

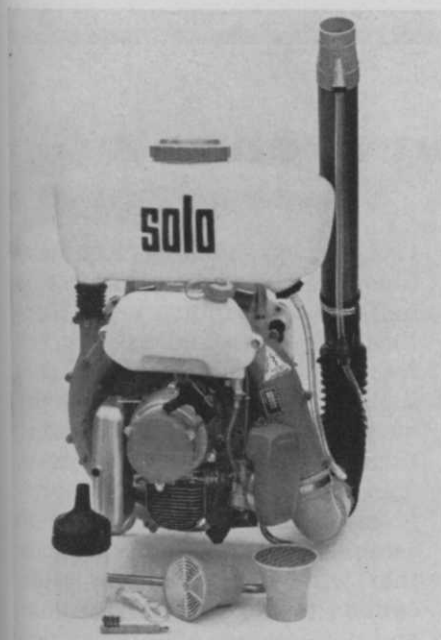


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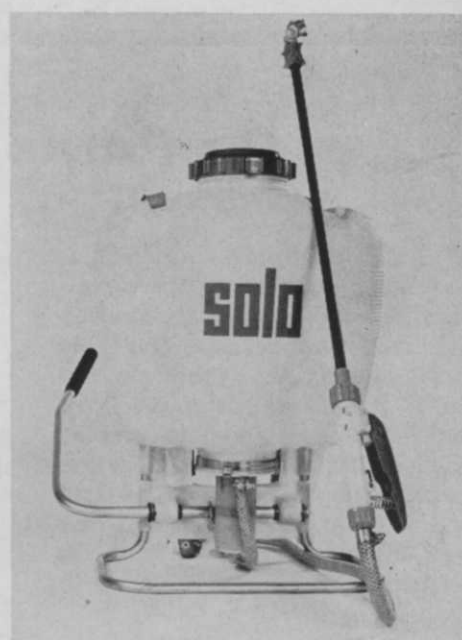


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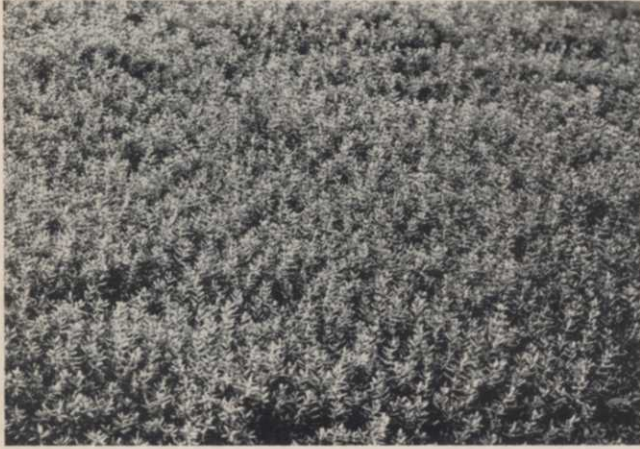
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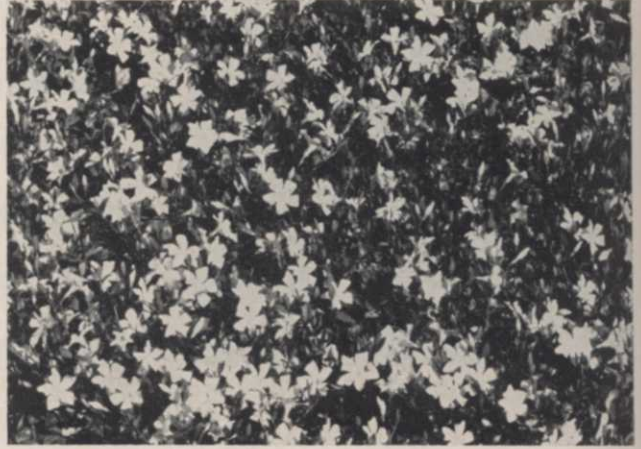
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Turfgrasses and

Ground Covers



Pachistima canbyi (Courtesy of The Arnold Arboretum)



Vinca minor (Courtesy of The Wayside Gardens Co.)

for Parks and Recreation Areas

BECAUSE more emphasis is being devoted to the development of parks and recreation facilities, and because they are more heavily used than in the past, the establishment and maintenance of good turfgrasses and ground covers are of prime importance. Proper planting and care of grasses and covers can make recreation facilities attractive and more enjoyable to the users.

Plan Turf Areas Early

The establishment of turfgrasses should be planned in the early stages of park or recreation area development. Once a facility is in use by the public, it is much more difficult to establish a good turfgrass lawn. Planning should encompass proper site grading, proper soil preparation (including the liberal use of commercial fertilizers), and selection of the best turfgrass species.

Quality of the soil will influence the amount and kind of commercial fertilizer required and also selection of grass

By
A. E. COTT

Extension Horticulture Turfgrass Specialist
Iowa State University, Ames, Iowa

species. Another major factor determining grass selection is the planned usage of the area.

"End Use" Recommendations

For a general playground, a turf mixture of bluegrass and creeping red fescue, or a straight seeding of Alta or Kentucky-31 tall fescue can be used. If the soil is reasonably good, and in an open area, a bluegrass and red fescue mixture will provide a beautiful turf. However, if the soil is a heavy clay or is extremely sandy, such a mixture will be difficult to establish, and straight seedings of Alta or Kentucky-31 fescue might be considered.

For picnic and limited-use areas in open, wooded spaces, Alta or Kentucky-31 fescue will not establish a good stand of grass. Neither can a good, full

turf be expected of Kentucky bluegrass. For these spaces, a half-and-half mixture of Kentucky bluegrass and creeping red fescue is recommended. In many little-used wooded areas, the use of ground cover plants rather than turfgrasses might be better.

In the more heavily used turfgrass areas, it is important to establish a maintenance program that will include annual applications of commercial fertilizer and possible use of turf aeration equipment to help relieve soil compaction.

Many of the most usable park areas may be subject to floods. This must be considered when planning for turfgrasses. What happens to a good stand of tall fescue if floods deposit a layer of silt over all or part of the area? In most cases, the stand of grass, whether tall fescue or bluegrass, will be lost if 2" to 3" of sand or silt are deposited. Most grasses, though, can recuperate from deposits of 1/2" to 1" of sand or silt.

Do not use cheaper mixtures

that include timothy, brome-grass, or legumes for seeding and establishing turfgrasses for parks and recreation facilities. Such mixtures result in rough, clumpy turfs, which can be dangerous in heavily used playgrounds.

Kentucky Bluegrass Best

To summarize procedures for establishing turfgrasses, when drawing up the original plans for development of the facility and its plantings: (1) include an item in the budget specifically for turfgrass establishment; (2) allow for adequate site and soil preparation; (3) be sure specifications include provision for a liberal quantity of a complete commercial fertilizer to be thoroughly incorporated into the seedbed before planting; and (4), consider how each area is to be used, and select the species of grass most suited to conditions. Remember that Kentucky bluegrass is still the best all-around permanent turfgrass throughout much of the country. Since bluegrass does not develop well in shaded areas, creeping red fescue can be added to these seedings. For the more heavily used areas, consider a heavy seeding of Alta or Kentucky-31 fescue. No other species of grass need be used along with tall fescue. Develop an annual maintenance program for turf areas, particularly those used most heavily, including the use of commercial fertilizer, possible use of turf aerification equipment, and overseeding where necessary.

Best Ground Covers

Though turfgrasses make the best and most solid ground plantings, there are many areas where turfgrasses cannot be used and where the use of other ground cover plants will add to the attractiveness of park and recreation facilities. In addition to more than 30 years of turfgrass research, Iowa State University has established plots to observe various herbaceous and woody plants that may have a place as ground covers under Midwest conditions. In the most recent plots, established slightly

more than 10 years ago, these plants are tested for winter hardiness, drought resistance, effectiveness as ground covers and general adaptability to Midwest situations. Some plots are in open sunny locations; others are partially shaded and have tree root competition.

There are several annual plants that have the distinct advantage, for a ground cover, of giving a show of bloom during a good part of the growing season. The annual known as the Dahlberg daisy (*Thymophylla tenuiloba*) performs best in the open sun, on a bank, or in similar areas. Once it starts to bloom in late spring, it will produce a profusion of yellow flowers until frost. It is best to start these plants indoors and set them out after danger of severe frost is over.

Annuals Provide Color

Another annual ground cover is the marigold *Tagetes signata pumila ursula*. This dwarf annual gives excellent color all during the growing season. It is easily started from seeds, and quickly develops into a good cover.

Alyssum is also a good ground cover. The variety, Carpet-of-Snow, has showy, white flowers. The variety, Royal Carpet, has equally attractive red flowers. Another annual, alyssum, *Alyssum maritimum*, is one of the best of this genus for reseeding itself.

We are all familiar with pen-tunias. These annuals do very well as a ground cover when set out early in the spring. If given a good start, they will bloom and grow profusely all summer long and will often bloom until after the first two or three heavy frosts.

A creeping form of zinnia also works very nicely as a ground cover plant. This is the genus *Sanvitalia*.

Still another familiar plant is the rose moss, genus *Portulaca*. Once established, it seems to reseed readily. This plant will perform very well in hot, dry soils and even appears to be able to grow in partial shade.

These annuals that readily reseed themselves are well adapted to park areas having steep banks that are difficult to mow and of little use. If they are started from plants and given a little extra care during the first year to establish them, many will reseed with little or no further care.

Herbaceous Perennials

Prostrate thyme (*Thymus serpyllum*) is one of the herbaceous perennials that provides a good ground cover. This is a very low grower and is excellent for planting between paving blocks, along rock walls, or on rock ledges. It can also be used in sunny areas for a ground cover. Prostrate thyme is occasionally injured by low temperatures during the winter, so it might be reserved for the more sheltered areas and for use in the southern Midwest. Some winter injury has been observed in Iowa trial plantings.

An old favorite among the herbaceous perennial ground covers, but one that is still widely used, is ajuga. This plant, like prostrate thyme, is on the climate borderline in central Iowa. *Ajuga reptans* has, however, survived most winter seasons without a great deal of injury.

Another herbaceous perennial that has long been well known as a ground cover is *Vinca minor*, also known as periwinkle or creeping myrtle. It prefers dense or partial shade and reasonably good soil. It will remain green if placed in a location that receives winter shade and will probably perform best in sheltered areas of the central and southern Midwest. It may be subject to some winter injury unless it is in a protected area or covered for the winter by snows or mulches. This ground cover, which produces lavender-blue flowers in May and June, is especially sensitive to winter injury if grown in the sunlight.

Moss pink (*Phlox subulata*) has also performed very well in Iowa State's ground cover plots. This plant prefers full sunlight and grows in almost any soil. Moss pink grows about 6" tall and produces masses of pink

flowers in late April or early May. The plants, which form small mounds of foliage that grow together into a solid carpet, can be used on banks, rock hills, and similar locations. Some persons may object to moss pink, because the cover occasionally looks slightly ragged after it blooms.

The herbaceous perennial, lily-of-the-valley (*Convallaria majalis*) is a plant that deserves consideration where there is a rich humus soil and dense or partial shade. Wooded bottom land areas are suitable. Once established, plants form a solid mass of broad, upright leaves that bear white, bell-shaped, fragrant flowers in the spring or early summer.

The violets, genus *Viola*, are found in many different species that perform well as ground cover plants. A number of species grow wild in the woods, and some spread so quickly that they could become weed problems. They are excellent, though, for wooded areas where there is no concern about their spreading into the finer turfgrass areas. They are completely hardy under Iowa conditions.

Fleece Flower Is Aggressive

The fleece flower (*Polygonum Reynoutria*) is quite vigorous and makes a fine ground cover if planted in an area where it can be contained. This species grows 12" to 14" high, so it cannot be called a low ground cover plant. The fleece flower grows best in full sun. It is quite aggressive and can invade flower beds and lawn areas unless it is restricted. It can be used to provide a solid cover for a bank or other out-of-the-way spot, where there is not too much worry about its spreading.

There are two sedums that have performed very well in the ground cover plots. One is *Sedum spurium*, which withstands hot, dry locations in full sun. The other is *Sedum acre*, a plant that grows about 1" tall and is covered with yellow flowers in the spring. Like the other sedums, it should have full sun.

A very rugged ground cover

plant that has been used extensively on highway embankments and road cuts in recent years is crown vetch (*Coronilla varia*). One selection, developed at Iowa State University and quite hardy for local conditions, is Emerald crown vetch. It has the ability to grow on steep banks in poor soil, clay soil, and other types of soil commonly found on road cuts and embankments. It is a legume and likes full sun, but is a little slow in becoming established. Once established, this plant will compete with all weeds and form a solid, dense cover. With showy, lavender flowers in the spring, the plant grows 18" to 24" tall and is propagated primarily by seeds.

Woody Plants As Ground Covers

There are several woody plants, mostly evergreens, that perform very well as ground covers. *Euonymus fortunei coloratus*, known as wintercreeper, seems to be hardy in the trial plots. It is fairly well adapted to full sun, but if planted in sunny locations, will turn quite brown during the winter months and lose most of its leaves much earlier than if it is planted in semishady or shady locations.

Two low-growing evergreen junipers make good ground covers. Andorra juniper forms an ample cover in full sun. Some persons object to the purplish color that it develops during winter months, though others find this winter coloring attractive.

Prostrate juniper (*Juniperus horizontalis*) is the second low-growing evergreen juniper. There are some selections or varieties of this plant that retain their green color during the winter months. These, too, are low growing, with a height of about 12".

Another evergreen that looks very promising in the trial plantings is *Pachistima canbyi*. *Pachistima* is a fine, low-growing, broadleaf evergreen that should be used more widely as a ground cover than it is. It performs in full sun, partial shade, or full shade. In central Iowa, it is sometimes subjected to slight

winter damage at the tips of new shoots, but damaged areas can be sheared or pruned off in early spring and the plants quickly recover. Damage does not occur every winter. Once established, *pachistima* forms a solid mass that eliminates weed problems.

Rock spray (*Cotoneaster horizontalis*) is a deciduous shrub that deserves serious consideration for sunny or partially shady locations where the soil is reasonably rich. A fine shrub for bank covers or open spaces, it grows about 2 ft. tall. Leaves are small, shiny, and green, and after the plant blooms, red berries last until after freezing, attracting birds.

Two other woody plants suited for ground cover use on steep banks or out-of-the-way locations are Japanese honeysuckle (*Lonicera japonica*) and Hall's climbing honeysuckle (*Lonicera japonica halliana*). Both plants could become weed problems if placed in areas where they cannot be controlled if they start growing too vigorously.

Wise Selection Paramount

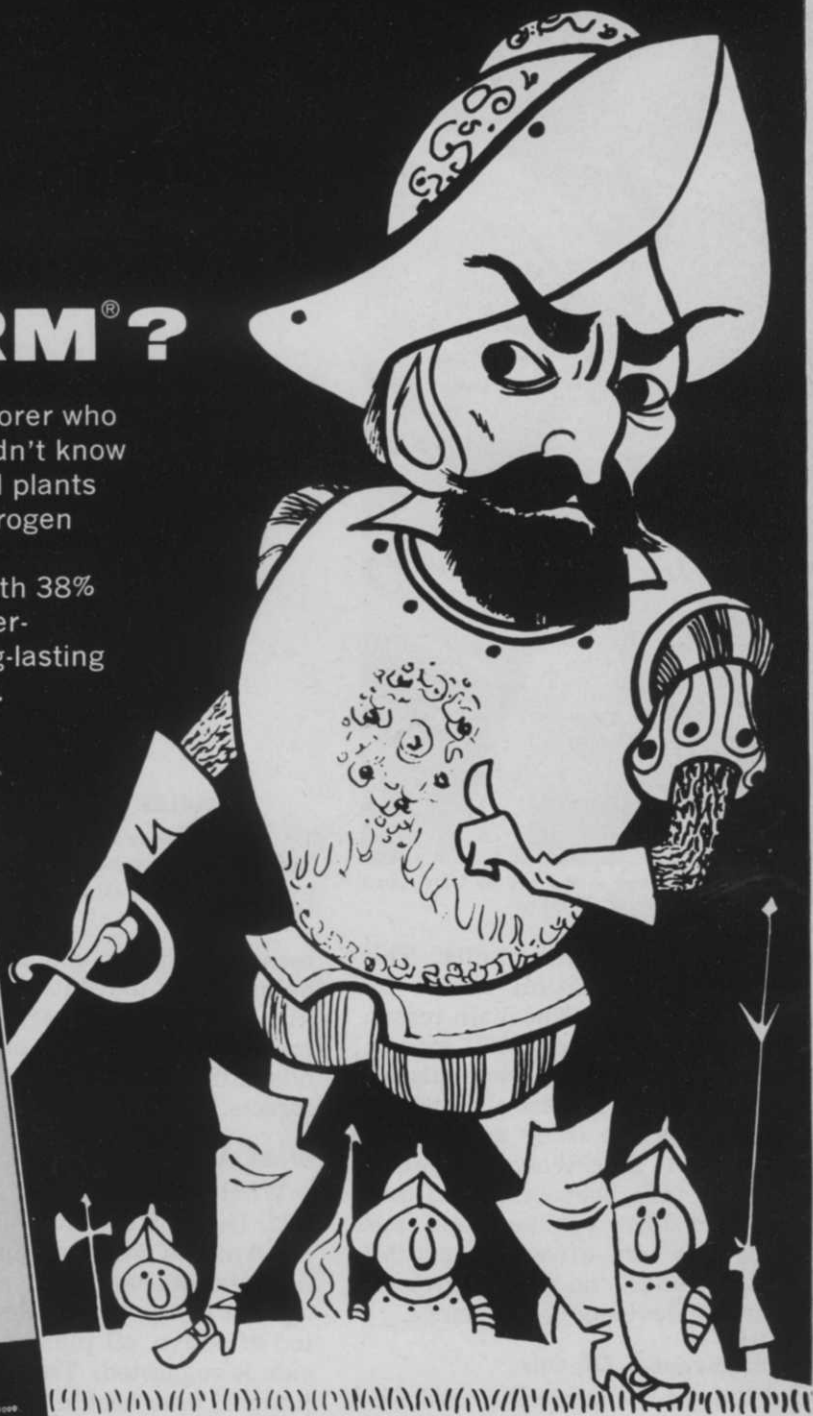
As we develop plans for our parks and recreation areas, serious consideration should be given to the use of ground cover plants in locations that will not be heavily used, and where it would not be convenient or possible to establish good turfgrass. By wise selection of ground cover plants, we can add large splashes of color to parks and cover some blighted areas with plants that will provide an attractive appearance, making these spots more enjoyable. On some steep roadbanks or hill-sides, where nothing but weeds and brush grow, or where the soil is bare, we can plant ground covers that produce a thing of beauty, particularly when flowers are in bloom.

Plan ahead for the establishment of ground covers in places where they will be most helpful and useful. Select the plants suited for the situation, give them a little extra care for the first year or two, and then these areas can become low maintenance ones.

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Aphids: nip them in the bud by killing their eggs with dormant oil sprays.

Why and How To Use Dormant Oils

By

CHARLES F. SCHEER, Jr.

Cooperative Extension Agent
Suffolk County Cooperative Extension Service
Long Island, New York

WHY use dormant oils? This is a question asked by many arborists. The main reason is to control hard-to-kill insects. In the early spring, when oils are applied, such insects are just becoming active (they are breathing). Oils effectively kill insects at this time because the oil covers and suffocates them, and thus provides an effective control with almost no possibility of insects developing resistance.

Effectiveness Of Oils

One of the questions most frequently asked about oils is: "Why can't we use summer sprays during the growing season to get as effective control of the same insects?"

Summer sprays are not as effective because, when oils are applied in the early spring, the insects are stationary.

Trees can also be treated in spring without interference from foliage; the oil can get through to do the job. The alternative is to make applications at the right time, and at higher pressures, during the growing season. This

means taking the chance of damaging trees to control hard-to-kill insects, which are actually easier to control with oils. Also, oils kill a higher percentage of insects.

What An Oil Is

What constitutes a dormant oil? Dormant oils are highly refined oils to which an insecticide may be added. For problems against which the oil alone is not too effective, oil plus an insecticide is suggested. This is true of juniper, pine needle, oystershell, and euonymus scales. The first step in selecting an oil is to make sure of its purity, which is measured in terms of U.R. rating. Oils purchased should have a U.R.

This is the first of two articles on the use of oils for insect sprays. Next month, D. H. Moore, of Niagara Chemical Div., FMC Corp., will discuss "Oil and Insecticide Combination Sprays for Ornamentals." Be sure to watch for this October feature.

rating of 92% or higher. At a 92% to 97% rating, oils will be quite pure and safe to apply to plant materials.

Many treemen have asked what "100 second" or "70 second" on the label of the can means. This notation stands for the viscosity, or general "flowability," of the oil. The smaller the "second" rating, the lighter the oil. A 100 second oil is heavy, and a 70 second oil much lighter. For effective control of many dormant insect problems, it's best to buy a 70 second oil with a U.R. rating of 92% or higher.

Do Oils Damage Trees?

Treemen often ask if dormant oils will damage trees. We have had reports of damage to some varieties. This may have occurred because of improper use of oils, or may have been because the plant was sensitive to oils. Trees such as sugar maple, Japanese maple, beech, hickory, walnut, and douglas fir have been known to be sensitive to dormant oil sprays. Information on oil damage to certain plants



Oystershell scale, shown on apple twigs, can be controlled with oil and insecticide.

is not well understood. Therefore, if there are any questions on application, it may be better to be on the safe side and not apply the oil.

What causes oil to burn a tree? This is hard to say, but two factors that may contribute to burn on sensitive plants are the sun (because sunlight is magnified by the oil while passing through it), and the use of extremely high pressures with a very fine spray. After all, plant material can be burned even with a fine spray of water under very high pressure, if spraying is done at close enough range.

When might oil damage trees? Oil may cause problems if very high pressure is used, and the oil spray is blasted into the foliage; if oils are not pure enough; or, if oil freezes on the foliage during the night. But, in general, we know that oils are one of the most effective sprays for controlling hard-to-kill insects. If the user is cautious, and carefully follows the maker's directions and the recommendations of his local agricultural extension service, he will have little problem applying dormant oils for maximum effectiveness.

Good Coverage Important

To kill insects, thorough coverage of the material being sprayed is necessary. All branches must be covered with the oil to suffocate any overwintering insects and their eggs. To do this, the applicator must

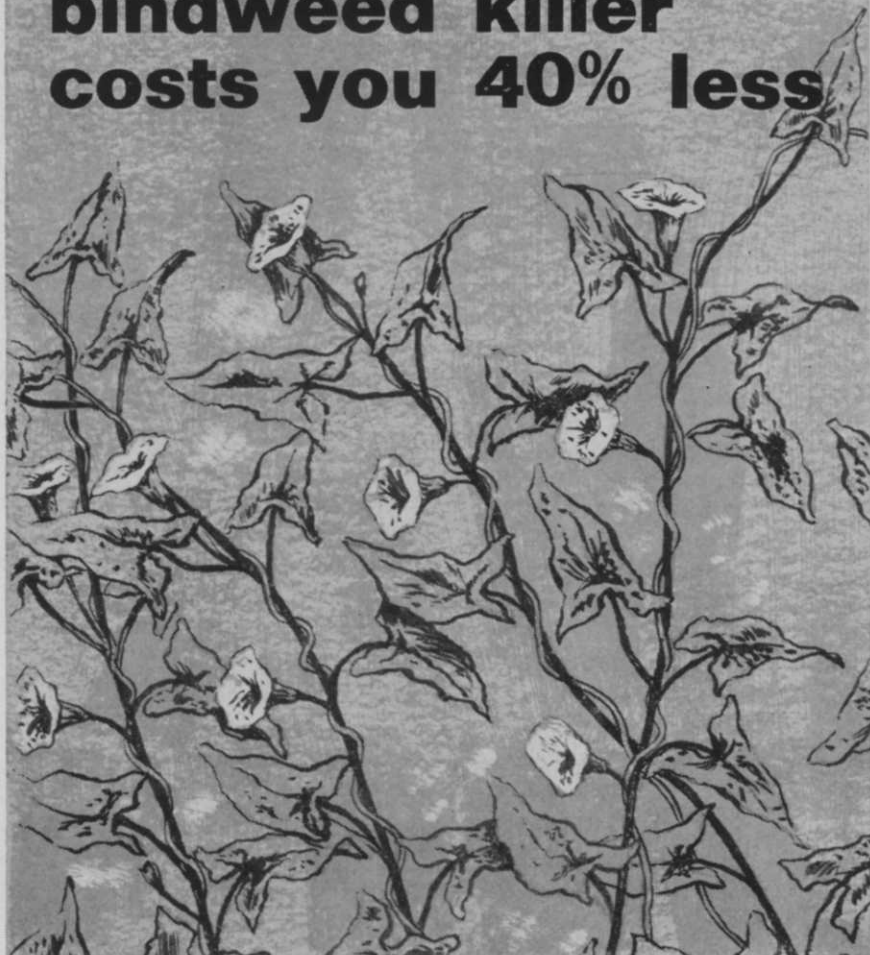
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move around the tree, applying sufficient spray from all sides. He should be careful not to use excessive pressure; just enough pressure to do the job is necessary.

Scout trees to be treated before spraying. If there are no pressing problems of overwintering insects or their eggs, it may not be necessary to apply an oil that year. And, note any overwintering problems on sensitive materials in the spring, so that plans can be made to treat them later in the year with a summer spray. On sensitive trees, for which oil has not been recommended, do not use it. But again, when dormant oil sprays are used, it is essential to thoroughly cover the plant material.

What Oils Control

Dormant oil sprays will control hard scales, soft scales, mite eggs, aphid eggs, and may, with good coverage, control overwintering caterpillar eggs on the bark.

For juniper, pine needle, oystershell, and euonymus scales, oil plus ethion insecticide will do the job. Other dormant sprays, such as lime sulphur and the

dinitro compounds, can also be used on these problem pests. Lime sulphur has been used primarily for pine needle and juniper scales. The dinitros have been effective against oystershell and euonymus scales. These sprays should be applied with care. The dinitros are very poisonous and may cause a yellowing on some evergreens. One problem with lime sulphur is that it will discolor paint, and should not be used close to houses or other buildings.

Summary

Remember that overwintering insects have not built up a resistance to oil. With good oil coverage, the insect problems listed above should be brought under control. Also, remember that it is better to wait until the insects start to become active (breathe) before applying dormant oils. In many cases, oils can be applied up to the time leaves begin to break and buds begin to open. Apple trees, in particular can be treated with a "delayed dormant spray" when the buds are showing $\frac{1}{4}$ " to $\frac{1}{2}$ " of green.

Spray-O-Rama '66 To Have Symposium, Equipment Show

Four of the Northwest's leading spraymen will take part in a symposium, when members of the Pacific Northwest Spraymen's Association meet at the Thunderbird Motel in Portland, Ore., Sept. 23-24, for their 1966 Spray-O-Rama.

Symposium speakers will be Donald Mock, Shamrock Spray Service, Seattle, Wash.; Ray Collier, Collier Spray Service, Portland, Ore.; L. F. "Lew" Sefton, Sefton Spray Service, Portland; and Erle Parker, Jr., Chemical Spray Co., Dayton, Ore. All have either built or are planning to build spray rigs, and will share their equipment experience with others at the confab. Bill Owen, president of the spraymen's group, will moderate the symposium and conduct a question and answer period afterward.

An equipment show is to give spraymen a look at unusual types of spray rigs, including a 1,000 gal. rig with 9 separate tanks and several pumps that was designed for one-man operation. Manufacturers will also display their spray equipment at the show.

With its theme, "People, Pesticides, and Professionalism," the program will provide spraymen with information both unusual and entertaining. "We are trying," Owen says, "not to duplicate technical information that spraymen can get in their own area." Emphasis will be on public relations for spraymen, though specialists from Oregon State University will also address the gathering.

Robert E. Averill, from Merritt Davis Schools, Inc., of Salem, Ore., will boost public relations as the banquet speaker. Other talks are to include a printer speaking on "the imaginative use of paper in the small business," and "public relations on the telephone," to be given by a consultant from the Pacific Northwest Bell Telephone Co. A humorous, feminine touch will be provided by a Northwest garden writer. Yet another feature of the two-day program will be a



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WTT Monthly Insect Report

Every month, WEEDS TREES AND TURF will report on insects causing problems in turfgrasses, trees, and ornamentals throughout the country. Reports will be compiled from information furnished by the U. S. Department of Agriculture, university staffs, and WTT readers. CA's and turf and tree specialists are urged to send reports of insect problems in their areas to:

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talk by J. D. Vertrees, county agricultural agent from Roseburg, Ore., and one of Oregon's outstanding entomologists, who will show some remarkable color slides while discussing the insect aspects of spraying.

The business meeting of the Northwest Spraymen's Association and election of officers will round out the meet. A. J. Overton, of Portland, is directing arrangements for the '66 Spray-O-Rama. He can be contacted at 7737 N.E. Killingsworth, for eleventh-hour registration.

Oct. 4-5 Fla. Turf Meet to Stress Soils, Fertilizers

Recommendations for improving soils and using fertilizers are to open this year's University of Florida Turfgrass Management Conference, Oct. 4-6, at the Ramada Inn, Gainesville.

Four professional workshop sessions will discuss problems in special areas of turf management on the second day. Participants will tour University of Florida research plots and the final technical session will discuss practical applications of research findings. Nearly 500 registrants are anticipated. Walter Anderson, FTGA executive secretary, can be contacted for further information at the FTGA Offices, 4065 University Blvd., North, Jacksonville, Fla. 32211.

Dow Cautions Tordon Users

Users of the recently introduced Tordon are cautioned by its maker, The Dow Chemical Co., to follow label instructions carefully when applying the herbicide. Misapplication can kill desirable plants, Dow emphasizes.

While the manufacturer reports excellent control of most deep-rooted perennial weeds, it warns that Tordon sprays should not be allowed to drift onto cropland or into irrigation water or ditches. Tordon should not be used by inexperienced applicators, nor should users deviate from label recommendations. Tordon is said to be 20 times as powerful as 2,4-D. Dow adds, "if it is used incorrectly, a lot more damage can be done."



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How to Buy an Irrigation System for a Sod Farm

Sod growers planning to purchase and install an irrigation system for their sod farm should ask about two important facets of the system: performance and cost of the equipment. But, to select the right equipment at the right price, the purchaser must first determine just what he wants the system to do. To establish these specifications, he should consider these points:

1. Area to be covered
2. Hours available for watering
3. Amount of water to be applied
4. Type of system
5. Use of system to aid seed germination
6. Use of system for applying fertilizers and herbicides
7. Maximum wind under which system must operate
8. Maximum precipitation rate
9. Uniformity of precipitation
10. Service life of system components

Area To Be Covered

The first step is to determine the area to be covered by the irrigation system and to specify this on an accurate plot plan. Areas that cannot be watered, as well as watered areas, should be shown since both will play an important part in selecting the type of heads best suited to the job.

Watering Hours

For large areas, the cost of an irrigation system is affected to a considerable extent by the time available to apply a specified amount of water. For example, watering 100 acres at the rate of 1½" per week requires 4,085,000 gals. of water per week, or 572,640 gals. per day. If watering must be accomplished in a six-hour period, the flow required will be 95,440 gals. per hour, or 1,590 gals. per minute. This means that the mains and pump will have to be big enough to deliver this volume of water. If, on the other hand, 12 instead of 6 hours can be allowed for watering, the flow required is

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A. W. FRY

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and

E. J. HUNTER

Moist O'Matic, Inc., Riverside, California

cut in half to 795 gals. per minute. This could make a difference of as much as \$14,000 to \$18,000 in material costs alone.

Amount Of Water

A sod farm irrigation system should be designed to take care of peak-moisture-use periods. Weather conditions determine how much water has to be applied. Temperature, air movement, and humidity determine the amount of water extracted from the soil, and consequently the amount that should be applied to maintain satisfactory growing conditions. Periods of peak use may require the application of 1" of water every three or four days.

Type Of System

Should the sod farmer purchase a portable system or a solid-set system? The quick-coupler system with impact sprinklers costs less initially but more to operate than the fully automatic system with pop-up rotor sprinklers. However, the operating cost of the solid-set system is sufficiently lower to quickly compensate for the higher first cost.

Sod growers should select a system that shows the highest dollar return for the frequency of irrigation and the cost of labor for their area. If a portable system is being considered, the cost of moving the system for an expected irrigation frequency should not be greater than the annual cost of a solid-set system. Varying factors are involved for each sod farm, but generally where frequent, light irrigations

are required, a solid-set system is most economical.

The choice between buried or surface irrigation systems also involves a compromise between labor costs and pipe interference with sod harvesting. A buried system will interfere with harvesting operations, whereas the surface system can be removed. Also, the surface system always has the possibility of being used in other locations. Each grower has problems that are individual, and his irrigation system must be designed to answer his particular needs.

Use Of System For Seed Germination

One of the most important considerations in selecting irrigation equipment is its use on germinating seed, for the sod crop will never be any better than the initial stand. A solid-set system, which does not require pipe to be rotated from field to field, is most desirable from this standpoint, since irrigation may be required several times a day during germination, depending on weather and soil conditions. Once the soil surface is wet, it must be kept damp to prevent crusting of the soil and dehydration of sprouted seeds. Also, to prevent compaction of the soil surface, water drops should be kept small. This requires a fairly high pressure for a given nozzle size.

Keep in mind that it is necessary to have a higher pump capacity for germination than is required for normal irrigation of sod.

Use For Fertilizer And Herbicide Application

For maximum efficiency, a sod farm sprinkler system should be used to apply chemicals, fertilizers, and herbicides or pesticides. This requires the incorporation of some type of injector into the system. When he selects the injector, the sod grower