

(1.) Kerosene Emulsion.

Pure kerosene or coal-oil, if applied to insects, will destroy them immediately. It is also injurious to plant-life. It will not mix with water, being considerably lighter in its specific gravity. If used with soap, however, it will form an emulsion which, when diluted, will not injure tender plant-growth and becomes decidedly effective in controlling insects.

Formula.—Whale-oil, soft or neutral laundry-soap, $\frac{1}{2}$ to 1 lb.; soft water, 1 gallon; kerosene, 2 gallons.

Soft water should be obtained, inasmuch as the kerosene emulsifies better in it than in hard water. Hard water may be often softened sufficiently by adding some such substance as borax, baking-soda, or lye. Dissolve the soap in the water and boil for a moment. Add the kerosene slowly while the water is still hot, stirring vigorously. The mixture then should be thoroughly emulsified. This can be most readily accomplished by pumping the mixture through a force or bucket pump back into the mixture again, or from one container to another and back again. In about ten minutes the mixture becomes like cream in colour and consistency, from which no free kerosene will separate. Such a stock solution will keep for a considerable length of time, especially if placed in an air-tight container.

When required for use it should be again stirred and diluted in the following parts with water: For dormant fruit-trees, 1 to 5 to 7; for trees or plants in leaf, 1 to 10 to 15; for evergreens, 1 to 20 to 25; for root-maggots of onion and cabbage, 1 to 25.

(2.) Carbolic-acid Emulsion.

Formula.—Soap, 1 lb.; water, 1 gallon; crude carbolic acid, 1 pint.

Dissolve soap in hot water. Add the acid and emulsify as with kerosene emulsion. For use, dilute 1 part of this stock solution to 30 to 50 parts of water.

(3.) Soap Solution.

Formula.—1 lb. of soap to 5 to 8 gallons of water.

(4.) Tobacco-soap.

Formula.—(a.) Soap, 8 lb.; water, 10 to 12 gallons. (b.) Tobacco waste, $\frac{1}{2}$ lb.; water, 1 gallon.

Steep the tobacco leaves and stems in 1 gallon of cold water for a few days, or allow the same to simmer, not boil, over a fire for a few hours. If any water has evaporated, make up to 1 gallon again, and add to the soap and water solution.