice	Sillingial BC	1.5pL
			Cything II	9 partial BC	114
			Design Der	an fail B'	
			Curries X/WSP	31% WST	14
			Dycele	top we	13-20 m
				765 17	Liez.
			Malatics Vi	to be an BC	
			hini at i an a fi	Sp.yel BC	j.J.m.
			Heistige		•
			Mathematical and a series	2 R. +2 R. q.4 BC	1494
			Matters 180	20.000	201
			Owtome	755 SP	1358.
			Orderes.	845 BC	435 m
			Occupit JOG	106 6	وتعلقا عدرار وتعد محملج اعتشادها مشتقده
			Presid DP	SUA DE	P3 In
			Symmetry Prove (see	7 Block CO	Lan. (autoral size's calls)
			Revenue + Byenhein	AN ALTERNATIVE P	ODUCTO
			Renthead Statis Trees		
			Innex Ryner	2 BC	2-3 4
			Sectors and	ADD AT	1444
			Serie 5 Deat	58 D	1.1.23 TE /1000 No. 1.
			Jerin Liquid	2 8.94 F	10
			Series Series	30# WP	28.
			South Conty Scill (Car)	AM ALTERNATIVE P	EDDCTSA
			Taken MINP	HOR TOP	16.11 (#
			Terro 2	S. Starten R. BC	Li m
			Tanje 2047	24 97	عف فل
			Taran	34 97	Los.
				2 IL YEL WOL	(Manay and 1904 March
-	LACE HIGH	Their black has been perifike are den sone.		1 7 Inga RC	4a É.a.
		and a support to be seen words.	Control 50	15 D	3.7 pt.
			CLAIP 500	105 D	HVA
			Colony I d.	6 Balgat P	16
			Cultury SWP	95 MP	2 h .
			Cybers	S hauged and	15
			Destilise	215 10	Lint.
			Di-Bynan	158 0	Parenter 5.5-7.25-m/101 A of our OIL
					2 of UDD and R
					Strate: 3.75 - T.5 gmm4/k, telgin
			Design Test	Children FT	1.
			Distance Schulle	578 W.D	0.1m
			Galilas 21	th./gal BC	1.54 p.
			fantas (fr	1.34 BC	449 gl
			Statement St.	A CALLER	13 *
			birds T2NT	150 10	1.1 T. Gerberne mitt
			Olt. Connet Gen AL	THIN AT THE INCOME?	19 ····
			Oits, horizoitatel, Acce	t (est ALTERNATIN	2 PACIDUCTS)
			Defining .	145	
			Contract Summ	Annual and	NVA Constants different contents
			Pigence. DP	99 DF	41.0
			Petralines & Ages.	t page SC	0.5 pt. (appropriate calling)
			Ecune 3.2EC	3.2. B. (al. B.	44 ar. mare (marries call)
			Points 777	10 TE 10	1-2 matrix (=0, F0,2 Push (000 rol Vormer arth)
			Resident State The		
			Josef State	2 K.+1.1 D-144 BC	2-3 g., internie piece raint
			Science WP	9.518 WP	144 4
			Service & Dans	+ 10.7pm (*	Latin and the
			Serie Liquid	Th. And P	24
			Seein XM	308 W.7	2 m.
			Scape (Sug- with sales)	(Ice ALTERNATIVE P	LODCICTES)
			Tables 190	7,94	14 m.
			Taxan Internet	2 BALL BC	ia.
			Tempo 20WP	274 MT	Line.
	12 ATMANDER	They show in the provide state and states and		12 Beat FC	444.**
		and a subscription of the subscription of	Column 5D	25.0	10A
			Cedary1 670	NS D	15/A
			Conserved all	a magent P	5 0
			Cadanyi SOWF	345 WP	2 m .

 		I shalled	Terrouletter	Amount To Add To.
Tes	When to Treat	Proticide	Yes ber	IN Gal. Water
147				
LEARIOFTERS		Critica	Sile.gat. BC	1.3 pt. (pointe & row in Departur only)
(collini)		C) Think I	S BAGAL BC	f pr. (pression & note biodilinggerie (relly)
		Desethin	205 147	Lt a.
		Decemp 104	205 WP	15
		(See mile)	215 10	t m.
		Destante 48 at AGMA	Abatal, BC	ia.
		Dis C) mican	155.0	Novem: 3.5-7.25 m/360 ft, at new OR
				7 w2,400 mp.ft.
				Stratu: 3.73 - 7.5 prese/9, bright
		Danker Traf	A Robert Terr	Trans. 7.5 of this and shoken.
		Durnes Sewist	50% N 20	P.J. In
		DioNo IE	Distant SC	24
		Denman	e.S.B.April BC	104
		Crimen 15	2 Ja Apak EC	179 🕫
		Notes IV	LIS BC	4.07 g.
		Manage Land	2.00.0pm.200	1.2 by checking has reproduced and
		Mederoothin Sonry	235 +245 April 197	2.72 pl. 4am (proper d) rost imference rate)
		bilining (i)	50% WP	23 8.
		Martin Aquation	2 Ib. (pak. P	4-10 as
		MACHINE TOWN	755 00	1.5 T. (landscape only)
		Colorado 200	2 30./pd. DC 9.48.007	23 4 .
		Delim	255.52	100
		Cardinauro, Spans	Antoni	N/A (curtain plants only)
		Changel 1007	05.0	contrain company plants autoiter tabels
		Norm DP	50% DP	6.5 Lb.
		Pepaliting E Ages.	a palent TC	D-3 pt. (markey opt) 4 di an farm (markey opt)
		France 1147	244.90	d de 17 d'are deres de servers artikk
		Primer 1720	21.15 97	C makes (~0 0.2 b.4./00 pd.)(Within 0.05)
		Pyrolicia (* PEC) (am	ALTERNATIVE IRCOL	JCT3
		Remotion STAF	2 B 4 4 50	i ps. (succed pixels coly)
		Release + Pypelinia	In VITENVIATIVE PE	
		Evential State Tor	The set of the set of the	14
		Arianita WP	1.0 *0.1 0 (pA D.)	1448
		Sevene	4.8. (m) F	
		Sevia 5 Dam	35 0	1-1.25 Bx/1000 mg.s.
		Savin 33W	50% WP	2 m.
		Status dilatiy acid Sell.()	Int ALTERNATIVE IN	DDCT3+
		Televi TAO	7/4 S F	Ball op.
		Table Divis	102 WF	a-11 al.
		Table 2/87	205 WP	1.9 06.
		Wpdame L.	2 BLOCK WSL	(connery only ()can late ()
	Sundust erman interesting are to be used against	Antro Con	3.2 KA1 KA	He fl.ct.
	interfering and have exhibite an the house which the	Active DC.	DAN BOTH	13.5 m.
		Durabac Terr	4 IB. ALL EC	10.
		Dentro MWSP	JOY WASP	E3 IK
		Dy link	2015.57	10-30 at. (Epicroni anily)
		Magene O	0.35 BC	2.55 p.
		NAME 1274 P	10 WP	1.1.5 of Andrews Barriss and Second States
		Parage Diff.	10.00	hith
		Press Will	24.16 WT	12 padde 9 - 0.1:0.3 Ball (07 p4.0pm) - 90
		Pagent 035P	NOR 57	20-31 on May-more autor
 A second address	****		3.4 Bilest DC	
MEALANCE	a un convergenza here income dennes (college biscon) In additioners an heift additional antipations may be	Nino I		2 Sul as
	and a state of the second seco	Colory 4.	+ putpet F	L pt
	Avera .	Californi 2007	***	72-
		Cythian	Sh.yath	13 pc
		Lymon A	C REAL DO.	
		Distant 22 A 155	200 MT	
		(Bootschief)	254 BC	l at
		Decise Terri	· Bulget SC	14
		Dentes 30With	875 W3P	LAL
		UNIONO JE	1 M. A. M. TC	1.
		Mainting Th	C.C.B. and DC	1.3 a.
		Sector St	I Jahred die	Light
		Mainteine		-
		Matterychter Sport	7 Barry Strangel BC	1.75 pl. Alex
		Northen 156	186	1-13 og/(000 pq. Pt. (magan(r milly)
		New 2004	0.36 80	2.95 pt. 3.1 T. (bashanas cala)
		Ole dement to all	TRANSTON MUCHANT	SA IT DESERVOIR AND A
		Offer, the similar till a sum	OF GALANTERNATIV	PRODUCTS
		-	9.4 S DC	1.41 -
		Contains Spacy	Austral	NVA (constr plants might
		Overaged 20Cl	10% C	(antria company pinets anty) (etc. 1848)
		Constitute DF	NOW DE	LBA Clinical comments which
		Constraints of West	* #** (\$ 12 B +	a set of the set of th

		Labelled	Permutation	Amount To Add To:
Part	When so Trans	Paticide	You Day	300 Gal. Water
				B.C
Tang 4		Cyrolina (+ 1921) (Au Zanazan + Cyrolina (ALTERNATIVE PRO	01013) 01000073)
		Science WP	1.52% %1	2448 00
		Sevimel	4 Martine F	1 gr.
		Serie Serie and a serie of the later	205 TT 	2 Ib.
		Tulan 140	1.95.7	2.0
		Table ION'P		4.4-12-
		Vydnie I.	2 m. spat. WHEL	(partery angle (text indext)
SIGULA BOOT	Their start datases the shall? In casts June and staffs	Discount SOW	203 TT	
WEEVE.	or product during the resource	Distance (E & ASSIM	48. gal. EC	in.
, and a		Owning Test	a pages Pri	10
		Danie 20037	2016 1452	1. The second s
		Been W	765 WF	1.
		ipotos. IV	ASK BC	4,00 gL
		Manik Aquilan	2 D. Jul P	64 6 .
		() determine	Dia an	LOB
		THENEDF	50% DF	1.
		Science WP	5,025 10	2444.00
		Terent	165 WP	16.
PERIODICAL CICADA	These parts that and then that is an advance surveyor.	Cathairi SD	35b	R/A
		Curbug1 100	105 D	WA.
		Catalyi 41. Catalyi 41.	A LA AGUEL P SINE TUTO	15
		Dentes Tell	4 Bulgat BC	1 m
		Dentes SWSP	95 T.T	0.5 8
		Pquet DP	20 F D#	0.5 36.
		Sectors (19.29)	AD AN P	s pr. compet public engli
		Arris Sibert	55.0	P. 23 B-2000 H.R.
		Serie Liquit	2 Duty 4 P	7.4-
		Scole SWW	50 S WP	11
PLANTILEAF BOOM	Mani plant that important i be controlled where the	440	3.2 pages BC	44 A.Q.
	nit synger op stille. One shelp ar lead, the	Cartery SD	58 D	XA
	nii. eelis Jooqqu Higuger	Carlwyi 190	MAD A	N/A
		Qu/vm \$/#7	205 WP	2
		Cything	Statute BC	J. Spl. (maintest & + Kingl raige)
		C) Ruber #	STAAL BC	t producerski de de fanski antys
		Densibiliti	205.107	174
		Dunches STATE	SOS TASP	6.5 h.
		Dytes	### SF	20-90 m.
		Mahatian Si	4.4 h. gal EC	Lá de guardines de Aldand apility
		HOMEGOID 7/	28.48 B	1.5 pt. (United to e-third only
		Medicer taker Steen	2 B. +2 B. 641 EC	3.35 m /acre (membried & 4-line) cobs
		Herric Aqualitar	2 D-940 F	+# #
		Ingene DP	50.5 DP	0.5 h.
		Preval MSP	105 SP	25-39 cm.
		Pyrantings (+ F 100) (the Restantings (+ F 206)	1 h del FC	and a second sizes aski
		Reisson + Pyteinia (ALTERNATIVE	SUDDUCTS)
		Scition WP	5.325 WP	244.846
		Environi Danaka Bilana Mil		19-
		Seein SeW	303 102	11
		Scope (Safer sold and as	ALTERNATIVE	M.ODAICTIN
		Taine T&O	7.9% P	1-00 m.
		Tables (1997) Tables 2	Sib Aut BY	4,4-34-04- 1 5 m
		T-maps 20WP	**	J.t.m.
etid upp			0 10 0	
F F F LAMP		Carbon SD	54 D	NA
		Cartery 10D	1035 D	14/A
		Carendi 4.	4b.qat.P	15
		Caroline www.	105 07	2 M. 1.3 m
		Dantes Ter	4 (5, 642, 60)	\$ CL.
		Decrine SOFT	505 WSP	4.5.4
		latin (V	8.0% BC	4.89-94
		Cite descare (no AL)	INATIVE PRODUC	
		California and California	\$45 BC	*
		Property CAP	101 OF	*.5 B
		Pyrettin (+780) (res	ALTERNATIVE THE	CURCITS)
		Rolagage + Pytolicia.		MODUCIAL
		Ander AND	10.000. 10.00	
		Some flow and mine	ALTERNATIVE I	RODUCTS
		Temp 2	TONGLEC	1.5
		Tanan Mary	the UP	10-

Dest	Tillion An Musac	Labelled	Formulation	Amount To Add To:
 Pest	When to Treat	Pesticide	Yon Buy	100 Gal. Water
SCALES (CRAWLERS)	Refer to each species for times that crawlers are	Carbaryl 5D	5% D	N/A
	emerging and setting. Some crawlers settle on	Carbaryl 10D Carbaryl 41	10% D Alb (not 17	N/A
	Armored scales which overwinter as easy are not	Carbaryl SOWP	4 10.7 gal. 1" 50 % WP	1 p. 2 lb
	generally susceptable to formant oil sprays. Most	Diazinon 50W	50% WP	1 b .
	soft scales are susceptable to fail and spring oil	Diszinon 2E & 25%		
	applications.	(Spectracide)	25% EC	1 gL,
		Diazinon 4E & AG500	4lb./gal. EC	t pl.
		Domban Thef	Ally (gal EC	L.Y OZ, L ol. (numed species)
		Duestan SOWSP	50% WSP	2 lb. (named species)
		Dursban IE	I Ib./gal. EC	4 qt. (named species)
		Dursban	0.5 lb./gal. BC	8 gt. (named species)
		Boton IV	8.5%EC	4.69 pL
		Malathion 50	4.4 lb./gal. BC	2-3 gt.
		Oils bostigathers, and	DERNALIVE PRODUCT	a) E decini (crim)
		Orthene	9.4% EC	4.69 aL
		Orthene	75% SP	0.67 lb.
		Orthenex Spray	Acrosol	N/A (certain plants only)
		Oxamy1 10G	10% G	(certain container plants only)(see label)
		Pageral DF	50% DF	2 16.
		Parathon 8 Agus	8 Ib./gal. BC	0.75 pt. (mansery only)
		Sevin Limid	→ w./get. F 2 ih./gat. F	1 yu 2 at.
		Sevin SOW	50% WP	2 kh.
		Soape (fatty acid salts)	see ALTERNATIVE PR	ODUCTS)
		Tempo 2	2 Ib./gal. EC	1.5 oz.
		Tempo 20WP	20% WP	1.9 oz.
 		Vydate L	2 Ib./gal. WSL	(musery only (see label)
 SNAILS AND SLUGS	Apply when leaf damage is first noticed and reapply	Bug-Geta	3.25 % Bail	1 Ib./1000 sq.fl.
	as needed.	Deadline Bullets	4% Ball	0.5-2 lb./1000 sq.tt.
		Grandalam 753/P	4 76 ISAN 75 K 11/10	0.3-2 ID./1000 SQ.11. A.Th. (1966 50 and (more))
		Shig-Geta	2% Bait	1 Ib./1000 sq.fl.
 COLUMN DED	Parties towards for this ' and season' write when			
MITE	mites first appear, ustally late April, and apply a	Omamite	30% WP	1 lb. (mesery only)
	second spray 10 days later. This mile usually stops	Pestroy 4EC	4 lb./gal. EC	1 gt.
	activity by July and starts up again in late September.	•	•	•
	Fall treatments are effective until regular frosts occur.			
	(see SPIDER MITES)			
 SPIDER MITES	Many species of spider mites attack ornamentals and	Avid	0.15 lb./gal. BC	4 02,
	percentials. Proper identification is important in	Cythion	5 lb./gal. EC	1.5 pt.
	determining control timing. 'Cool season' mites are:	Cythion 8	8 lb./gal. EC	l pL
	approve spinger mile on conners and southern red mile	Distaton	4 ID./gal. BC	1.20 gC Elementer 3 5-7-25 en (100 ft) of rear OR
	season mites are: twosnotied spider mite and	Desystem	13%0	7 pz./100 so.ft.
	European red mite on many plants, bacwood spider			Shrubs; 3.75 - 7.5 grams/ft, height
	mite, honeylocust spider mite and oak mite. Spider			Trees: 2.5 og. /inch trunk diameter
	mite control usually requires a geney program. This	Dursban Turf	4 lb./gal. EC	8 cz.
	requires an application at 7-10 day intervals for 2-3	Dursban 50WSP	50 % WSP	0.5 lb.
	apraya.	Dursban 1E	i ib./gal. EC	2 pl.
	Notes Do no neg doit	Dursban Genetalaan 2000	U.3 Ib./gal. EC	2 qL
	(NORS: DO NO USE AVID OR CONTENS.	Contraction / Jower	,∋γewn¥ Alb/asi⊒	1-2 ID. (USE DV SSL/SCIP) 4.8 nz. (note sinutotrainity fiet)
		Kelthane 35	35% WP	1-1.3 b.
		Kelthane 50	50% WP	0.5-1 b .
		Malathion 57	5 lb./gal. EC	1.5 pt.
		Malathion		
		Methoxychior Spray	2 lb. +2 lb./gal. EC	3.75 pt./acre
		Mayrik Aquaflow	2 ID./gal. F	4-10 02.
		Moretan A	2 10.7gal. EU 4 lh./gal. F	4-8 ns. (note abutatacieity fiel)
		Oils, demant (see AL)	TERNATIVE PRODUCT	S)
		Oils, horticultural, sum	DET (See ALTERNATIV	PRODUCTS)
		Orumite	30% WP	3-7.5 lb. (Christmas trees/conifers only)
		Oxamyi 10G	10% G	(certain container plants only)(see label)
		Pageant DF	50% DF	9,5 D.
		PERMC Aquaflow	I D. AGAL P	ar-⊥tō 022. 12-16 ozt
		Parativos 4PC	-мж чт Allh./eal. FC	0.5 nt. (Christmas trees only)
		Parathion 8P	8 lb./gal. EC	0.25 nt. (Christmas trees only)
		Parathian 8 Agua	8 lb./gal. EC	0.5 pt. (marsery only)
		Pyreihrin (+PBO) (see	ALTERNATIVE PROD	UCTS)
		Remeilurin EC26	2 lb./gal. EC	1 pt. (named plants only)
		Rotenone + Pyrethrin (Roteland Shade Terr	see ALTERNATIVE PR	ODUCTS)
		Insect Spray	2 (b. + 1. 1 fb./gal. BC	2-3 qt.
		Scimitar WP	9.52% WP	2.4-4.8 oz.
		Soaps (faity acid salts)	(see ALTERNATIVE PR	ODUCTS)
		Talstar T&O	7.9% F	12-40 oz.
		Tablar 10WP	10% WP	9.6-32 cz.
		Vvdale 1.	2 (b./2a), WSL	(mursery only)(see label)

 		Laballad	Formulation	Amount To Add Tax
Pest	When to Treat	Pesticide	You Buy	100 Gal. Water
 				200 0000 00000
SPRUCE	Begin treatment when mites first appear, usually	AND:		
SPIDER MITE	late April, and apply a second spray 10 days later.	Hexygon 50-WP	50% WP	1-2 az. (manery only)
	This mite usually stops activity by July and starts	Isotan IV	8.5% BC	4.69 qt.
	again in September. Fall treatments are effective	Malathion 50	4.4 lb./gal. BC	1.5 qt.
	veniti fate Uctober.	Vender SowP	JUSE WP	8-16 cz.
	(See SPEDEK MILLES) Note: Oile will survive the blue color from cattain	VEDER 42.	a tovičen inc.	8+10 CZ. (INTERECTA OUTA)
	conifers.			
 TIDIRO		D:	0.4.F. Do	A 6 6
Indro	Repeat amplications on a weekly basis are often	Carbaryl SD	55 D	N/A
	needed uptil the normations are under control.	Carbaryl 10D	10% D	N/A
		Carbary) 4L	4 lb./zal. F	l pL
		Carbaryl 50WP	50 % WP	2 ib.
		Cythion	5 ib./gal. EC	1.5 pt.
		Cythion 8	8 Ib./gal. BC	L pt.
		Decathion	20% WP	1.9 cz.
		Distance OF A 255	JUM WP	1 10,
		(Spectracide)	25% BC	1 at
		Diazinon 4E & AG500	40./241. EC	lyu Int.
		Di-Syston	15% G	Plowers: 3.5-7.25 oz/100 fl. of row OR
				7 oz./100 sq.ft.
				Shruba: 3.75 - 7.5 grams/ft. height
		Darshan Turf	A lb /set EC	Tree: 2.3 OZ./mch trutz grandler
		Durshm WW/CD	SOS WSP	10
		Duraban 1R	Lib./gal. BC	2 at.
		Durstan	0.5 lb./gal. BC	
		Dycarb	76% WP	12-20 cz.
		Picam W	76% WP	11 oz.
		Outhion 23	2 lb./gal. BC	1.5-2 pt.
		Lindane 20%	1.65 lb./gal. BC	1 pt.
		Malathion 30	4.4 lb./gal. EC	1.5 qt.
		Matathian 3/	2 ID/GET EC	1.5 pl.
		Methorswhier Sonry	2 lb +2 lb /eal, BC	3.75 rd. /acre
		Marathon I SG	15 G	9-15 cr/1000 en. El. (numery only)
		Margosan-O	0.3% EC	2.5.5 pL
		Mariate 50	50% WP	2-3 h. (flower thrips only)
		Mavrik Aquaflow	2 fb./gal. F	4-10 cz.
		Merii 75WP	75% WP	3.5 T. (landscape only)
		Methoxychlor 2BC	2 Ib./gal. EC	2-3 qt. (flower thrips only)
		Orthene	9.4% EC	4.69 cpt.
		Ormenet Speny	ACTORNE 10 SE /G	N/A (certain panes only) (certain container plants only)/certain()
		Present DF	10 M G	I The
		Parathion # Aces	8 b./gal. EC	0.5 pt. (pursery only)
		Pyrethrin (+PBO) (see	ALTERNATIVE PROD	UCTS)
		Resmethrin EC26	2 lb./gal. BC	i pt. (neared plants only)
		Rotenone + Pyrethein (see ALTERNATIVE PR	ODUCTS)
		Scimitar WP	9.52% WP	2.4-4.8 02.
		Services Service 5 Date:	4 ID./SAL IF	1 gr. 1-1 25 lb (1000 er #
		Sevin Limit	2 Ib./mail. IF	2 at.
		Sevin 50W	50% WP	2 .
		Sceps (fatty soid salts)	See ALTERNATIVE PR	(ODUCTS)
		Talutar T&O	7.9% P	12-40 cz.
		Talatar 10WP	10% WP	9.6-32 oz.
		Tempo 2	2 lb./gal. BC	1.5 oz.
		Tempo 20WP	20% WP	1.9 02.
		i urcinii Viziate f	2 Th./en1 10/57	11 06. Antropy anisylaas labab
 		· .	- The first and fi	Aborach and the break
TWOSPOTTED	Treat when mites are present and repeat in 5-10	AND:		
SPIDER MITE	days, then repeat the procedure as needed.	Diazinon SOW	30% WP	1 p .
	(SOC OPTIMER MITES) Notes Do to the Anid on confident	Constantial	15K 80	1.04
	trate: For the mic Value of contrictly	Diazinon 4R & A(3400	Alb./zal. HC	+ 37- 1 ot.
		Heavygon SO-WP	50% WP	1-2 oz. (numery only)
		Isotox IV	8.5% BC	4.69 qt.
		Omemite	30% WP	i Ib. (morsery only)
		Orthese	9.4% BC	4.69 qt. (suppression only)
		Vender 50WP	50% WP	
 		veiner 4L	e mongan est	o-to oz. (numery ony)
 WHITEFLIRS	Treat when first notices and repeat in 5-10 days,	Astro	3.2 lb/gal BC	4-8 1.02.
	then repeat the procedure as needed.	Azetin BC	0.265 lb./gal. BC	10-16 az. (named species only)(morsery only)
		Bioneers,	0.3% EC	2.3-5 pt.
		Cymian Cydriae a	5 IO./gal, EC	1.3 pt.
		Cynnan a Deceiblau	205 WP	1 pr. 1.9 cz.
		Diazinon 50W	50% WP	1 fb.
		Diazinon 2B & 25%		
		(Spectracide)	25% BC	1 gL
		Diszinm 4E & AG500	4lb./gal. BC	J pL

		Labelled	Formulation	Amount To Add To:
Pest	When to Treat	Pesticide	You Buy	100 Gal. Water
WHITEFLIES (cout'd)		Di-Sy#an	15% G	Flowers: 3.5-7.25 oz/100 fL of sow OR 7 oz./100 sq.fL Shuha: 3.75 - 7.5 grams/fL height
		Durahan That	1 16 (4.4) 15/2	Trees: 2.5 cz./mch trunk diameter
		Duniona Turi	4 10./241. EC	8 07. 0 K D-
		Dunicki Jowar Dushan 16	176 Mar	3
		Durshan	051k /sel EC	2 pt. 2 ot
		Isotor IV	8.5% EC	2 qu 4.69 m.
		lanst	4 lb./gal. F.	4-8 oz. (note phytotocicity list)
		Malathion 50	4.4 lb./2al. EC	L.S. aL
		Malathion 57	5 Ib./gal. EC	1.5 pL
		Malathion	•	•
		Methoxychior Spray	2 lb. +2 lb./gat. EC	3.75 pt./ecre
		Marathon 1%G	1% G	9-15 oz/1000 sq. FL (nursery only)
		Margosan-O	0.3%EC	2.5-5.0 pl.
		Mavrik Aquaflow	2 lb./gai. F	4-10 oz.
		Meria 75WP	75% WP	3.5 T. (landscape only)
		Morestan 4	4 (b,/ga). P	4-8 oz. (note phytotoxicily hat)
		Oils, dormant (see AL.	TERNATIVE PRODUC	
		Oils, hordcullarat, sum	DEF (SEE ALTERNATIV	A (0 at
		Orthone Come	9.470 EC	4.89 gt.
		Onemal 10C	10 C	(metrin container cleate only)
		Decent DE		(certain comanies plans only (see sides)
		Pagethion 8 Acto	Sib /est BC	0.5 m.
		Paince 3.7BC	3.2 h /eal. BC	4.8 oz./acre (numery only)
		Pratice 25WP	255 WP	6.4-12.8 oz./acre (reusery only)
		Praince WSB	24.7% WP	1-2 packets (=0,1-0,2 [0,ai,/100 gal.)(nursery only)
		Pyrethrin (+PBO) (see	ALTERNATIVE PROL	UCTS
		Remethrin EC26	2 lb./gal. EC	1 pt. (named plants only)
		Rolenone + Pyrethrin ((see ALTERNATIVE PI	RODUCTS)
		Scimitar WP	9.52% WP	2.4-4.8 cz.
		Soups (fatty acid salts)	(see ALTERNATIVE P)	RODUCTS
		Taistar T&O	7.9% F	8-40 oz.
		Talstar 10WP	10% WP	6.4-32 oz.
		Tempo 2	2 lb./gal. EC	1.5 oz.
		Tempo 20WP	20% WP	1.9 oz.
		Turcam	76% WP	5-16 02. (names species only)
		vydale L	2 ID./Ball WOL	(marsery may (see moet)
WHITEGRURA	For larvae of Japanese beetle, masked chafers.	Discus	5% G	40 lb./acre
(IN SOIL)	May/June beetles, green June beetle, Aziatie	Merit 75WP	75% WP	3-4 t./ 1000 sq. fl.Oftanol 2 Insecticide
(garden beetle and Oriental beetle, apply a coarse	Merit 0.5G	0.5% G	1.4-1.8 lb./ 1000 sq. R. (landscape only)
	spany to the soil and turf under and around the infested plants. In Ohio, trest grubs in soil in mid-August to early September.	Oftanol 2 Insecticide	2 lb./gal. F	l gal./acre (apply to soil with coarse spray and irrigate so that no run-off occurs)
(IN CONTAINERS)	Drench infeated containers as soon as grubs are	Discus	5% G	6.3 cz./cn. yd. (apply during soil mixing)
	detected according to label instructions. Late August to early September is the Meal time.	Oftenoi 2 Insecticide	2 lb./gal.	3.7 oz. (drench at rate of 1 gal./1.6 ca.ft. of growing media, or use 100 gal./6 ca.yd.)

Steinementa carpocapsae (see ALTERNATIVE PRODUCTS)

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IMPORTANT NOTICE

The Listing of Products & Pesticides There has been no attempt in this bulletin to list the registered pesticides on the basis of most effective to least effective. We do not have effectiveness information for all the pesticides listed and have decided to list them in <u>alphabetical order</u>. Thus, pesticides in this bulletin are not listed in order of effectiveness.

Table 2. ORNAMENTALS

			Labelled	Fermulation	Amount To Add To:
Host	Pert	When to Treat	Pesticide	You Buy	100 Gal. Water
AJUGA	Twospotted spider mite	(see GENERAL PESTS)			· ··· ···
ALDER	European alder	treat when minus are first seen and repeat as needed.	Dursban Turf	41b./eal. EC	t at.
	lestining	_	Duciban 50WSP	50% WSP	216.
	(Hypenoptersus)		Bioneens	0.3%EC	2.5-5 mt
			Manaosan-O	0.3%EC	2.5-5 mt
			Parent DF	50% DF	t th.
			Talstar TAO	7.9% F	20-40 ez.
			Taistar 10WP	10% WP	16-32 ez.
	Weaty alder split	(see GENERAL PESTS: Aphids)			
ARBORVITAE	Aphide	(res GENERAL PESTS)	AND:		
	-	•	Dibtom 1 Employe	\$ Ib./gal. EC	1 pt.
			Dimethouts 2.67EC	2.67 B./gal, EC	50 az.
			Dimethoats 400	4 D./gal EC	35 az.
	Arborniteo lesfisient	Sneav in early May and again 2 works later, then	Bioneem	0.3%EC	2.3-5 pt
	(Louidenterons)	again in only August for the new generation.	Dursban Turf	4 lb./gal. EC	1 at.
	.	0 1 2 2	Dursban 54WSP	50% WSP	21.
			Marrosan-O	0.3%EC	2.5-5 et.
			Parent DF	50% DF	216.
			Talstar T&D	7.9% F	20-49 oz.
			Talstar 10WP	10% WP	16-32 .
	Barwonin	(see ORNERAL PESTS)	AND:		· · · · · · · · · · · · · · · · · · ·
			Dimethosis 7.67BC	2.67 B./ml BC	50 oz.
			Dimethoate 400	Alle /rol. EC.	31 07
			Rockland Shale Tree	-100 5 20 20	55 4 4
			Insaci Spray	2 lb.+ L l lb./gel. EC	2-3 qt.
	Fletcher costs	Her of at a demand tradment in carine. The saw	AND	·····	
		one for allow materials explored manager from late	Cuthing	Sik Ad TO	1 at
		The to only indicates against converting only for the	Cutting	AN AN EC	2 pt.
		And to they say and repair in they september.	Lyunon a	s loven de	1.2.5 pc
		(NOR CHENCHER FEBTIS: SOUND)	Backland Shade Terra	Shoge DC	2 pc
			Insect Spray	2 lb.+1.1 lb./gal. BC	2-3 et.
	Somos cridar mite	(ma CEDIFE & L PESTS)	AND		
	phone there was	(an olligate rests)	Dimethosts 2 67BC	2.67 B. And BC	\$1 az
			Dimethoate 400	Alk And EC	21.07
				10056600	
	Tip dwaf mite	Treat about mid-May and repeat as needed.	Dimethoate 2.67BC	2.67 lb./gal. EC	50 oz.
	(Eneghyid)		Dicotol 4EC	4 ID./gal. EC	1.25 qc.
			Keikane 35	33% WP	1-1.3 ID.
			Kalikasa 39	XXX WP	0.5-1 Ib.
			Methoystox-K2	2 ID./gal. EC	1-1.5 oz./mon munt manter (sen mjeor owy)
			Pennic Aquanow	I ID/gal P	8-10 m2
			Pentic WP	MAR AND D	12-10 02
			Sevenioi	4 10./gal F	l gr.
	Twospotted spider mite	(see GENERAL PESTS)	AND:		
			Dibrom 1 Emultive	t fo/gal. EC	1 pt.
ASH	Aphid	(see CENERAL PESTS)	AND;	-	
	-		Dihrom # Emulsive	\$ D./gal. EC	l pt.
	Ash flowergall mite	Use all as domains treatment. Use any one of the	Carbaryl 4L	41b./gal. F	1 pt
	(Enophyid)	others when first blossoms begin to form.	Carbaryl 50WP	50% WP	2 lb.
		-	Dicofol 4BC	44b./gal. BC	L.25 qt.
			Joust	4 lb./gal. F	4- 4 #Z
			Kelthane 35	35% WP	1-1.30.
			Keithene 50	50% WP	0.5-1 26.
			Morestan 4	4 lb./gai. F	4- 8 ez
			Oils, dermant (see AL	TERNATIVE PRODUCT	3)
			Pentao Aquaflow	1 fb./gai. F	\$-16 ez.
			Pentac WP	50% WP	12-16 ez.
			Sevimol	4 fb/gal. F	1 gt.
					-

.	D1		Labelled	Formulation	Amount To Add To:
	Pest	When to Treat	Pesticide	Yeu Buy	100 Gal. Watsr
18 H	Ash sewflics	Treat when lavae are present, usually late May.	Sevin 50W	50% WP	26.
(0000.0)			Carparys 4L Carbarys 4L	4 30./gal. r 49%, 11/D	1 pc 2 0.
			Decables	24% WP	1.3 oz.
			Durshan Traf	4 lb./ml. EC	197.
			Duruban 50WSP	50% WSP	0.5 ph.
			Leotox IV	1.5%EC	4.69 pt.
			Mont 75WP	75% WP	3.5 T. (landscape only)
			Orthone	9.4%EC	4.69 qt.
			Ortheas	75% SP	1. 9 /b.
			Pageant DF	50% DF	0.5 Jb.
				4 lb./gal. P	l qt.
			Soaps (nury has saits)	USED ALTERNATIVE PRO	
			Tempo 20WP	20% WP	1.3 oz.
			•		
	Banded ash clearwing	Treat truck and large branches in mid-August in	Dursban Turf	4 Ib./gal. EC	1 gt.
		southern Onto and 2 weeks later in northern Ohio.	Dursban 39WSP	50% WSP	216.
			Dursten III	1 ID./gal. BC	4 gr.
			Densona DE	NO ID./BH. BC	8 gr. 7 %
			ragons trr	30% DF	£ 10.
			SPECIAL INFORMA	TION	
		casarvang borer maps can be used to perpoint adult emergence before normal treatment time. See timing listed for specific p	ce to and in proper timing of sp pest and calculate proper time	nays. Traps should be dep te deploy traps.	uyaq səqət 3 wests
	Em speawonn	Treal when haves are som in only to mid-June.	Bionean	0.3%EC	2.5-5 pt.
	-	(see GENERAL PESTS; caterpillars)	Carbaryl 4L	4 fb./gal. F	1 pt.
			Carbary1 50WP	50% WP	2 I ḥ.
			Decathion	20% WP	1.3 az.
			Durshm Turf	41b./gal. EC	8 oz.
			Dursban 30WSP	50% WSP	0.5 D.
			Margosan-O	0.3%EC	2.5-5 pL
			Pageant DF Basenathde ECMC		U.S.In.
			Kesmelann HC20		I pt. (named plants only)
•				4 10./82L P 5A94 3L/D	1 qc 7 th
			Sam SWW		210,
			Temes 2	2 lb./ral. EC	1.02.
			Temps 20WP	20% WP	1.3 øg.
	Fall webwern	(see GENERAL PESTS)	AND: Dibrom \$ Emulsive	t lb./gal. EC	l pt.
	Fishended analetree	Treat trunk in late May and repeat after 4 weeks.	Durshen Turf	4 lb./gal. EC	1 ot.
	borer	······································	Dursban SoWSP	50% WSP	2.16.
			Lindane Borer Spray	1.651b./gal. EC	3 qL
			Pageant DF	30% DF	216.
	Forest tent caterpillar	(see GENERAL PESTS)	AND:		
			Dilecom & Emulsive	4 lb/gal. RC	1 pt.
	Leafhoppers	(see GENERAL PESTS)			
	Leafrolier	Treat when the just lowes are seen folded together.	Bioncom The dependence	0.3%EC	2.5-5 pt
		(see GRINERAL, PESIS: Caterparate)	"BT" (Eusenic)	Vanious Alle (and 12	Vanoes
			Carbood SOURD	- 10-211 F \$04/ 11/D	1 Jun
			Depathion	20% ₩₽	1.3 oz.
			Dursban Turf	41b./zel. EC	f oz.
			Deciden SOWSP	30% WSP	0.5 lb.
			Dyoarb	76% WP	20-40 oz.
			Margosan-O	0.3%EC	2.5-5 pt.
			Methoxychior 25	216./gal. EC	2-3 qt.
			Orthene	75% SP	0.331b.
			Pageant DF	50% DF	0, 5 lb.
			Sevimal	4 lb./gal. F	l gt.
			Sevia 50W	30% WP	216.
			Tempo 2 Tempo 20WP	2 10./gal. BC 20% WP	1.5 oz.
	May/June berlies	Treat when adults are first seen and rescat as approximy.	Carbaryl 5D	5%D	WA
	······································	······································	Carbary1 10D	10% D	N/A
			Carbary1 4L	416./gal. F	1 pt.
			Carbary1 50WP	50% WP	2 lb.
			Decathion	20% WP	1.9 oz.
			Duesban Text	41b./gal. BC	1-2 pt.
			Dersban 30WSP	10% WSP	1-2 lb.
			Pageant DF	50% DF	210.
			Sevenos Sevenos	4 16./gal. F	1 qu
			Sovie 30 W	2076 WP 215 And TC	210. 1 \$ an
			Tempe 2 Tempe 2011/b	2 10.783EL INC. 2004 W/D	19.02
			1.40% 74 M L	2474 WI	

Host	Pest	When to Treat	Labellad Pesticide	Formulation You Buy	Amount To Add To: 100 Gal. Water
ASH	Oystershell scale	Apply any one of materials against curvlets	AND:		
(cont'd)		about late May and again in 10 days in southern	Cythion	5 lb./gal. BC	1 pt.
		Ohio: 2 Weeks later in northern Ohio.	Cythion 2	th.gd.EC	1 pt.
		(See CENERAL PESIS: SCHOOL	Malafition 57 Midafitian	5 ID./gal. BC	1 pt.
			Methoxyahlor Spray	2 lb.+2 lb./gal. EC	2.5 pt/scm
	Plantical bugs	Treat when young bugs (nymphs) appear in early			
		sping and report & accord. (ree GENERAL PESTS)			
	Putnam soile	Use oil as dominant treatment in spring. Use one of	AND:		
		(no clement internal against craviers in suc puty. (no: CREMERAL PESTS: Scales)	Greated a 25	210/ JH EC	4.0 pl
	Sourfy scale	Use all as domant treatment. Use any one of the	AND:	436 /	14
		(International Southant Conversion of the Property of Property of Property (Conversion)	Cythion 2	th/gal BC	Lop
		(in character point, county	Malathian 57	51b./gal. EC	lýpt
AZALEA	Azales bark scale	Treat when crawlers are present, which is in inte	AND:		• .
			Cythion	STOUGHL BC	2 pt 1 25 ml
		(905 (ELIERAL LEG 19; 3000)	Malathion 57	s (b./gal. BC	1.5 pt
	Azalea lace bug	Treat when first ince bugs are seen and repeat as	AND:		
	•	needed to protoct new folings.	Cygon 2B	2 lb./gel. BC	1 pt.
		(see GENERAL PESTS: Lace Bugs)	Dimethonie 2.67EC	2.67 h./gal. EC	25 az.
			Dimothesis 400	4 lb./gal. EC	17.5 ez.
			Dyongin Tilonon TV	76% WP 16% U/D	12-20 oz.
			Lindaine 20%	1.652h/eal. RC	11 02. 1.5 mt
			Terms	76%	11 oz.
	Azales Issiminer	Treat when invocare procest, which is about	Bioacem	0.3%BC	2.5-5 pt.
	(Lepidopterous)	endy-fune.	Carberyl 4L	4 (b./gal. F	1 pt
			Carberyl SOWP	50% WP	2 .
			Lygen 28: Dimetante 2 6780	2 ID/gal HC 2 67 Ib (ed EC	1 pl. 15 - n
			Dimethosic 400	41b/ml EC	17.5 ez.
			Duction Tesf	4 lb./gal. BC	let
			Ductions 59WSP	50% WSP	2 h .
			Lindano 20%	1.65 lb./gal. BC	1 pt.
			Ficun W	76% WP	42.02.
			Rangesan-O	0.37450	2.3-3 pt.
			Orthoney Seray	Amosol	1487 qL N/A
			Pageant DP	30% DF	216.
			Pestroy 4EC	4 (h./gal. EC	1 qt
			Scimitar WP	9.52% WP	2.4-4.1 ez.
			Sovimat	4 lb./gal. F	1 qt .
			Sovie 50W	50% WP	21b.
			Taletas 1810	/.376 F 1694 30/0	20-40 dz. 16-33 ez
			Thream	76% WP	42 62.
	Azalea mite	Begin treatment in May when miles appear and apply	Carbaryl 4L	4 lb./gal. F	1 pt.
	(Eriophyid)	a second treatment in 10 days. Repeat this procedure	Carbaryl 50WP	50% WP	2.10.
		as goodoll.	Cygon 2B Disefet 400	2 10./gal. HC 4 fb /and 120	I DÚ 195 et
			Dimeterate 2.678C	2.67 lb./zel. EC	25 oz.
			Dimethoate 400	4 ib./gul. BC	17.5 oz.
			Joust	4 ib./gal. F	4 - 3 oz.
			Kelthane 35	35% WP	1-1.316.
			Katthane 50	50% WP	
			Monsystex-R2 Monster A	2 DBJ gal. BC 4 Da Janal 19	I-L2 62/2000 INDE GENERATE (SOIL 10/601 691)
			Dentro A modern	n usgel f 1 lb./gel T	1-16 m
			Pentac WP	50% WP	12-16 02
			Sevimal	41b/gal F	1 gt.
			Sovia SeW	50% WP	2 (Å. 8 ODUCTS)
			owner ward and said		
	Azales whitely	Treat when addits are first soon and repeat at 3-day intervals Intil infostation is checked. Repeat some	AND: Cyron 2R	2 lb/cal. RC	1 et.
		procedure at acceled.	Dimethonte 2.67EC	2.67 m./gal. BC	25 az.
		(see GENERAL PESTS: Whitelies)	Dimetsonio 409	4lb/gal BC	17.5 42.
	Black vine weevil	(see GENERAL PESTS)			

Host	Past	When to Treat	Labelled Pesticide	You Buy	Amount To Add To: 100 Gel. Water
474LEA	Rhododenikos herr	Treat treats and larger branches in mid-Miny for	Durchan Teaf		lat
(confd)		southern Ohio and early June in northern Ohio.	Dunsban JOWSP	50% WSP	216.
• • •		• • • • • • • • • • • • • • • • • • • •	Dunsban	0.51h/gal.EC	\$ qt.
			Lindano 20%	1.65 lb./gal. EC	3 pt,
			Lindane Borer Spray	1.65 lb./gal. EC	3 pL
			Pageant DF	50% DF	2 lb.
		Charming hours trans one ha word to also old table on any	SPECIAL INFORMA	FION The Action of the Action	leval shart i unate
		before sermal treatment time. See timing listed for specifi	c pest and calculate proper time i	n deploy trops.	CANCE EDINE 2 HOURS
	Southern red mite	(FOR CEINERAL PESTS)	AND: Dimethoste 2.678C	2.67 lb/ml EC	21 nz.
			Dimethoats 400	4 lb/gal. EC	17.3 oz.
ALD- CYPRESS	Bagwonn	(see GENERAL PESTS)	AND: Orthener Servy	Aeresoi	N/A
CT DEAU	Bald-cypress mite	Trast in early spring when foliage is fully out, then	Carbary 4L	4lb/gal F	1.04
	(Eriophyid)	an seeded.	Carbary1 50WP	50% WP	2 16.
			Disofol 4EC	4 lb./gal. EC	1.25 gt.
			Joust	41b/gal. F	4-4 02.
			Keithane 35	35% WP	1-1.30.
			Kelthane 50	50% WP	0.5-1 lb.
			Metacysten 12	2 lb Aral FC	1-1 5 oz finch trunk diameter (soil inject only)
			Mantha A	Alls feed E	A.L. or
			Dile domast (sec 117	ግሥራይጫ ም ፕሮዩ አስተቸው የውስተለምምሳ	
			One, bornster (see AL)	ENNAIIVE PRODUCIS	the optimizes)
			Usis, Romonificati, Status	UNE (SOUTH ALLIERNATIVE	
			Poste Aquanow	L 10./gal. P	
			Popling W.P	3976 WF 415 4-5 T	14-10 00%
				4 (D./gal. F	1 qt.
			Soviel SUW	JU% WF	2 JD. 2011 (1995)
			Scaps (mity acad same)	(800 ALIEKNAIIVE PRO	
RBERRY	Barberry aphid	(see GENERAL PESTS)			
	Barberry looper	Treat in late May and then as meeded. There are	Bioncom	0.3%EC	2.5-5 pt.
	(Barberry cateroillar)	futee concentions per year.	"Bt" (Janstaki)	VARIONS	Various
	·,		Decathion	20% 17	13.02
			Margaras ()	0.20450	1 - S of
			Baserathers E(*)6	alls feel EC	1 of (comed plants only)
					T pt. (manuful pennes osny)
				1.976 P	₽=40 0Z.
			Talstar IVWP	1075 WP	0.4-32 02
			Tempo 2	2 Ib./gal. EC	1 02.
			Tanpo 20WP	20% WP	1.3 62
	Barberry soils	Spray when canviers are present. (see GENERAL PESTS: Scales)			
	Barborry webworm	Treat in late July when larvae appear.	Bioncem	0.3%EC	2.5-5 pt
			Carbaryl 4L	4 Ib/gal. F	l pt
			Carbaryl 50WP	50% WP	2 lb.
			Decathlon	20% WP	L3 oz.
			Diszinon 50W	50% WP	L fb.
			Diazinon 2E & 25%		
			(Spectracide)	25% EC	1 gt.
			Diazinon 4E & AG540	4b./gal_EC	1 pL
			Dylex	\$0% SP	20-30 az.
			Margosan-O	0.3%EC	2.5-5 pt.
			Provol 20XP	60% SP	20-30 oz.
			Serimol	4 lh /eal. F	lot.
			Same Salu	5054 W/D	2 IN
			Tale face T & C	7 644 G	5-40 oz
			Tailor to the	1.3778 F	6 4-22 ap
			Takat Takat	1979 W.F 3 Ib Jack 1773	1 m
			Tempo 20WP	210/gal. EC 20% WP	1 dz. 1.3 dz.
ROH	Aphid	(600 GENERAL PESTS)	AND:	-	
			Cygon 2E	2 lb./gal. EC	0.5 pt.
			Dibsom # Emultive	Ib./gal. EC	1 pt.
			Dimethoute 2.67EC	2.67 Jb./gal. EC	12.5 az.
			Dimethouse 400	4 fb./gal. EC	17.5 cz.
	-		Orthouge Speny	Actorol	NA
	Bagworm	(see GENERAL PESTS)	AND: Orthonex Spray	Acrosol	N/A
	Birch besogail mite	Treat in only spring when folings is fully expended,	Carbaryl 4L	4 lb./gal. F	1 pt.
	(Eriophyid)	film at needed.	Carbaryl SOWP	50% WP	2 lb.
			Dicofel 4BC	4 lb/gal. EC	1.25 gt.
			Joust	4 lb./gel F	4-8 oz. (do not use on giver birch)
			Keithana 33	35% WP	1-1.3 15.
			Keithane 50	59% WP	0.5-1 lb.
			Motasystex-R2	2 lb./zel. EC	1-1.5 oz./inch trunk diameter (soil inject only)
			Merestan 4	4 lb./zel. F	41 02.
			Oils, domant free ALT	ERNATIVE PRODUCTS	·
			Oile hadraitand rame	Ner (see ALTERNATIN	PRODUCTS)
			Carly BOILDARY SUITE	11k /wall D	16 or
			Forter Agelliow	ANA MAD	17-16 or
				3970 WE Allo /out P	1
				4 KD J gal. P	1 gr.
			Sovia 30W	39% WP	2 D.

Host	Post	When to Treat	Labelled Pesticide	Formulation You Buy	Ameunt Te Add Te: 100 Gal. Water
BIRCEI	Trianh Instantioned	The case of the metadole line last as a data and	Dia	4 16/20	
(Cant'd)	(Bymenanierone)	essent in mid-May and arain in late line. The systemic	Carbord 5D	0.37800 1% D	2.5-5 pt. N/A
((11)	insectides after mines are evident.	Carbaryl 10D	10% D	N/A
			Carbaryl 4L	41b./gol. F	l pt.
			Carbaryl 50WP	30% WP	2 lb.
			Cygon 2E	2 lb./gul. BC	0.5 pt.
			Cythion	5 lb./gal. EC	2 pt
			Cythion \$	\$ Ib./gal, EC	1.25 pt.
			Discons Englished	110./gnL BC	1 pt.
			Dimethosts (00	Alls (m) EC	12.3 VZ
			Di-Systee	440.gal 80. 15% G	2 % az ánob innek dinnestar
			Durshan Torf	4 lb./cal. BC	l at
			Dursban 50WSP	50% WSP	216.
			Imidaa-70WSB	70% WP	0.75-1 16.
			Letex IV	1.3%EC	4.69 pt.
			Lindane 20%	1.65 (b./gal. BC	l pt.
			Lindane Borer Spray	1.65 lb./gal. BC	1 pt.
			Malathion 57	5 lb./gal. EC	2 pt.
			Magosan-O	0.3%EC	2.3-5 pt.
			Ortheas	9.4%EC	4.69 gt.
			Orthone Course	73% SP	0.33 D.
			Demonst DC	AGOSCI SOM DE	20
			Pastany (BC	Ally feed 18C	2 10. L at
			Rocktand Shade Tree	A 107Ber 190	1 dr
			lesect Servy	2.16.+1.1 (h./est. EC	2-3 at.
			Sevimol	4 lb/gal F	Lot.
			Telstar T&O	7.9% F	20-40 oz.
			Telster 10WP	10% WP	16-32 oz.
	_		_		
	Bronze birch borer	Treat entire tree, especially the upper part of the	Duskan Turf	4 lb./gal. BC	L gt.
		tree in late May. Retreat in early July if season is	Durshan SWSP	50% WSP	216.
		cooler than normal.	Licasa W	76% WP	21 42.
			Pagetal Dr	2076 LUF 1666 XUD	216.
			1 10.000	1076 WC	21 02.
	Fall webworm	(see (ENERAL PESTS)		· · ··	
	Forest tent caterpiller	(see CENERAL PESTS)			
	Japanese beelle	(600 GENERAL PESTS)			
	Lasflante	(en STARD AT PROTS)	AND		
	rentichbet		AND: Orthenex Spray	Aerosol	N/A
	Oystershell scale	Apply any one of the materials against crawlers about late May and again in 10 days in southern	AND: Cythion	51b./gal. BC	l pt.
		Ohio; 2 weeks later in corthern Ohio.	Cythion 1	\$ lb./gal. EC	lpt
		(see GENERAL PESTS: scales)	Malathion 57	5 lb./gal, EC	1 pt.
			Malafinon		
			Methoxychler Spray Orthener Spray	2 lb.+2 lb./gal, EC Aerosol	2.5 pt/sore N/A
BITTERSWEET	Ruonymus scale	Use oli as a domnant irrestment in spring. Use any one	AND;		
		of the other materials in late May and/or late June.	Dyearb	76% WP	20-40 oz.
		Apply treatment when enswiers are present and	Guthion 28	2 lb./gal EC	1.3-2 pt
		repeat 10-14 days later.	Metachion 57	51b./gal. BC	1.5 pt.
		(see GENERAL PESTS: Scales)	Malathion		
			Methodychier Spray	2 10.+2 HL/gal. EC	2.5 pt/acro
			Incent Country	216+1.116-6-4 80	2-3 at
			many of the	SWARD TO THE PARTY OF	~ ~ A #
BOXELDER	Boxelder bate	Direct spray against bugs in only summer.	Carbary1 5D	5% D	N/A
		· · · · · · · · · · · · · · · · · · ·	Cerberyl 10D	10% D	N/A
			Carbaryl 4L	41b./gal. F	1 pt.
			Carbaryl SoWP	50% WP	2 🚯.
			Decathion	20% WP	1.9 gz.
			Darsban Tuef	4 Ib./gal. EC	3 02.
			Darsten SOWSP	JUX WSP	U.3 ID. 1 4 -+
			Maratinon 30	4.4 10./gal. HC 2564, 50	1.5 QL
			Paramet DE	50% DE	0.51h
			Scientiter WP	9.52% WP	2.4-4.8 07.
			Sevimal	4 lb./ml. F	1 et
			Sevin 30W	50% WP	210.
			Teleter T&O	7.9% F	8-40 cz.
			Teleter 10WP	10% WP	6.4-32 02.
			Tampe 2	2 lb/gal. EC	1.5 oz.
			Tampe 20WP	20% WP	1.9 02.
ROXWOOD	Boymod Infinier	Lie any one of these statefuls in entry May when	Amhuah	2 lb./ml. RC	6.4-12.8 oz. (samory oshr)
	(Distances)	adults are active. Use evitemics when have are areas	Ambuah 25W	25% WP	6.4-12.8 oz. (namery only)
	·	in miner in Mac.	Bioncom	0.3%EC	2.5-5 pt.
			Carbaryl 5D	5% D	N/A
			Carbaryl 10D	10% D	N∕A
			Carbaryl 4L	4 lb./gal. F	1 pL
			Carbary1 SOWP	30% WP	2 lb.
			Cygon 2E	2 lb./gal. EC	1 pt
			Cythion	516./gal. EC	2 pt.

Host	Put	When to Treat	Labolled Pesticido	Formulation You Buy	Amount To Add To; 100 Gal. Water
	<u> </u>				
BOXWOOD	Boxwood leafminer		Cythion 1	8 lb./gal. EC	L25 pt.
(cent'd)	(o ent 'd)		Dimethoate 2.67EC	2.67 lb./gal, EC	25 oz.
			Dimethonic 409	4 Ib./gal. EC	17.3 oz.
Host When to Treat BOXWOOD (coard) Boxwood Indimizer (coard) Treat when inites are present and make a seption of the sept		Durchan StWSP	4 10./gal. EC 40% WSP	1 gr. 2 fk	
	Post When to Tract Label-d Paticide Permitted on You Bay D Betwood leadininer (cent/i) Shipd, EC Dimeksion 24702 Shipd, EC Dimeksion 2470 Shipd, EC Dimeksion 24702 Shipd, EC Dimeksion 247 Shipd, EC Dimeksion 377 Shipd, EC Dimeksion 377 Shipd, EC Dimeksion 377 Shipd, EC Dimeksion 377 Shipd, EC Dimeksion	20-30 oz.			
			Lindene 20%	1.65 fb./gal. EC	1 pt.
			Malathion 57	51b./gal. EC	2 pt.
			Margosen-O	0.3%EC	2.5-5 pt.
			Officie Beneral DE	9,4% EC	4.69 gt.
			Provid 2000	NYA DE NYA SD	2 10. 2030. or
			Rockland Shade Tree		1050 02
			Insect Spray	2 fb.+1.1 lb/gal. EC	2-3 gt.
			Sevimol	4 fb./gal. F	L gt.
			Sovin 5 Duct	5% D	1-1.25 lb./1000 sq.ft.
			Sevia 50W	50% WP	2 16.
			Taistar 1800 Taistar 10WP	7.9% F 10% WP	20-40 oz. 16-32 oz.
	Boxwood spider mite	Treat when mites are present and make a second	AND:		
	k	application 7-10 days later. Repeat same procedure	Cygon 2E	2 lb./gal. EC	1 pt.
		as acceled. (see GENERAL PESTS: Spider Mites)	Dimethoste 2.67EC Dimethoste 400	2.67 lb./gal. EC 4 lb./gal. EC	23 oz. 17.5 oz.
	Denne of second d		4575		
	Boxwood psymid	Treat when young psylnes are present, which is m easily May, and repeat treatment as needed.	AND: Pestroy 4EC	4 lb./gal. EC	1 gt.
		(soo GENERAL PESTS: Psyllids)	-	•	•
	Baropean frait	Use oil as a dormant spray in fall or spring. Treat	AND:		
	lecanium scale	when crawlers are present, which is usually in carly June. (see GENERAL PESTS: Scales)	Malathion 57	5 lb./gal. EC	2.5 pl.
BUCKTHORN (Fallhoige)	Bagwarm	(see CENERAL PESTS)			
	Japanese beete	(see CENHRAL PESTS)			
CATALPA	Catalya sphinx	Treat when larvae are small.	Bioneem	0.3%BC	2.5-5 pt
			"Bf" (karstaki)	various	Various
			Carbaryl 4L	4 lb./gal. F	1 pt.
			Carbaryl 50WP	50% WP	216.
			Decellion	20% WP	1.3 02.
			Dursbar 191	4 ID./gal. EC	5 ag. 0 4 1h
			Durson, wwor kom IV	1076 WAP	0.310.
			Marrosan-O	0.3%EC	2.5-5 pt
			Orthese	9.4%EC	4.69 gt.
			Pageant DF	50% DF	0.5 lb.
			Sevimol	4 D./gal. F	1 qt.
			Sevin SOW	50% WP	216.
			Talstar T&O	7.9% F	5-40 oz.
			Taistar 10WP	19% WP	0.4-32 ez.
			Tempo 20WP	20% WP	1.3 ez.
	Tenenara haafa	(see (SINUP AT DESTS)			
	AMARO DAE WOOVI	These when about are feeding.	Beonsem Dursban Tarf	e.swesc 4 lb./col. BC	2.3-3 pt. Let.
(,			Dursban 50WSP	50% WSP	110.
			Pageant DF	50% DF	1 16.
	Louthopper	(see CENERAL PESTS)			
CHRYSANTHEMU (personial)	M Aphić	(see GENERAL PESTS)			
	Boot annywern		Bioncem	0.3%EC	2.5-5 pt.
			"B" (korstaki)	various	various
			Cerberyl 4L Cerberyl 4L	4 ID./gal. P 409/ 33/b	1 pt.
			Carparyi 50 wr	2076 W F	210.
			Durshan Terf	4 lb./gal. EC	t oz.
			Dusban SOWSP	50% WSP	0.546.
			Lotox IV	\$.5%EC	4.69 pt.
			Magosan-O	0.3%EC	2,5-5 pt.
			Orthenex Spray	Acrosol	N/A
			Pageant DF	50% DF	0.5 lb.
			Scimitar WP	9.52% WP	2.4-4.5 02.
			Sevimol Service 5077	4 ID./gal. F 5044 10/D	1 gr. 2 (h
			Talstar T&O	7.9% F	9.6-40 07.
			Talstar 10WP	10% WP	12-32 02
			Tempo 2	2 lb./gal. EC	1 ez.
			Tempo 20WP	20% WP	1.3 oz.

al	Pest	When to Treat	Labened Pesticide	Formulation You Buy	Amount To Add To: 199 Gal. Water
RVSANTER.	<u>а</u> тм				
2016) 2016)	Cabhare loaner	Treat at first size of feeding damage of when	Bionecon	0.25650	2.5-5 of
		caternillars are seen.	"Bf" (kuntaki)	Valious	Vaciente
			Decethics	20% WP	1.3 07
			Jector IV	1.9%80	4 69 01
			Magrosse ()	1 264RP	2 5-5 of
			Orthogo		4.56 at
			Recursting BC26	2 % (ed 5/2	t at (assessed alartic calls)
			Temps 1	2 HOLE BC	1 pr. (composition comy) 2 aug
			Tempo 2 Tempo 20WP	28% WP	1.3 oz.
	Com earworm		Bioneem Merrosee-O	0.3%EC	2.5-5 pt. 2.5-5 nt.
	Leefbanner	(ree (TENTE AL PESTS)	4 NTr		•
	Louitype		Orthours Spray	Accord	N/A
	Leafminer (Distances)	Treat when mining of leaves is first detected and remeat as needed	Ambach Ambach 2537	2 lb./gal. BC 25% W/P	6.4-12.8 cz. (nastery only) 6.4-12.8 cz. (nastery only)
	(raharas)	Tehen S Meener	2.1.1 A . 1.1	AJ70 WE A1516 Gul EC	4.4-12.8 GZ. (INDERTY ONLY)
			AVID Disease	0.17 BURGEL BU	4 576 7 1 - 5 me
				U.37800	4.3-9 pt.
			Duzmen 30W	30% WP	110-
			Diazinen ZE & 23%		
			(Spectmeide)	25% EC	1 g1.
			Diszines (E & AG300	40./gal EC	l pL
			Dursban Teaf	4 fb/gal. EC	1 gt.
			Dursban SOWSP	50% WSP	216.
			Dylox	20% SP	20-30 ez.
			Lindene 20%	1.65 fb./gal. EC	1 pt.
			Magesan-O	0.3%EC	2.5-5 pt.
			Orthese	9.4% EC	4.69 at
			Orthoney Speny	Amesal	NA
			Parent DF	50% DF	216.
			Preval 108P	20% SP	20-30 #7
			Taktar T.H.O	7.9% F	20-40 az.
			Talstar 10WP	10% WP	16-32 42
	Omaiverous leafsoller	(see GENERAL PESTS; Caterpillars)	Bioncem	0.3%EC	2.5-5 pt.
			"Bí" (konstaki)	varieus	various
			Carbaryt 4L	4 lb./gal. F	l of.
			Carbory1 30WP	50% WP	216.
			Decation	20% ₩₽	1.9 07
			Distinge 500/	5454 W/D	116
			Diszinen 48 & AG100	dib inst BC	1 of
			Deschool 42 of ACOU	Alls ind RC	t pr.
				4 BOUGHLED.	0 UZ.
			Distan Swar		0.340.
			reading sean-to		2.3-3 pt.
			Methoxychler 25	2 Bo/gal. EC	2-3 4.
			Pagement DF	.97% DF	0.5 05.
			Scimitte WP	9.52% WP	2.4-4.8 02
			Sovimol	4 ID./gal. F	1 gt.
			Sovia SOW	59% WP	2 ib.
			Talstar T&O	7.9% F	9.6 -40 az .
			Telster 10WP	10% WP	12-32 az.
			Тепро 2	2 lb./gal. BC	1.5 oz.
			Tampo 20WP	20% WP	1.9 02.
	Twospotted spider mite	(con GENERAL PESTS)			
	Thrips	(see GENERAL PESTS)			
	Whitefly (Greenhouse)	Treat at first sign of adults on underside of leaves	AND:		· · · · · · · · · · · · · · · · · · ·
		and repeat at 10-14 day intervals as needed.	Dycarb	76% WP	12-29 42.
		(see GENERAL PESTS: Whitefier)	Endecide 3BC	3 Bb/gal. EC	0.67 qt. (aussery only)
			Fican W	76% WP	21 02.
			Phasa	3 lb./gal. EC	0.67 qt. (nursery only)
			Thiodan SOWP	50% WP	Lib. (mentery only)
			Thioden 3EC Texas	3 Re/gal. EC 76% WP	0.67 qt. (nessery only) 21 oz.
MANA	Lestminer	Treat silves mining of leaves is first detected and	Avid	4.1519 /r=1 FC	4 02
CARDINE:	(Distance)	Present of Board of Sources In This Accession Fing	Binner	A MARC	
	(raherone)	Taken IP Reprod.	Developments Developments	4.37854. 418. (a.4. 1741	L.P. PL
			Tartany (4 D./gat. BC	t der
			Tartegelt 20M25	JUA WSP	210.
			Dylex	66% SP	20-30 42.
			Lindens 20%	1.65 B./gal. EC	1 pt.
			Magesan-O	0.3%EC	2.5-5 pt.
			There are the second se	SEN DE	17 Th
			La cant DL		2 18.
			Proced \$0SP	58% SP	20-30 ez.
			Pagean DF Praxal \$0SP Taistar TAO	88% SP 7.9% F	20-30 ez. 20-40 ez.

Host	Pest	When to Treat	Labeiled Pesticide	Formutation You Buy	Amount To Add To: 100 Gal. Water
COTONEASTER	Aphids	(see GENERAL PESTS)			
	Hawthom lace beg	Treat when young lace bugs are seen and repeat	AND;		
		as needed to protect young fallage.	Dycarb	76% WP	12-20 oz.
		(see GENERAL PESIS: Lace Bogs)	Pertray ARC	70% WF Alb/est RC	• 0Z.
			Turcun	76% WP	6 ez.
	T	(ANA CENTER AT DECOTE)			
	rearmoppers	(section and rests)			
	Pear slug (sawfly)	Spray foliage about 2 weeks after the petals fail	Carbaryi 4L	4 lb./gal. F	1 pt.
		and again in 2 weeks.	Carbaryl 50WP	50% WP	21b.
			Distinger MW	20% WP	316
			Diszinon 4E & AG500	4b/gal EC	3 at
			Dusban Teaf	4 lb/gal. EC	\$ oz.
			Dumban 50WSP	50% WSP	0.5 lb.
			Monit 75WP	75% WP	3.5 T. (landscape only)
			Oils, horicultural, simin Research DE	ACT (See ALTERNATIVE)	PRODUCTS)
			Pagenai Dr Second	Allh (mail 3)	и, эро. 1. at
			Serin 10W	10% WP	2 th.
			Sonps (fatty acid saint)	See ALTERNATIVE PRO	DUCTS)
			Тепро 2	2 lb./gal, EC	1 02-
			Tempo 20WP	20% WP	1.3 oz.
	Sam Jose scale	Use oil as a dormant treatment in spring. Use any one of the other materials against carefulers in late June and apply at least 2 treatments at 10-day intervals. (see (SENER AL PRSTS: Scales)			
	Two-sponed spater million	(see GRINBRAL PESIS)			
	Webwonn	Treat when haven are present.	Biencem	0.3%EC	2.3-5 pt.
			Carbaryi 4L Carbaryi 5097P	4 10./gal r 40% 31/D	1 p. 2 16
			Decethion	20% WP	2 10. 1.3 oz.
			Distinon SOW	50% WP	116.
			Diszinon 2E & 25%		
			(Spectracide)	25% EC	1 qL
			Dutting 4E & AG300	AD-ART BC	1 pL 20.20 m
			Marrasan-O	00763F 63%EC	2.0-50 MZ. 2.5-5 at
			Prezol 40SP	20% SP	20-30 ez.
			Sovimol	4 fb./gal. F	1 gf.
			Sevin Liquid	2 fb/gal. F	2qt.
			Sevia SeW	50% WP	2 Ib .
			Telister T&O	7.9% F	8-40 oz.
			Taktar IOWP	10% WP	6.4-32 oz.
			Tempe 2	2 10.7gm EC 2094 1970	102
		-	100000000	2474 42	
CRAPEMURTLE	Aphids	(see GENERAL PESTS)			
DAY LILY	Aphids	(see GENERAL PESTS)	AND;		
	-	-	Dimetheate 2.67EC	2.67 lb./gal. EC	50 oz.
			Dimethoate 400	4 lb./gal. EC	35 oz.
	Sings	(see GENERAL PESTS)			
	Thrips	(see GENERAL PESTS)	AND:		
	-		Dimethoute 2.67EC Dimethoute 400	2.67 lb./gal. EC 4 lb./gal. EC	50 az. 33 az.
	Twospotted spider mite	(FRA CHINERAL PESTS)			
DEUTZIA		(reg (HINFE AL PRSTS)			
DEUTZIA	Aphids	(
DEUTZIA	Aphids Lileo lesfininer	Treat when first mines are seen and report as	Bioneem	0.3%EC	2.3-5 pt.
DEUTZIA	Aphids Lileo Ioefininor (Lepidopterous)	Treat when first minor are seen and repost as needed.	Bioacom Dursben Turf	0.3%EC 416./gal. EC	2.3-5 pt. 1 gt.
DEUTZIA	Aphids Lileo Ioefininor (Lepidopterous)	Treat when first mines are seen and repost as noticed,	Bioneem Dursben Tud Dursben 30WSP	0.3%EC 41b./gal. EC 50% WSP	2.5-5 pt. 1 qt. 2 lb.
DEUTZIA	Aphids Lilao loafininor (Logidopterous)	Treat when first mines are seen and repost as needed.	Bioneem Dwrsten Tuef Dwrsten 30WSP Lindage 20%	0.3%EC 41b./gal. EC 50% WSP 1.65 lb./gal. EC 5.9%C	2.5-5 pt. 1 qt. 2 lb. 3 pt. 4 60 pt.
DEUTZIA	Aphids Lilso loafininoz (Lopidopterous)	Trent when first mines are seen and repost as acoded.	Bioacom Dursben Taef Dursben 30WSP Lindage 20% Isotox IV Menyaco-O	0.3%EC 41b./gal. EC 50% WSP 1.651b./gal. EC 8.5%EC 0.3%EC	2.5-5 pt. 1 qt 2 lb. 1 pt 4.69 pt. 2 5-5 pt.
DEUTZIA	Aphids Lilso leafininer (Lepidopterous)	Treat when first mines are seen and repeat as andcol.	Bioasem Dursben Tauf Dursben 30WSP Lindane 20% Isetox IV Margosan-O Orthene	0.3%EC 4 (b./gal. EC 50% WSP 1.65 (b./gal. EC 8.3%EC 0.3%EC 9.4% EC	2.5-5 pt. 1 qt. 2 lb. 1 pt. 4.69 pt. 2.5-5 pt. 4.69 qt.
DEUTZIA	Aphids Lilso Isefininor (Lopidopterous)	Treat when first minos are seen and repost as anoded.	Bioesem Dursben Tuf Dursben 39WSP Lindano 20% Isetox IV Margoran-O Orthene Pagesant DF	0.3%EC 4 lb/gal. EC 50% WSP 1.45 lb/gal. EC 8.3%EC 0.3%EC 9.4% EC 30% DF	2.5-5 pt. 1 qt. 2 lb. 1 pt. 4.69 pt. 2.5-5 pt. 4.69 qt. 2 lb.
DEUTZIA	Aphids Lilso Icefininer (Lepidopterous)	Treat when first mines are seen and repost as anoded.	Bioesem Dursben Tud Dursben 30WSP Lindage 20% Isetox IV Margosan-O Orthene Pageant DP Taistar T&O	0.3%EC 4 lb/gal. EC 50% WSP 1.45 lb/gal. EC 8.3%EC 0.3%EC 9.4% EC 50% DF 7.9% F	2.5-5 pt. 1 qt. 2 lb. 1 pt. 4.69 pt. 2.5-5 pt. 4.69 qt. 2 lb. 2 0-40 az.

Host.	Pest	When to Trest	Labelled Pesticide	Formulation You Buy	Amount To Add To: 100 Gal. Water
Dogwood	Dogwood born	Treat trunk and lower branches in mid-May.	Dursban Tarf Dursban 59WSP	4 lb./gni. EC 50% WSP	1 qt. 2 3b.
			Dursban 1B	t lb./gal. EC	4 qL
			Dursban Badacida 1970	0.3 lb./gill EC 3.lb./coll EC	5 qL • 57-1 1 at (engener s=br)
			Lindene 20%	1.65 fb./gel EC	3 of
	Pret When is Treat Labelled Percenticion Degwood keer Treat insk and lower branches is mid-May. Durkes Tref 4 b./gt, EC Degwood keer Treat insk and lower branches is mid-May. Durkes Tref 4 b./gt, EC Degwood date Treat insk and lower branches is mid-May. Durkes Tref 4 b./gt, EC Degwood date Treat about the test shown on struming in do Cathory 4. 1 b./gt, EC Degwood date gal Treat about the test shown on struming in do Cathory 4. 4 b./gt, F Degwood date gal Treat about the test shown on struming in do Cathory 4. 4 b./gt, F Degwood date gal Treat about the test shown on struming in do Cathory 4. 4 b./gt, F Cathory 4. Cathory 4. Strum 5. 3 b./gt, EC 3 b./gt, EC Degwood date gal Treat about the strum bay and sgin in 19 days AND: 3 b./gt, EC 3 b./gt, EC Cathory 4. Cathory 4. Treat about the strum bay and sgin in 19 days AND: 3 b./gt, EC Degwood date gal Treat about the strum bay and sgin in 19 days AND: 5 b./gt, EC Degwo	3 pt.			
Host DOGWOOD DOUGLAS-FIR			Pageant DF	50% DF	2 b .
			Phaser Thisday 56W/D	3 Ib./gaL EC 50%, 37/D	9.67-1.5 qt (messery only) 1.2 lb (environt actual)
			Thiodan ÆC	3 lb./gal. EC	0.67-1.5 qt (ansery only)
	Dagwood dub gall (midse)	Treat about the time leaves are expanding in the	Carbaryl 4L Carbaryl 50WP	4 fb./gai. F	1 pt.
	(тушқ.	Savimal	4 fb./gui. F	1 qL
	Lethonner	(can (UNITE AL PENTS)			2 84
	Overenteel coule	Treat contribute about fate May and arain in 18 days	AND		
	C yatero and posto	in southern Olico; 2 weeks later in northern Olico.	Cythion	5 lb./gal, EC	1 pt.
		(see GENERAL PESTS)	Cythion 1	t fb./gal, EC	1 pt.
			Mainthion 57	5 Ih./gal, EC	1 pt.
			Malathion Methoxychlor Spray	2 lb.+2 lb./gal. EC	2.5 pt/scco
	Red-headed fies beets	Treat when feeding damage to leaves is observed.	Carbary 5D	5% D	NA
		Repeat as needed.	Carbaryi 10D	10% D	N/A
			Cerberyl 4L	4 Ro./gal. F	1 pt.
			Carbaryi SWP Desething	20% WP	2 ib.
			Diszinon 50W	50% WP	1.7 WZ. 1 lb.
			Diazinon 2E & 25%		
			(Spectracide)	25% BC	1 qt .
			Diszinon 4E & AG500	4b/gal EC	1 pt.
			Dunsban 1821 Dunsban 408/SD	4 10./gat_EC 56% W/CD	₹ #Z 0 < 16
			Mawrik Aquaflow	2 lb./gal. F	4-10 gz.
			Pageant DF	50% DF	0,5 Ib .
			Scienter WP	9.52% WP	2.4-4.8 oz.
			Sevimol Serie Lievid	4 De./gel. F	1 mt.
			Sevie Liquis Sevie 401/	2 10./get r 4044 32/10	2 gr. 2 Ma
			Tempo 2	2 lb/gal EC	1.5 ez.
DOUXILA8-FIR	Aphids	(see GENERAL PESTS)	AND: Dibrom # Emulsive	\$ Jh./gal. EC	1 pt.
	Bagwonn	(see GENERAL PESTS)			
	Cooley sprace gall	Apply early in spring , at budbreak, or anytime	Carbaryl 4L	416./gal. F	1 pt.
	adeigid (aphid)	during the summer when trawlent are active.	Carbaryl SOWP	SO% WP	21b.
			Dursban 1 un	4 10/gal EC 50% WSP	1 pc. 0.5 lb.
			Oils, donnant (see ALT	ERNATIVE PRODUCT	(5)
			Oils, horticultural, suma	er (see ALTERNATTV	E PRODUCTS)
			Pageant DF Sociocal	50% DF 40. 6-0 E	9.5 D. 1-3 et
			Sevia 30W	50% WP	216.
			Soaps (fatty acid salts)	(see ALTERNATIVE P)	KODUCTS)
ELM		Bark beetles (native)	Dursban Turf	416/gal EC	1 gal.
	N		Densban 50WSP	50% WSP 1.16 /mai R	8.33 Bb.
	INNER MERIZION 37% EC	nav reaso rafin uñata to any torafer	Lindage Barer Serev	1.651b./gel. RC	gal. 3 st. (do not apply to foliane)
			Methexychlor ZEC	2 lb./gal. EC	*gal
			Methoxychlor 23	2 fb./gal. EC	t gal
			Pageant DF	50% DF	16.51b.
			Sevimol	410./gal F	20 qt
	Ohio 43013.	Control of Duich clim distance vectors is a highly specialized to	sk. For farmer information w	wite to Forest Schemoes I	abezetory, 339 Minia, R.4., Delaware
		To reduce overwintering survival, treat in early fall. Spray bas- summer to tree crown. Spray theroughly to minimize inocula	al 9 feet of truck until wet but tions.	t not to ronoff. Make ap	plication in spring and early
	Cankerworms Note: Do not use Isotox	(see GENERAL PESTS) IV or Orthone on American elm as foliage damage may occur.	AND: Dibrom # Emulsive	\$16./gal. EC	l pt.
	Elm leaf beetle	Treat when larvas first appear, about when leaves are fully expanded and again in July.	"Bt" (tenebrionis) (see . Carbaryl 5D	ALTERNATIVE PROD 5% D	UCTS) N/A
		• • • •	Carbary1 10D	10% D	N/A.
	Note: Do not use Isotox	IV er Orthene en American eim as foliage darinege may occur.	Carbary14L	4 ib./gal. F	1 pt.
			Carbary1 SOWP	30% WP 30% WP	2 1b.
			Dibrom 2 Resulsive	Sib/esi. FC	1.7 vz. 1 ot.
			Di-Syston	15% G	2.5 oz./inch trank diameter
			Durshan Turf	4 lb./gal. EC	1-2 pt.
			Dursban SOWSP	50% WSP	1-2 Ib.
			Dycarb Nicers W	76% WP 76% WD	12-20 02. (Jarvec) 11. oz.
			A Design of the local data and t		

	Pest	When to Treat	Labelled Pesticide	Formulation You Buy	Amount To Add To: 100 Gai. Waler
	Then less haute		In: dam. 7811/51	7084 1170	A 74 1 K
n	(cent'd)		Itolat IV	1070 WF	4.73-110. 4.69 at
,	(0)		Malathion	4,274 200	en de
			Methorychior Spray	2 lb +2 lb /est. BC	1-2 at
			Mazik Agailow	210. 2100 gan 1.00 21h /oal F	4-10 cz
			Merit 75%/P	71% WP	3.5T. (landscane only)
			Metervatox-R2	2 lb /ral EC	1.1 5 oz. önch trank diameter (coll iniert only)
			Dila bartimitural spore	ner /cee AT TER MATIVE	PRODUCTS) damas)
			Onthene	6 4% EC	A 69 at
			Orthese	79% SP	1.331h
			Parcent DF	50% DF	1-2 lb
			Pestrov ASC	Allh /col EC	1-2 10.
			Permethon EC26	4 Ito gal EC	1 yu 1 nt (nemod elentrophi)
			Residend Shade Tees	TIONER DO	The forming brave only)
			Rocalitatio Silane Lice	18-118-64-50	3.3 at
			Enjoyitan M/D	4 4)4/ 1/1 10/EGE DU	2-5 gs
			Series al	Ally family	Lat
			Serie & Dest	410/gal r 48/ D	L 194 16 /1000 co 🕀
			2 min \$037	4/44/2 30/00	1-1.1.5 105 1000 BQ.10
			Seven Jow		
			Scape (Larry acto sats)	(FOR ALLERNATIVE PK	000018)
			Talstar 180	7.9% F	\$-4U 0Z.
			THEM TOWP	10% WP	e.4+52 02.
			Tempe Z	2 ID/gal. EC	L) 02
			Tempo 20WP	20% WP	1.9 02.
			I WICHIN	/076 WP	11 62.
	Elm Jeafminer	Treat when mines are seen, in early May for the	Bioneem	0.3%EC	2.\$-5 pt.
	(Hymencolerons)	first repeation and endy lane for the second	Dibtom # Econfrier	t ib And Eff	Int
	(**) manahananah	The President and really and real and the phones.	Domber Test		l art
		Farmentary.		4 100 gal, EU 509/ 10/20	1 m/u 2 m/u
	Nature Description of the		L'union DUWSP	JU76 WAP	∠ 30. 1 -4
	Lines: The Hot sto Ottpon	o on Winderstu citte an Ionago quittadio may occut.	Langane 20%	LOD ID./get EC	T hc
			Lindane Borer Sprey	1.63 lb/gal. EC	1 pt
			Margosan-O	0,3%EC	2.5-5 pc
			Orthene	9.4% BC	4.69 qL
			Pageant DF	50% DF	2 lb.
			Talstar T&O	7.9% F	20-40 oz.
			Talstar 10WP	10% WP	16-32 oz.
	Farmers des code	The off as Filian play of as a dormost treatment	4 MD:		
	Perober an some	in the entire. The one of other materials assinct	Di-System	196.0	2 1 oz linch trank dismeter
		arandar in late Ince	Confiden 28	216 6470	2.4 of
		CERVICES IN 1999 JUNES.	Counse 25	2 ID/galec	3-4 pc 1.1.6 cm for all damage de standard (na 21 in inder an bai
	Fall webwonn Note: Do not use Isotax I	(see GENERAL PESTS) IV or Orthene on Amorican clan as folioge damage may occur.			
	Fail webwonn Note: Do not use isotox i Japanese booke Note: Do not use isotox i	(see GENERAL PESTS) IV er Orthene en American eim as foliege damage may occur. (see GENERAL PESTS) IV et Orthene en American eim as foliage damage may occur.			
	Fall webworm Note: Do not use Isotox I Japanese booke Note: Do not use Isotox I Leafhoppers Note: Do not use Isotox I	(see GENERAL PESTS) IV er Orthene en American eim as foliege damage may occur. (see GENERAL PESTS) IV et Orthene en American eim as foliage damage may occur. (see GENERAL PESTS) IV or Orthene en American eim as foliage damage may occur.			· · · · · · · · · · · · · · · · · · ·
	Fail webworm Nete: Do not use Isotex Jepennes boole Nete: Do not use Isotex Leafhoppers Nete: Do not use Isotex Woolly sphid	(see GENERAL PESTS) IV er Orthene en Amedican elm as folinge damage may occur. (see GENERAL PESTS) IV et Orthene en Amedican elm as foliage damage may occur, (see GENERAL PESTS) IV et Orthene en Amedican elm as foliage damage may occur, (see GENERAL PESTS) Trast in actur May utues (seus en gruppdige			
	Fail webworm Note: Do not use Isotox Japanses books Note: Do not use Isotox Leafhoppers Note: Do not use Isotox Woolly aphid Note: Malethion 57% BC Note: Do not apply Isoto	(see GENERAL PESTS) IV er Orthense en American einn as folinge damage may occur. (see GENERAL PESTS) IV et Orthense en American einn as folinge damage may occur. (see GENERAL PESTS) IV et Orthense en American eins as folinge damage may occur. (see GENERAL PESTS: Aphids) Treet in sady May when issues are expanding. may omkes fight injury to eim folinge. (x) oc Orthense is American ein as injury to folinge may occur.			· · · · · · · · · · · · · · · · · · ·
107	Fail webworm Note: Do not use Isotox Japanses books Note: Do not use Isotox Leafhoppers Note: Do not use Isotox Woolly aphid Note: Malethion 57% BC Note: Do not apply Isotox	(see GENERAL PESTS) IV er Orthense en American ein as folinge damage may occur. (see GENERAL PESTS) IV et Orthense en American ein as folinge damage may occur. (see GENERAL PESTS) IV et Orthense en American eins as folinge damage may occur. (see GENERAL PESTS) IV et Orthense en American eins as folinge damage may occur. (see GENERAL PESTS: Aphids) Treat in sady May when issues are expanding. reay omise slight injury to eim folinge. (N or Orthense is American ein as injury to folinge may occur.			
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MUS	Fall webworm Note: Do not use Isotox I Jepenses books Note: Do not use Isotox I Leafhoppers Note: Do not use Isotox I Woolly aphid Note: Malefhion 57% BC Note: Do not apply Isotox Aphids	(see GENERAL PESTS) IV er Orthene en Amedian ein as folinge damage may occur. (see GENERAL PESTS) IV et Orthene en Amedian ein as folinge damage may occur. (see GENERAL PESTS) IV et Orthene en Amedian ein as folinge damage may occur. (see GENERAL PESTS: Aphids) Trout in endy May whon leaves are expanding. may omise slight injury to ein folinge. k IV or Orthene to Amedian ein as injury to folinge may occur. (see GENERAL PESTS)	AND: Cygon 2E	2 (b)/gal. EC	2 pt.
MUS	Fall webworm Nete: Do not use Isotox Japanes boole Nete: Do not use Isotox Leafhoppers Nete: Do not use Isotox Woolly aphid Nete: Malefhion 57% BC Nete: Do not apply Isoto Aphids	(see GENERAL PESTS) IV er Orthense en American ein as folinge damage may occur. (see GENERAL PESTS) IV et Orthense en American eim as folinge damage may occur. (see GENERAL PESTS) IV or Orthense on American ein as folinge damage may occur. (see GENERAL PESTS: Aphids) Trout in saidy May when leaves are expanding. may omase slight ingivy to eim folinge. (see GENERAL PESTS)	AND: Cygon 2E Dimethoate 2,47EC	2 16./gal. EC 2.47 16./gal. EC 4.16 (15) 70	2 pt. 30 oz.
MUS	Fail webworm Note: Do not use Isotox Jepanses booke Note: Do not uso Isotox Leafhoppers Note: Do not uso Isotox Woolly aphid Note: Malathion 57% EC Note: Do not apply Isotox Aphids	(see GENERAL PESTS) IV er Orthene en American ein as folinge damage may occur. (see GENERAL PESTS) IV et Orthene en American ein as folinge damage may occur. (see GENERAL PESTS) IV or Orthene en American cint as folinge damage may occur. (see GENERAL PESTS; Aphids) Treat in sady May when leaves are expanding. reay onnes slight injury to eim folinge. (see GENERAL PESTS; Orthenes as injury to folinge may occur. (see GENERAL PESTS)	AND: Cygon 2E Dimethoate 2.67EC Dimethoate 400	2 15./gal. EC 2.47 15./gal. EC 4 15./gal. EC	2 pt. 50 oz. 33 oz.
MUS	Fall webworm Note: Do not use Isotox Jepennes booke Note: Do not uso Isotox Leafhoppers Note: Do not uso Isotox Woolly aphid Note: Malathion 57% EC Note: Do not apply Isotox Aphids	(see GENERAL PESTS) IV er Orthene en American elm as folinge damage may occur. (see GENERAL PESTS) IV et Orthene en American elm as folinge damage may occur. (see GENERAL PESTS) IV or Orthene en American elm as folinge damage may occur. (see GENERAL PESTS: Aphids) Trout in east y May when leaves are expanding. may omae slight injury to elm folinge. x IV or Orthene to American elm as injury to folinge may occur. (see GENERAL PESTS)	AND: Cygon 2H Dimethoste 2.47EC Dimethoste 400 Oribeaex Spray	2 fb/gal. EC 2.47 fb/gal. EC 4 fb/gal. EC 4 fb/gal. EC Acrosol	2 pt. 30 oz. 33 oz. N/A
MUS	Fall webwonn Note: Do not use Isoton I Jepenses books Note: Do not uso Isoton I Leafhoppers Note: Do not uso Isoton I Woolly aphid Note: Maisthion 57% BC Note: Do not apply Isoton Aphids Bagwonn	(see GENERAL PESTS) IV er Orthease en Amedicas elm as foliage damage may occur. (see GENERAL PESTS) IV er Orthease en Amedican elm as foliage damage may occur. (see GENERAL PESTS) IV et Orthease en Amedican elm as foliage damage may occur. (see GENERAL PESTS: Aphids) Trout in eady May whon feaves are expanding. may omus sight injury to elm foliage. x IV or Orthease to Amedican elm as injury to foliage may occur. (see GENERAL PESTS) (see GENERAL PESTS)	AND: Cygon 2E Dimethoste 2.67EC Dimethoste 400 Orthener Spray AND:	2 lb./gal. EC 2.47 lb./gal. EC 4 lb./gal. EC Acrosol	2 pt. 30 oz. 33 oz. N/A
MUS	Fall webworm Note: Do not use Isotox I Jepenses boole Note: Do not uso Isotox I Leafhoppers Note: Do not uso Isotox I Woolly aphid Note: Malathion 57% BC Note: Do not apply Isoto Aphids Bagworm	(see GENERAL PESTS) IV er Orthene en American elm as folinge damage may occur. (see GENERAL PESTS) IV et Orthene en American elm as folinge damage may occur. (see GENERAL PESTS) IV or Orthene en American elm as folinge damage may occur. (see GENERAL PESTS: Aphids) Trout in east y May when leaves are expanding. may cause slight injury to elm folinge. (see GENERAL PESTS) (see GENERAL PESTS)	AND: Cygon 2E Dimethoste 2.67EC Dimethoste 400 Orthenex Spray AND: Orthenex Spray	2 fb/gal. EC 2.47 fb/gal. EC 4 fb/gal. EC 4 fb/gal. EC Acrosol Acrosol	2 pt. 50 oz. 33 oz. N/A
MUS	Fall webworm Nete: Do not use Isotox Japanes boole Nete: Do not use Isotox Leafheppers Nete: Do not use Isotox Woolly aphid Nete: Malefinion 37% BC Nete: Do not apply Isoto Aphids Bagworm Black vise weevil	(see GENERAL PESTS) IV er Orthense en American ein as folinge damage may occur. (see GENERAL PESTS) IV et Orthense en American ein as folinge damage may occur. (see GENERAL PESTS) IV or Orthense en American ein as folinge damage may occur. (see GENERAL PESTS: Aphids) Treat in andy May when leaves are expanding. rasy onnes slight ingery to ein folinge. x IV or Orthense to American ein as injury to folinge may occur. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS)	AND: Cygon 2E Dimethoate 2.47EC Dimethoate 400 Ortheaex Spray AND: Ortheaex Spray	2 15/gal. EC 2.47 15/gal. EC 4 15/gal. EC Acrosol Acrosol	2 pt. 50 oz. 33 oz. N/A N/A
MUS	Fail webworm Nete: Do not use Isotox Japanese boole Nete: Do not use Isotox Leafheppers Nete: Do not use Isotox Woolly aphid Nete: Malefhion, 57% BC Nete: Do not apply Isoto Aphids Bagworm Black vine weevil Emerymus scale	(see GENERAL PESTS) (see GENERAL PESTS) V et Orthease on American eim as foliage damage may occur. (see GENERAL PESTS) V et Orthease on American eim as foliage damage may occur. (see GENERAL PESTS) IV et Orthease on American eim as foliage damage may occur. (see GENERAL PESTS: Aphids) Trout in easy May when leaves are expanding. may onuse slight injury to eim foliage. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS)	AND: Cygon 2E Dimethoate 2.47EC Dimethoate 2.47EC Orthease: Spray AND: Orthease: Spray	2 lb./gal. EC 2.47 lb./gal. EC 4 lb./gal. EC Acrosol Acrosol	2 pt. 30 oz. 33 oz. N/A N/A
MUS	Fall webworm Note: Do not use Isotox Jepanses boole Note: Do not use Isotox Leafhoppers Note: Do not use Isotox Woolly aphid Note: Malathion 57% BC Note: Do not apply Isotor Aphids Bagwoom Black vise weevil Emerymus scale	(see GENERAL PESTS) IV er Orthene en American ein as folinge damage may occur. (see GENERAL PESTS) IV er Orthene en American ein as folinge damage may occur. (see GENERAL PESTS) IV or Orthene en American ein as folinge damage may occur. (see GENERAL PESTS) IV or Orthene en American ein as folinge damage may occur. (see GENERAL PESTS: Aphido) Treat in sady May when leaves are expanding. reay onnes slight injury to ein folinge. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use off as a domaant spray in late fall or early spring. Use any one of other materials arging the candern	AND: Cygon 2E Dimethoate 2.67EC Dimethoate 400 Ortheasec Spray AND: Ortheasec Spray	2 lb/gal. EC 2.67 lb/gal. EC 4 lb/gal. EC Acrosol Acrosol 2 lb/gal. EC	2 pt. 30 oz. 33 oz. N/A N/A
MUS	Fall webworm Nete: Do not use Isotex Japanes boole Nete: Do not use Isotex Leafheppers Nete: Do not use Isotex Woolly sphid Nete: Malathion 57% BC Nete: Do not apply Isoten Aphids Bagwoom Black vise weevil Esseymus scale	(see GENERAL PESTS) (see GENERAL PESTS) V er Orthease en American ein as foliage damage may occur. (see GENERAL PESTS) V er Orthease en American ein as foliage damage may occur. (see GENERAL PESTS) V or Orthease on American ein as foliage damage may occur. (see GENERAL PESTS: Aphids) Trout in sady May when leaves are expanding. reny onuse slight injery to ein foliage. k IV or Orthease to American ein as injery to foliage may occur. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use oil as a dommant spray in late fall or early spring. Use oil as a dommant spray in late fall or early spring. Use oil as a dommant spray in late fall or early spring. Use any one of other materials against the craviers in late May, early Una, spid-Dama, Anoty first	AND: Cygon 2E Dimethosic 2.67EC Dimethosic 440 Ortheaex Spray AND: Ortheaex Spray AND: Cygon 2E Cythion	2 fb/gal. EC 2.47 fb/gal. EC 4 fb/gal. EC Acrosol Acrosol 2 fb/gal. EC 5 fb/gal. EC	2 pt. 50 oz. 33 oz. N/A N/A 2 pt. 1-1.5 pt.
MUS	Fail webworm Nete: Do not use Isotox Japanese boole Nete: Do not use Isotox Leafheppers Nete: Do not use Isotox Woolly aphid Nete: Malefhion, 57% BC Nete: Do not apply Isoto Aphids Bagworm Black vine weevil Emerymus scale	(see GENERAL PESTS) (see GENERAL PESTS) V et Orthease on American elm as foliage damage may occur. (see GENERAL PESTS) V et Orthease on American elm as foliage damage may occur. (see GENERAL PESTS) IV or Orthease on American elm as foliage damage may occur. (see GENERAL PESTS: Aphids) Trout in easy May when leaves are expanding. may onuse slight injury to elm foliage. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use oil as a domnant spezy in labe full or early spring. Use oil as a domnant spezy in labe full or early spring. Use any one of other materials against the crawlers in late May, early lang, mid-June. Apply first treatment in May and here analy two event in lade or	AND: Cygon 2E Dimethoate 2.47EC Dimethoate 400 Ortheaser Spray AND: Ortheaser Spray AND: Cygon 2E Cythion 1	2 lb./gal. EC 2.47 lb./gal. EC 4 lb./gal. EC Acrosol Acrosol 2 lb./gal. EC 5 lb./gal. EC 5 lb./gal. EC	2 pt. 30 oz. 33 oz. N/A N/A 2 pt. 1-1.5 pt. 1 ot.
MUS	Fall webworm Note: Do not use Isotox Jepanses books Note: Do not use Isotox Leafhoppers Note: Do not use Isotox Woolly aphid Note: Distribution 57% EC Note: Do not apply Isotox Aphids Bagworm Black vise weevil Enceymus scale	(see GENERAL PESTS) IV er Orthene en American ein as folinge damage may occur. (see GENERAL PESTS) IV er Orthene en American ein as folinge damage may occur. (see GENERAL PESTS) IV or Orthene en American ein as folinge damage may occur. (see GENERAL PESTS) IV or Orthene en American ein as folinge damage may occur. (see GENERAL PESTS: Aphids) Treat in early May when issues are expanding. may omas slight injury to ein folinge. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use oil as a domaant spezy in late fall er early spring. Use any one of other materials against the crawlers in late May and face apply two more at 10-day intervise. Report the se and distance apply two more at 10-day intervise. Report the se and distance apply two more at 10-day	AND: Cygon 2E Dimethoste 2.67EC Dimethoste 400 Orthenex Spray AND: Orthenex Spray AND: Cygon 2E Cythion 2 Cythion 3 Dimethoste 2.67EC	2 lb/gal EC 2.67 lb/gal EC 4 lb/gal EC Acrosol Acrosol 2 lb/gal EC 5 lb/gal EC 5 lb/gal EC 5 lb/gal EC 5 lb/gal EC	2 pt. 30 oz. 33 oz. N/A N/A 2 pt. 1-1.5 pt. 1 pt. 50 oz.
MUS	Fall webworm Nete: Do not use Isotex Japanes boole Nete: Do not use Isotex Leafheppers Nete: Do not use Isotex Woolly sphid Nete: Malathion 57% BC Nete: Do not apply Isoten Aphids Bagworm Black vine weevil Baseymms scale	(see GENERAL PESTS) (see GENERAL PESTS) V er Orthease en American eim as foliage damage may occur. (see GENERAL PESTS) V er Orthease en American eim as foliage damage may occur. (see GENERAL PESTS) V or Orthease on American eim as foliage damage may occur. (see GENERAL PESTS: Aphids) Trout in sady May whom leaves are expanding. renty onus elight injury to eim foliage. k IV or Orthease to American eim as injury to foliage may occur. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use oil as a dommant spray in late fail or early spring. Use oil as a dommant spray in late fail or early spring. Use any age of other materials against the craviers in late May, early late, spid-fuest treatment in May and then apply two more al 10-day intervals. Repeat this procedure as acceded.	AND: Cygon 2E Dimethosic 2.67EC Dimethosic 400 Orthesex Spray AND: Orthesex Spray AND: Cygon 2E Cythion Cythion 8 Dimethosic 2.67EC Dimethosic 2.67EC	2 lb./gal. EC 2.47 lb./gal. EC 4 lb./gal. EC 4 lb./gal. EC Acrosol Acrosol 2 lb./gal. EC 5 lb./gal. EC 3 lb./gal. EC 4 lb./gal. EC 4 lb./gal. EC	2 pt. 30 oz. 33 oz. N/A N/A N/A 2 pt. 1-1.5 pt. 1 pt. 50 oz. 35 oz. complexe is lete May or
MUS	Fall webworm Nete: Do not use Isotox Japanses boole Nete: Do not use Isotox Leafhoppers Nete: Do not use Isotox Woolly aphid Nete: Malefhion, 57% BC Nete: Do not apply Isoto Aphids Bagworm Black vine weevil Emerymus scale	(see GENERAL PESTS) (see GENERAL PESTS) V et Orthease on American elm as foliage damage may occur. (see GENERAL PESTS) V et Orthease on American elm as foliage damage may occur. (see GENERAL PESTS) IV or Orthease on American clm as foliage damage may occur. (see GENERAL PESTS: Aphids) Trout in easy May when leaves are expanding. may onuse slight injury to elm foliage. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use oil as a domnant spery in late full or early spring. Use oil as a domnant spery in late full or early spring. Use oil as a domnant spery in late full or early spring. Use oil as a domnant spery in late full or early spring. Use oil as a domnant spery in late full or early spring. Use any one of other materials against the crawlers in late May, early lane, mid-June. Apply fust treatment in May and fune apply two more at 10-day intervals, Repeat this geneoilties as accodel.	AND: Cygon 2E Dimethoate 2.67EC Dimethoate 400 Ortheaser Spray AND: Cygon 2E Cythion 5 Cythion 5 Dimethoate 2.67EC Dimethoate 2.67EC Dimethoate 2.67EC	2 lb./gal. EC 2.47 lb./gal. EC 4 lb./gal. EC Acrosol Acrosol 2 lb./gal. EC 5 lb./gal. EC 3 lb./gal. EC 2.67 lb./gal. EC 4 lb./gal. EC 4 lb./gal. EC	2 pt. 30 oz. 33 oz. N/A N/A N/A 2 pt. 1-1.5 pt. 1 pt. 50 oz. 35 oz. 78-46 oz.
MUS	Fall webworm Note: Do not use Isotox Jepanses books Note: Do not use Isotox Leafhoppers Note: Do not use Isotox Woolly aphid Note: Do not use Isotox Woolly aphid Note: Do not apply Isotox Aphids Bagworm Black vise weevil Emerymus scale	(see GENERAL PESTS) IV er Orthease en Amedicas elm as foliage damage may occur. (see GENERAL PESTS) IV er Orthease en Amedican elm as foliage damage may occur. (see GENERAL PESTS) IV er Orthease en Amedican elm as foliage damage may occur. (see GENERAL PESTS) Trost in eady May whon leaves are expanding. resty cause slight injury to elm foliage. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use oil as a domnast spezy in late full or early spring. Use an el of other materials against the crawlers in lato May, early lane, mid-Juae. Apply first treatment in May and then apply two more at 10-day intervals. Repeat this procedure as accided.	AND: Cygon 2E Dimethoste 2.67EC Dimethoste 400 Orthesec Spray AND: Orthesec Spray AND: Cygon 2E Cythion 2 Cythion 3 Dimethoste 2.67EC Dimethoste 400 Dynarb	2 lb./gal. EC 2.47 lb./gal. EC 4 lb./gal. EC Acrosol Acrosol 2 lb./gal. EC 3 lb./gal. EC 3 lb./gal. EC 3 lb./gal. EC 4 lb./gal. EC 4 lb./gal. EC 4 lb./gal. EC	2 pt. 50 oz. 33 oz. N/A N/A 2 pt. 1-1.5 pt. 1 pt. 50 oz. 35 oz. crawkers in lato May, cm. 29-40 oz.
MUS	Fall webworm Nete: Do not use Isotox Japanes boole Nete: Do not use Isotox Leafheppers Nete: Do not use Isotox Woolly aphid Nete: Maisthion 57% BC Nete: Do not apply Isoto Aphids Bagyworm Black vise weevil Baseymus scale	(see GENERAL PESTS) (see GENERAL PESTS) V et Ortheas en Amedican elm as foliage damage may occur. (see GENERAL PESTS) V et Ortheas en Amedican elm as foliage damage may occur. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS: Aphide) Treat in sady May when leaves are expanding. reay onus: slight injery to elm foliage. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use oil as a domnant spezy in late fall er early apring. Use any one of other materials against the crawlees in late May, early June, mid-June. Apply first reatured in May and flam apply two more at 16-day intervals. Repeat this procedure as needed.	AND: Cygon 2E Dimethoate 2.47EC Dimethoate 400 Ortheaex Spray AND: Ortheaex Spray AND: Cygon 2E Cythion Cythion 2 Dimethoate 2.67EC Dimethoate 400 Dyoarb Ricem W	2 lb/gal EC 2.47 lb/gal EC 4 lb/gal EC Acrosol Acrosol 2 lb/gal EC 3 lb/gal EC 3 lb/gal EC 2.47 lb/gal EC 2.47 lb/gal EC 2.47 lb/gal EC 7.6% WP 76% WP	2 pt. 50 oz. 33 oz. N/A N/A N/A N/A 2 pt. 1-1.5 pt. 1 pt. 50 oz. 35 oz. 29-46 oz. 6 oz. 1 a z.
MUS	Fall webworm Nete: Do not use Isotox Jepenses boole Nete: Do not use Isotox Leafhsppers Nete: Do not use Isotox Woolly aphid Nete: Malethion 57% BC Nete: Do not apply Isoto Aphids Bagworm Black vine weevil Emeryment scale	(see GENERAL PESTS) IV et Orthease en Amedican ein as foliage damage may occur. (see GENERAL PESTS) IV et Orthease en Amedican ein as foliage damage may occur. (see GENERAL PESTS) IV et Orthease en Amedican ein as foliage damage may occur. (see GENERAL PESTS) IV et Orthease en Amedican ein as foliage damage may occur. (see GENERAL PESTS: Aphids) Treat in early May when leaves are expanding. may omase slight injury to eim foliage. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use oil as a dommast spray in laste full er early spring. Use oary one of other materials against the crawlers in late May, early lane, mid-lane. Apply first treatment in May and then apply two more at 10-day intervals. Repeat this procedure as anceded.	AND: Cygon 2E Dimethoate 2.67EC Dimethoate 2.67EC Dimethoate 300 Orthease: Spray AND: Cygon 2E Cythion 2 Cythion 8 Dimethoate 2.67EC Dimethoate 400 Dyoarb Ficem W Guthien 28	2 lb./gal. EC 2.47 lb./gal. EC 4 lb./gal. EC Acrosol Acrosol 2 lb./gal. EC 5 lb./gal. EC 5 lb./gal. EC 2.47 lb./gal. EC 4 lb./gal. EC 76% WP 2 lb./gal EC	2 pt. 30 oz. 33 oz. N/A N/A N/A 2 pt. 1-1.5 pt. 1 pt. 50 oz. 33 oz. crawders in isto May, cr. 20-40 oz. 6 oz. 1.5-2 pt.
MUS	Fall webworm Nete: Do not use Isotex Jepanse boole Nete: Do not use Isotex Leafhoppers Nete: Do not use Isotex Woolly sphid Nete: Malathion 57% BC Nete: Do not apply Isote Aphids Bagworm Black vine weevil Baseymms scale	(see GENERAL PESTS) IV er Orthease en Amedican ein as folinge damage may occur. (see GENERAL PESTS) IV et Orthease en Amedican ein as folinge damage may occur. (see GENERAL PESTS) IV et Orthease en Amedican ein as folinge damage may occur. (see GENERAL PESTS) IV et Orthease en Amedican ein as folinge. (see GENERAL PESTS: Aphids) Trout in eady May vhoa leaves ere expanding. reaty onice slight injury to elem folinge. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use oil as a domaat spery in labe full er eady spring. Use oary case of other materials against the crawlers in lab May, eady Juna, raid-Juna. Apply first treatment in May and then apply two more at 10-day intervals, Repeat this genocellate as accided.	AND: Cygon 2E Dimethoate 2.67EC Dimethoate 400 Ortheaser Spray AND: Ortheaser Spray AND: Cygon 2E Cythion Cythion 2 Dimethoate 2.67EC Dimethoate 400 Dyoarb Ricem W Guthion 28 Malathion 57	2 lb./gal. EC 2.47 lb./gal. EC 4 lb./gal. EC 4 lb./gal. EC 5 lb./gal. EC 5 lb./gal. EC 5 lb./gal. EC 5 lb./gal. EC 1 lb./gal. EC 7 d% WP 7 d% WP 2 lb./gal. EC	2 pt. 30 oz. 33 oz. N/A N/A N/A 2 pt. 1-1.5 pt. 1 pt. 50 oz. 35 oz. 20-40 oz. 6 oz. 1.5 pt. 1.5 pt. 1.5 pt.
MUS	Fall webworm Nete: Do not use Isotox Japanes boole Nete: Do not use Isotox Leafheppers Nete: Do not use Isotox Woolly aphid Nete: Malefhion 37% BC Nete: Do not apply Isoto Aphids Bagworm Black vise weevil Euseymms scale	(see GENERAL PESTS) IV er Orthene en Amedican ein as folinge damage may occur. (see GENERAL PESTS) IV et Orthene en Amedican ein as folinge damage may occur. (see GENERAL PESTS) IV or Orthene en Amedican ein as folinge damage may occur. (see GENERAL PESTS) IV or Orthene en Amedican ein as folinge. (see GENERAL PESTS: Abide) Treat in endy May when leaves are expanding. reary ontace slight injury to ein folinge. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use off as a domaant spray in late fall or early spring. Use any one of other materials against the crawlers in late May, early Jane, mid-Jane. Apply first treatments in May and flows apply two more at 10-day intervals. Repeat this procedure as needed.	AND: Cygon 2E Dimethoate 2.47EC Dimethoate 400 Ortheaser Spray AND: Cytheon Spray AND: Cythion 2E Cythion 2 Dimethoate 2.67EC Dimethoate 2.67EC Dimethoate 2.67EC Dimethoate 2.67EC Matchion 37 Matchion 37 Matchion 37	2 lb/gal. EC 2.47 lb/gal. EC 4 lb/gal. EC Acrosol Acrosol 2 lb/gal. EC 3 lb/gal. EC 3 lb/gal. EC 2.47 lb/gal. EC 2.47 lb/gal. EC 2.47 lb/gal. EC 2.47 lb/gal. EC 7.4% WP 2.16% WP 2.16% IC 3 lb/gal. EC	2 pt. 30 oz. 33 oz. N/A N/A N/A N/A 2 pt. 1-1.5 pt. 1 pt. 50 oz. 35 oz. 29-40 oz. 6 oz. 1.5-2 pt. 1.3-pt. 1.3 pt. 1.3 pt.
MUS	Fall webworm Nete: Do not use Isotox Jepense boole Nete: Do not use Isotox Leafhoppers Nete: Do not use Isotox Woolly aphid Nete: Malefhion, 57% BC Nete: Do not apply Isoto Aphids Bagworm Black vine weevil Receynme scale	(see GENERAL PESTS) IV er Orthense en American ein as folinge damage may occur. (see GENERAL PESTS) IV et Orthense en American ein as folinge damage may occur. (see GENERAL PESTS) IV et Orthense en American ein as folinge damage may occur. (see GENERAL PESTS: Aphids) Treut in enty May when leaves are expanding. may outse slight injury to eim folinge. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use oil as a domnast spray in late full er early spring. Use any case of other materials against the crawlers in late May, early lane, spid-lane. Apply first treatment in May and then apply two more at 10-day intervals. Repeat this geneeding a anecded.	AND: Cygon 2E Dimethoate 2.47EC Dimethoate 2.47EC Dimethoate 2.47EC Dimethoate 300 Ortheax Spray AND: Cygon 2E Cythion 8 Dimethoate 2.67EC Dimethoate 2.67EC Dimethoate 2.67EC Dimethoate 2.67EC Dimethoate 2.67EC Dimethoate 3.67EC Dimethoate 3.67EC	2 lb./gal. EC 2.47 lb./gal. EC 4 lb./gal. EC Acrosol Acrosol 2 lb./gal. EC 3 lb./gal. EC 3 lb./gal. EC 4 lb./gal. EC 4 lb./gal. EC 4 lb./gal. EC 7 6% WP 7 6% WP 2 lb./gal. EC 5 lb./gal. EC 5 lb./gal. EC	2 pt. 30 oz. 33 oz. N/A N/A N/A 2 pt. 1-1.5 pt. 1 pt. 50 oz. 33 oz. crawlers in lato May, cm 2 e oz. 1.5-2 pt. 1.5 pt. 2.5 pt/acre
MUS	Fall webworm Nete: Do not use Isotex Jepennes boole Nete: Do not use Isotex Leafhoppers Nete: Do not use Isotex Woolly aphid Nete: Malethion 57% BC Nete: Do not apply Isotex Aphids Bagworm Black vine weevil Baseymms scale	(see GENERAL PESTS) IV er Orthease en Amedican ein as folinge damage may occur. (see GENERAL PESTS) IV er Orthease en Amedican ein as folinge damage may occur. (see GENERAL PESTS) IV er Orthease en Amedican ein as folinge damage may occur. (see GENERAL PESTS) IV er Orthease in Amedican ein as folinge. (see GENERAL PESTS: Aphids) Trout in eady May who leaves are expanding. may omize slight injury to ein folinge. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use oil as a dommast spezy in late full er eady spring. Use oas one of other materials against the crawlers in lato May, eady they and flow apply two more at 10-day intervals. Repost this procedure as accided.	AND: Cygon 2E Dimethoate 2.67EC Dimethoate 2.67EC Dimethoate 400 Ortheasex Spray AND: Cygon 2E Cythion Cythion 3 Dimethoate 2.67EC Dimethoate 2.67EC Dimethoate 400 Dycarb Ficern W Guthion 2S Malathion 37 Malathion Methoxychitor Spray Rockland Shade Tree	2 lb./gal. EC 2.47 lb./gal. EC 4 lb./gal. EC Acrosol Acrosol 2 lb./gal. EC 3 lb./gal. EC 3 lb./gal. EC 3 lb./gal. EC 3 lb./gal. EC 4 lb./gal. EC 2 lb./gal. EC 2 lb./gal. EC 2 lb./gal. EC 2 lb./gal. EC 2 lb./gal. EC	2 pt. 30 oz. 33 oz. N/A N/A N/A 2 pt. 1-1.5 pt. 1 pt. 50 oz. 35 oz. 29-40 oz. 6 oz. 1.5-2 pt. 1.5 pt. 1.5 pt. 1.5 pt. 2.5
MUR	Fall webworm Nete: Do not use Isotex Japanes boole Nete: Do not use Isotex Leafhoppers Nete: Do not use Isotex Woolly aphid Nete: Malathion 57% BC Nete: Do not apply Isoten Aphids Bagwoom Black vise weevil Essaymus scale	(see GENERAL PESTS) IV er Orthease en Amedican einn as folinge damage may occur. (see GENERAL PESTS) IV et Orthease en Amedican einn as folinge damage may occur. (see GENERAL PESTS) IV et Orthease en Amedican einn as folinge damage may occur. (see GENERAL PESTS: Aphids) Trout in sady May when leaves are expanding. reny omacs slight injery to einn felinge. k IV or Orthease to American einn as injery to folinge may occur. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use oil as a dommant spray in late fail er early spring. Use any one of other materials against the craviers in late May, early Juan, mid-Juan. Apply first treatment in May and then apply two more al 10-day intervals. Repeat this procedure as needed.	AND: Cygon 2E Dimethosic 2.67EC Dimethosic 400 Orthesex Spray AND: Orthesex Spray AND: Cygon 2E Cythion 5 Dimethosic 267EC Dimethosic 400 Dycarb Ficam W Guthion 25 Milathion 57 Milathion 57 Milathion Stade Tree Insect Spray	2 lb/gal. EC 2.47 lb/gal. EC 4 lb/gal. EC 4 lb/gal. EC 4 lb/gal. EC 3 lb/gal. EC 3 lb/gal. EC 3 lb/gal. EC 2.47 lb/gal. EC 2.47 lb/gal. EC 74% WP 76% WP 76% WP 76% WP 76% WP 2 lb/gal. EC 3 lb/gal. EC 2 lb.+2 lb/gal. EC 2 lb.+2 lb/gal. EC	2 pt. 30 oz. 33 oz. N/A N/A N/A N/A 2 pt. 1-1.5 pt. 1 pt. 50 oz. 35 oz. 20-40 oz. 6 oz. 1.5 2 pt. 1.5 pt. 1.5 pt. 2.5 pt./acros 2-3 qt.
MUS	Fall webworm Nete: Do not use Isotex Japanes boole Nete: Do not use Isotex Leafhoppers Nete: Do not use Isotex Woolly aphid Nete: Maisthion 57% BC Nete: Do not apply Isoten Aphids Bagyworn Black vise weevil Essaymus scale	(see GENERAL PESTS) IV er Orthene en Amedian ein as folinge damage may occur. (see GENERAL PESTS) IV et Orthene en Amedian ein as folinge damage may occur. (see GENERAL PESTS) IV of Orthene en Amedian ein as folinge damage may occur. (see GENERAL PESTS: Aphids) Trout in eady May when leaves are expanding. reny onuse slight injery to ein felinge. (IV of Orthene to Amedian ein as injery to folinge may occur. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use oil as a dommant spray in late fall er eady spring. Use any one of other materials against the craviers in late May, eady lane, mid-Juna. Apply first in techny, eady May and face apply two more at 10-day intervals. Repeat this procedure as needed.	AND: Cygon 2H Dimethosic 2,67EC Dimethosic 440 Orthesex Spray AND: Orthesex Spray AND: Cygon 2E Cythion 5 Dimethosic 400 Dyoarb Ficem W Guthion 25 Milathion 57 Milathion 57 Milathion 57 Milathion Spray Rockland Shade Tree Insect Spray Turvam	2 fb/gal. EC 2.47 fb/gal. EC 2.47 fb/gal. EC 4 fb/gal. EC Acrosol Acrosol 2 fb/gal. EC 3 fb/gal. EC 3 fb/gal. EC 2.47 fb/gal. EC 2.47 fb/gal. EC 76% WP 76% WP 2 fb/gal. EC 3 fb/gal. EC 3 fb/gal. EC 2 fb.+2 fb/gal. EC 2 fb.+1.1 fb/gal. EC 76% WP	2 pt. 30 oz. 33 oz. N/A N/A N/A N/A 2 pt. 1-1.5 pt. 1 pt. 50 oz. 35 oz. 20-40 oz. 6 oz. 1.5 2 pt. 1.5 pt. 1.5 pt. 2.5 pt./acree 2-3 qt. 6 oz.
MUS	Fall webworm Nete: Do not use Isotor. Jepenses boole Nete: Do not use Isotor. Leafhsppers Nete: Do not use Isotor. Woolly aphid Nete: Malethion, 57% BC Nete: Do not apply Isoto Aphids Bagworm Black vine weevil Base ymms scale	(see GENERAL PESTS) IV er Orthease en Amedicas ein as folinge damage may occur. (see GENERAL PESTS) IV er Orthease en Amedican ein as folinge damage may occur. (see GENERAL PESTS) IV er Orthease en Amedican ein as folinge damage may occur. (see GENERAL PESTS: Aphids) Trost in aufy May when leaves are expanding. resy cause slight injury to ein folinge. (IV or Orthease to Amedican ein as injury to folinge may occur. (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) (see GENERAL PESTS) Use oll as a dormaat spezy in late full er eerly spring. Use any one of other materials against the crawfers in late May, early Jane, mid-Jane. Apply fiest treatment in May and then apply two more at 10-day intervals. Repeat this procedure as accided.	AND: Cygon 2E Dimethoste 2.67EC Dimethoste 400 Orthenex Spray AND: Orthenex Spray AND: Cygon 2E Cythion 8 Dimethoste 2.67EC Dimethoste 400 Dycarb Ficam W Guthion 2S Malathion 57 Malathion Methoxychior Spray Rockland Shade Tree Insect Spray Turcem AND: Orthenex Somy	2 lb./gal. EC 2.47 lb./gal. EC 4 lb./gal. EC Acrosol Acrosol 2 lb./gal. EC 3 lb./gal. EC 3 lb./gal. EC 3 lb./gal. EC 4 lb./gal. EC 4 lb./gal. EC 2 lb./gal. EC	2 pt. 30 oz. 33 oz. N/A N/A N/A 2 pt. 1-1.5 pt. 1 pt. 30 oz. 35 oz. 20-40 oz. 6 oz. 1.5-2 pt. 1.5-2 pt. 1.

Tart	D	11Dans to Marriel	Labelled	Formulation	Amount To Add To:
HOM	FeN	AARDAN TO TANK	Lewice	too Bay	100 Gal. Water
-					
EUONYMUS	Winged enonymus	Use oil, or Ethion plus oil as a domnant treatment			
(cont.d)	scale	m me sping. Use any one of other managers			
		Starte canvece in early same and again in the lash			
		For vyane and only on commercial planing not			
		for none proving. Apply 200 gas of spiny per			
		and or 514 gas, per 1,000 square loss of area. (see (FINERAL PESTS: Scales)			
FICUS	Théps	Treat when thrips are first seen and repeat as	AND:		
(Cubun Laural)		needed	Dimethoate 400	4 fb./gel. EC	17.5 az.
		(see CENERAL PESTS: Thrips)			
FIR	Bernnen	(an CENERAL PESTS)			
	Degraduation				
	Black vine weevil	(see GENERAL PESTS)			
	Belsem twig aphid	(see GENERAL PESIN: Aplies)	AND:	A // B /- 1 DO	
		1 rear when hist spinos are seen, so out May 1.	Assas XL	oree myRar free	3.8-9.6 oz. (amisery only)
	Balsam woolly adeleid	-	Asama YI.	0.66 lb /mail EC	1.2.4.6 oz. (menery only)
	Dista monty and the		Durshan Turf	4 lb./eni. EC	1 mt
			Durshan SOWSP	SON WSP	0.516.
			Pageant DF	50% DF	0.516.
			-		
	Sprace spider mite	(see GENERAL PESTS)			
	Dalas mamil	Bestort young trees by traning with Enders is			
	Parts weever	mid Anii-mid May and arain in Awrast.			
FIR	Pine needle sonle	Use oil as a fail donnast treatment. Use one of other	AND:		
(co efd)		materials against craviers in late April or early May	Cythion	5 Ib./gal. EC	4 pt.
		Second generation of crawlers can be treated in	Cythion 2	2 Jb./gal. EC	2 pt.
		mid-July.	Malathion 57	5 lb/gal EC	1.5 pt.
		(see GENERAL PESTS)	Malathion		/
		Natu Oil will ining Doubles fit flower hade	Methoxychiot Spray	2 Ib.+2 lb./gal. HC	5 gt/acre
		LINK OF AN UNIT POSSIBLE FORM DORY			
FIRETHORN	Aphida	(100 GENERAL PESTS)			
(Pyracanom)	Rinck vine weevil	(san (#INFR A1, PESTS)			······································
	Hawthorn lace bug	Tyeat when first lace bugs are seen and repeat	AND:		
		as needed to protect new foliage.	Dycarb	76% WP	12-20 az.
			Ficam W	76% WP	6 0Z.
			Lindane 20%	1.65 lb./gal, EC	1 pt.
			Pestroy 4EC	41h./gal.EC	lar
			THE CANE.	70% WP	● 02.
FLOWERING	Aphids	(see GENERAL PESTS)	AND:		
FRUIT TREES	Note: Do not use isotox IV	or Orthene on flowering orabappie as injury to	Ortheast Spray	Acrosel	N/A
(emanasatel)	foliage may occur.				
(onth apple)					
(cherry)					
(quince) (applant)	Decrement	(and CENER AL DESTS)			
(apaces)	Neter Do not use isstery IV/	(sou carrender a flowwing contracts as initiaty to foliage may accur.			
(elem)	1000. 00 10: 00 00000 10	a composition and another is which a randomic occar.	AND		
(near)			Orthenex Serry	Actorel	N/A
u · =,					
	Boras	Treat wank in late May and late Jane.	Lindane 20%	1.651b./gal. BC	3 pt.
	(flatheaded)		Lindene Borer Spray	1.63 lb./gal. EC	3 pt.
	Clearning home	Trust truck apparially at craft involves in late May	Deether Terf	All and RC	1 at
	(dogwood)	and arrise a mostle later.	Dersban SOWSP	SO% WSP	216.
	(Dersben IR	11b/gel. EC	4 at.
			Dursban	0.5 lb./gal. BC	t at.
			Lindano 20%	1.65 lb./eal. BC	3 pL
			Lindano Boser Spray	1.65 lb./gal. EC	3 pt.
			Pageant DF	50% DF	2 fb.
		2.0			
		Character bases trace on he would be also and adult assume to	SFECIAL INFORMA	TION 	- Internet a second balance second descenters
		time. See timing listed for specific past and calculate proper time	te deploy imps,	1874. 11896 SEV 008 VC 04	checker and the second s
	Eastern tent ceterpiller	(rev GENERAL FESTS)			
	NUME: DO NOT THE ISOTOX IV (er Ormene en nowenne omospjes as mjury to remige may scour.			
	Fall webwonn	(see GENERAL PESTS)	<u> </u>		
	Note: Do not use isotox IV	or Ortheas on flowering arabappie as injury to foliage may scour.			
	T				
		(SOR CRININGAL PISSIS)			
	Japanese secus Note: Do not Toote: D2	Cothana an Bannalan amhanala as latans in fallana ar ar an an			
	Japanese neeus Note: Do not use Isoka: IV (or Orthens on flowering ambappie as injury to foliage may occur.			
	Japanese neens Note: Do not use Isotox IV (Leafhoppers	or Orthease on Rowering embappie as injury to folinge may occur. (see GENERAL PESTS)	AND:		
	Inputes needs Note: Do not use Isolax IV a Leafhoppers Note: Do not use Isolax IV a	or Orthenes an flowaring embappile as injury to foliage away occur. (see GENRIKAL PESTS) or Orthene on flowering embappile as injury to	AND: Ortheast: Spray	Accord	N/A
	Japanese needs Note: Do not use isotox IV o Leafhoppets Note: Do not use isotox IV o falinge may occur.	or Orthenes on flowering embappile as injury to foliage away occur. (see GENERAL PESTS) or Orthene on flowering embappile as injury to	AND: Orthonex Spray	Acrosal	NA

			Labelied	Formulation	Amount To Add To:
Hest	Past	When to Treat	Peoticido	You Buy	100 Gul. Water
LOWERING	Latest peach	In southern Ohio, sonly the first spray early May:	Duesban Tuef	4 lb/ral. EC	1 at.
RUIT TREES	tree borer	in northern Ohio, mid-May. Apply the second spray	Dursban 50WSP	SW% WSP	2 b,
confid)		about the first of July; the third spray in mid-August	Pageant DP	59% DF	2 lb.
(Direct the spray to thoroughly cover injured bank and acaffold branches.	·		
	Nites Note: The sector of the State	(see GENERAL PESTS: Spider miles)		·	
	Note: Do not use isotox IV c	or Orthene on Lowering crabaptic as mjury to tolings may occur.			
	Peach tree borer	Spray trush in late lines to endy July.	Dursban Turf Dursban 50WSP	4 lb./gal. EC 50% WSP	3 gt. 6 lb.
			Durshan iE	1 lb./zal. EC	12 at.
			Dursban	0.5 lb./gal. EC	25 gt.
			Lindane 20%	1.65 lb./gal. EC	3 pt.
			Lindane Borer Spray Benerat DE	1.65 lb./gal. EC	3 pt.
			ragean Dr	,3076 DF	o to:
	Peer slug (condity)	Treat larves when first detected, usually mid-May, and arain in July if needed.	Cerbaryl 4L Carbaryl 50WP	4 lb./gal. F 50% WP	1 pt. 2 lb.
	(Decembion	20% WP	1.3.02
			Diszinon 50W	50% WP	316.
			Dinzinon 4E & AG500	40./zal EC	3 pt.
			Durshan Terr	4 lb./gal. EC	1 02.
			Dursban 50WSP	50% WSP	0.516.
			Ment 75WP	75% WP	3.5 T. (landscape only)
			Oils, horticultural, summ	ANY DE	RODUCTS)
			ragent Df Savinal	መንቀይም ለበአራል ወ	0.3 10. Lat
			Serie Lionid	and gas r	r yr 2 at
			Sevie SOW	50% WP	216.
			Soups (faity acid sales)	See ALTERNATIVE PRO	DUCTS)
			Tempo 2	2 D./gal EC	L oz.
			Tempo 20WP	20% WP	1.3 oz.
	Pear psylla	Apply doemant oil for pear prylls during dormant season. (see GENERAL PESTS) Spray failinge about 2 weeks after the petals fail and again in 2 weeks.	Bioneun	0.3%EC	2.5-5 pt.
	Scales	Use oil as a formant treatment in spring. Use any each of other materials against careviers when they are proceed.			·····
	Tades contractor	(see CENERAL PESIS: Some)			
	Note: Do not use Isotox IV	(see Cherner on flowering crabepple as injury to foliage may occur.			
	Woolly aphids	(see GENERAL PESTS: aphids) Apply first spray about Jone 10 and them repeat as needed. This aphid forms blaich-while threads of cottony maturial around itself and can be rec- optized by the threads.			
	Noise Do not use holes IV	or Orthons on flowering embrypic as injury to falinge may occur.			
RSYTHA	Red-breaded	Treat when feeding damage to leaves is observed.	Carbaryl 4L	41b/gel. F	1 pt.
		Report as needed.	Carbary1 30WP Depathion	30% WP	210. 10
			Diszinos 50W	20% WP	1.9 02.
			Discince 2E & 25%		
			(Spectracide)	25%EC	1 qt.
			Diazinon 45 & AG500	4b./gel. EC	1 pt.
			Ducsben Turf	4 lb./gel. EC	1-2 pt.
			Deciden SOWSP	20% WSP 216 (and E	1*210. 4.10 cm
			Parcent DR	40% DF	1-7 lb.
			Scimitar WP	9.32% WP	2.4-4.8 02
			Sevimoi	416./gal. F	1 qt.
			Sevin Liquid	216./gal. F	2 qt.
			Sovia 50W	50% WP	216.
			1 ompo 2	Z INJER EC	1.5 02.
	Spider mites	(see GENERAL PESTS)			· · · · · · · · · · · · · · · · · · ·
LDEN AINTREE	Leafhoypers	(see GENERAL PESTS)			
CKBERRY	Heckberry nipplegal	Treat in carly May.	Bioncom	0.3%EC	2.5-5 pt.
	peyllid.	(see CHINERAL PESIS: Psylids)	AND: Dimethoate 400	4 lb./zal. EC	Soil injection; use a 1:3 dilution, inject 1 fl.oz.
			Pestroy 4EC	4 lb./gal. EC	of dilution for each 0.5 inch of trusk dismoter 1 at.
	Lace bugs	Treet when small symphs appear in mid-May.			<u> </u>
	_	(see GENERAL PESTS: Lace Bugs)			
	Putnam soile	Use oil as a domnant treatment in spring. Use any one of other mutatisk against conview in late May. (see GENERAL PESTS: Scales)	AND: Guthion 28	2 lb./gal BC	4 pi.

Host	Pest	When to Treat	Labelled Peatleide	Formulation You Buy	Amount To Add To: 100 Gal. Water
HAWTHORN	Aphids	(see GENERAL PESTS)	ERAL PESTS) ERAL PESTS And A May. ERAL PESTS A AND: Dycarb 76% WP Pestroy 4EC 4 ib/gal EC Taccam 76% WP Pestroy 4EC 4 ib/gal EC Taccam 76% WP ERAL PESTS) a lowest are fully expanded or at first owning about eady to mid-May. ERAL PESTS) AND: Dystem 104 4 ib/gal EC Darban 50WSP 0% WSP Margosan-O 0,3%EC Orthone 9,4% EC Pageant DF 74star 7400 7,9% F Tabtar 10WP 10% WP ERAL PESTS) AND: Cythica 5 1b/gal EC Malathion Methoxychlor Spray 2 ib.+2 ib/gal, EC		
	Bagwonn	(see GENERAL PESTS)			
	Barters tent outerpillers	(see GENERAL PESTS)			
	European red mite	(see GENERAL PESTS)			
	Fall cankerworm	(see GENERAL PESTS)	·····	· · · · · · · · · · · · · · · · · · ·	
	Fell webworn	(see GENERAL PESTS)	<u> </u>		
	Jenenese beete	(see GEINERAL PESTS)			
	Lace her	Treat when satall avmills stores, assaily is mid-May.	AND		
		(see GENERAL PESTS: Lace Bugs)	Dycarb	76% WP	12-20 oz.
			Ficen W Perform AFC	76% WP 415 /md EC	6 oz. 1 ot
			Тексена	76% WP	6 oz.
	Leafhopper	(ece GENERAL PESTS)			
	Leafminer	Treat when leaves are fully expanded or at first	Ripport	0.394EC	2.5-5 pt.
	(Hymenopterous)	sign of browning about early to mid-May.	Dursban Touf	41b./gal. EC	l qt.
			Duesban 50WSP	50% WSP	2 lb.
			Margosan-O Orthene	9.4% RC	2.3-3 pt. 4 69 at.
			Pageant DF	50% DF	2 /b.
			Talsia: T&O	7.9%F	20-40 oz.
			Taistar 10WP	10% WP	16-32 oz.
	Oystepshell scale	(see GENERAL PESTS)	AND:		
	•	, .	Cythion	5 lb/gal. EC	1 pt.
			Cythian 5 Melathian 57	Bib/gal.EC	1 pt
			Melathion	SIDJEN. NC	LSPC
			Methoxychlor Spray	2 lb.+2 lb./gal. EC	2.5 pt/acre
	Post sing	Spray foliage about 2 weeks after the peaks fail	Carbaryi 4L	4 lb./gal. F	l pt
	(savely)	and again in 2 weeks.	Carbaryl 50WP	50% WP	2 fb.
			Diszinon 50W	20% WP	3.1b.
			Distance 4E & AG500	4b./gal, EC	1 pt
			Darshan Turf	4 fb./gal. EC	8 oz.
			Dusban SOWSP	50% WSP	0.5 B.
			Oils, horicultural, sum	ner (see ALTERNATIVE	PRODUCTS)
			Pageant DF	50% DF	0.5 fb.
			Sevimol	41b./gal. F	l qt.
			Sevin Liquid Sevin Sew	2 10./gal. r \$6% WP	2 gr. 2 fb.
			Soaps (fatty acid salts)	(see ALTERNATIVE PRO	DUCTS)
			Tempo 2	2 lb/gal EC	1 oz.
			Tempo 20WP	20% WP	1.3 oz.
	Sourfy scale	Use oil as a dormant treatment. Use any one of	AND:		14
		other metonals against cuswions in late May. (con (WHER AL PESTS: Scales)	Cythion #	5 ib/gal. EC 2 ib/gal. EC	L) pL 1 at
		(Malathion 37	5 lb./gal. EC	1.5 pt.
	Terrapin scale	Use oil as a domaant treatment in spring. Use any one of other materials when cravilers are on leaves in June. (see GENERAL PESTS: Scales)	AND: Malathion 57	5 lb./gal. EC	2.5 pt.
HEMLOCK	Bagwonn	(see CRINERAL PESTS)			
	Black vine woovil	(see CENERAL PESTS)			· · · · · · · · · · · · · · · · · · ·
	Hemlock loveer	Treat when women are first som, about	Bioneem	0.3%EC	2.5-5 pt.
		August 1.	"Bt" (kurstaki) (see AL	TERNATIVE PRODUCT	s)
		(see GENERAL PESTS: Caterpillers)	Decathlen Montana O	20% WP	1.3 oz.
			Resmethin EC26	2 lb./ral_EC	1 pt. (aarned plants only)
			Talstar T&O	7.9% F	6-40 oz.
			Taistar 10WP	10% WP	6.4-32 oz.
			Tompo 2 Tompo 20WP	2100gal EC 20% WP	1.3 oz.
	Hemiook sonie	Use eil as a dormant treatment is spring. The any	AND:		· · · · · · · · · · · · · · · · · · ·
		one of other materials when craviers are present,	Cygon 2E	2 lb./gal. EC	l pL
		about mid-July. (non CENTER AL DESTS: South)	Dimethoate 2.67EC	2.67 lb/gal EC Alb/est EC	25 oz. 17 5 oz.
			1.441.642.644	- 1978 EC	1
	Hemlock nest mite	Treat is early spring after leaves are expanded	Carbaryl 4L	41b./gal. F	l pt.
	(клораую)	and then as needed.	Communication Comm	20% WP 21b/gal FC	zio. let
			Dicofol 4EC	4 lb./gal EC	1.25 qt.
			Dimetheete 2.67EC	2.67 lb/gal. BC	25 02
			Dimetheate 400	4 Bb./gal. BC	17.5 oz.
			20054	A BASE L	*** 02

iost	Pest	When is Treat	Labellod Pasticida	Formulation You Buy	Amount To Add To: 100 Gal. Water
				-	
EMLOCK	Hemlock rust mite		Keithane 35	35% WP	1-1.316.
oonra)	(conrd)		Keifhane 50 Metacontor-20	50% WP 215 /ml 50	0,3-1 lb. 1-1 \$ or fact the first for all interview.
			Morectan 4	4 lb./col. F	1-1.3 OZ/DICH DUNK ODDIOCHT (SON DJECT ONLY) A-1 oz.
			Oils, doement (see AL)	FRNATIVE PRODUC	TS)
			Olls, horticultural, suma	net (see ALTERNATIV	/E PRODUCTS)
			Pentao Aquaflow	1 lb./gal. F	\$-16 oz.
			Featac WP Sector of	20% WP Alb (est E	12-16 ø2.
			Sevin SeW	4 10.7gal. r 50% WP	5 IP 1 dr
			Sceps (fatty acid salts)	(see ALTERNATIVE P	RODUCTS)
	Pine needle scale	Use all as a dominant troutment in full. Use any	AND:	215 (m) 60	
		use a data maraphs when crevers are present, nexally early May and are is mid-July.	Cygon 25 Cythion	5 lb /est BC	a pr. Dot
		(see GENERAL PRSTS; Soules)	Cythics 8	t fb./enl. EC	1 of
			Dimethoate 2.67EC	2.67 fb./gal. EC	25 02.
			Dimethoate 400	4 ib./gal. EC	17.5 oz.
			Malafhion 57	5 Ib./gal. EC	L5 pt.
			Malethion Methoxychlor Spray	2 ib.+2 ib./gal. BC	5 qt/sore
	Spruce spider mite	(see GENERAL PESTS)	AND:		
			Cygon 2B	2 fb./gal. EC	1 pt.
			Dimethoate 2.67EC	2.67 b./gal. EC	25 oz.
			Dimethorie 400	4 lb/gal EC	17.5 oz.
	Stawberry	Treat foliage and soil around infested plants in	Bioncem	0.3%EC	2.5-5 pt.
	roof weevil	the middle of June and twice more at 3-week	Dursban Turf	4 lb./gal. EC	1 pt.
		intervals.	Dursban 50WSP	50% WSP	1 16.
		(See GENERAL PENIS: Black vine Weevel)	Orthene Marsik Associations	73% SP 315 (and 12	1.0 (b). 5.4 10 est
			Pageant DF	2 10.7gat. P 30% DF	•.•-10 02. 1 Jh.
	Theips	(ace GENERAL PESTS)			<u> </u>
ICKORY	Caterpillars	(see GENERAL PESTS)			
	Elm spanworm	Treat when larvae are seen in early to mid-June.	Bioneem	0.3%EC	2.5-5 pt.
			"Bt" (kurstaki)	various	Various
			Carbaryl 4L Carbaryl 4C	4 ID./gal. F	l pt.
			Depthion	2076 WF 2094 1070	2,00, 13,07
			Dursban Turf	4 ib./zal. EC	1 02.
			Ducsban SOWSP	30% WSP	0.5 lb.
			Margosan-O	0.3%EC	2.5-5 pt.
			Pageant DF	50% DF	0.5 lb.
			Resmethrin EC26	2 lb./gal. EC	i pt. (named plants only)
			Sevenol Serie 50%/	4 JDJgal F	1 qr.
			Sevin JV w Taletar T.M.D	20% WF 20% F	2 80. 1-44 nz
			Talstar 10WP	10% WP	6.4-32 oz.
			Tempo 2	2 lb./gal. EC	1 02.
			Tempo 20WP	20% WP	1.3 ez.
	Hickory peñole	Use oil in the spring as a domnant treatment against	Dursban Turf	4 lb/gel. EC	\$ 02.
	gal adeigid (phylloxera)	overwinkering eggs. Apply any one of the other materials	Dursben 50WSP	50% WSP	0.5 lb.
		Elect and save naiches, which though at most late May	Oils document (see A11	7,276 WF TENIATTUE DE ODIFE	3,5 (. ((anyme cape oney)
		or carry state.	Parent DF	40% DF	13) 1.5 h.
			Soaps (faity acid saits)	(see ALTERNATIVE P	RODUCTS)
	Hickory chuckworm	Winter is spent as a larva inside the shucks of fallon puts. Get	having and destroying infector	I anis decing the winter	is helpful in control.
LLY	Black vize weevil	(see GENERAL PESTS)			
	Helly bud moth		Carbaryl 4L	4 fb./gel. F	1 pt.
			Carbaryl 50WP	50% WP	2 BD.
			Disziene AR & A/2464	All Angle RC	a pro- 1 mt
			Dansban Tuff	41b./gal. EC	1 pt.
			Dursban 50WSP	50% WSP	116.
			Pageant DF	50% DF	1 16.
			Sevimal Sevin 50W	4 (b./gal. F 50% WP	1 qt. 2 Jb.
	Helly leafminer	Use a non-systemic insecticide on the failure about	Ambnah	2 lb./gal. EC	6.4-12.3 oz. (pussery only)
	(Dipterous)	May 15 to control the adults. Use one of the systemio	Aminush 25W	2.5% WP	6.4-12.8 az. (nursery only)
	· · ···	materials in early June for control of larver in lower.	Bioneem	0.3%EC	2.5-5 pt.
			Carbaryl 4L	41b/gal. F	1 pL
			Carbary1 30WP	50% WP	2 lb.
			Diszlaca SOWP	54% WP	1 10.
			Linzmon 215 & 25%	1194 87	l at
			(Spourscies) Diszison die & Accesso	2376 BC. Allh Argil 127	1 qu 1 ot
			Dimethoste 2.67EC	2.67 lb/gal EC	25 oz. (not Burford Holly)
			Dimethoate 400	4 lb./gal. BC	17.5 az. (not Barford Hally)
			Di-Syston	15% G	2.5 oz./inch trunk diameter
			Dersben Turf	4 lb./gal. EC	l at
				-	

	-		Labelled	Formulation	Amount To Add To:
Hest	Pest	When to Treat	Perticide	You Buy	100 Gal. Water
	Holly leafining		Deceber 40078D	5094 B/CD	1 H
(cmfd)	(confd)		Dycarb	76% WP	210. 28.40 az.
(, , , , , , , , , , 	(Dylex	80% SP	28-30 02.
			Isotox IV	1.5% EC	4.69 gt.
			Magosan-O	0.3%BC	2.5-5 pt.
			Orthens	9.4% BC	4.69 pt
			Pageant DF	59% DF	2 lb.
			Proxol 30SP	##% SP	20-30 az.
			Rockland Shade Tree		••··
			Insect Spray	2 ID.+1.1 ID./gal. EC	2-3 qt.
			Serie SAN	4 10./gal. r 54%, 10.0	2 QC
			Teleter TAO	70% WF	2 10. 20.40 m
			Telster 10WP	16% WP	16-72 az
	Southern red mite	(see GENERAL PESTS)	AND:		
			Dimetheate 2.67EC	2.67 h./gd. EC	25 oz. (not Burford Holly)
			Dimethoate 490	4 B./gal. EC	17.5 uz. (not Burford Holly)
RONEYLOCUST	Berworn	(see GENERAL PESTS)			
	Cottony maple	A dommant oil spray may be used before growth			
	scale	starts in the spring. Spray infected trees theroughly			
		with one of the other materials about July 10 and			
		again in 20 days. Be sure to cover lower leaf			
		surface with spray. New information indicates that			
		a spray applied as late as late July and during			
		September should control scale found on the un-			
		sides of leaves. (see CENERAL PESTS: Scales)			
	Honey loonst enider mite	(ease (JENER AL DESTS: Smider mitter)	· · · · · ·		
	Homeyloods: spaces mate	Trest when mittee are present and proin in 10			
		devs and then repeat the same procedure as pended.			
	Honeylocust	Treat when louves first appear.	·		
	plant bug	(see GENERAL PESTS: Plant bugs)			
					• •
	Honeylocust	Treat growing ups as growth starts in the spring	Carbaryl 4L	4 Ru/gel. F	1 pt.
	pod gall mølge	and re-treat at 10-day intervals with intestation	Carbaryl 50WP	50% WP	2 16.
		is deened up.	Sevimal	4 RL/gel P	1 qr.
			Sevin 50 W	30% WP	215.
	Honestocest	The off in domant encore. The any one of the	AND		
	erole	other meterials when creations are present	Rocking Shade Tree		
		(see GENERAL PESTS: Scales)	Insect Seray	2 16.+1.1 (b./mail, BC	2-3 at.
		·····			
	Honeylocust	Treat when mittes are present in early spring and	Dicefoi 4BC	41b./gel. EC	125 qt
	stunt inits	then as needed.	Joust	41b/gel P	4-8 #Z.
	(Edophyid)		Keithane 35	35% WP	1-1.3 lb.
			Kotthane 50	59% WP	
			Memoystox-K2	2 Bu/get EC	1-1.5 oz./mch trunk dunneter (sou mycor only)
				4 strigget P	
			Olic, horicalitarii, sumo	NOT (DOD ALTERNATIVE	(PRODUCTS)
			Penner Aquation	1 80./28. 1	\$-10 02. 10 14
			Source (faithy actid solite)	(ere AT THE NATIVE PR	ODUCTS)
	Leafhoppen	(see GENERAL PESTS)			
	14	March and the state of the state of the state		A 16/EC	044.4
		a real at the mist sign of Joinge Browning, which	paoleon TRA' Armsteinin (armstein	U.J7NUL DER NATTUR DE ODITETT	4.273 PC
		to sense they but the same generation works and	LA 394) (LAUSSING) 14. Cadacet 47	Alk feel E	let
		(and CENHERAL DESTS: Consentition)	Carbard 4537D	SANGE TO P	2 pr.
		fann ann ann an a marain a san fannan)	Decalition	20% WP	1.302
			Diszinon 50W	54% WP	1.16.
			Diszinon 2B & 25%		
			(Spectracide)	25% EC	1 gt.
			Diszinon 4E & AG500	4b./gal. BC	1 pt.
			Di-System	15% G	2.5 oz./ieck treek diemoter
			Dursban Taaf	4 lb./gal. EC	1 pt.
			Dursban SOWSP	50% WSP	110.
			Dersban 1E	1 lb./gil. EC	2 qt.
			Dursban	0.5 lb./gal. EC	4 qt.
			Dyoarb	76% WP	12-20 42.
			Dylox	ST% SP	20-30 02.
			HORE W	78% W1	1 ID.
			Rowx (A	LINEC	4.0% pt.
			Magotaa-O	ULFREUC	2.5-3 pt.
			Orthone	7.4% EC	ፋርሃ ብር አርሃ ብር
				1370 AF 4045 DF	V.0710.
			Fagent DF	3078 (J1)" 9085 570	1 UA 20 20 cm
			PRIMU (US)" Desmathete ECM6	oute of 3 th (eat 1947	ge-Set 12. 1 mil (nemed plents oph?)
			Sevine!	A lb./eal. P	1 of
			Такено	76% WP	
			Tenno 2	2 lb./zal. EC	1 02.
			Tenno 20WP	20 % WP	1.3 02.

	· · · · · · · · · · · · · · · · · · ·				
Theret	Baat	Million to Tourst	Labelled	Formulation Von Door	Amount Te Add To:
1304t	1.482		remage	1 ou Buy	100 Gal Water
HONEVI OCIRT	Overteenhall code	Treat constant shout late May and series in 10 days	43TD-		
(cont'd)	~/	is conthern Obio: 2 weeks later in porthern Obio.	Cythica	5 lb./eal. EC	1 ot.
•		(see GENERAL PESTS)	Cythion \$	1 lb/gal. EC	1 pt.
		• • • • • • • •	Malathion 57	5 lb/gal EC	1.5 pt.
			Malathion		- · • •
			Mothoxychior Spray	2 lb.+2 lb./gal. EC	2.5 pt/scre
	4.114.		4150		
DOING TOUCALL	vhmei	(ROCOEPEERAL PESTS)	ANU: Digneth sate 400	Alk And EC	Sail Injection: nee a 1/3 dilution - Inject 1 24 🖡
				4 BORNEC	or of dilution for each 0.5 inch of treak
					diameter.
	Hencysuckie	Apply to foliage at first sign of mines in leaves	Bioncem	0.3%EC	2.5-5 pt.
	leafminer	or about June 1.	Dursban Tucf	4 fb./gal. EC	1 qt.
	(Cobigebrasone)		Dursban 30WSP	50% WSP	216.
			Margesan-O	9.3%EC	2.3-5 pt
			Ormene Beasent DE	9.4% EC	4.09 QL
			Taktar TAO	70% Dr 7.044 E	1 10. 20_40
			Taistar 10WP	10% WP	16-32 47.
	Spider Mites	(see GENERAL PESTS)			
	Tataricae aphid	Treat when bude show grown in early April and	AND:		- ·
		again in about 14 days when leaves are expanded.	Dimethoute 400	41b/gel. EC	Soil Injection: use a 1:3 dilution. Inject 1.24 fl.
		(see GENERAL PESTS: Aphids)			oz. of dilution for each 0.5 inch of truck
					diameter.
HORNBEAM	Berwen	(see GENERAL PESTS)			
	1				
	Lonnopper	(SO GENERAL PESIS)		<u> </u>	
HOSTA	Stoge	(see GENERAL PESTS)			
	Twospotted spider mits	(see GENERAL PESTS)			
INKBERRY	Inkberry leafminer	Use a non-systemic incerticide on the foliage	Ambush	21b./gal. EC	6.4-12.8 oz. (narsery only)
	(Dipterous)	about May 15 to control the adults. Use one of	Ambush 25W	25% WP	6.4-12.8 oz. (nursery only)
		the systemic materials in early June for control	Avid	0.15 Ib./gal. BC	4 62,
		of the larvae in the leaf mines.	Bionocra	0.3%EC	2.5-5 pt.
			Carbaryl 4L	4 lb./gel. F	1 pt.
			Carboryl SOWP	50% WP	216.
			Diszinos SeW	50% WP	L 16.
			Diazinos 2E & 23%	140/ TC	1
			(Spectrace)	2376EU Ab (est EC	1 gr.
			Durings 41: 4: AU704	Alb./gal. BC	1 pt.
			Durchan SOURCE	4 10./gm. EC.	1 gr. 7 16.
			Drout	76% WAP	2 10. 20-40 oz
			Delar	10% SP	20-30 nz
			Isetan IV	1 1% EC	4.69 nt.
			Marrasa-O	0.3%EC	2.5-1 ot.
			Orthoas	9.4%EC	4.69 at.
			Pageant DF	50% DF	216.
			Provol 30SP	30% SP	20-30 oz.
			Sevinaal	4.1b./gol. F	lgt
			Sevin 50W	50% WP	2 lb.
			Taistar T&O	7.9% F	20-40 oz.
			Talstar 10WP	10% WP	16-32 oz.
	Southern red mite	(FOR GENERAL PESTS)	·····		
TRIA	kis hozer	Cut and imm langer in fail after frast Tract langer	_		
		in spring when they are about 5-9 inches tall.	Cypen 2E	2 lb./gal. BC	1 gt.
		then as accorded to kill larvae in them.	Dimethoate 2.67EC	2.67 lb./gal. BC	50 oz.
			Dimethoate 400	41b./gai. EC	35 02.
			Lindane Borer Spray	1.65 lb./gal. BC	1 pt.
			Pestroy 4EC	41b./gal. EC	1 gt.
				·	· · · · · · · · · · · · · · · · ·
IVY	Aphids	(see GENERAL PESTS)	AND:		
			Orthones: Spray	Accesol	NA
	Japanese beelle	(see GENERAL PESTS)	AND:		
	-	(Sovia injures Boston ivy and Virginia crooper.)	Isotox IV	1.5%EC	6.25 qt.
			Onthese	9.4%EC	6.25 qt
	Leafhoppers	(see GENERAL PESTS)			
	Scale	Treat when graviers are present, usually May.			
		For Vydele net only on commercial planting not			
		ANT BARDING PERSONNEL APPENDENCE OF SPECIAL PORT			
		(See CHURKE & I, DECLES, Svepes) and an 2-14 Bask has shown plants (1951 61 Mon			
		An and the second set of the second set of the second set of			

Hert	Pest	When to Trust	Labelled Perticide	Fermulation You Buy	Amount To Add To: 100 Gal. Water
JUNIPER	Bagwann	(see GENERAL PESTS)	AND:		
	-	· ·	Cygon 2E	2 lb./gal. EC	2 pt.
			Dimethode 2.67EC	2.67 lb/gal EC	50 oz.
			Dimethosis 400 Resident Shade Terra	4 lo./gal. EC	35 02.
			Insect Spray	2 lb.+1.1 lb./gel. BC	2•3 gt.
	funioer midge	Treat foliage in mid-May when adults are present	Cygon 2E	2 lb./gal. EC	2 pt.
	• •	and/or dreach soil under infected plants in late	Dimetheate 2.67EC	2.67 lb./gal. EC	50 oz.
		April.	Dimethoute 400	4 lb./gal. EC	35 oz.
	Juniper scale	Use all as a domnant treatment in the early spring.	AND:		
		Use any one of other materials from mid-May to	Cythion I Cythion 25	# lb./gal. EC	1.25 pt.
		he needed at 10-day intervals to clean no an	Malathian 57	2 IO/gat BC 5 lh/gat EC	1.3-2 µc 2 nt
		infestation. Repeat same procedure as needed.	Malathion	- m. P	5 F.
			Methoxychior Sprey	2.16.+2 lb./gel. EC	2.5 gt/scre
			Rockland Shade Tree		
			Insect Spray	215.+1,1 B./gal. EC	2-3 qt.
	Jumper up midge	Treat foliage about May 15 and again June 20,	Cygon 2E	2 lb./gal. EC	2 pt.
		August 5 and September 15, if needed.	Dimethoate 2.67EC	2.67 lb./gel. EC	50 ez.
		· · · · · · · · · · · · · · · · · · ·	Liunautoste 400	416.7gm. EC	20 62
	Juniper webworm	Treat in mid-April or early May and again in late	Bioneum	0.3%EC	2.5-3 pt.
		September, if gooded. (and CEARTER & 1 DESTRY Conternitions)	Carbary1 41, Carbary1 40070	4 lb./gal. F 509/ 370	1 pt.
		(See CEVERAL PESIS: Completely	Decethion	20% WP	210. 13 c2
			Diszinon 50W	50% WP	110.
			Diszinon 2E & 25%		•
			(Spectracide)	25% EC	1 qt.
			Dizzinon 4E & AG500	4b./gal. BC	1 pt.
			Dilgion I Emokive	I lb./gal. EC	1 pr.
			Darshan MWSP	4 IOSER EC 50% WSP	а од 0.41Б.
			Dylox	80% SP	20-30 oz.
			Magosas-O	0.3%EC	2.5-5 pt.
			Methoxychior 25	2 lb./gal. BC	2-3 qt.
			Pagement DF	50% DF	
			Paremon & Aqua Provol 285P	8 10./gul BC 20% SD	0.07 pt. (and serve only) 20-30 ex
			Sevinol	4 lb./gal. P	20-50 02. 1 ot.
			Sevia Liquid	2 lb./gal. F	2 gt.
			Sevin 50W	50% WP	2 lb.
			Talstar T&O	7.9% F	8-40 oz.
			Tausar Luwr Taunn 2	10% WF 11b/col EC	6.4-52.02 Jan
			Tempo 20WP	20% WP	1.3 az.
	Sprace spider mite	(see GENERAL PESTS)	AND;		
		Note: Joust & Morestan may damage certain junipers.	Cygen 2E	2 fb./gal. BC	2 pt.
		Test spary prior to overall spray program.	Dibrom & Emulsive	8 lb./gal. BC	l pt.
			Dimethours 2.67EC Dimethoute 400	2.67 10./gal. BC 41b./gal. BC	30 dz. 35 dz.
	The second sector	A water and a state and at the state of the	0-44 47	416 (m) 10	1-4
	The swell mile	Apply my one of the materials about Jane 1 and as needed. The dorment of in late Newember and	Carboryi 4L Carboryi 50WP	4 10.5 gm P 30% W/P	1 p. 2 m
	******	March or horticultural oil in early spring and late	Dicofol 4EC	41b/gal EC	1.25 gt.
		fall,	Joust	41b./gal. F	4-\$ 0Z.
			Ketthane 35	35% WP	1-1.316.
			Keithene 50 Metrovator-D 2	30% WP 315 /web B/2	0.3-1 10. 1-1 1 az fach teach diamatar (seil iniact calv)
			Morestan 4	2 Devigent Box 4 lb./gal. F	4-8 az.
			Oils, doment (see AL)	ERNATIVE PRODUCTS	3)
			Oils, korticultural, sume	ner (see ALTERNATIVE	PRODUCTS)
			Pentso Aquaflow	i 16./gal. F	8-16 cz.
			Pentac WP	30% WP 415 (m) E	12-16 oz.
			Sevia 50W	4 10.7gal F 30% WP	21b.
			Soups (faity acid salts)	(see ALTERNATIVE PR	ODUCTS)
LANCH	Response	(ere CENERAL PESTS)	AND		
	2.0		Rockland Shade Tree		
			Insect Spray	2 lb.+1.1 lb./gal. EC	2-3 qL
	Larch caseboarer	Treat in early May when lawns are feeding or in late June when new generation is present.	Methoxychlor 25	21b./gal. EC	2-3 qL
	Woolly larch	Treat is only May when crewken first somear	Marii 75WP	75% WP	3.5 T. (landscape only)
	adelaid		Rockiese Shede Tree		······································
			Insect Spray	2 lb.+1.1 lb./gal. BC	2-3 qt.
			Oils, dormant (see ALT	TERNATIVE PRODUCTS	
			Cas, horicalized, semi Scene (faits and state)	DET (SEE ALTERNATIVE	PRODUCIS)
			nonthe (rest's area and a	WW ALLERMATIVE PRO	000010j

Host	Pert	When to Treat	Labelled Posticide	Formulation. You Buy	Amount Te Add To: 100 Gal Water
LILAC	Fall webworn	(see GENERAL PESTS)			
	Lilec (=Ash) borer	Treat brack and large branches in mid-May in	Daraban Tarf	41b./gal. EC) qt.
		southern Ohio and early June in northern Ohio.	Dursban SOWSP	50% WSP	216.
			Dursban 1E	1 lb./gal. EC	4 gt.
			Dursban Red a diffe	0.5 B./gal. EC	Igt.
			Finderic SHC	3 10./gal. HC 1.65 % /mai. BC	0.07-1.3 qt. (minisery only) 3
			Lindage Room Sport	1.651b./gal. BC	3 pt.
			Pageant DF	50% DF	2 (b.
			Phasec	3 lb./gal. EC	0.67-1.5 qt. (nursery only)
			Thiodan 50WP	50% WP	1-2 lb. (numery only)
			Thiodan 3EC	3 lb./gal. EC	0.67-1.5 qt. (nursary only)
		SPECIAL	NFORMATION		
		Clearwing borer itaps can be used to pinpeint adult emer See timing listed for specific pest and calculate proper tim	gence to aid in proper timing of sp ne to deploy traps.	mys. Treps should be de	ployed about 3 weeks before normal tradment have.
	Lilac leafminer	Treat at first sign of mining in lorves.	Bioncom	0.3%EC	2.5-5 pL
	(Lepidopterous)		Ducsban Turf	4 lb./gal. EC	l qt
			Dursban 30WSP	50% WSP	216.
			Managan D	1.3% EC 0.3%EC	4.69 gL 2 5.5 et
			Official	9.4%EC	4.69 at
			Parcent DF	50% DF	2 B.
			Rocking Shade Tree		
			Insect Spray	21b.+1.1 lb./gal. EC	2-3 qt.
			Talstar T&O	7.9% F	20-40 oz.
			Taistar 10WP	10% WP	16-32 ez.
	Oystenshell scale	(see GENERAL PESTS)	AND:		
			Cythion	5 lb./gal. EC	1 pt.
			Cyfhion \$	t Ib./gal. EC	1 pt.
			Miletinon 37 Malethion	DID/gal BC	l pl
			Methagychlar Santy	2 lb.+2 lb./gal. EC	2.5 of /acm
			Rocking Shade Tree		
			Insect Spray	2 lb.+1.1 B./gal. EC	2-3 qt.
LINDEN	Aphids	(see GENERAL PESTS)			<u> </u>
	Bagworm	(see GENERAL PESTS)			·
	Basswood lace burs	Treat at first size, of fanding domage or when the		· ·	 ··· ·
	THE MOOT THE OWNER	burs are present.			
		(see GENERAL PESTS: Lace Bags)			
	Borers	Treat about early May and again in 4 weeks.	·····		
	Cottony maple	A dominant oil spray may be used before growth			···
	scale	starts in the spring. Be sure to follow the man-			
		ufacturer's recommendations.			
		As a foliar treatment, spray infested trees			
		Chorong My with one of these matching about			
		lower leaf surface thith soray			
		(see GENERAL FESTS: Scales)			
	<u> </u>				
	Fall and spring cankerworms	(fee GENERAL PESTS)			
	Fall webwonn	(see GENERAL PESTS)			
	Japanese beetle	(ace GENERAL PESTS)	AND:		
		, <i>*</i>	leotex IV	8.5% EC	6.25 gt.
			Ortheas	9.4% EC	6.25 gL
	Linden lenf beede	Sonay trees at first size of bootles and funding	Meenik Agnetion	21b/ral P	4-19 oz.
		injury, which should be in late Jene or early July.	Scops (fatty acid salts)	(see ALTERNATIVE PR	ODUCTS)
	Sourfy scale	Use oil as a domnant treatment. Use any one of	AND:		
		other materials against crawlers in late May.	Cythion	5 Ib./gal. EC	L3 pt
		(see GENERAL PESTS: Scales)	Cythion \$ Malathion \$7	a fo./gal, EC 51b./gal, EC	1.5 ot.
				- 101. Ever 73.	
LOCUST	Locust borer	Spray tree tranks thoroughly in early September	Carbaryl 4L	4 lb./gal. F	1 pt.
(Black)		(when goldented is bicoming).	Carbaryl 50WP	50% WP	2 lb.
			Dusban Turf	4 lb./gal. EC	1 qt
			Dursban 50WSP	20% WSP	2 10 .
			Percent DP	1.85 ID/BAL EC 90% DF	2 yr. 2 fb.
			Sevimal	41b/mail F	let
			Sevin 50W	34% WP	210.
	.	4			
	Leathopper	(see GENERAL PESTS)			

Best	Pert	When to Treat	Labelled Perticide	Formulation You Bay	Amount Te Add To: 100 Gal. Water
LOCUST	Locust leafminer	Treat when foliage is developing and again in	Bioncem	0.3%EC	2.5-5 pt
(Black)	(Colcopterous)	endy Juns.	Dibtom I Emulaive	#1b./gal_EC	1 pt.
(cont'd)			Dersban Teef	41b/gal_EC	1 qt.
			Duesban SOWSP	50% WSP	216.
			Linders 20%	1.65 (b./gal. EC	1 pt.
			Lincane Borer Spray	1.00 10./gas. E.C.	1 pr.
			Descent DF	50% DE	2.3-3 pt. 4 th
			Talster T&O	7.9% F	20-40 =2
			Talstar 10WP	10% WP	16-32 e2.
MAGNOLIA	Leafminer	Treat when minor are first soon and repeat as	Bionoum	0.3%EC	2.5-5 pt.
	(Colcopeterous)	Roofol.	Dibrom I Emulsive	¥ lb./gal. EC	1 pt.
			Dursban Tarr [*]	4 lb./gal. EC	l gt.
			Dursban SOWSP	50% WSP	216.
			Margeon-U	0.3%EC	2.5-5 pt.
			Orthono Bases The	SOAL DIE	4.09 gL
			Telefor TAD	70% DF	210. 20.40 em
			Taletar 10WP	10% WP	16-32 oz.
					10.02.02
	Marnolia scale	Use domnant oil as fail or spring treatment. Treat	AND;		
	•	with any one of the other materials when crawlers	Cythion	5 fb./gal. BC	2.pL
		are active in August and September. Report treat-	Cythion 2	# lb./gal. EC	1.23 pt
		ment as needed. An April spray may also effect	Mainthion 57	5 B./gal. EC	2 pt.
		some soile methity.	Rockland Shade Tree		
		(see GENERAL PESTS: Scales)	Insect Spray	21 5.+1.1 (b./gal. EC	2-3 gt.
	Yellow pepter	Treat Joinge when adults first appear, which should	Carbaryi 41,	4 ID./gal. F	L pt.
	WARKIN .	De in the June of early July.	Carbarys Sew P	Ally fault RC	2 IB. 1 at
			Durshan 181	4 KOJERL EC 4444 UUVD	1 pc 1 %
			Percent DR	50% DR	140. 1 lik
			Sevinal	41h/ral, F	1 at.
			Sevia 50W	50% WP	216.
MARONIA	Barberry aphid	(see GENERAL PESTS)			
	Barberry looper	Treat in late May and then as needed. There are	Biencem	0.3%EC	2.5-5 pt.
	(Barberry caterpular)	Three generations per year.	Decision	24% WP	L.3 0Z
		(see GEPERAL PESIS: CHEIPHERS)	Ringesin-O		2.3-3 4
			Edistrie 1800 Trabater 1800	/.376 P 984/ WID	8-40 0Z
			Tampa 7	1970 WF 11b And DC	0.4-32 GZ
			Terme 28WP	20% WP	1.3.02
	Barberry webwern	Treat when larvas are present.	Bionoam	0.3%EC	2.5-5 pt.
	-	(see GENERAL PESTS: Caterpillars)	Cerberyi (L	41b./gel. F	1 pt
			Carbaryl 50WP	50% WP	2 fb.
			Decethion	20% WP	1.3 oz.
			Diszines 50W	50% WP	L 16.
			Diszines 2E & 2.5%		• /
			(Spectracide)	23%EC	l gr.
			Diazinan 415 & AGSWU	40./gal EC	1 pL
			Гунах Маталана О	8979 81° 8 38/07	20-30 02. 2 5.5 of
			Destal 102D	9.3780C	2.3-3 pc 20.30 cm
			Savimal	4 lb /eal E	1 at
			Sevia Lionid	2 fb/gal. F	2 at.
			Sevia SOW	50% WP	216.
			Teleter T&O	7.9% F	\$-40 oz.
			Tuistar 10WP	14% WP	6.4-32 #2.
			Тапро 2	2 Ib./gal. EC	1 🕫 🛛
			Tempo 20WP	20% WP	1.3 ez.
			4385		
MAPLE	Apelos	(See CHINERAL PESTS)	AND: Dibeen t Emploire	the local BC	Let
	Nata: Mainthion may cause	dight injury to manie.	THEFT & Distriction	• 103gat 130	r þr
	Note: Do not apply hotor I	or Orthone to red or regar meples.			
		- •			
	Bagwonn Note: Do not apply hotox IV	(see (HINERAL PESTS) J or Ortherne to red or sugger maples.			
	Borers (berk berlies &	Treat trenk and lower branches in the Miry, June	Lindage Borer Sprey	1.00 lb/gal EC	3 qt.
	(00000000)	ana valy.			
	Cottooy manie	A dominant of spraty may be used before exorth starts			
	some	in the social. Be sure to follow the manufacturer's			
		recommendations. Some variation of manie are successible			
		to oil injury. Spray infected trees throughly with one of the			
		standard materials about July 1 and again in 10 days.			
		Be sure to cover forwar leaf surfaces with spray. New			
		information indicates that a spray applied as late as late-July			
		and during September should control scale found on the			
		undersides of leaves.			
		(see GENERAL PESTS: Scales)			
	Note: Do not apply hotex IV	/ or Orthene to red or sugar maples,			

Pest	When to Treat	Laballed Pesticide	Formulation. You Buy	Amount To Add To: 100 Gal. Water
Rinetta miter	Trast infested trees in early soving about time	Cathary 41.	416./zat. F) ot
(Edeph yid)	buils are starting to open or at first sign of red	Carbary1 50WP	50% WP	216.
	or yellow patches on under surface of the lerves.	Dicofel 4EC	41b./gal. EC	1.25 gt.
		Jonst	416./gal. F	4-t oz.
		Keithane 35	35% WP	1-1.3 lb.
		Keithans 50	50% WP	0.3-11b,
		Mensystox-K2	2 10./gal. EC 415./1. E	1-1.5 oz./inch trank diameter (seil inject on 4.9
		Morestan 4 Oile dogment (see AT	4 10/gal. P TUR MATTUE DRODIN	4-6 02. TTC)
		Oils, horiculturel, sum	mer (see ALTERNATI	VE PRODUCTS)
		Pentac Aquaflow	1 lb/gal. F	\$-16 az.
		Pentac WP	50% WP	12-16 oz.
		Sevimol	4 lb./gal. F	l gt.
		Sevin 59W Seans (fatty acid salts)	50% WP (see ALTERNATIVE)	2 Ib. PRODUCTS)
Fell ouskerwoon	(see GENERAL PESTS)			·····
Note: Do not any	V isotax IV at Onlinene to red or starse menios.	Dibson & Emulsive	\$ lb./gal. EG	1 pt.
Fell ambanon	(AAA (SENER AT PESTS)	ANTI-		
	(*** **********************************	Dibuon & Fernisive	11b./est. EC	1 of
Note: Do not app Note: Do not use	ly isotox IV or Orthene to red or sugar maples. Mothoxychior on tod or Japanese maples.		*****	- F
Ferest test catag	an (see GENERAL PESTS)			
Note: Do not app	ly isotox IV or Ortheast to red or sugar maples.			
Greenstriped	Treat in late May or early Jana.	Biomsenn	0.3%EC	2.5-5 pL
maplement	(see GENERAL PESTS: Caterpillars)	Decathion	20% WP	1.3 oz.
-	· · ·	Margosan-O	0.3%EC	2.5-5 pt.
Note: Do not ap	ty Orthene to red or sugar maples.	Orthene	9.4%EC	4.69 gt.
		Telstar T&O	7.9% F	\$-40 oz.
		Telstar 10WP	10% WP	6.4-32 oz.
		Tempo 2 Tempo 2014/P	2 10-Jgal EC 20% WP	1 ez. 1.3 ez.
			20/0 #1	
Japanese Deelle	(AND CHINEKAL PESIS)			
Note: Do not spp	y isotox IV or Orthono to roll or sugar maples.			
Leafhoppers	(see GENERAL PESTS)			
Note: De not app	y Isotox IV or Orthene to red or sugar mapies.			
Locanium scalas Nota: Do not app	Treat Mont carviacs are first soon, which is usually mind to late June (soo GEUNERAL PESTS: Soulos) ly Isotox IV or Orthene to soil or sugar maples.	AND; Malathion, 37	5 Jb./gal. EC	2.5 pt.
Manie bladd og af	mite Domnant oil may reduce overwindering populations.	Carbaryl 4L	4 lb./cal. F	1 #4
	Use any one of the standard materials when the leaves	Carbaryl SOWP	54% WP	20.
	are boat 1/4 expanded and again in 10 days. Cover	Dicofol 4EC	4 lb./gal. EC	1.25 gt.
	lower leaf surface with spray.	Joust	4 Ib./gal. F	4-1 az.
		Kathane 35	35% WP	1-1.316.
		Keithane 50	50% WP	9.5-1 JD.
		Metasystex-R2	2 10./gal. EC	I-1.5 02/IRCh Wank disension (Soul Mjoci ed A 2 au
		Mille Assessed (see 1	4 IN SEL P	
		Olic haritation (199 AL	mar (see ATTRENATE	VE PRODUCTS)
		Purpo Acuallow	1 Db./gal. F	k-16 oz.
		Pentac WP	54% WP	12-16 oz.
		Sevimal	4 lb./gal. F	1 qt.
		Sovin 50W	56% WP	2 16.
		Soups (Butty acid sults)	(See ALTERNATIVE)	PRODUCTS)
Maple polisie ber (Hymanopturo)	er Nothing is registered for this post. Losf drop will s) not damage trees. Larve stays in posicle stam on plant, so raking leaves will not help in control.			
Maple shoot met	IN Treat in early May and repeat as needed.	Instar B7	1 5% EA	4.60 at
тини то во арр	A ferminent at on community for all sufficients	Orthene	9.4% FC	-K07 yu 4.69 al
		Talster TAO	7.9% F	12-40 07.
		Teister 10WP	10% WP	9.6-32 az.
Oystorsholl scale	Treat crawless about late May and again in 10 days	AND:	\$16 /ad 7/0	
	in souther uno; 2 weeks have it acclient Ohio. (and Charles AT Differe. Castan	Cyulion Cyulion	P DA GAL EC	1 pt.
	(FOR CEPERAL PESIS; SOME)	Lyunon i Malathian 41	STE GAL DC	sp. Lot
Note: Some maai	es are maccodible to all injury. See label.	Malathion	STRUGEL BU	T Bar
Note: Do act spp	y Isotax IV or Orthone to rod or stigar maples.	Methoxychior Spray	2 lb.+2 lb./gal. BC	2.5 pt/sore
Spider mites Nate: Do not some	(see GENERAL PESTS)			
Service and Bar app	J BANKA I VI VILLER VILLE VILLER	4 XIT).		
apage callerwor	n (100 UERURAL PEN 13)	AND:	• Th / TO	1
TANK TO BUT CHU	A THEMAY TA OF CHIMME IN LOP OF CHIMME WHEN	Trintomy & Suppleine	a norgan BC	1 pc

72200-121			Labelled	Formulation	Amount To Add To:
Hotz	Fest	When to I reat	Perikide	Yen Buy	100 GoL Water
MOCK ORANGE	Aphids	(see GENERAL PESTS)			
	l estminers		Rieneem	0 354EC	25.5 ===
			Dursban Tarf	4 fb./gal. EC	Lot
			Dursban 50WSP	50% WSP	216.
			Magesan-O	0.3%EC	2.5-5 pt.
			Pageant DF	56% DF	2 Tb.
			Taister T&O Taister 10WP	7.9% F 10% WP	20-40 az. 16-32 az.
MOUNTAIN	Bacapean rad mits	(see GENERAL PESTS)			·
ASE	Fail webwerm	(see GENERAL PESTS)	. <u> </u>	••	
	Janaansa heefie	(see GENERAL PESTS)			
	Laca hors	Treat in mid-May. Make two ambications snaced			
		about 10 days spart. (see GENERAL PESTS: Lace Bugs)			
	Monstain ash confly	Spray foliage about 2 weeks after the patais fall and again in 2 weeks	Carbaryl 4L Carbaryl 10WP	4 16./gal. F	1 pt. 2 th
	a a muy	(max (EDER AL PESTS)	Decathion	20% 100	13.02
		(Durshan Thaf	4 lb/eal_EC	\$ 62
			Durshan 50WSP	50% WSP	0.5 m.
			Modit 75WP	75% WP	3.5 T. (landscape only)
			Oils, horticultural, sum	mer (see ALTERNATTV	E PRODUCTS)
			Orthene	9.4% EC	4.69 gt.
			Reckland Shade Tree		1 1 -
			Insect Spray	2 lb.+1.1 lb./gal. EC	2-3 qt.
			Serimol	4 fb/gal F	1 gL
			Sovin Liquid	2 fb/gal. F	2 gL
			Seria 50W	50% WP	2 lb.
			Sceps (faity ecid salts)	(see ALTERNATIVE PI	RODUCTS)
			Tempo 2	2 lb./gal. EC	1 02.
			Tempe 20WP	20% WP	1.3 02.
	Woolly sphids	Spiny in early May. (see GENERAL PESTS)			
MOUNTAIN	Azaloa bark soule	Trout when crawlers are precent, which usually is	AND:		
LAUKEL		June. A second spiny in 10 days may be needed.	Cythion	DID/gal. EC	2 pL
		(500 CENTRAL PES (5: 50005)	Malathian 57	s lo/gal. EC 5 lb/gal. EC	125 pc 2 pc
	Azales lesiminat	Trust when mines are first seen and repeat as	Rioneern	0.3%EC	2.5-5 pl
	(Lepidopterons)	needed to protect new growth.	Dursban Turf	416/gal. EC	1 gL
			Dursban 30WSP	50% WSP	2 lb.
			Magosan-O	9.3%EC	2.5-5 pt.
			Orthene	9.4% EC	4.69 qt.
			Pageant DF	59% DF	216.
			Sevimol	4 fb/gal. F	1 gt.
			Sevin 50W	50% WP	216.
			Taistar 1000 Taistar 10WP	7.9% P 10% WP	20-40 82. 16-32 82.
	Lava bus	Treat in certy land			
	······	(see GENERAL PESTS: Lace Bugs)			
	Rhododendron borer	Treat trunk and large branches in mid-late May.	Dursban Turf	4 lb/gal. EC	L qL
			LINESON SOWSP	2076 WAP 1 IS 4-4 TO	2 419. A - 10
			Darson LE	n novgat, etc.	4 QL
			Pageant DF	50% DF	• 4L 216.
OAK	Aphida	(FAG GENERAL PESTS)	AND: Dibrom # Emulsive	8 lb./gal. EC	l pt.
	Asatic oak weevil		Bioneem	0.3%EC	2.5-5 M
			Dursban Torf	4 lb./gal. EC	1 pt.
			Dursban 50WSP	50% WSP	1 fb.
			Pageant DF	50% DF	1 fb.
	Bagwonn	(see GENERAL PESTS)			
	Bornes	Spray tracks thereastly in mid-June and July.	Durshan Turf	41b/rel EC	1 of.
			Durshan 50WSP	50% WSP	216.
			Pageant DF	50% DF	216.
	Clearwing borer in	Pin oak borer firs during odd gumbered years.	Dursban Turf	4 lb./gal. EC	1 qL
	pin oak	Flight begins in mid-May in northeastern Ohio.	Dursban 50WSP	50% WSP	21b.
	~	Apply spray in late May.	Pageant DF	50% DF	2 lb.
			SPECIAL INFORM	ATTON	
		Clearning have trans on he used to pleasint adult onem	ence to sid in proper timizer of s	oreva. Trues should be d	enloyed shout 3 weeks before

Pest	When to Treat	Labelled Pesticide	Formulation. You Buy	Amount To Add Te: 100 Gal. Watur
	······································	D '	6 85 M	
ETHE PARTWOLL	(and GRNER AL PESTS: Colorvilland)	Boneem "Be" (constabil)	U.372BC	2.3~3 pt
		Cerbood AL	All first E	1 of
		Carbord 50WP	4044 1070	2 Jan
		Decalition	DOM TOP	13.02
		Durshan Tarf	d lb./cal. FC	Lo viz
		Dorshan 10W/SP	SON WEP	0.116
		Magasan-O	0 39/80	2.1-1 of
		Parent DF	SON DE	0.516
		Resmethia EC26	2 fb./cal. BC.	1 pt. (second plants only)
		Sevimal	4 lb /rsl. E	Lot
		Sevin 30W	SW% WP	216.
		Tuistar T&O	7.9% F	1-40 az.
		Talatar 10WP	18% WP	6.4-32 az.
		Tempo 2	2 b./zal. EC	1 az.
		Tempo 20WP	20% WP	1.3 ez.
Fall webworm	(500 CENERAL PESTS)	AND: Dibrom \$ Employe	\$1h./gal. EC	1 pt.
Forest tent caterpillar	(see GENERAL PESTS)	·		···
Guilis	Chemical control recommended only in special cases	Carbary1 4L	41h./gal. F	1 pt.
(Hymenopterous)	because galls needy harm trees. Stem and twig galls	Carbaryl 30WP	50% WP	2 lb.
	should be pruned and destroyed while they are still green	Sovimol	416./gel. F	1 gt.
	to reduce further infectation. Adult gelt waspe are usually active when the new leaves and shoots are expanding.	Sevia 50W	50% WP	216.
Golden oak sonie	Use oil as a domaget treatment in the sector. Use	AND:		
	new one of other materials evaluation are opting. Use	Dimethorse 2 678C	2.67 lb./well RC	50 nz.
	about mid-May and aboly 2 or 3 andientions encoul	Dimethoate 400	41b/gal PC	35 ez.
	about 10 days anart.	Reckingd Shada Teor	·	
	(see GENERAL PESTS: Sonies)	Insect Spray	2 lb.+1.1 lb./gal. EC	2-3 qt. (chestnut, English & white only)
Сурьу тоф	(see GENERAL PESTS)			·····
Japanese heefe	(see GENERAL PESTS)			
Leafhoppers	(see GENERAL PESTS)			· · · · · · · · · · · · · · · · · · ·
Ladininers	Treat when adults are present, which should be	Biensem	0.3%EC	2.5-5 ot.
(Lenidopterons)	when the leaves are about half expanded. Recent	Carbaryl 4L	4 fb./enl. F	Int
()	treatment for second generation on white oak only.	Carbaryl 50WP	50% WP	216.
	Cover upper leaf surface with saray.	Dibrom & Randsive	1 ib/eal. BC	let
	ere diameter and deale	Dambas Tarf	4 lb/ral RC	l of.
		Durshee 50WSP	50% WSP	21h
		Mattacan O	0.3%28C	2 %-1 mt
		Orthone	9.4% EC	4 69 41
		Orthoney Service	Amoral	N/A
		Present DE	50% DE	216
		ragani Dr	50% TVD	210. 216
		Seven Juw	JU75 WF	210. Lot
		Southou	4 ID./gal. b	L qr.
		Talstar T&O	7.9% F	20-40 ez.
		Telstar 10WP	10% WP	16-32 ez.
Lecanium scales	Treat when crawfers are present, usually mid to into June.	AND: Malathion 37	51b/gal BC	2.5 pt
	(see GENERAL PESTS: Scales)			
May/June beetes	Spmy when foliage is being easen, which should	Carbaryl 5D	5% D	N/A
	be in June. Bootles feed at night.	Carbaryl 10D	10% D	N/A
		Carbaryl 4L	4 (b./gal. F	1 pt.
		Carbaryl 50WP	50% WP	216.
		Decathion.	20% WP	1.9 oz.
		Dursban Turf	4 lb./gal. EC	1-2 pt.
		Dursban 50WSP Malathion	50% WSP	L-2.1b.
		Methoxychior Somy	2 (b.+2 lb/gal, EC	1-2 et.
		Parcent DF	50% DF	216.
		Scimiter WP	9.52% WP	2.4-4.8 02
		Sevimal	41b/gal. F) at
		Sevia 50W	50% WP	2 lb.
		Tempo 2	2 ib./gol. BC	1.5 02.
		Tempo 20WP	20% WP	1.9 oz.
Oak kennes solle	Use all as a domnant freetment in the spring. Use	AND:		
	any one of other materials egainst crawlers in	Cythion	3 JB./gal. BC	2 PL
	mid-May and apply 2 or 3 applications at 10-day	Cythion \$	TIN/gal BC	L25 pt
	intervals. Repeat treatment in late July.	Malathion 57	5 lb./gal. EC	2 pt
	(see CHNHRAL PESTS: Scales)	Rockland Shade Tree Insect Spray	2 16.+1.1 15./gal. EC	2-3 qt. (white & red only)
	Treat when bugs are first seen, as nally in early	AND:		
Onk lace bag	the sound latency and support on soundard	Melathion		
Oak lace bag	(see GENERAL PESTS; Lace Burn)	Methoxychior Some	2 lb.+2 lb./cal. EC	1-2 at

Hert	Pert	When to Trent	Labelled Perticide	Formulation You Buy	Amount To Add To: 100 Gal Water
					<u></u>
OAK	Orangestriped	Trent in late May or in June.	Bionecum	0.3%EC	2.5-5 pt.
(com/d)	CALINOTT		"Bt" (kurstala)	VALIONS	various
			Carbaryl 4L Carbaryl 4M7P	416./gel. F 409/ 35/0	L pL
			Carolyl 70WP Desethion	2075 WP 2084 WP	2 (D. 1 3 er
			Dechas Terf	4 lb./mal. BC	1,5 02. 1 ez
			Darsban 50WSP	50% WSP	0.51b.
			Isotox IV	8.9% EC	4.69 eL
			Orthese	9.4% BC	4.69 qL
			Pageant DF	50% DF	0.516.
			Sevimol	41b/gal. F	L gt.
			Sever 20W	20% WP	2 10.
			Taleter 1007D	1.978 C	1-40 4Z.
			Terrato 2	2 fb/cal EC	0.4-52 W2.
			Tempo 20WP	20% WP	1.3 92
	Pin oak sawily	Treat when laval fooding is seen.	Carbaryl 4L	41b./gal. F	l pt.
			Carbaryi JewP	50% WP	216.
			December Test	2076 WY	1.3 02.
			Dursten 100	4 10./gal E.C. 4/44. W/CD	4 022. 0 < 11.
			Inster IV	144 EC	4.60 at
			Marit 75WP	75% WP	3.5 T. fandscane only)
			Orthene	9.4%EC	4.69 at
			Orthese	75% SP	1.0 16.
			Pageant DF	50% DF	0.5 Ib.
			Sevimel	4 lb/gal. F	1 qt.
			Sevin SOW	50% WP	2 Ib.
			Tampo 2 Tampo 20WP	2 fb./gal. EC 20% WP	1 oz. 1,3 oz.
	Skeletoniazers	Treat when damage is first seen; about mid-June	Carbaryi 41.	4 D./gal. F	l pt.
	(Lepidopterous)	and again in August.	Carbaryl SOWP	50% WP	2 lb.
			Decathion	20% WP	1.9 02.
			Scimitar WP	9.52% WP	2.4-4.5 02.
			Sevimal C = 4: 4001	4 fb./gal. F	1 qt.
			Seven 20W	20% WP 21b /eel RC	2 Ib.
			Tampo 2 Tampo 20WP	20% WP	1.5 dz.
	Spider mites	(see GENERAL PESTS)			
	Socieg cankerworm	(see GENERAL PESTS)	AND:		
		······································	Dibrom \$ Emulsive	‡ ib./gel. EC	1 pt.
	Teat caterpillars	(con GENERAL PESTS)			······································
	Twig present	Chamical control is not practical. Rake and destroy fallen	Dursten Terf	41b./gal BC	l qt.
		twigs before late May,	Dussban 30WSP	50% WSP	2 Ib.
			Pageant DF	50% DF	2 b .
			Talstar T&O	7.9% F	9.6-40 oz.
			Talster IUWP	10% WP	12-32 02.
	Twolined chestnut	Treet in late May and again late June.	Dursben Terf	4 lb./gel. EC	lqt
	borer		Densben 30WSP	50% WSP	2 lb.
			Pageant DF	30% DF	216.
PACHYSANDRA	Enonymus scale	Treat when crewlers are present, late May and early	AND:		118-4
		sume supply a least of controllers special about 19 doug spect and context the series controllers as such at	Cymion Cymhon P	s so sgan. EC R ib. Jack IPC	Int
		(see (#OFR AT. PESTS: Scales)	Guillion 28	2 lb /eal RC	1 5-2 nt
		(see on end of Date: perce)	Malafbion 57	51b./eal. FC	1.5 nt.
			Melathion		•••• E -
			Methoxychior Spray	21b.+21b./gal. EC	2.5 pt/scre
			Rockland Shade Tree	-	
			Insect Spray	2 lb.+1.1 lb./gal. HC	2-3 qL
	Oystershell scale	(see GENERAL PESTS)	AND:		
			Cythion	5 lb./gal. BC	1 pt
			Cychion 5	#1b./gal_EC	1 pt
			Malamion 57	5 Ib./gal. BC	1 pr.
			Methoxychior Spray	214.+214./gd. BC	2.5 pt/sce
	Twospotted spider mits	(see GENERAL PESTS)			· · · · · · · · · · · · · · · · · · ·
PHILOX	Twospotted spider mite	(see GENERAL PESTS)			
PIERIS	Andromoda lace bug	Treat in mid- to into-May. Make two applications	AND:		
(Japanese mudromoda)		(see GENERAL PESTS: Loce Bugs)	Resmethtin EC26	2 lb./gal. EC	l pt. (anned plants ealy)
	Southern red mite	(see GENERAL PESTS)			

Het	Pest	When to Trint	Labelled Perticide	Formulation You Buy	Anaount To Add To: 100 Gal. Watur
PINE	Allesheev excend e-4	Treatie andy And by the smaller source the	Timethon Tool] of
LINE	verified and the	n an	Dursban 50WSP	4 10.7gal. gc. 50% WSP	1 gr. 2 th.
			Pegcent DF	50% DF	2 lb.
			Scimitar WP	9.52% WP	2,4-4,‡ oz.
	Aphide	(see GENERAL PESTS)	AND:		
			Cygon ZH Dibtom 8 Fimilaise	2 ID/gal EC 8 Ib (cal EC	2 pt.
			Dimethoute 2.67EC	2.67 lb/gal. EC	50 oz.
	Bagwooni	(see GENERAL PESTS)	AND:	· · · · · · ·	
	-		Cygon 2E Dimethoate 2.67EC	2 lb/gal, EC 2.67 lb/gal, EC	2 pt. 50 oz.
	Bark booties	Spray all truck surfaces when adults are active.	Carbaryi 4L	4 lb./gal, F	4 gal. (named beefles only)
		Engraver bortles (ips species) may require several,	Carbaryl SOWP	50% WP	40 lb. (named bestles only)
		sessonal sprays. Healthy frees are usually not	Lindano 20% Lindano Dona Sona	1.65 lb./gal. EC	1 pt/3 gal. (wet trunks) 6 T/ml (mut trunks)
			Parcent DF	50% DF	16.51b.
			Sevimel	41h./gal. F	20 qt. (named beetles only)
			2001 JUW	3076 WF	40 ID. (RATEO BOOLES ONLY)
	Black pine leaf scale	(see GENERAL PESTS: Scales)	AND:	AR (-150	A A A
			Melathion 57	2 Do./gol. EC 5 Do./gol. EC	3-4 pt. 2 pt.
	Sectors ninethoot	Moths appear in May and larvae feed inside terminat	Outhion 28	2 lb/gal EC	1.5-3 of. (Christmas trees only)
	borer	and lateral shoots. Treat in early May and again in	Talstar T&O	7.9% F	9.6-40 oz.
	(Rucosma gloriola) (vdute pine only)	LU days or press out brown, willted or distarted shoots.	Talstar 10WP	10% WP	12-32 øz.
	Esophyid mites	The mites out be controlled best when new growth	Carbaryl 4L	4 lb./gal. F	1 pt.
	-	is 3-5" long (early June).	Carbaryi 50WP	50% WP	216.
		Note: Oile will access adverse different Marco Barro	Dionfal 4EC	4 lb./gal. EC	1.25 qt.
		Note: Ous was remove grandes (also) moora from trom trom	Keithane 35	4 ID./gai. F 35% WP	4-6 02. 1-1.3 lb.
			Keithane 50	50% WP	0.5-1 fb.
			Metasystex-R2	2 lh./gal. EC	1-1.5 oz. inch trank diameter (soil inject only)
			Morestan 4	41b./gal. F	4- 5 oz.
			Oils, domaat (see ALTERNATIVE PRODUCTS) Oils, horticultural, summer (see ALTERNATIVE PRODUCTS)		
			Oils, horticultotal, sourmer (see ALTERNATIVE PRODUCTS) Peatre Aguality 115/cal F 5-16 oz.		5-16 oz.
			Pentac WP	50% WP	12-16 02.
			Sevimol	41b./gal. F	1 gt.
			Sovia 50W Soups (fatty acid selts)	50% WP (500 ALTERNATIVE I	216. PRODUCTS)
	Encoder dies	These templant many the thread with the sold stand and as is	Contract of	416 (ma) E	1 = 4
	shoot meth	about hato June. Pringing off infested terminals before	Carbaryl 50WP	50% WP	2 lb.
		June vill help.	Cygon 2E	2 lb./gat. EC	2 pt.
			Cythion	5 lb./gat. EC	1.5 pt.
			Cythion 3 December	8 ID./gal. EC 2006 3770	1 pt.
			Diszinen 50W	50% WP	115.
			Diszinen 4E & AG500	4b/gal EC	l pt.
			Dimethoate 2.67EC	2.67 lb./gal. EC	50 oz.
			Dursban Turf	4 lb./gal. EC	l pt.
			Gathion 28	2 lb/mil FC	1.5-3 ot.
			Malathion 57	5 lb./gal. EC	1.5 pt.
			Methyl Parathion 4E	4 lb./gal. EC	2 pt/acre (Christmas trees only)
			Monyl Parathéon 7.5 Portecest DE	7.5 ID./gal. EC 50% DE	1 pL/acce (Christmas trees only) 2 15
			Postroy 4EC	4 lb./gal. EC	L at.
			Sevimal	416./gal. F) qt.
			Sevin 30W	50% WP	2.1b,
			Taistar 1000 Taistar 1000	7.3778.# 10%5 W/P	₽~₩ 02. 6.4=32.07.
			Tempo 2	2 lb./gal EC	1 02.
			Tempo 20WP	20% WP	1.3 oz.
	Nastucket pine	Treat in April through May and again from	Ambush	21b./gal. EC	6.4-12.8 oz. (Christmas trees only)
	ip meth	mid-July to only August as needed.	Ambuch 25W	25% WP	6.4-12.8 oz. (Christmas trees only)
			Asima XI, Carbord AT	u.oo,to,/gal.EC Alla /a⊨al Ti	2.8≠9.0 02. (£302507.9 05077)]m1.
			Carbaryi 50WP	50% WP	2 lb.
			Cygon 2E	2 lb./gal. EC	2 pL
			Decathion	20% WP	1.3 02.
			Dumethoule 2.67EC	2.67 10./gal. BC 4.16./gal. BC	59 0Z. 60 47
			Dimilin 4L	41b./gal. EC	2 07/2010
			Dimilia 25W	25% WP	4 oz./acte
			Di-Systen	15% G	2.5 oz./inch trank diameter
			Durshan Taxf	4 lb./gal. EC	1 pL 1 (5
			Darrow 200.8%	76% WP	20-10 oz.
			Fican W	76% WP	216.
			Gethion 2S	2 fb./gal BC	1.3-3 pt. (numery only)
			Isotox IV	8.5% EC	4.69 qL
			Mothyl Parathion 4B	4 D./gal. EC	2 pL/acre (Christmas from only)

Pest		When in Trent	Lahellod. Pesticide	Yet Buy	Amount To Add To: 100 Gal. Water
Mentad	ket nine tit stath		Mathui Parathian 7 S	75th and EC	1 at farm (Christmas have only)
(conf	ten paro ap soon.		Orthene	4 494 EC	A 60 at
	,		Orthone	75% SP	1.0 5
			Parated DF	5054 DE	1 1h
			Pagement /CC		1 at
			Pennoy 4EC		
			POURCE S.ZEC	S210./gal. EC	4-1 oz./acre (anisery only)
			Potace 25WP	23% WP	6.4-12.3 az/acre (nursery only)
			Scimitar WP	9.52% WP	2.4-4.1 42.
			Sovimal	4 lb./gal. F	1 q¢.
			Sevin 50W	50% WP	2 Jb.
			Telstar T&O	7.9% F	8-40 az.
			Takina 10WP	10% WP	6.4-32.02.
			Tampo 2	2 lb./gal. EC	1 02.
			Tennes 20WP	20% WP	1.3 07.
			Turcam	76% WP	2 lb.
Norther	n piec	STUMP TREATMENT	Asana XL	0.66 lb./gal. EC	5.8-9.6 oz. (antsery only)(stump only)
WOOVE		Full and doctroy stamps octors rate same or treat	Dursban 14.0	4 IDJgal EC	1 pc
Pales w	and a second	stumps before late April or after trees are out	Duesban 50WSP	50% WSP	1 lb.
		and the temperature is above 50°F. Kerosene or fuci-	Dycarb	76% WP	20-49 oz.
		ail is often used as a carrier.	Ficam W	76% WP	42.02
			Parcent DE	50% DE	11h
		POLIAD TOPATATIONT	Destroy (EC	d the family RC	1 at
			FRATON ALC	410788. EC	I yu
		Seedings and young tways can be protected by spraying with findance in mid-April to early May and again in August.	Turan	7 6% W P	42.62.
Tino ba	nt adelaid	Use cit in spring as a dominant treatment. Use any one	Dursban Turf	4 lb./gal. EC	\$ 02.
	· · · ·	of other materials when crawlers are active, namely	Durshan 50WSP	50% WSP	0.516
		shout mid-May. A fast stream of paster one he used	Made 750/P	2594 W/P	3 ST fleedscene only)
		to much means addride from your trees	Olls downant (ass ATT	TRAINING BROWNING	
		te wasa meny soughts mom your more.	Ous, comant (ree AL)	EKMAIIVE PRODUCIS	
			Ous, nortourural, suma	DET (SEE ALTERNATIVE	PRODUCTS)
			Pagenst Dr Scaps (fatty acid salts)	50% DF (see ALTERNATIVE PR(9.546. DDUCTS)
Pine not	odle midge		Asana XL	0.66 lb./gei. EC	5.1-9.6 oz. (nursery only)
Pine no	odio scale	Use Ethion and oil as a donmant treatment. Use	AND:		
		any one of other materials against crawlers in late	Cythion	516./gal. EC	4 pt.
		April and mid-July.	Cythion 1	1b./zel BC	2 pt.
		(rec (HNER AL PESTS: Scales)	Cinflion 28	2 lb /rol SC	1.5-3 of. (Christmas trees only)
		(we chickler i here to come)	Relation \$7		A at
			Ministration 37	3 10 JEL EC	4 p.,
			Malathion Methoxychlor Spray	2 lb.+2 lb./gal. EC	5 qt/acre
Pine ros	et coller	Apply the Lst spray about mid-May, the 2nd somy	Dursben Turf	4 lb./gal. BC	1 st.
WEEV	1	about mid-Aurust and a 3rd spray in only	Durshan 10WSP	10% WSP	115.
	-	Soptember.	Pageant DF	50% DF	11b.
Pine tor	rtaise scale	Use all as a dormant treatment in spring. Use any	AND:		· · · · · · · · · · · · · · · · · · ·
		one of other materials against envelors in mid-Juno through July. (see GENERAL PESTS: Soules)	Gedhion 28	2 lb./gnL HC	1.3-3 pt. (Christmas trees only)
Pine (n)	he meth	Torot in and y May and actin in mid-Inly	Telebe T&O	7 9% 6	8.dl) e7
			Talstar 10WP	10% WP	6.4-32 02.
		10		6.06/12/3	
Life As	WWW.CERI)	Then when they as the point, secondly in the staty and unled the met		4.37000- 4.15 (not 17	2.5=5 ph
			CHIDREYI 4L	4 10./gal F	1 pr.
			Caroaryi 50WP	70% WP	2 ID.
			Decsibles	20% WP	1.3 02.
			Diszinon 50W	50% WP	116.
			Distinon 2B & 25%		
			(Spectracide)	25% EC	1 q t .
			Diszinon 4E & AG500	4b./gal. EC	1 pt.
			Dylaz	80% SP	20-30 oz.
			Protol INCP	80% SP	20-30 oz.
			Calmal	Alb feel E	1 at
			Casi-Timid	The family E	- 1- 2 at
				A DOUGHL F	- 4L 212
			Service 20W	3076 WP	210.
			Taking T&O	7.9% F	I-40 6Z.
			Taistar IOWP	10% WP	6.4-32 oz.
			Tempo 2	2 Ib./gai. EC	1 oz.
			Tempo 20WP	20% WP	1.3 oz.
Sauffin	•	Treat when larvas first appear and fashing is seen.	Asaaa XI.	0.66 lb./mal. EC	5.8-9.6 oz. (named sawflies only)
	-	in and y May for most coacies of condine (Sambire	Bioneter	0.3%EC	2.55 of
		In only ready for more sports of severals. (Devices	Cashand 47	A Die Ander Th	all and the second s
		may be present nom me Apiil through September.)	Curearyi 4L	4 10./gal P	1 pr.
			Carbaryl 50WP	50% WP	2 Jb.
			Decathion	20% WP	1.3 oz.
			Dersban Terf	4 lb./gal. EC	1 oz.
			Durshen SOWSP	50% WSP	0.51b.
			Cintition 25	21b/ral EC	1.5.3 nl. (Christmas trees only)
			Leader Df	1 500 gm 200	A 49 at
			LEOTOX IV	6.376 EU	ACT QL
			Mont 75WP	75% WP	3.3 T. (landscepe only)
			Methoxychlor 25	2 ib./gal. EC	2-3 qt.
			Oils, hosticultural, summ	or (see ALTERNATIVE	PRODUCTS)
			Orthene	9.4%EC	4.69 art.
			Orthere	75% SP	1.016
				1470 GE	1.4 10.
			Parenal Div	JU76 LJF	V.3 10.

D-++		When as Transf		l'ar instantion.	Agermal T+ Add Ta:
	E.M.	WHEEL IN CIVEN		2 au 1946.	304 Call Water
-			Barbary (BA)	-	4
1000	(x+a)4+		Lotitud Lints Tree		
			Server Special	200.+L100.gal.SC	234
			Second St.	0.52% 197	2449
			Several Second	ALLEL I	1 <u>4</u>
			Sect. ST	375.37	216
			Steam Birthy acid auffe)	OW ALTERNATIVE PR	0000130
			Terrer 7	2 B. gal. Sc	142
			Tange Mary	20% ¥P	1.) es.
	Saladan c	Tous when you we are a starting on the	den II	0440-00100	S Life (many self)
		samily show and file to here.	Catent C.	48.46.1	fat
			Colored SVAP	576 VI	21k
			Decetica	225.17	1946.
			Delayers I Braddone	In gal BC	16
			Design all the	10.90 H	1 ML
			Nam W	10.37	21 45
			Bretter: TV	8.7% BC	4.67 (4.
			Orbers	ANNE:	400 4
			Padany 40,0	A RUget, BC	l et. (Semiera vely)
				SIRTAR DC	1 pt. passad passa sitty
			Incessi Zerror	20.4110-040-227	ta.
			Segura WP	A24 W	1410
			Sectored	all yet	14
			Come Series	31. 11	19k
			Temps 2	2 B. Spill BC	134
			Tempe /****	DA VI	1746
				100.00	2162
	Sprace spilles mile	(Im CEMERAL PETER)			
	While play needs	Speny instant in spring when beeling appent, about mid-shymil	Linter Sea Spry	LAS REGISTER	3 pt
	Zamatania	المرديا بما يعربونه متعادية ليترار فنعد ويربعه	C70 re 25	234-404 BC	2 #4
	piers provide	constant.	Chineses & Zion allabor	LB /gd EC	1 .
			Constituen 3,476C	2.41 Build BC	9
			David and the		U.C.
			Deater VIII	10,000 84	
			interior de	Albert RC	Latin and the second
			Pagener D4	375.DJ	L A
			l'ann	Silking at BC	Let incomy enty)
			Biefes NV?	365.10	L 5 B. (annuary coly)
			TRANSPORTEC	DEAD BC	i de (namel, est);
70114	Paper i sul categorier	(ma capatila ji ratiti)			
	and the second second	International Profile	1)ID:		
	0/	lan carsanger strateg	Cylline	J BANK EC	let.
	Print Do not apply Order	an in feastantly popular.	Cylline 3	10.00.00	TA .
			Malatine St	19 April EC	lat.
			bisistica		
			Terenary cities albot	Thru holderor.	23 pt and
	Pedar non-mater	True when haven are first seen, would be blay	Nettern.	ALSHAEC:	15-5pt
		is October, at another.	Decelling Decelling	30% TT	1.3
		(Her CEPTERAL PROFILE CONTINUES)	Deater Mills	*16.7g0.00.	
			Dynafe	10 L	13-28 at.
			None W	NWW	
			lister IV	1.754 (0)	4.00 yi
			Colliver	S.M. BC	467 g.
			Tricket UP	100.0	
			New Wills	HTN MT	6 A 2 4
			1-mm ²	10-44 EC	195
			Tampa 2007	2456 47	1.9 m.
			Terrar	19 19	14
TALGOSE	بلغت سلقوه فسكاه وحدك	(Internet and Indexes)			
70/11	Prime peet mitte	Treat refers spins an Spin som in Max and resont a.	Capitan 1 12	49-Jul 7	1.4
	(Edia physic)	mini	Cablery NOT	ST. 1.9	2 0 .
			Denses SHE	24 VE	LIN-
			Linnes di & Athies	and the second s	優
			DIGNON HELC	4 m/gd. BC	
			Kellins 21	100	LLAN.
			2 مغلقات	200 Y	LANK.
			Name your Pt	2 B./gd. BC	1-1.5 og ford und dissets (tell igiel with
			Microsoft a	dia.gat P	41 E
			Ode, de senar der all T	EARATINE PLODUCTS	H Hababita Tan
			Product A new York		Line on
			Panel UT	775 L P	ED-IN OF
			Sectored	4B.M.F	14.
			Sevia SPL	500; WS	24

	t	When in Zouit	Freidige	Tealty	Agenge To Add Te 100 Call Water	
ritivita (seaf-0	Prival Raips	Trans at State sign of a thelps infrastration. (144 (Michael A. 1955)): Thelps)	Bongo (haly naisl salat)	WH ALTERNATIVE	HLOOUETTI)	
	White preck calls	Tent vien analas ar permi, dani ine L (an CEORLAI, PESES: Salas)				
TIFACANTE	L (I-re Territoria)					
REARING	Fill velocation	(Se GENERAL JEST)				
	Lathogen	(HH GENERAL FISITS)				
	Diete: Do Set apply in a	na. IV as Calcun to called as falls injury any actus.				
	L-IndiaGa	Trace for day of here big with a ngate. See ODERAL 19873: Complemi				
	Thembugs	ील्ड क्रीन में के क्रम कर करने के साथ में के र	Calleryl 4L	(Mal F	i și.	
			Dantes Ted	4 Maple BC	12.	
			Distance MW2P	30% 921	0.5 Jb.	
			1	alb.gal. P	T af	
			Sealar SPIC	376 WP	2 b .	
THOODERNE	RON	And a state of the state of the				
	A DESCRIPTION OF A DESC	(Pre CEMERAL PESTS: Suite)	Cythian	Shigal BC	2.0L	
			Cydline I Maladaine M	Fillinged, BC	12146	
	Net the word	\$44 CENERAL PENTS)				
	Linde danken	Tool balt and banches in mid-biny the cool-un	Deschen Teal	distant BC	10	
		OLD SHO MAY PARK & SPIRITUOUS.	Juston	0.1 DA(på BC	10. FG	
			Lindian 2010.	141 bigst fac	101	
			Talana (h)	110 Inga Bu	2 MA	
	Få så såndensk forse blog	Tani olan, kan biga fali agam (alarti mig- bias) nda agama asadal te panat mwayooth. taa (2015), AL PISTS: Lam Dept	ABØ: Linden 20%	145 Ib/gal. BC	UK	
	Section of airs	(*** CER4EXAL 2017)				
PORE .	طناوى	\$++ OBNERAL PERTS)	AND.			
			Crym 25 Northerit 1 (1956	ZRLAND RC Z C UNIN RC	l pl I al	
			Final sets 491	a de la dec	if Jak	
	Agences builts	(an Official NETS)				
	Langequer	(m OBHELAL NEXTS)	Aude.			
			Committeents 2.0786	2.61 B/m BC	12	
			Dissetti solit 401		17.3 wz.	
				ever a		
	Lealasiers	(1999) (1929) (1937) (1937) (1937)	Financian Text		2.5-1 pt. Lat	
			(Section of Section	120.000	26.	
			Lindens 384	LASIN MALEC	1 1 1	
			Pageane DE	2505	IN	
			Tony Tao	1.05.0	20-81-81.	
				MAAL	No. L	_
	Oppie was in the last	These values from loanses are available balag filling,	Br (marti)	verifieren. A ha deren dit	videos	
		(ma (B) BLAL FESTS: Complian)	Cashary A.M.W.	35.12	15.	
			Designed Safety	24 Yr	1 .	
			December.	201 107	13m	
			Danks Daf	4 BAR BC	1n	
			Dankan MWSP	18.54 PC	5 M	
			Process DV	24 D	LIN.	
			Series and	A Magel P	12	
			train Self	58% W?	i C	
			Triene 740	155.5	5 6-19 er.	
			Tanga 2	1 BATHL BC	1445 HE	
			Turne attach	20% WP	11 4	

					·······
Hout	Part	Wilson in Trant	Labellet Rostistão	Fermulation Non Burn	Amount To Add Te:
Thus:	1.444		t contractions	I OR DAY	IOU GAL WARE
DAGE	Bass Chafer	Teact the set of the an entry much in last last	Contrast II	416 (m) 17	1-4
(cont ^a d)	Yote Citike	and again as needed.	Carbary 40	4 10./gal P 4044 3070	1 pc 2 fb
(*******			Dusben Turf	4 lb./gal. BC	I 0Z.
			Dusban SOWSP	50% WSP	0.5 lb.
			Mariate 50	50% WP	2-3 lb.
			Methoxychlor 2EC	2 16./gal. EC	2-3 qt.
			Pageant DF	50% DF	0.5 lb.
			Scorpol Conta Linuid	4 10/gal. F 3 0. 6-3 7	1 qt .
			Savin SOW	2 10/ges r 50% \\/P	2 gu 2 16
	Rose midge	Cut and destroy infected bads to destaoy maggets.	Ophene	9.4% BC	4.69 qt
		Treat as soon as affected build are noticed, usually in	Officience Spray	Actoso	NA
		cally fairy, he felless is freeded.			
	Rose sings	Treat when skeletonized leaves are first noticed in	Carbaryl 5D	5% D	N/A
	(Hymenopterent)	only May. Retreat as needed.	Carbaryl 10D	10% D	N/A
	(samilios)		Carbaryl 4L	4 Ib./gal. F	1 pt.
			Carbary1 50WP	50% WP	216.
			Decalition	20% WP	1.3 ez. (bristy)
			Destinan SORVED	4 10.7 gal E.C.	4 02, 0 5 lb
			Medata 50	1044 W/P	0,5 ps, 9.3 lb
			Merit 75WP	75% WP	3.5 T. (landscape only)
			Methoxychlor 2EC	2 lb./gal. EC	2-3 qL
			Oils, horicultural, summ	ner (see ALTERNATIVE	PRODUCTS)
			Pageant DF	50% DF	0.5 fb.
			Resmothine BC26	2 lb./gal. EC	1 pt.
			Sevinei	4 Ib./gal. F	1 qt.
			Sevin Lapad Serie SCU	2 10./201. F 5086 1170	2 gr. 9 16
			Termo 3	AND WE AND BO	400. Log Christhy)
			Tempo 20WP	20% WP	1.3 oz. (bristy)
	Spider mites	(see GENERAL PESTS)	AND:		
			Cygon 2E	2 lb./gal. EC	1 pL
			Dimethoade 2,67EC	2.67 D./gal. BC	1 pL
			Liningthoute 409	4 IB/gal BC	17.3 02.
	Theips	Treat when theips are seen and report as needed.	AND:		
	•	(see GENERAL PESTS: Theips)	Cygon 2B	2 lb./gal. EC	l pt.
			Dimethoute 2.67BC	2.67 B./gal. BC	1 pt.
			Dimethoute 409	4 lb./gal. EC	17.5 ez.
SPRVICEREPRV	Anbide	(res (HINER & L DECETS)			
(Amelanchiar)	- Aliano				
•	Hawibers lace bug	Treat when bugs are beginning to build up, usually	AND:		
		mid- to late-May. Then treat as needed throughout	Dycarb	76% WP	12-20 az.
		the summer,	Fican W	76% WP	6 az.
		(see GENERAL PESTS: Lace Bugs)	THEOREM	70% WP	0.02
	Japanese beetle	(and GENERAL PESTS)			···
		· · · · · · · · · · · · · · · · · · ·			
	Pear stog	Treat when skeletonizing of the leaves is seen.	Carbaryi 4L	4 (b./gal. F	l pt.
	(severy)		Catheryl SWP Destfiler	20% WP	210.
			Diszinas SOW	50% WP	316.
			Diazinoa 48 A AGS00	4b./gal. EC	3 pL
			Daniban Turf	4 lb./gal. EC	\$ oz.
			Dursban 50WSP	50% WSP	0.5 lb.
			Monit 75WP	75% WP	3.5 T. (landscape only)
			Oils, korticulturai, summ	HER (SEE ALTERNATIVE	PRODUCTS)
			Pageant DF Sectored	20% DP Alls And E	U.2 ID.
			Sovietor Societ Lionia	910/88. F	r ye. 2 at
			Sevia 50W	50% WP	216.
			Scaps (failty acid calts)	See ALTERNATIVE PRO	DDUCTS)
			Tempe 2	21b./gal. EC	1 az.
			Tempe 20WP	20% WP	1.3 oz.
	مار نظر ا	(AND (WARD & L DECTS)			······
	Spirce leaftler	Treat when the first leaves are seen folded together. (see GENERAL PESTS: Compilars)			
40076°0	a _6:4.	((ELEP AT DESTRIC	A 1071-		
oraule	All and a second se	(Rec ORNERAL PESTS)	Diluom \$ Emulsive	t ib./gal. EC	1 pt.
	Black vine wervil	(see GENERAL PESTS)			
			4 h 87-		
	Retwom	(see GENERAL PESTS)	AND: Real-to-defined State of The state		
			ROUBLERO MANDE TROP	216 41 116 441 120	3-3 at
			THEAS OBILIN	TINALL'I IDA UN RC	2-5-4E
	Bulson twig	Trust when splids up first present, usually late	AND:		····
	aphid -	April of only May.	Asana XL	0.66 lb./gal. EC	5.8-9.6 oz. (musery only)
		(see GENERAL PESTS)			
Table 2. ORNAMENTALS--(Continued)

	<u> </u>					· · · · · · · · · · · · · · · · · · ·
-	-		Labelled	Formulation	Amount To Add To	:
Fiert	Let	when to treat	Perticide	You Buy	109 Gal Water	
	······					
SPRUCE	Cooley service zell	Treat before buds start to break in the spring flate March to	Carbaryl 4L	4th/rel F	1 of	
(confd)	adeleid (anlied)	mid-Antil), or after the sails ones in late July to	Carbaryl 50WP	50%4 W/P	216	
·		mid-Angest.	Durshan Turf	41b/zel EC	L oz.	
			Durshan 50WSP	50% WSP	0.516.	
			Menit 75WP	75% WP	3.5 T. finadecane onl	vì
		Note: Oils remove the sizaces (blue) bloggs from	Oils, dormant (see ALT	ERNATIVE PRODUCTS)		,,
		tres.	Oils, horticultural, summ	ET (SEE ALTERNATIVE)	RODUCTS	
			Parcent DF	50% DF	0.316.	
			Sevimal	4 lb./gal. P	I-2 of	
			Sevia 50W	50% WP	216.	
			Soops (faity acid salts) (See ALTERNATIVE PRO	DUCTS)	
					,	
	Eacture spruce gall	Treat before buds start to break in the spirng flate	Carbaryi 4L	4 lb/cal F	l pt.	
	adeigid (aphid)	March to mid-Apid), or after the galls open in	Carbaryt S9WP	50% WP	216.	
		mid-Angust to September.	Durshan Tinf	4 Ib./gal. EC	8 oz.	
		• •	Durshan SOWSP	50% WSP	0.516.	
			Meet 75WP	7 5% WP	3.5 T. (Inndscape only	y)
		Note: Oils ramove the glances (bine) Moom from	Oils, dogmant (see ALT)	ERNATIVE PRODUCTS)	• •	
		tron.	Oils, horicultural, summ	ET (SECALTERNATIVE]	RODUCTS)	
			Pageant DF	50% DF	0.516.	
			Sevimal	4 lb./gal. F	l at.	
			Sevia SOW	50% WP	216.	
			Soaps (faity acid salts) (see ALTERNATIVE PRO	DUCTS)	
			• • • •	·		
	Pine needle scale	Use any of the materials against convicus in late	AND:		• •	
	= .	April or early May.	Cythion	5 fb/gal EC	4 pt.	
		(see GENERAL PESTS: Soules)	Cythion \$	\$ fb/gal EC	2 pt.	
		,	Guthion 25	2 fb/gal EC	1.5-3 pt.	(Christmas trees only)
	Note: Oil will remove the M	ne color from Colorado Mae soruce.	Malathian 57	51b./gal. EC	4 pt.	·
			Malathion		- 2-	
			Methoxychior Sorey	216.+216./#1 FC	5 ot/acre	
			Resmethin BC26	2 lb /rsl EC	lot	
			Rockland Shade Tees	- 10% 54 . 50		
			Turant Samu	215 +1 1 15 /mil BC	2-3.01	
			insect opiny	210.+1.1 100ga 150	z-s de	
		Teast when langue any smalls in early engine	Cerbend 41	Allh /and E	1 of	
		HAR AROUNTARY OF BURNE, IN SHARY SPRING.	Carbon 4 403/70	4 10.5gal. F 4ao/ 1170	1 .	
			Describion		210.	
			December Traf	AND AND THE	1.302	
			Drashan 101	4 ID/gal. HC	6 0Z.	
			Dustan Duwor	2014 WAP	0.510.	(61
			Guinton 25	2 ID/gat EC	1.5+5 pt	(Cantennas mees omy)
			ISOTOX IV	1.3% BC	4.69 gC	
			Ment /SwP	13% WP	3.5 1. Usinaiscape entry	y)
			Memorycanor 25	2 lb./gal. EC	2-3 QL	
			Unis, horneuman, summ	IN (SOCALIERNATIVE)	KODUCIS)	
			Orthens	9.4% BC	4.69 qt.	
			Orthens	75% SP	1.016.	
			Pageant DP	30% DF	0.516.	
			Sevienoi	4 lb./gal. F	1 qt.	
			Sovin Liquid	216./gal. F	2 qL	
			Sevin 50W	50% WP	2 6.	
			Soaps (fatty acid salts) (see ALTERNATIVE PRO	DUCTS)	
			Tampo 2	2 lb./gal. EC	1 oz.	
			Tempo 20WP	20% WP	1.3 oz.	
						-
	Sprace badwarm	Treat in late April to early May when bud sheaths become	Asana XL	0.66 lb./gal. EC	3.8-9.6 oz. (aucsery (onaly)
		Jeose.	Cerbaryl 4L	4 lb./gal. F	1 pt.	
			Carbaryl 50WP	30% WP	2 Ib,	
			Decethion	20% WP	1.9 az.	
			Dibrom 3 Emulsive	t ib./gal. EC	1 pt.	
			Dursban Tud	4 lb./gal. EC	8 oz.	
			Darsban 50WSP	50% WSP	0.5 lb.	
			Pageant DF	50% DF	0.5 fb.	
			Resmethein EC26	2 lb./gal. EC	l pt.	
			Sevimol	41b./gal. F	1 qt.	
			Sevin 50W	50% WP	21b.	
			Tempo 2	21b./gal. EC	1.5 oz.	
			Tempo 20WP	20% WP	1.9 oz.	
	Sprace bad scale	Treat about July 1 when crawlers are present.	AND:			
	-	(see GENERAL PESTS: Scales)	Gathion 25	2 lb/gal EC	1.5-3 pt.	(Christmas trees only)
	Sprace needlominer	Apply to folinge in early June and late July. (In	Carbary1 4L	4 fb./gal. F	1 pt.	
		northeastern Ohio, late April for overvisiting	Carbary1 50WP	50% WP	2 16.	
		lavas)	Darsban Tauf	4 Jb./gal. EC	1 gt.	
		·	Dussban 50WSP	50% WSP	216.	
			Pageant DF	50% DF	2 i b.	
			Sevimol	41b./gal. F	1 qt.	
			Sevin 50W	50% WP	2 fb.	
	Somce spider mits	(see GENERAL PESTS)	AND:			
	Note: Oil will remove the bi	ne calor from Colorado bine sprace.	Resmethrin EC26	2 lb/gal. EC	1 pt.	
					•	
	White pine weevil	Spray leaders in spring when beetles appear in April.	Lindens Borer Sprav	1.65 fb./gal. BC	3 pt.	
	• -	· · · · · · · · · · · · · · · · · · ·			-	

Best	Pest	When to Trust	Labelied Porticide	Formulation You Bay	Amount To Add Te: 100 Gel. Water
SWEET GUM	Bagwonn	(see GENERAL PESTS)			
	Fall webworm	(see GENERAL PESTS)			·····
	Lesfminer	Treat when minet first anness and sensest at mandad	Nicesso	A 29/EC	2 5 5 at
		Trees once much The shipse are token to hereof.	Dusban Turf	4 lb./gal. EC	2,55 pc 1 qL
			Dusban 50WSP	50% WSP	2 m.
			Margosan-O	0.3%EC	2.5-5 pt.
			Pageant DF	50% DF	- Luo y qu, 2 M.
			Talstar T&O	7.9% F	20-40 oz.
			Talstar 10WP	10% WP	16-32 oz.
	Sweet gum jitmaking sclas	Use the oil as a domant treatment in the spring. Use other matchinks against crawlers on leaves in mid-Jene or September when young scales are seen on twigs and buds. (see GENERAL PESTS: Scales)	·		
	Sweet guan leaffier	Treat when harves are seen webbing leaves together.	Methexychior 25 Talstar T&O Talstar 10WP	2 lb./gal. EC 7.9% F 10% WP	2-3 qL 8-40 oz. 6.4-32 oz.
	Twospotted spider mite	(see GENERAL PESTS)			
SYCAMORE	Aphids	(tee GENDRAL PESTS)	AND: Difeen # Emulsive	\$ fb./gd. BC	l pt.
	Bagwarm	(see GENERAL PESTS)	_		
	Fall webwonns	(see GENERAL PESTS)	AND: Dibrom \$ Emulsive	4 lb./gal. EC	1 pt.
	Japanese beelle	(544 GENERAL PESTS)			
	Leaffolder	Trest othen leaves are seen folded together. (see GENERAL PESTS: Caterpillars)			
	Leafhopper	(see GENERAL PESTS)			
	Sycamore lace bag	Treat in mid- to late-May. Make two applications	AND:		
		spaced about 10 days apart.	Figure W	76% WP	11 cz .
		(SE OEIGAAL FESTS, LES BIES)	Methoxychior Spray Turcam	2 lb.+2 lb./gal. EC 76% WP	2.5 pt/ecre 11 ez.
					· · · · · · · · · · · · · · · · · · ·
	Tentagan scale	Uside any one of the materials when crewters are present on Jeaves in June. (see GENERAL PESTS: Scales)	ANU: Malalhion 57	5 lb/gal. EC	2.5 pt.
	Whitemarked	Treat when caterpillars are first seen and repeat	Bioscem	0.3%BC	2.5-5 pt.
	tussock moth	as needed.	Decatalon	20% WP	1.9 ez.
		(see GENERAL PESTS: Caterpillans)	Dibrom # Emulsive	LID./gol. EC	1 pt
			Dimilia 25W	25% WP	4-t oz/ege
			Durshan Turf	4 fb./gal. EC	1 pt.
			Dursban 50WSP	30% WSP	116.
			Methonychior Spray	2 lb.+2 lb./gal. EC	2.5 pt/scre
			Magosun-O	0.3%EC	2.5-5 pL
			Methoxychior 25	2 Rb/gal. EC	2-3 qL
			Parcent DF	54% DF	1.00- en.
			Rockland Shade Tree		
			Insect Spray Eximites W/D	21b.+1.11b./gal. EC	2-3 qt. 2 4-4 3 ee
			Telster T&O	7.9% F	\$-40 oz.
			Talstar 16WP	14% WP	6.4-32 02.
			Tempe 2 Tempe 2011/70	2 lb/gal. EC 2464 3/D	1.5 02.
			Tombe to et.		
TULIP TREE	Leafminer	Treat when mines first appear.	Bioneem	0.3%EC	2.5-5 pt.
	(Coleopterous)		Darsban Tuff Darsban SöWSD	410./gal. EC 4842.10/20	1 qt. 2 Th
			Magosan-O	0.3%EC	2.5-5 pt.
			Orthene	9.4% EC	4.69 gt.
			Pageani DF Talata T&O	50% DF 2 0% F	2 D. 20-40 oz
			Tabtar 10WP	10% WP	16-32 oz.
	Talip spot gall midgo (Thecodenioviv	Treat when mining of leaves starts, but before rais form, early summer.	Carbaryl 4L Carbaryl 50WP	4 lb./gal. F 50% WP	1 pt. 2 lb.
	(triodendri)	Dere round only semilitie	Sovimal	4 lb./gal. F	1 qt
	-	<u></u>	Sevin SW	10% WP	21b.
	Tulip tree scale	Use oil as a dormant treatment in fail or spring. Use other meterials when crawless are present,	AND: Rookland Shado Tree		
		neusliy in August. (see GENERAL PESTS: Scalar)	Insect Spray	2 (b.+1.1)b/gal. EC	2-3 qt

Table 2. ORNAMENTALS--(Continued)

Table 2. ORNAMENTALS--(Continued)

				-	
Hest	Pert	When to Treat	Labelled Perticide	Formulation You Buy	Amount To Add To: 100 Gal. Water
TULIP TREE (coat [*] d)	Yellow poplar worvil	Use any one of the materials to control adults in only July.	Bioneem Carberyl 4L Carberyl 50WP Duesban Tarf Dersban 50WSP Pageant DF Sevimol	0.3%EC 4 lb./gal. F 50% WP 4 lb./gal. EC 50% WSP 50% DF 4 lb./gal. F	2.5-5 pt. 1 pt. 2 kb. 1 pt. 1 kb. 1 kb.
			Sevia 50W	30% WP	2 16.
VIBURNUM	Aphids	(see GENERAL PESTS)	••		
	Spider mites	(see GENERAL PESTS)			
	Note: Malathion may injur	s Viðurnum.			
WALNUT	Aphids Note: Do not apply Diazing	(see GENERAL PESTS) (If walants are to be easen, check insecti- cide labels for days-waiting-time from last application to harvest.) an after husks open.	AND: Dibrem 3 Emulaive	\$16./gal EC	1 pt.
	European red mite	(see GENERAL PESTS)			
	Fall webworm	(see GENERAL PESTS)	AND; Dibers & Franking	115 6-4 EC	1-4
	Leafhoppers	(see GENERAL PESTS)	Liniain 4 Fineland		1 pc
	Twospotted suider mite	(See CHNERAL PESTS)			
	Note: Do not apply Dinzine	on after basile open.			
	Walaut caterpillar	Treat when caterpillars are first seen; about late June.	Bioneem Carbaryl 4L Carbaryl 36WP	0.3%EC 4 lb./gal. F 50% WP	2.5-5 pt 1 pt 2 lb.
	Note: Do not apply Diazing	se efter kucks open.	Decembion Duesban Turf Duesban, 50WSP	20% WP 4 fb/gel EC 50% WSP	1.3 ez. 8 ez. 0.5 fb.
			Magoran-O Percent DF	0.3%EC 50% DE	2.5-5 pt.
			Sevimal	4 fb./gal. F	1 gt.
			Sovia SOW Taistar TAO	50% WP 7.9% P	2 lb. 5-40 m
			Taistar 10WP	10% WP	6.4-32 oz.
			Tempo 2 Tempo 20WP	2 lb./gal. EC 20% WP	1 ez. 1.3 ez.
	Weinst petiole	Treat in only spring about the time the leaves	Carbaryl 4L	4 lb./gal. F	1 pt.
	gell mite	nre half open or at first sign of miles on the leaf neticies.	Carbaryl SOWP Digofol 4EC	50% WP 4 fb./col. EC	2 lb. 1.25 at
		Person	Jonst	4 fb./gal. F	4-1 oz.
			Keithene 35 Kaithene 50	35% WP	1-1.316.
			Morestan 4	Alb./zal. F	4-8 oz.
			Pentro Aquallew	1 lb./gal. F	\$-16 cz.
			Pentuc WP Sevimal	50% WP 4 Ib./val. F	12-16 02. 1 mt
			Sevia 50W	50% WP	216.
WILLOW	Aphids	(see GENERAL PESTS)	AND: Dibrem \$ Emulaive	tib/gal. BC	1 pt.
	Вадлини	(see GENERAL PESTS)			
	Borers (beeffes)	Apply thereaghly to the truck area at monifoly intervals from May to August.	Lindano Borer Spray	1.65 lb./gal. EC	3 qt.
	Fell webwoon	(see GENERAL PESTS)	AND: Dibson & Envisive	\$1b./gel. EC	1 pt.
	Leaf beetles	Treat at first sign of loaf fooding and repeat as	Cadacyl SD Cadacyl 1970	5%D	N/A N/A
			Carbaryl 4L	41b./gal. F	1 pt.
			Curbaryl 50WP	59% WP	216.
			Dursben Turf Dursben 40WSP	4 lb./gal. EC 50% WXP	1 az. 0.11h.
			Dycarb	76% WP	12-20 02.
			Fican W Isotor IV	76% WP 1 % EC	11 ez. 4 69 et
			Methacychier 25	2 lb./gal BC	2-3 qL
			Onthene	9.4%EC	4.69 qt
			Pageant DF Postnov dBC	50% DF 4 16/mil SC	0.510. 1 mt
			Rockland Shade Tree	- 100 BBL 100	- 1-
			Insort Spray	2 1b.+1.1 lb./gal. EC	2-3 gt.
			Sevinol Regio Tionid	4 (b./gal. F 2 (b./gal. F	l qt. 2 at
			Sonia SW	50% WP	216.
			Soaps (fatty acid salts)	(SOR ALTERNATIVE PRO	DUCTS)
			T. Brocking	70% WP	11 62.

Table 2. ORNAMENTALS-(Continued)

Hest	Peri	When to Treat	Labelled Perticide	Formulation You Buy	Amount To Add Te: 100 Gal. Water
WILLOW	Oysters)jell scale	(see GENERAL PESTS)	AND:		
(cont'd)			Cythion	5 Ib./gal. EC	l pt.
			Cythion 2 Malathion 57	8 lb./gal. EC 5 lb./gal. EC	l pt. l pt.
			Malathion Mothoxychlor Spray	2 [b.+2]b./gal , EC	2.5 pt/sage
			Rockland Shade Tree Insact Seray	216+1.116./mail. FC	2-3 at
				_	1-
	Poplar textmaker	Treat when larvae are first seen which can be	Decathion	20% WP	1.3 oz.
		from May to October or as needed.	Durshan Turf	41b./gal. EC	\$ az.
		(see GENERAL PESTS: Caterpillans)	Dursban 50WSP	50% WSP	0,5 fb.
			Jisotax IV	4.5% EC	4.69 qt.
				9.4% EU 444/ DE	4.07 QL
			Televis ThO	20% DF 4.0% E	9.5 ID. R.4A.am
			Taletar 100/D	/	5 4.20 or
			Tempo ?	1076 WF 2 ik /eel BC	0.4-52 UZ.
			Tempo 2011/P	2103gar 150 2094 M/D	13.07
		· · · · · · · · · · · · · · · · · · ·	100000000		1.5 042
	Sawfiles	Treat when larvae are small but before extensive	Carbaryl 4L	4 1b./gel. F	1 pt.
		leaf feeding is noted.	Carbaryl SOWP	30% WP	2 (b.
			Decuthion	20% WP	1.3 m2.
			Dursban Terr	4 Ib./gal. EC	5 CZ.
			DUISDER DEWSP	2076 WAP 2664 1170	0.510. 26T. den derme entrè
			Mattrin Swir	/ 37% W P 0.4% EC?	3.5 L. (canniscape overy)
			Orthone	9,476 EL 7564 ED	4.05 gL 1.01k
			Dercent DE	50% DE	0.516
			Saimel	Ath ind R	lat
			Sais Limid	2 lb /gal B	2 gc
			Seria SOW	Sex WP	210.
			Tompo 2	2 lb/ed. EC	1 02.
			Tempo 20WP	20% WP	1.3 ez.
	Spider miles	(see GENERAL PESTS)			<u>.</u>
	Tent cuterpillars	(spe GENERAL PESTS)		·	· · · · · · · · · · · · · · · · · · ·
WISTERIA	Leathoppers	(see GENERAL PESTS)			
YEW	Black vine weevil	(see GENERAL PESTS)	AND:		
(Tanu)			Endocide 3EC	3 Ib./gal. EC	1.33 qt. (nursery only)
			Lindage Borer Spray	LODIO/gal EU	3 pl.
				SD/gal EC	1.33 qC (Aursery only)
			Thiodan 35C	3 lb./gal. EC	1.33 at. (nursery only)
	Hotcher scale	Use oil as a domnant treatment in the spring. Use	AND:		2-4
		any one of the other planetal against cravers	Cathian 1	the fact the	1 25 m
		(see GENER AL PESTS: Scaler)	Dimethosts 2 67EC	2 67 b /est EC	50.02
		(Dimethoate 499	4 lb/eal EC	35 oz.
	Moslylveg	Use oil as a domant treatment in the spring.	AND:		
		Treat with any one of the other metalials when	Dispethoate 2.67EC	2.67 b./gal. EC	50 oz.
		overwindering symphs become active in mid-May	Dimethoale 400	4 Jb./gal. EC	17.3 oz.
		and about June 1 and again in late July. Dreach	Dycarb Tisse 117	76% WP	12-20 02.
		(and (ICAURAL DEFERS) Madedana)	From w	7076 WE	11 42
		(see GENERAL PESIS: REEKYDIGS)	1 ie n	/\$% Wr	11.02
	Taxas bud mite	Treat when mittes are first seen and repeat in 10	Dicafol 4EC	4 fb/gal EC	1.25 qt.
		days and then as gooded.	Dimethoute 2.67EC	2.67 lb/gal. EC	50 ez.
			Dimethoate 400	4 lb./gal. EC	17.5 02.
			Endocide IEC	3 lb./gal. EC	0.67 gL (nursery only)
			taroi.	4 JD./gal. F	4-8 07_ 1 (1)}
			Kamané Jo	3376 WP	1+1.21D. A <_1 (b.
			R. C.	2 ib Jack PC	v. 22 10. 1-1 4 oz finch tutnik disartator (soli iniact oolu)
			Morestee 4	z storget EX. d Bh./gel. F	2-4.2 oz. man many annorm (son myou only)
			Pente Amilou	1 fb./gal. F	\$-16 m2.
			Pentac WP	10% WP	12-16 ez.
			Photos	3 lb./gal. EC	0.67 gt. (aussery only)
			Thiedan SOWP	58% WP	1 lb. (nursery only)
			Thiodan 3EC	3 lb./gal. EC	0.67 qt. (aursery only)
YUCCA	Aphids	(ICO GENERAL PESTS)			····

Scalos

Treat when crawless are first seen and repeat in 3 weeks. (see GENERAL PRSTS: Scales)

DILUTION TABLES - A GUIDE TO ACCURATE MEASURES

Wettable Powders

Number of ounces of wettable powder to use in small sprayers when amount per 100 gallons is known.

100 Gels.	10 Gais.	5 Gels.	2 Gals.	1 Gal.
0.5 lb.	0.8	0.4	0.2	0.1
1 Њ.	1.6	0.8	0.3	0.2
2 lbs.	3.2	1.6	0.6	0.3
3 lbs.	4.8	2.4	1.0	0.5
4 Ibs.	6.4	3.2	1.3	0.6
5 Ibs.	8.0	4.0	1.6	0.8

Emulsifiable Concentrates

Number of fluid ounces of emulsifiable concentrate to use in small sprayers when amount per 100 gallons is known.

100 Gals.	10 Gals.	5 Gals.	2 Gals.	1 Gal.
1 pt.	1.6	0.8	0.3	0.2
lopt,	3.2	1.6	0.7	0.3
2 at.	6.4	3.2	1.3	0.6
1 gal.	12.8	6.4	2.6	1.3

Mist Blower Quantity of emulsifiable concentrate (EC) needed to make a 25X concentration.

If Amount per 100 Gals. for	Use This .	Amount in a Mi	st Blower for:	
Sprays is:	25 Gals.	10 Gals.	2 Gals.	1 Gal.
1 pt.	6.25 pt.	2.5 pt.	8 fl. oz.	4 fl. oz.
1 qt.	6.2,5 qL	5.0pt.	1 pt.	8 fl. oz.
2 qt.	3.13 gal.	5.0qt.	l qt.	1 pt.
1 gal.	6.25 gal.	2.5 gal.	2 qt.	1 qt.

Table of Measures

Liquids

- 1 level tablespoonful = 3 level teaspoonfuls
- 1 fluid ounce = 2 tablespoonfuls = 29.57 milliliters
- 1 cupful = 8 fluid cunces
- 1 pint = 2 cupfuls = 16 fluid cunces
- 1 quart = 2 pints = 32 ounces
- 1 gallon = 4 quarts = 128 fluid ounces

Weights

- 1 ounce = 28.3 grams
- 1 lb. = 16 ounces = 454 grams
- $1 \tan = 2,000 \text{ lbs.}$

Pounds Actual Pesticide		Poun	ds Actual o	f Pesticid	e Neede		
Per Gallon	1/4	1/2	3/4	1	2	3	4
Concentrate		Pints o	f Liquid C	oncentral	e to Use	r Per J	Acre
1	2	4	6	8	16	24	32
1 1/2	1.3	2.6	4	5.3	10.6	16	21.3
2	1	2	3	4	8	12	16
4	.5	1	1.5	2	4	6	8

Pounds Actual Acre Pesticide		Pounds	of Actual	Wettable	Powder	to Use Per
in Wettable Powder	1/4	1\2	3\4	1	2	3 4
15%	1.75	3.33	5	6.5	13	20 26.5
25%	1	2	3	4	8	12 16
40%	.6	1.25	1.75	2.5	5	7.5 10
50%	.5	1	1.5	2	4	68
75%	.4	.7	1	1.33	2.66	4 5.33

Percent Actual Acre Pesticide		Pound	s of Actual	Wettable	Powder	r to Us	e Per
in Dust or Granules	1/4	1/2	3/4	1	2	3	4
2 1/2%	10	20	30	40	80	120	160
5%	5	10	15	20	40	60	80
10%	2.5	5	7.5	10	20	30	40
20%	1.25	2.5	3.75	5	10	15	20
25%	1	2	3	4	8	12	16

Small Gallonage Rates

If an insecticide recommendation is given on the basis of 100 gallons of finished spray but only 1 gallon is wanted, the following is a general rule to follow to prepare that 1 gallon of spray:

Dry Formulations -

For each 1 pound of powder that is recommended per 100 gallons of water, use 1 level tablespoonful (T) per 1 gallon of spray.

Liquid Formulations -

For each 1 pint that is recommended per 100 gallons of water, use 1 teaspoonful (t) per gallon of spray.

Rates to Use To Treat One Acre

INFORMATION ABOUT INSECTICIDES/MITICIDES

Perticule (Common Chemical Name)	Trade Name(s)	Clauification	Oral LD _m ¹ (mg/kg) ²	Dermal LD _m ¹ (mg/kg) ²	Manufacturer
abameetin	Avid	microbial toxina	650	>2000	Merok
scephate	Dendrex, Isotox IV, Orthene, Orthenex	organophosphate	980	10250	Valent
əzədirəctin (=neem, əzətin)	Bioncom, Margoran-O, Noomisis	botanical	>5000	>2000	Grace-Sierra, Safer
azinphos-methyl	Guthion	organophosphate	19	220	Miles
Bacillus thuringiensis var. kurstaki	Biobit, Bectospeine, Caterpillar Attack, Dipel, Javelin, Larve-BT, Thurleide, Victory and others	spores + crystalline delta-endotoxia, misrobial	Done	none	Numerous - Abbott DuPont, Upjohn Co Sendoz , etc.
Bacillus thuringiensis var. tenebrio (=san diego)	M-Oos, Trident II	microbial	Кове	none	Myeogen, Sandez
bendiscarb	Dyvarb, Ficam, Turcam	earbamate	156	>1000	Nor-Am
bifenthrin	Talatar	pyrethroid	375	>2000	FMC
carbaryl	Carbaryl, Sovimal, Sovin	carbaronte	246	>4000	Rhone-Poulenc, Drexel
chlorpyrifos	Dumban, Pageant	organophosphate	270	2000	DawElanco
eryolite	Kryvoide	inorganic fluorine	practically	nontoxic	Aiochem
cyfluthrin	Decathion, Tempo	pyrethroid	826	>2000	Miles, Olympic
diazinon	Diszinon, Spootzecide	organophesphate	400	3600	Ciba, Drexel
dicofol	Docofol, Kethane	chlorinsted hydrocarbon	595	>5000	Rohm & Haas
dierotophos	Bidrin, Inject-a-cide B	organophosphate	17	224	DuPont, Mauget
dienochlor	Pentac	chlorinated hydrovarbon	3160	>3160	Sandoz
diflubenzuron.	Dimilin	insect growth regulator	>4640	>10,000	Uniroyal
dimethoste	Cygon, Dimethoste	organophosphate	235	>400	American Cyanamid, Drexel
disulfoton	Di-Systen	organophosphate	4	10	Miles
endosulfan	Endocide, Phaser, Thiodan	chlorinated hydrocarbon	160	359	FMC, Hoechet
esfenvalente	Asana XL	pyretuoid	458	>2000	DuPont
fenetrothion	Pestroy	organophosphate	800	1300	PBI-Gorden
fkrvalimate .	Mavrik Aqua Flow	pyretinoid	282	20000	Sandoz
hexythiazox	Hexygon	carboxamide	5000	>5000	Gowan
imidaeloprid	Marathon, Merit	chloronicotinyl	2591	>2000	Miles, Olympio
isofemplios	Discus, Oftanol	ogenophosphate	20	700	Miles, Olympic
lambda-cyhalothrin	Scimitar	pyrethroid	79	632	Zenios
lindanc	Lindane	chiorinated hydrocarbon	125	1000	Drexel, Bonide
malathion	Cythion, Malathion	organephosphate	1000	4100	Setre, Drexel, UAP
metaldehyde	Bug-Gota, Doadline, Slug-Gota	metacetaldehyds	360		Valent
methiocarb	Grandslam, Mesurol	carbamate	20	>5000	Olympic, Miles
methoxychlor	Mariate, Mothoryschior	chlorinated hydrocarbon	6000	>6000	Droxel, Prentise
methyl purathion	Methyl Parathion	organophesphate	20	491	Platte
naled	Dibrom	organophosphate	272	1100	Valent
examyl	Oxamyi, Vydate	carbamate	5.4	2960	DuPont
oxydemeton-methyl	Harpoon, Inject-a-cide, Metasystax-R2	organophosphate	48	112	Gowan
oxythioquinex	Jourt, Morestan	dithiocarbonate	1500	>2000	Miles, Olympic

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INFORMATION ABOUT INSECTICIDES/MITICIDES (cont'd)

		·			
Perticide (Common Chemical Name)	Trade Name(s)	Claudification	Oral LD _a 1 (mg/kg) ²	Dermal LD _m ¹ (mg/kg) ²	Manifiscturer
parathion	Parsthion.	organophosphate	2	50	Platte
permethrin	Ambuch, Pounce	pyrethroid	4000	>4000	FMC, Zenece
petroleum oils	Dormant, Summer, Superior Oile, etc.	hydrocarbon oils	exempt		ministous
phosmet	Imidan	organophosphate	147	>4640	
propargite	Omamite	sulfite ester	4029	2940	Uniroyal
pyrethrum	Pyrethnia, Pyrellin, Pyrenone, etc.	botanical	1500	1800	Farifield, Prentiss, etc.
reamethtin	Resmethrin	pyrethroid	>2500	>3000	Fairfield
rotenone, subé	Prensux, Rotenone	botanical	1500		Fairfield, Prontine
soaps, pesticidal	Aphid-Mite Attack, Insecticidal Scap, M-Pede, etc.	fatty aoid salts	practically:	nontoxio	Mycogen, Ringer
trichlorfon	Dylox, Proxel	organophosphate	250	>2100	Miles, Nor-Am

Farm Chemicals Handbook 93 (Meister Publishing Co., Willoughby, OH), and technical data information where available. "Equals mittigrams per kilogram of body weight applied orally or demaily. (1 milligram = 1/1,000 of a gram, 454 grams = 1 lb.)

PRODUCTS LISTED IN TABLES AND TYPE OF REGISTRATION ¹

Ambush 2EC (†) Ambush 25W (†) Asana XL (†) Avid (*) Bioneem "Bt" (kurstaki) (see ALTERNÁTIVE PRODUCTS) **Bug-Geta** Carbaryl 5D Carbaryl 10D Carbaryl 4L Carbaryl 50WP (*) Cygon 2E Cythion 5EC Cythion 8EC Deadline Bullets **Deadline Granules** Decathlon 20% WP (*) Dendrex Diazinon 50W (*) Diazinon 2E Diazinon 4E & AG500 (*) Di-Syston 15% G (†) Dicofol 4EC **Dibrom 8 Emulsive** Dimethoate 2.67EC Dimethoate 400 Dimilin 4L (†) Dimilin 25W (†) Discus 5% G (*) Dursban Turf (*) Dursban 50WSP (*) Dursban 1EC Dursban 0.5EC Dycarb 76% WP Dylox (*)

Endocide 3EC (*) Ficam W 76% WP (*) Grandslam 75WP (†) Guthion 2S (†) Harpoon (†) Hexygon 50-WP (*) Imidan 70-WSB (*) Inject-A-Cide (†) Inject-A-Cide B (†) Isotox IV Trenst Kelthane 35 (*) Kelthane 50 (*) Kryocide 96% WP Lindane 20%EC (†) Lindane Borer Spray Malathion 50 Malathion 57 Malathion + Methoxychlor Spray Marathon 1% Granular Margosan-O Mavrik Aquaflow Mesurol 75% WP Merit 75WP Merit 0.5G Metasystox-R2 (†) Methyl Parathion 4E (†) Methyl Parathion 7.5E (†) Morestan 4 Oftanol 2 Insecticide (*) Oils (see ALTERNATIVE PRODUCTS) Omamite Orthene 75% SP Orthene 9.4%EC Orthenex Spray, Aerosol

Pageant DF (*) Parathion 4EC (†) Parathion 8E (†) Parathion 8 Aqua (†) Pentac Aquaflow (*) Pentac WP (*) Pestroy 4EC Phaser (*) Pounce 3.2EC (†) Pounce 25WP (†) Proxol 80SP (*) Pyrethrin (+PBO) (see ALTERNATIVE PRODUCTS) **Resmethrin EC26** Rotenone + Pyrethrin (see ALTERNATIVE PRODUCTS) Rockland Shade Tree Insect Spray Scimitar WP (*) Sevimol 4F Sovin Liquid 2F Sevin 50W Sevin 5 Dust Slug-Geta Soaps (see **ALTERNATIVE PRODUCTS)** Spectracide 25% EC Steinernema carpocapsae (see ALTERNATIVE PRODUCTS) Talstar T&O (*) Talstar 10WP (*) Tempo 2 Tempo 20WP Thiodan 50WP (*) Thiodan 3EC (*) Turcam (†) Vydate L (†)

Oxamyl 10G (†)

> Products without symbols are general use products.

Products with (*) are designated on labels as "Commercial or Agricultural Use Only" Products with (†) are designated on labels as "Restricted Use Pesticide"

