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OIL SPRAYS FOR DORMANT USE

by

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Oil sprays, based on crude petroleum oil, when properly compounded have given quicker and surer results against scale insects, eggs of red spider and aphids, and other overwintering pests than has lime-sulphur. When properly made and applied they have not harmed orchard trees in the least. In those districts of Washington where lime-sulphur has proved ineffective in controlling San Jose scale such oil sprays should surely replace the inefficient spray.

Oil like crude petroleum will not mix with water, but if an emulsifier which ordinarily is soap, be first worked into the oil a more or less perfect emulsion is formed by the addition of water. The exact amount of soap will depend on the kind of oil used as well as on the soap itself and the nature and amount of water. The mixture of oil and emulsifier is called a miscible or a soluble oil and can be purchased ready for dilution. It is possible to prepare a dependable oil spray in the orchard but it is advisable to buy the ready-made material even at additional cost. Virgin crude oil is very hard to locate and secure. The balancing with emulsifier requires knowledge and care. Unless the miscible oil is properly made it will not produce a stable emulsion, and a poor emulsion will not kill scales and it might injure the trees. Fuel oil is not the same as crude oil and is especially difficult to emulsify.

It sometimes happens that certain lots of miscible oils are hard to emulsify. This is sometimes due to acid barrels destroying the soap, or to lack the proper shaking before drawing off the sample. A miscible oil on standing will have the upper portion too strong in oil and the lower portion too strong in soap. The top part will then be hard to emulsify and might harm the trees. The bottom part will produce a beautiful emulsion, but might not have enough oil to kill the insects.

The emulsification of a miscible oil is called "manipulation". If a certain miscible oil will not produce a stable emulsion, i. e. if the milky suspension of finely divided oil droplets floats a layer of free oil on standing a few moments, the oil can sometimes be manipulated into a good emulsion. In such a case work into the miscible oil about one-third as much water as you have oil, before adding the rest of the spray-water. If this fails, work some soap solution (of whale oil soap, fish-oil soap, laundry soap or washing powder) into the miscible oil before diluting. It is probably always a good plan to manipulate some water or soap solution into the miscible oil before diluting. The miscible oil should never be added to a tank full of water.

Our tests of crude petroleum oil sprays have been surprisingly satisfactory. Even at somewhat higher cost the final results have repaid the extra expenditure. Oil sprays are not so disagreeable to use as lime-sulphur and they have slightly more covering power. With eastern made oils, like orchard brand

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and scalecide, we have had perfect results from a 5% emulsion. Sprays based on California petroleum, like dormant soluble oil and Rex Lormant oil, should be used at 6% strength. No oil spray can be depended on at 2 or 3% strength, especially if based on oils from the distillation of woods rather than on mineral oils. Where lime-sulphur gives satisfactory results it is cheaper to use, particularly if winter fungous troubles are to be considered. At present prices eastern oils cost about \$1.00 a gallon and western oils about half as much. Comparing equivalent solutions will give the following approximate costs for a 200 gallon tank of spray:-

Eastern oil, 5%	\$10.00
Western " 6%	\$ 5.00
Lime Sulphur 3 ^o from 32 ^o concentrate,	2.90
" " 3 ^o " 26 ^o "	2.65
" " 3 ^o " dry lime sulphur	7.20
Soda-sulphur 3 ^o dry soda sulphur	8.40