



# HORTICULTURE NEWS

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**Notes from my desk:** well spring has sprung and now we get to enjoy a couple of months of well deserved mild weather...

We just completed a very successful first time program. The Landscape Design and Rainwater Harvesting Seminar was well attended. Water has always been a precious commodity in Texas and the fact that we have had a lot of rain over the last couple of months doesn't change that. Interest by the participants has the potential of creating many more educational and hands-on programs, so stay tuned for coming attractions...

**Things** have been hopping around here with many questions from the community and we are always eager to help resolve those issues. The usual inquiry on how to control turf weeds was asked regularly. The over abundance of rain created several fungal related problems for ornamentals.

**As always,** do not hesitate to contact me with your questions, suggestions or program needs.

**Now** get ready, set, go...enjoy all things nature has to offer!

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### Inside this issue:

|                     |    |
|---------------------|----|
| Notes               | 1  |
| In The Garden       | 2  |
| Horticulture Tips   | 4  |
| Featured Plant      | 6  |
| Horticulture Issues | 10 |
| Upcoming Events     | 13 |
| Contact Us          | 13 |



## IN THE GARDEN

**T**he Department of Soil & Crop Sciences receives soil samples from all parts of Texas. Every few months they review the results of several routine soil test. One issue that occurs occasionally in a majority of the horticultural samples from home gardens is High to Very high ratings for both Phosphorus (P) and Potassium (K). The ratings of High basically means that the soil can supply all of the plant's needs to complete its total lifecycle without adding any fertilizer containing that nutrient. The Very High rating means that the soil can more than supply the plant's need for a nutrient, thus that nutrient does not need to be added as fertilizer.

- \* How do soil test levels of P and K become elevated? One issue is the indiscriminant application of synthetic/chemical fertilizers without the guidance of a soil test. Some folks get “heavy-handed” and apply more fertilizer than is needed. Many gardeners do not realize how much fertilizer they are applying, especially on small garden plots. Repeated over-applications of fertilizer materials can develop into a problem with fertilizer salts. All of our fertilizer materials are a salt of one kind or another; chloride, sulfate, nitrate, carbonate, borate, phosphate, etc. As these accumulate in the soil/planting material, they do reach a threshold level, at which time the salts become detrimental to plant growth and development.
- \* Another issue with Very High soil test-P levels is that these high P concentrations do cause problems with both Zinc (Zn) and Iron (Fe) uptake and utilization by plants. These soils will likely have problems for 3-5 years. Foliar applications of Zn and/or Fe chelates are advisable. Soils with high P levels will require special treatments for much longer. Sometimes, flipping the soil, if the underlying soil contains less P might do the trick. Foliar sprays of Zn and/or Fe along with flipping the soil may be sufficient to alleviate some of the problems. Then there are times when it would be necessary to “move-the-garden” and start over! Manures and composts should be applied judiciously. Using organic fertilizer, manure and compost, with unknown fertilizer values, can significantly increase soil test-P values in a rather short period of time. Repeated applications over several years can cause high soil test-P values. Just think about it like this, leaves are the factory where food is developed and when leaves fall-off of plants, they contain nutrients. In the composting process, it is generally said that ten parts of organic material degrades down to one part of compost. We have concentrated the nutrients in the compost. Something to remember is that about 45 pounds of anything/1,000 square feet is equivalent to one ton per acre. So the home gardener might ask “How much compost or manure was added to the garden each year or every other year?”

It is recommended that a soil test is done every 3 to 5 years, so let us know if you need a kit...

*“The soil is the great connector of lives, the source and destination of all. It is the healer and restorer and resurrector, by which disease passes into health, age into youth, death into life. Without proper care for it we can have no community, because without proper care for it we can have no life.”* Wendell Berry

### Using Oils as Pesticides

Oils have been used as pesticides for centuries and are some of the most effective, safe alternatives to synthetic insecticides and fungicides. Most oil based products sold as pesticides are regulated by the Environmental Protection Agency (EPA) under the Federal Insecticide, Fungicide and Rodenticide Act. Exemptions are granted to edible oils and other specific exempt ingredients that are considered to pose minimum risk to humans (<http://www.epa.gov/>). Safe and effective use of any oil as a pesticide, however, requires a basic understanding of its chemical nature, mode of action and limitations of use.

Types of oils and oil products that are commercially available for use as pesticides will be listed later. These include oils distilled from petroleum (also known as horticultural or mineral oils) and oils extracted from plants and animals. Most oil-based pesticides are used for insect control; but in many cases oil products also have fungicidal properties.

**Petroleum oils** are highly refined, paraffinic oils that are used to manage pests and diseases of plants. Similar paraffinic oils are found in automotive and household lubricants and cleaners. Petroleum oils may be referred to by many names, including horticultural oil, spray oil, dormant oil, summer oil, supreme oil, superior oil, Volck oil or white mineral oil. These names usually refer to particular types, uses or brands of petroleum oil. The terms “summer oil” or “all season oil” indicate that the product can be safely used on plant foliage during the growing season. Prior to the advent of modern, highly purified oils, the term “dormant oil” referred to heavier, less refined oils. They could only be used in the fall and winter after leaf drop or in the spring before plant buds open. Because these older, dormant oil sprays would damage growing foliage, they were used mainly to combat the over-wintering stages of the pest or pathogen.



## HORTICULTURE TIPS

**Modern, petroleum-based horticultural oils** are refined to standard specifications. The unsulfonated residue (UR) is a measure of the degree of oil refinement and is expressed as a percentage. Oils contain saturated and unsaturated hydrocarbons. Saturated hydrocarbons are more stable than unsaturated hydrocarbons, which can form toxic substances when sprayed on plants. In general, the higher the UR, the less unsaturated hydrocarbon content in the oil and the less likelihood of plant injury. Dormant oils have UR between 50 and 90 percent; summer oils, between 92-96 percent. Stilet oils are highly refined horticultural oils and have UR above 99 percent. Viscosity is a measure of oil “thickness” and is expressed in time units (Saybolt seconds) required for the oil to flow through an opening of standard size. In general, the lower the viscosity, the less likelihood for plant injury. The viscosity of horticultural oils varies between 60 and 90. Distillation range is a measure of the purity of the oil fraction and is expressed as a temperature range (degrees Fahrenheit). The temperature range represents the boiling point of the oil components at 10 and 90 percent distillation. In general, the more narrow the distillation range, the more predictable the performance of the oil when sprayed on plants. Distillation ranges of 80°F or less are considered “narrow range” appropriate for spray oils. Oils with boiling points above 455 °F may damage plant foliage. Minimum and maximum boiling points of horticultural oils vary between 412 °F and 468 °F, depending on the type of oil.

**Plant oils** include oils extracted from plant seeds, leaves, stems or flowers. They contain fatty acids and other lipids. Some of the most common fatty acids in plant oils are palmitic, steric, linoleic and oleic acids. Neem oil is extracted from the neem tree, *Azadirachta indica*. Some neem oil products contain an additional active ingredient, azadirachtin. It is considered an insect anti-feeding agent and insect growth regulator. Canola oil is extracted from rape, *Brassica napus* and *B. campestris*. It is generally sold as dormant oil although there are products recommended for the growing season. Soybean oil is extracted from the widely grown legume, *Glycine max*. Soybean oil and cottonseed oil are extracted from cotton, *Gossypium hirsutum*. They are commonly used in food and feed products. Many plant oils are exempt from EPA regulations and some are sold for organic production.

**Fish oils** are very similar in chemical composition to plant oils. They are mostly by-products of the fish processing industry. Fish oil products are often combined with plant oils, and the fish oil is listed as an inert ingredient. Some fish oil products are certified organic.

One limitation of plant and animal oils is that their natural origin contributes to a wide variation in composition and quality. This depends on geographic origin and species from which the oil is extracted. There are no well defined standards for quality and use of plant and animal oils.

### **Mode of Action Of Oils**

Regardless of the source or type, all oil-based products have a similar mode of action. Insecticidal oils kill insects on contact by disrupting gas exchange (respiration), cell membrane function or structure. They also kill them by disrupting their feeding on oilcovered surfaces. Their toxic action is more physical than chemical and is short-lived. When used against plant pathogens, oils may smother fungal growth and reduce spore germination on treated surfaces. They are mostly fungistatic, stopping fungal growth rather than killing the pathogens. Stylet oils are highly refined oils and may control insect-vectored plant viruses in addition to insects, mites and fungal pathogens. These oils reduce the ability of aphids to acquire the virus from an infected plant and transmit it to healthy plants. Stylet oils may interfere with the virus's ability to remain in aphid mouthparts (stylets). Some plant oils that contain sulfur compounds, such as neem oil, may possess additional fungicidal activity compared to petroleum oils.

Oil-based pesticides have low residual activity and must be sprayed directly on the insect or mite. To combat plant fungal pathogens, oils generally must be applied prophylactically prior to infection. Repeated applications of oils may be needed to achieve desired levels of control.

### **Target Pests and Diseases**

Oils are most effective against soft-bodied arthropods. They are most commonly used against mites, aphids, whiteflies, thrips, mealybugs and scale insects. Dormant oil sprays are also used against over-wintering eggs and scales. Horticultural and plant oils are commonly used to suppress certain fungal diseases, like powdery mildew and black spot on rose. Stylet oils may be used to manage insect-vectored plant viruses.

### **Application**

While oil treatments have historically targeted fruit trees and woody ornamentals, several different types of pesticidal oils are currently marketed for house plants, flowers and vegetables. Commercial oil products include emulsifiers to enable the oil to mix readily with water. These emulsifiers are generally considered to be inert, but may have some insecticidal properties. Oil formulations are generally designed to be mixed with water at concentrations of 0.5-2.0 percent (volume/ volume). When applying oils, it is best to agitate hand pump sprayers frequently and keep tank spray agitators running. This reduces the risk of oil separation that could result in sprayer clogging, uneven plant coverage and possible plant injury.

## HORTICULTURE TIPS

When mixed with other pesticides, oils can enhance application efficiency. Oils often act as surfactants, and improve plant coverage and penetration of pesticides into leaf surfaces. Always read pesticide product labels carefully to make sure the product can be mixed with oil. Most labels prohibit the use of sulfur pesticides within 30 days of oil treatment. Oils may be incompatible with copper applications in some crops.

### Phytotoxicity

Although generally considered safe, oils can injure susceptible plant species. Symptoms of plant injury (phytotoxicity) may be acute or chronic. They can include leaf scorching and browning, defoliation, reduced flowering and stunted growth. Phytotoxicity may be associated with plant stress, ambient temperature and humidity, and application rate. It can vary among plant species and cultivars. To reduce the risk of phytotoxicity, do not treat stressed plants. Apply when conditions are below 85 °F degrees and 90 percent humidity. Applications during the summer season are best in the morning or late evening. The longer wet oil sprays remain on foliage, the greater the chance of phytotoxicity.

During winter it is best to apply oils only when temperatures are above 40 °F. Apply dormant oils or higher rates of summer oils only after stems and buds have become winter-hardened and before buds begin to swell in the spring. Evergreen trees generally should be treated only by summer rates of all-season oils. Some evergreens, especially those with a glaucous (waxy) coat, may become discolored following an oil application. This usually does not harm the tree or shrub.

When treating a new kind of plant, it is best to apply horticultural oils to part of the plant or to a few small specimens before treating large quantities of foliage. With oils it is especially important to read, and follow label instructions and recommendations. Manufacturers' labels provide useful information about sensitive plant species based on extensive testing.

Some plants most commonly listed as being oil sensitive include azalea, carnation, fuchsia, hibiscus, impatiens, photinia, rose, cryptomeria, juniper, Japanese holly and spruce.



## Safety

Oils have many characteristics that make them desirable to growers and homeowners. For **example**, they are low in toxicity to humans, wildlife and pets. Since oils are only active for a short time, they do not Scale insects can be controlled with horticultural oils. Oils will separate from the carrier. Agitation is necessary to keep oils in solution. affect insect predators or parasitoids unless they are exposed to the direct spray. Oils evaporate quickly and do not generally contaminate the soil or groundwater sources. Plant and fish oils are broken down rapidly by microorganisms on plants or soil, and pose minimum risk to non-target organisms. Oils are also considered one of the few classes of pesticides to which insects and mites have not developed resistance.

### Examples of Common Oil-Based Products and Sources

| Oily Type/Source                 | Insecticide/ Fungicide | Brand Name                                       |
|----------------------------------|------------------------|--|
| Petroleum/Paraffin               | I, F                   | Orchex®  |
| Petroleum/Paraffin               | I, F                   | Ultra-Fine® Oil                                  |
| Petroleum/Paraffin               | I                      | All Seasons® Horticultural and Dormant Spray Oil |
| Petroleum/Paraffin               | I, F                   | Saf-T-Side™                                      |
| Petroleum/Paraffin               | I                      | Horticultural Oil Spray                          |
| Petroleum/Paraffin               | I, F                   | JMS Stylet-Oil® and Organic JMS Stylet-Oil®      |
| Plant/Canola                     | I                      | Vegol Growing Season Spray Oil                   |
| Plant/Clove, Cotton Seed, Garlic | I, F                   | GC-Mite  |
| Plant/Corn, Cotton Seed, Garlic  | F                      | GC-3   |
| Plant/Cottonseed Oil             | I, F                   | SeaCide™   |
| Plant/Neem                       | I, F                   | Trilogy®   |
| Plant/Neem                       | I, F                   | Triact®  |
| Plant/Neem                       | I, F                   | 70% Neem oil                                     |
| Plant/Neem                       | I, F                   | Neem® Concentrate                                |
| Plant/Neem                       | I, F                   | Rose® Defense                                    |
| Plant/Rosemary & Clove           | I, F                   | Phyta-Guard EC                                   |
| Plant/Sesame oil                 | I, F                   | Organocide                                       |
| Plant/Soybean                    | I, F                   | Golden Pest Spray Oil                            |

**Source:** Department of Entomology Texas A&M University

## Tough Plants

Spring brought us more than our fair share of rain, but with summer right around the corner, we might think about planting some tough Texas natives and desert plants to ensure your landscape is ready for those sun-soaked and sometimes dry summer months. Cacti which are also succulents are native only to the Americas and are easy to grow but there are also some other natives that can take a “beating and keep on ticking.”

Succulents are plants that have organs such as leaves, stems or roots that are capable of storing water during the wet season in order to survive extended periods of drought. So most cacti need little rainfall and sandy, well-drained soil to do well, however, just about all soil types in Texas will support some species of cacti, even our clay soils.

- ◆ **Prickly Pear**, also known as nopal, have yellow, red or purple flowers and was selected to be the State Plant of Texas in 1995. There are about 13 to 20 species of prickly pear that grow wild in Texas. Their pads are capable of absorbing large quantities of water. Also the fruit and pads are edible, but the tiny, barbed spines on the pads must first be carefully removed.



- ◆ **Ponytail Palm**, a larger-growing cactus makes a dramatic floor plant with heights from 3 to over 10 feet. It was named for its thin, grasslike foliage that droops downward. It's a slow growing evergreen succulent that does best when planted in full sun 12 to 15 feet away from other plants in the landscape. It produces flower stalks, which consist of clusters of small beige blossoms.

◆ **Century Plant**, a majestic Texas native agave that can grow as tall as 6 feet. Agaves are ornamental succulents that vary significantly in size, color, form and flowers. They can contrast sharply with other landscape plants which helps to provide a dramatic accent. Agaves have sword-shaped leaves and produce a tall spike covered with flowers. This agave blooms in the summer and has greenish white flowers. They can live 10 to 25 years and like most succulents will need full sun and prefers a well drained soil.



## FEATURED PLANT

- ◆ **Twisted Leaf Yucca**, is another member of the agave family. It is drought-tolerant and has spiky foliage that twist as they age and magnificent springtime bell shaped greenish-white flower clusters. This yucca is native to the Edwards Plateau, growing primarily in the southeastern area. It grows well in poor dry soil over rock or on rocky slopes and would do well in a rock garden landscape as a small shrub. Also does well in sun or partial shade, the blossoms at top of the spikes attract butterflies and evening moths.



- ◆ **Texas Sage**, is a medium-sized shrub with delicate silvery to gray-green leaves and prolific purple blooms from summer to fall. It is native to the Rio Grande Plains, is extremely drought and heat tolerant as well as low maintenance once established. This shrub will not do well in a area with poor drainage or if it is overwatered so probably plant in a raised bed where there is plenty of sunlight. Only light pruning is necessary if at all and doesn't need to be fertilized. It will tolerant low temperatures but if it happens to freeze down to the ground, it will recover the next spring.



- ◆ **Downy Phlox**, a low growing native of the Pineywoods is drought tolerant, prefers well-drained soil and grows well in sun to partial shade. It bears clusters of fragrant, pale pink to lavender flowers in the spring which attract many butterflies, bees and skippers. This native is easy to care for but would also benefit from frequent dividing every couple of years in the fall or winter. It grows well with many other plant species as a border or accent in the landscape.



*“A garden is a complex of aesthetic and plastic intentions; and the plant is, to a landscape artist, not only a plant – rare, unusual, ordinary or doomed to disappearance – but it is also a color, a shape, a volume or an arabesque in itself.”*

Roberto Burle Marx

As we know, bluebonnets aren't the only thing that emerges this time of year. The annual symphony of ringing phones in pest control offices is proof that insect activity returns with warm weather. This year is shaping up to be an active year for caterpillars in Texas, so I thought that a review of some of the more common caterpillar pests might be appropriate.

### Forest Tent Caterpillar

Forest tent caterpillar, *Malacosoma disstria*, is one of the most widespread and abundant of the tent-making caterpillars in the U.S. Like its close cousins the eastern and western tent caterpillars, forest tent caterpillars feed primarily on trees; but unlike their cousins, and the also abundant fall webworm, the forest tent caterpillar doesn't make an actual tent. Instead it aggregates between feedings on a silken mat which is spun on some area of the trunk or on large branches of the host tree. After completing its larval development in two or three weeks, the caterpillar pupates and eventually turns into a handsome, but obscure, brown moth.



Forest tent caterpillars appear but once a year and sometimes in very large numbers. They then "disappear" for a whole year until the cycle begins again. Some years caterpillar numbers are very high, but most years they may be noticed only by the sharpest-eyed observers. The cycles of up and down appear to be driven by a combination of environmental and natural control factors, like birds and parasitic insects. This may be one of those abundant years, at least for some areas of Texas. Sam Houston Electrical Cooperative reported dozens of power outages this month from masses of tent caterpillars covering electrical transformers, causing fuse overloads. I have been receiving emails over the past few days from homeowners concerned about the caterpillars massed on their silken mats.

### Spring Cankerworm

Another caterpillar that can completely defoliate trees in the spring is the spring cankerworm, *Paleacrita vernata*. When cankerworm outbreaks occur, they can produce some of the most spectacular tree defoliation events seen in this part of the country. If you have a chance to walk through an infested forest you will see millions of tiny caterpillars hanging from tree branches and blowing on the wind. After a week or two of feeding, trees can be largely stripped of leaves. Fortunately, these outbreaks normally pose little danger to trees, especially trees in woodlots and forests. Healthy trees on good soil can usually withstand total defoliation without significant damage. Trees that lose their leaves to spring cankerworms generally re-leaf and show no signs of long-term damage. However, trees that are under stress from drought or transplantation may benefit from a timely insecticide application, before the leaves are stripped. This species also has only one generation per year, so late treatment of a tree with an insecticide, or follow up sprays, are not necessary.

Cankerworms belong to the moth family Geometridae. Spring cankerworms range in color from light green to brown. Like all geometrids, spring cankerworms have fewer than normal caterpillars. Where normal caterpillars have three to five abdominal feet, spring cankerworms have only two. The result is a distinctive looping walk, giving these caterpillars their common name "inchworm". [Click here to see a video of this walk.](#)

### Eastern and Western Tent Caterpillars

The eastern and western species of tent caterpillars are in the same genus, *Malacosoma*, as the forest tent caterpillar. The eastern tent caterpillar, *Malacosoma americanum*, feeds mostly on trees in the rose family, which includes most fruit trees (apples, cherries, plum, crabapple and hawthorn). These species, however, go beyond silk mat construction and produce protective tents in branch crotches. These tent caterpillars are common sight throughout the country. In addition to chewing leaves, the tents themselves, when abundant, detract from the appearance of the trees in urban landscape settings especially. Again, these caterpillars produce only one generation per year.



### Fall Webworm

Even though it is called the fall webworm, in Texas *Hyphantrea cunea* can be found throughout the growing season, starting in the spring. Recorded from over 400 different species of trees, fall webworm webs are a common site both in cities and along rural roadsides. Unlike the tent caterpillars, fall webworms live full-time within their webs. As leaves from the tree are devoured, the webworm colony simply expands its web to cover new leaves. Silk from tent caterpillar and fall webworm "nests" likely serve to protect the insects from bird and, to some extent, insect predation. In some years whole trees can be stripped of leaves and become covered with the unsightly webbing. Unlike the other tent-making caterpillars, fall webworms produce 3-4 generations per warm season, and may need repeated treatment.

### Non-Chemical Control Options

With fall webworms and tent caterpillars, non-chemical control might include physical removal or destruction of the nest(s). A pole pruner can be used to cut out webs from high branches, or it can be used to physically disrupt the nest and knock caterpillars from the tree. This is only practical for early infestations restricted to a few nests or superficial branches.

### To Treat or Not to Treat

Most trees can withstand significant leaf loss without any significant reduction in sugar production and storage (a measure of tree health). A rough rule of thumb is that 20% loss of foliage (for deciduous trees) should not be harmful to a tree. Over 20% defoliation and trees may suffer slowed growth and stress. An otherwise healthy tree can lose all its spring leaves and will re-leaf; however this does reduce vitality. Defoliation in combination with other stresses, such as root compaction, drought, disease, or other insect attack, can push a tree into decline or die back. For this reason, it may sometimes be worthwhile to tree a tree for caterpillars.

Other reasons to treat a tree for caterpillars include aesthetics (preventing unsightly webs, or temporary leaf loss) or prevention of nuisance factors from droppings and caterpillars falling from trees.

Every customer faces a few decisions before having trees sprayed for caterpillars.

- Is the cost of the spray worth it for aesthetic options?
- Is the tree in a location where it can be treated without drift falling into a swimming pool or neighbor's yard? If drift is inevitable, can it be mitigated by covering the pool, or getting the neighbor's OK to proceed?
- Can the spray treatment be done quickly enough to be worthwhile? This is often the critical question, because most tree infestations are not noticed until caterpillars are nearly fully developed and the damage is mostly done.

### Chemical Control Options

If you and your customer determine that a spray is justified, you must determine the best active ingredient. There are many options for caterpillar control. Spinosad and *Bacillus thuringiensis* are two of the better low-impact insecticides effective against caterpillars. However they are most effective against smaller caterpillars. Newer options include clothianidin (Arena®), chlorantraniliprole (Acelepryn™), and the combination product spinetoram+sulfoxaflor (Xxpire™). Pyrethroid insecticides are fast and tend to provide longer residual; however they are more toxic to non-target organisms such as beneficial insects. You should note that many of these products are toxic to bees and pollinators, so it is best to avoid spraying trees in bloom.

Lastly, it may be possible to save your customer some money and reduce drift potential and damage to beneficial insects through spot treatments. Forest tent caterpillar aggregations are easily spot-treated with a variety of insecticides including insecticidal soap and horticultural oil. Likewise, individual nests of tent caterpillars or fall webworms can sometimes be spot treated even with a pump sprayer using a pinstream nozzle. Such applications, being very targeted, should control the caterpillars with little impact on other beneficial insects.

**Source:** Mike Merchant, PhD, Extension Urban Entomologist

# TEXAS A&M AGRI LIFE EXTENSION

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The Jefferson County Office of Texas A&M AgriLife Extension Service educates Texans in all areas of agriculture including horticulture, marine sciences, environmental stewardship, youth and adult life skills, human capital and leadership, and community economic development. We offer the knowledge resources of Texas A&M and Prairie View A&M Universities to educate Texans for self-improvement, individual action and community problem solving. We, the Jefferson County Office of Texas A&M AgriLife Extension Service, are part of a statewide educational network and a member of the Texas A&M University System linked in a unique partnership with the nationwide Cooperative Extension System and Jefferson County Commissioners Court.

## UPCOMING EVENTS

### **Jefferson County Horticulture Committee's 43rd Annual Fruit and Vegetable Show**

**Saturday, June 13th**

**Central Mall (365 & Hwy. 60, Port Arthur)**

**Anyone can enter, entries received from 9:00 to noon**

**Win ribbons and prizes**

**Call 835-8461 for show rules and regulations**