

same for the control of codling moth would be discontinued at the end of 1925. Districts were, however, given the opportunity of forming compulsory spraying zones. An Order in Council was passed which made this possible upon receipt of a petition from any district signed by 60 per cent of the growers. Your Branch also thought it advisable that there should be certain regulations as to the number of spray machines. This requirement was finally placed at one 4-horsepower machine for every 50 acres. Regulations were also drafted based upon the 'Agricultural Act,' Part II, R.S.B.C. 1924, which outlined the actual spraying requirements and penalties for non-compliance. Because of certain deficiencies in the Act under which this work would have to be carried out no spraying zones were formed. It is expected, however, that with the amendment to the Act which it is proposed to make at the next meeting of the Legislature there will be a number of zones established during the coming year."

A certain amount of work, however, was still carried on. At Okanagan Landing and Kamloops, spraying and banding

were done by the provincial government in 1926 and paid for by the growers. This work was continued in 1927 at the above points and in the city of Kelowna. At Salmon Arm, growers sprayed an area in quarantine in 1925, 1926 and 1927 under supervision of the Horticultural Branch and the cost of band inspection was borne by the government. The Salmon Arm quarantine was lifted in 1927 when no further infestation was found.

In 1929, trees were sprayed throughout the Vernon City area and the cost assessed to the lot owners. This work was continued in this area until 1941, when it was done by contract under the supervision of the city.

Aside from spraying work in and around the Vernon district by the Department of Agriculture, all quarantine work was dropped in 1926 and the Okanagan Valley south of Vernon was assumed to be generally infested with codling moth. Though many sections then were commercially free of the insect, infestations were so numerous and widespread that it was conceded by officials and most growers that the codling moth had become a pest with which the apple industry had to learn to live.

EFFECT OF LIME AND LIME-SULPHUR ON THE LARVICIDAL VALUE OF CRYOLITE*¹

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Apparently it is generally believed that because of chemical incompatibility, sodium aluminum fluoride (cryolite) should not be used in a spray mixture containing lime or lime-sulphur. So far as can be determined, however, there has been presented no evidence of incompatibility in terms of insecticidal effectiveness.

Carter (1931) mentions that sodium silicofluoride (sodium fluosilicate) and lime react to precipitate the insoluble

fluoride of calcium which evidently is considerably less toxic than the more soluble salts such as sodium fluoride. Barium silicofluoride, according to Carter (1932), is likewise incompatible with lime as well as with lime-sulphur solution. Popov and Rasina (1939) report that the addition of lime to sodium fluoride and sodium silicofluoride lowers both the phytocidal properties and the insecticidal value of these compounds. On the other hand Hockenyos (1939) states that as a contact insecticide, sodium fluoride was more quickly lethal to the

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American cockroach when used with 50 per cent by weight of calcium hydrate than when used alone. He is of the opinion that the calcium hydrate reacts with or absorbs the oily film covering the integument and the fluoride then penetrates by osmosis.

Field experiments in codling moth control carried out at Kelowna, B.C., in 1939 indicated that as an adjuvant for cryolite, casein-lime might be superior to ammonium oleate or blood albumin. Further experiments were undertaken in 1940 and 1941 to determine the effect of varying quantities of lime on the larvicidal value of the cryolite-casein-lime mixture². Several plots, each consisting of 4 McIntosh, 1 Newtown and 1 Stayman tree, were sprayed with mix-

Table 2. Effect of Lime-Sulphur and Elemental (Ground) Sulphur on the Larvicidal Value of Cryolite

Materials Per 100 Gallons	Number of Larvae	Av. Per Cent Stings	Av. Per Cent Larval Entries
Cryolite 3.75 lb. - casein 0.5 oz. - lime 4 oz.	231	14	29
Same but with added lime sulphur 1.6 gal.	217	6	60
Same but with added elemental sulphur 4.5 lb.	229	13	35
Check—no spray	217	1	70

tures composed of natural cryolite 3.75 pounds, lactic casein 0.5 ounce and high calcium hydrated lime in amounts varying from 4 ounces to 4 pounds per 100 gallons of water. Four cover sprays were applied in 1940 and five cover sprays in 1941. Check plots adjoining the experimental plots were sprayed with lead arsenate 3.75 pounds, casein 0.5 ounce, lime 4 ounces. Each year in the single second brood spray, cryolite was substi-

2. The field experiments were co-operative with the British Columbia Horticultural Branch. Mr. B. Hoy, in charge of the Kelowna office, supplied the sprayer and did much of the spraying and fruit checking. The staff of the Vernon laboratory was responsible for the remainder of the work.

Table 1. Effect of Lime on Cryolite in Codling Moth Cover Sprays

	Average Per Cent Wormy Fruit	
	1940	1941
Cryolite-casein-1 oz. lime	10.4
Check adjoining (1)	9.4
Cryolite-casein-4 oz. lime	9.1	9.5
Check adjoining (2)	9.4	10.5
Cryolite-casein-16 oz. lime	8.0	15.6
Check adjoining (3)	12.5	10.5
Cryolite-casein-64 oz. lime	22.3
Check adjoining (4)	12.3

tuted for lead arsenate in the check plots.

Table 1 gives results in terms of fruit infested by codling moth at harvest.

While lime used at 0.25 pound per 100 gallons of spray did not measurably lower the larvicidal value of cryolite, four pounds appeared to be detrimental.

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The addition of one pound of lime per 100 gallons evidently had little effect.

A laboratory experiment in which natural cryolite was used with lime-sulphur and with elemental sulphur, gave the results noted in Table 2. Newly hatched codling moth larvae were allowed to attack individual apples that previously had been sprayed with the experimental mixtures. The apples were examined for stings and entries after two weeks. The experiment comprised three replicates of each material.

Although elemental sulphur had little influence on the larvicidal value of cryolite, lime-sulphur at equivalent sulphur concentration apparently had a detrimental effect. The results were consistent in each of the three replicates.

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