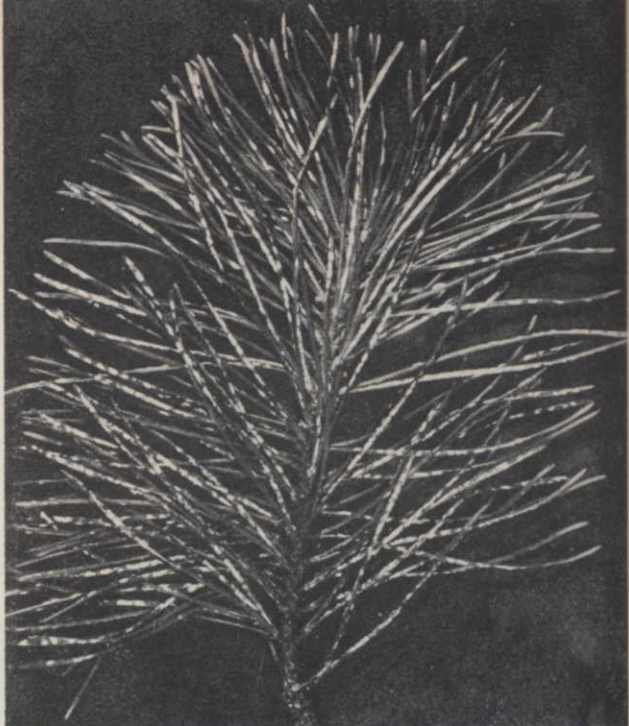


New Practice on the Rise . . .

By
D. H. MOORE

Research & Development Department
Niagra Chemical Div., FMC Corp.



Pine needle scale can be all-but-eliminated with application of ethion-oil combined spray. (See table 1. for field test results).

Oil-Insecticide Combination

MANY nurserymen and professional landscapers are taking a long and interested look at a relatively untouched mode of pest control—a combination of oil and insecticide.

Though oils have been used by themselves as insect sprays in this country for more than 75 years, they have had rather limited acceptance since World War II. Now, increasing resistance of pests to some organic compounds and the marriage of small quantities of chemical insecticide with oil have spurred increasing interest in oils once again.

Why Insecticide With Oil

When properly applied, oil sprays generally provide good control of mites and most scale insects. But thorough coverage is an absolute must when using oil alone. The oil must make direct contact with the pest upon application since its action is via suffocation and there is no residual toxic effect. It is strictly a "one shot" material, and if you don't hit the pest upon application, for all practical purposes you have missed him.

The possibilities regarding types of insecticide-oil combinations are almost limitless and there has been experimentation with several variations. Ethion, malathion, parathion, DDT, Trithion and many other insecticides have been used successfully in combination with different grades and viscosities of oil. At present, however, only an ethion-Superior oil combination is being used commercially to any extent and is available as a preformulated product that does not require mixing of components by the user.

Ethion-oil formulations are registered both for dormant and summer sprays. For dormant applications they can be used on some 20 different ornamental trees and shrubs (including such common varieties as maple, elm, oak, birch and dogwood) to curb 12 species of scale. For summer sprays a special formulation containing less oil and more ethion has registration for control of both mites and scale on 11 ornamental varieties (including such plants as camellias, box-

wood, gardenias, and azaleas).

This combination has been found considerably more effective than straight oils. Inclusion of ethion in the formulation provides additional assurance of control. Even if eggs are missed by the oil during application, the insecticide, with its long residual activity, will halt resulting larvae as they crawl around. Control of aphids, leafhoppers and mealybugs is another plus for ethion-oil, although there is currently no registration regarding these pests on ornamentals. Straight oil has never been a reliable weapon against them.

Use of oil-insecticide combinations as dormant sprays might be considered as a means for combating resistance. Petroleum oils appear to be resistant proof, at least there is no indication of pests developing immunity to them. Then, too, by controlling pests in their overwintering form, the population is more exposed and therefore more readily reached by the pesticide.

The closer to hatching, the more susceptible insect eggs are

Table 1. Field Tests on Effectiveness of Ethion-Oil**Control of Pine Needle Scale**

Treatment	Date Applied	Average No. Growing Scale/Leaf		
		6/5	6/12	6/21
Ethion-oil 2 qt./100 gal.	5/22	0.4	0.6	0.0
Ethion-oil 3 qt./100 gal.	5/22	0.0	0.0	0.05
Untreated check		15.0	24.1	45.6

**Control of Taxus Mealybug on Taxus
with Ethion .67 Superior 60 Oil**

Material	No. of Mealybugs/Tip		
	7 Days* 7/5	13 Days 7/11	39 Days 8/6
Ethion .67 Superior 60 oil (ME C241), 3 qt./100 gal.	0.8	0.0	0.0
Untreated check	12.9	6.2	155.0

*Number of days after first treatment.

Sprays for Ornamentals

to oil. Because of this, many nurserymen have found it effective to apply oil-insecticide sprays in the delayed dormant stage—after some foliage has appeared. A good rule of thumb is to treat when about one-half inch of leaf tissue is exposed.

200 Species Tested

Care must be taken to avoid phytotoxicity (damage to the plant) when using oil-insecticide combinations. This is particularly true of summer sprays which should utilize lighter viscosity oils. It might be noted here that ethion and light grades of superior oil have been tested on over 200 ornamental species without injury, even on orchids.

Cold weather is a factor to consider regarding delayed dormant sprays. Treatment should not be made when temperatures are expected to drop to freezing or below.

Still another consideration is compatibility of oils with other materials which may be applied around the same time. Oil and sulfur are incompatible, for ex-

ample, and may lead to damage of new growth.

A major deterrent to the use of oils has always been their tendency to injure plants. Development of a class of highly refined, basically paraffinic oils having a narrow distillation range has relieved this problem somewhat. The term Superior oil was coined by New York State Experiment Station workers to describe them.

Another factor making oil sprays somewhat safer to use today is the trend toward lighter (less viscous) oils, particularly where summer use is concerned.

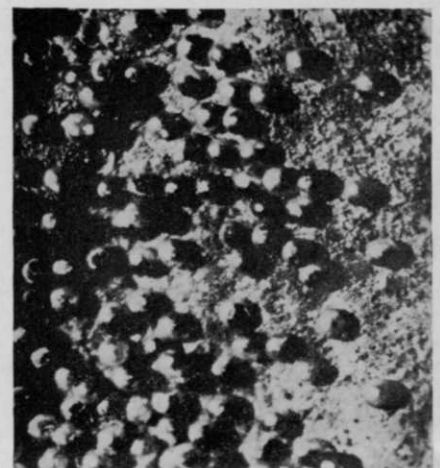
Among the lighter oils frequently used are 60-second and 70-second Superior oils, so named to indicate the number of seconds it takes for a sample of oil to flow through a special test device. The lower the number, the lighter the oil.

Today's oil formulations are "fast breaking." That is, they contain just enough of the proper emulsifier to keep the oil in proper suspension in the spray tank, provided there is adequate

agitation. This permits rapid disassociation of the oil and water upon application to a plant surface. In short, the emulsion will "break" upon striking the plant, leaving oil on the surface and permitting water to run off. This is in contrast to older so-called "tight" emulsions which did not break rapidly but allowed both oil and water to run off the plant.

This "speed of breaking" has become very important in recent years because application techniques have changed so much. With today's speed sprayers, fast-breaking oils are very necessary. They do not have as great a tendency to leave the tree with the water carrier and "runoff" of oil is therefore minimized. When hand guns and stationary spray tanks are employed, however, fast-breaking oils—through overlap spraying—will result in excessive oil deposits on trees and may lead to phytotoxicity. Hence slower breaking oils are still best where these older or simpler types of equipment are used.

It can be seen from the foregoing that oil sprays are quite different today from what they once were. Now, improvement in the oils themselves and their use in combination with small amounts of insecticide, make them safer and more effective than they ever were. It would appear that as a result, a rise in the use of oil-insecticide sprays can be expected in the years ahead.



European red mite eggs on the bark of ornamentals will hatch into trouble if not checked. Ethion-oil has proved effective.