CIHM
Microfiche
Series
(Monographs)

ICMH
Collection de
microfiches
(monographies)

Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

Technical and Bibliographic Notes / Notes techniques et bibliographiques

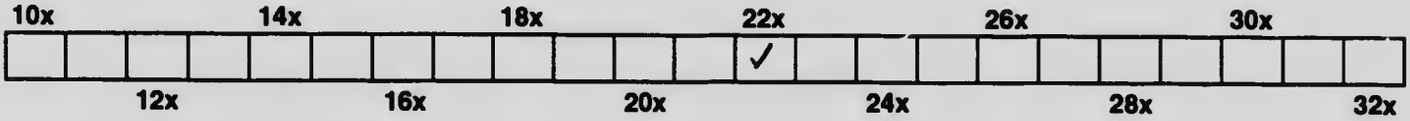
The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming are checked below.

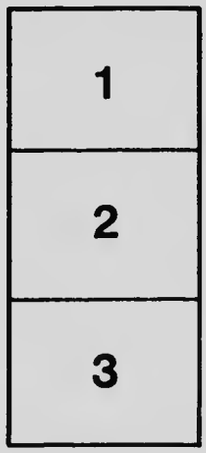
- ☐ Coloured covers / Couverture de couleur
- ☐ Covers damaged / Couverture endommagée
- ☐ Covers restored and/or laminated / Couverture restaurée et/ou pelliculée
- ☐ Cover title missing / Le titre de couverture manque
- ☐ Coloured maps / Cartes géographiques en couleur
- ☐ Coloured ink (i.e. other than blue or black) / Encre de couleur (i.e. autre que bleue ou noire)
- ☐ Coloured plates and/or illustrations / Planches et/ou illustrations en couleur
- ☑ Bound with other material / Relié avec d'autres documents
- ☐ Only edition available / Seule édition disponible
- ☑ Tight binding may cause shadows or distortion along interior margin / La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure.
- ☐ Blank leaves added during restorations may appear within the text. Whenever possible, these have been omitted from filming / Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- ☐ Additional comments / Commentaires supplémentaires:

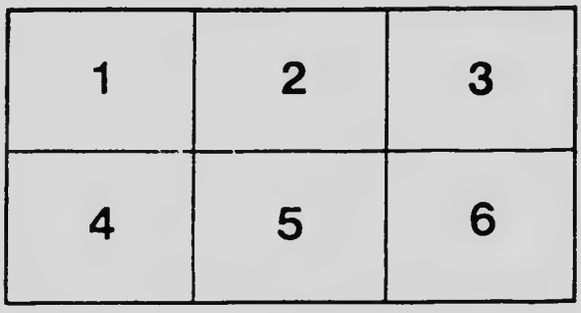
L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- ☐ Coloured pages / Pages de couleur
- ☐ Pages damaged / Pages endommagées
- ☐ Pages restored and/or laminated / Pages restaurées et/ou pelliculées
- ☑ Pages discoloured, stained or foxed / Pages décolorées, tachetées ou piquées
- ☐ Pages detached / Pages détachées
- ☑ Showthrough / Transparence
- ☐ Quality of print varies / Qualité inégale de l'impression
- ☐ Includes supplementary material / Comprend du matériel supplémentaire
- ☐ Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image / Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.
- ☐ Opposing pages with varying colouration or discolourations are filmed twice to ensure the best possible image / Les pages s'opposant ayant des colorations variables ou des décolorations sont filmées deux fois afin d'obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below / Ce document est filmé au taux de réduction indiqué ci-dessous.

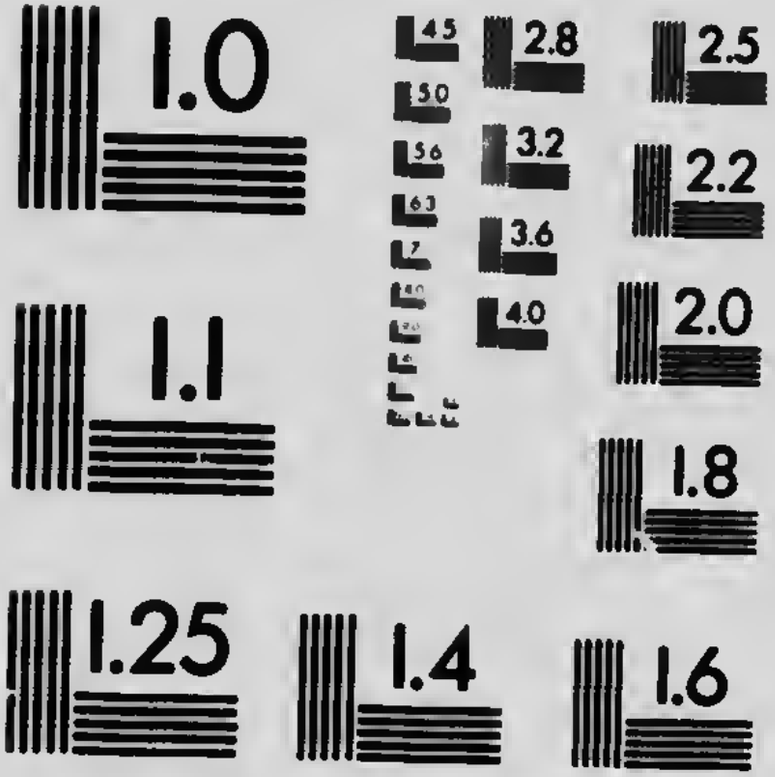






MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



APPLIED IMAGE Inc
1653 East Main Street
Rochester, New York 14609 USA
(716) 482 - 0300 - Phone
(716) 288 - 5989 - Fax

PROVINCE OF BRITISH COLUMBIA.

DEPARTMENT OF AGRICULTURE
(HORTICULTURAL BRANCH).

Soap Solutions for Spraying.

INSECTS which attack growing crops may, in general, be divided into two classes—those that bite and actually devour their food and those that derive their nourishment from plants by sucking. To the latter class belong such insects as the *cabbage-aphis, rose-bush aphis, apple-aphides, woolly aphis, thrips, chermes, scale-insects,* and the immature stages of true bugs. All of these types possess minute tube-like mouth-parts which are inserted into the epidermis of plant-tissues, the juice of the plant being thereby sucked up into the body of the insect. It is obviously impossible to poison such insects by the application of an arsenical or any other stomach-poison which is deposited in the free state on the outer layers of the plant.

It is a matter of common knowledge, however, that insects breathe by special organs located along the sides of the body. Further, it is known that the body-walls of a great many sucking-insects are delicate and easily affected by caustic or corrosive mixtures. Consequently, if it is necessary to combat an insect of the sucking type, some spraying solution must be found which either destroys the body-wall or plugs up or affects the breathing-organs. To the former class belong such insecticides as caustic lye and to some extent lime-sulphur solution. To the latter class belong the soaps and oils and nicotine solutions. A necessary adjunct to effective control lies obviously in thorough applications, by means of which nearly every individual insect is directly touched with particles of spray.

The following formulæ are given, with their methods of manufacture, as a guide to fruit-growers and gardeners in the control of such insects as have already been mentioned:—

(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, ½ 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, ½ 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.

(5.) Nicotine-Sulphate Soap.

Formula.—40 per cent. nicotine sulphate, 5 teaspoonfuls; soap, 4 oz.; water, 4 to 5 gallons.

(6.) Nicotine Sulphate-Lime.

Lime may be used to replace the soap as a "spreader" and "sticker," in which case the following formula may be used: 40 per cent. nicotine sulphate, ⅛ gallon; slaked lime, 8 lb.; water, 160 to 200 gallons.

(7.) Lye.

Lye forms a useful spray for old apple-trees which are encrusted with superfluous bark and covered with lichens. It may be used at the rate of 1 lb. to 4 to 5 gallons of water. This makes an extremely caustic solution and it should only be applied once in every few years. If there is danger of getting any of the spray on the face or hands, it is better to rub vaseline or soap on such exposed parts of the body before treating the trees. One pound of lye to 40 gallons of water may be used against soft-bodied scale-insects.

NOTE.—The ratio between an imperial gallon to a United States gallon is as 4 to 5.

Victoria, B.C., issued March, 1918.

This circular has been prepared by R. C. Treherne, Field Officer for British Columbia, Entomological Branch, Dominion Department of Agriculture, at the request of the Horticultural Branch.

Copies of this circular may be obtained free of charge on application to the Horticultural Branch, Department of Agriculture, Victoria, B.C., or from local branch offices of the Department.

VICTORIA, B.C.:
Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.
1918.