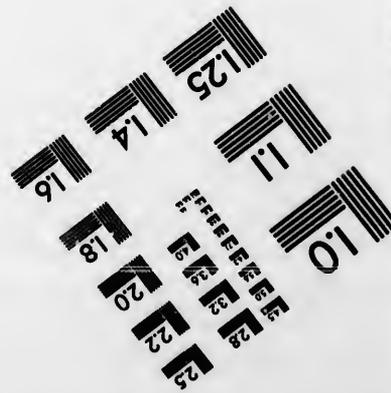
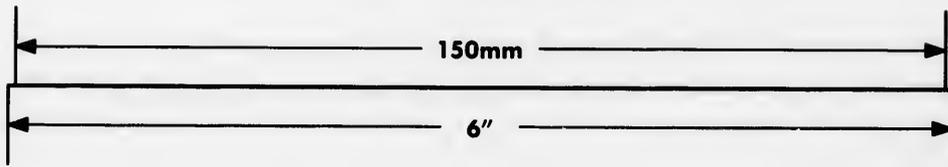
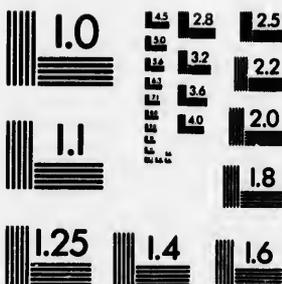
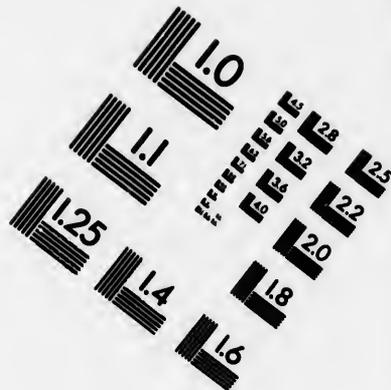
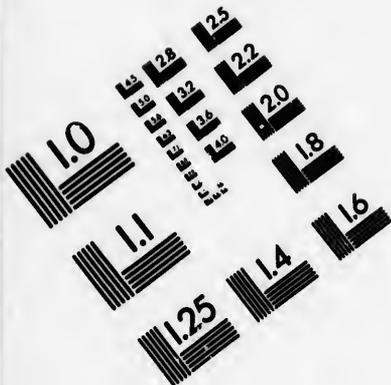


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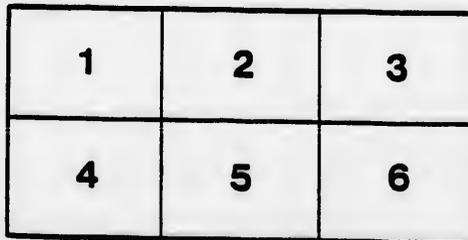
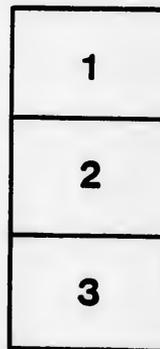
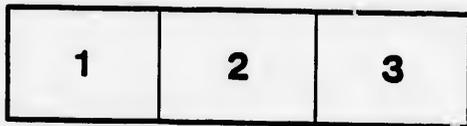
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SPRAYING OF FRUIT TREES.

The Legislative Assembly of Ontario, at the 1892 session, passed the following Act, in reference to the spraying of fruit trees and the protection of bees. Following it will be found a brief summary of the evidence taken before a special committee of the House in connection with the consideration of this Bill.

AN ACT FOR THE FURTHER PROTECTION OF BEES.

(Assented to April 8, 1892.)

1. No person in spraying or sprinkling fruit trees, during the period within which such trees are in full bloom, shall use or cause to be used any mixture containing Paris green or any other poisonous substance *injurious to bees*.

2. Any person contravening the provisions of this Act, shall, on summary conviction thereof before a justice of the peace, be subject to a penalty of not less than \$1.00 or more than \$5.00 with or without costs of prosecution, and in case of a fine or a fine and costs being awarded, and of the same not being upon conviction forthwith paid, the justice may commit the offender to the common gaol, there to be imprisoned for any term not exceeding thirty days unless the fine and costs are sooner paid.

3. This Act shall not come into force until the first day of January, 1893.

EVIDENCE AS TO SPRAYING OF FRUIT TREES.

Mr. Allen Pringle, ex-President Bee-keepers' Association, Selby, gave evidence as to bees being killed by Paris green sprayed upon fruit trees, referring to various accounts taken from bee journals. He cited Prof. Cooke, of Michigan, as authority. He had no experience himself as to effect of poisonous spraying upon his bees.

Mr. F. A. Gemmell, President Bee-keepers' Association, Stratford: Bees will feed upon sweetened matter that contains poison. Spraying during bloom is only throwing away time, labor and money; when bloom has fallen is the proper time.

Mr. Wm. McEvoy, Bee Inspector, Woodburn: Had heard many complaints that bees are being poisoned. Had seen them dying and dead; thought the honey also might be injured by poison being carried to it by the bees.

Mr. Gemmell did not think the honey would be affected, as when spraying is done the honey is being gathered for brood.

Mr. Gilmer said only one fruit grower in his neighborhood sprayed; there was no loss, however, as he did not spray during bloom.

Mr. A. W. Peart, fruit grower, Burlington: Had been for some time in the habit of spraying apples, plums and cherries immediately after fall of blossoms. Did so because the blossoms are much more tender than the leaves. The bees play a very important part in cross-fertilization and therefore should not be destroyed. Had had success in spraying, trees sprayed giving more bountiful harvest than those not sprayed. Thought this Bill was in accordance with the researches on these lines for the last ten years. Fruit-growers in his district delay spraying until after the blossoms fall and are favorable to this Bill.

Mr. P. C. Dempsey, fruit-grower, Trenton: Had sprayed for over

thirty years ; with Paris green for only five or six. Sprayed only after blossoms fall. Since he had sprayed he would not find in 50 barrels of apples one barrel of bad ones, whereas before spraying was introduced it would have been difficult to get that number of really good ones. As to injury to bees, he keeps 150 colonies of bees right in his orchard, and has never seen any of them suffer on account of spraying. Never sprayed during bloom. He sometimes sprays cherries and plums before the petals drop. He believed a Bill prohibiting spraying while in full bloom would be a benefit.

Capt. Felan, fruit-grower, Oakville : The proper time to spray is when the blossoms fall. He did not think this Bill would injure fruit-growers. He is the only man in his section who sprays.

Mr. G. E. Fisher, fruit-grower, Burlington : His experience corresponded to Mr. Peart's. We are very generally dependent upon insects for the fertilization of our orchards. To destroy them to any extent would be very injurious to fruit-growers. He thought this Bill is just what fruit-growers require. If a man does not know enough not to spray while his trees are in full bloom there should be an Act to prevent him from doing so. He had had no experience as to bees being injured by Paris green. A gentleman in Burlington told him that one of his neighbors used Paris green on his trees while in full bloom, and while it was going on he noticed that many of the bees died.

Mr. Theo. Woodruff, fruit-grower, Niagara Falls, thought that trees, especially the plum tree and cherry tree, should be sprayed when the blossom is going off, but not when it is in full bloom. His experience is that he did not get perfect fruit by spraying after the blossoms had gone. He believed that as soon as the fruit is formed it gets too hard for curculio to work in. He thought the bees robbed his orchard every year, and was certain that they carry "the yellows" from one section to another. Fruit-growers should oppose that Act. He did not believe you could draw the line as to when trees are in full bloom.

Mr. E. Morden, fruit-grower, Niagara Falls, had never yet heard a speaker who advocated spraying in full bloom. The codling moth and curculio do not deposit eggs on the blossom, but on the calyx of the embryo fruit. The curculios do not appear until about a week after the blossoms fall ; then they are very numerous for about ten days, after which they become comparatively rare. It is during these ten days that we ought to spray. As to the canker-worm, spraying should be done before full bloom. Articles were produced, written by fruit men, advocating spraying only after full bloom.

Mr. Kew, fruit-grower, of Beamsville, thought sufficient evidence had been given to show that the bees would be injured by the use of poisonous substances at an improper time. There would be a difficulty as to peaches, which he preferred to spray while the bloom is on. He thought fruit-growers should be allowed to use their own experience.

Prof. Jas. Fletcher, Dominion Entomologist, Ottawa, stated that the pistil of the blossom is very sensitive, and a very weak solution of Paris green would destroy it and prevent the formation of fruit. Bees are much more easily killed than other insects. There is no accurately recorded experiment as to whether or not bees have been killed by spraying. An experiment has been arranged. He did not believe the honey is at all affected. The poison taken by the bee is in the nectar that comes from the flowers and before the bee can deposit it the bee is dead, so that the honey in question is never deposited. Even if the bee did not die before depositing it this honey is used not for surplus, but for feeding the young. As to spraying, if you wait until the flowers are all gone you will cover the canker-worm and all the insects that he new of except the bud-worm, and in the case of the bud-worm he thought it would be necessary to spray before the flower is open. As to the codling-moth and the curculio, there is no possible use in spraying for them while the fruit is in flower. In California the insects injure the fruit right up to the time that it is full grown. He did not think there would be any use in spraying the cherry until it is the size of an ordinary pea. Apple trees remain in flower about a week. The eggs are not laid until the flowers are in full bloom. Wait till they all drop before spraying. Bees do not visit fruit in dull weather, and then we get little fruit in consequence. As to bees injuring fruit there is no direct evidence. Wasps may start the work, and then bees continue it. We have never been able to find a case of primary injury by bees. As to their carrying "the yellows," that is a point requiring serious consideration, as we do not even know what "the yellows" are. He drew attention to the false statements of the English press that our apples are poisoned from their absorbing arsenic. The statement is absurd. The physiology of the plant renders such a thing impossible. The pistil of the apple cannot absorb arsenic or any other poison. If we could only get our farmers to spray more we would have better fruit crops. He thought there was nothing in this Bill but advantage to the fruit-grower.

Prof. J. H. Panton, Entomologist, Agricultural College, Guelph: He could not imagine that anyone was doing what this Bill prohibits. In all cases of spraying that had come under his observation it was invariably the rule not to spray during bloom. But if there are people who will persist in doing such a thing he should certainly think it necessary to have a bill to prevent it, and to protect others. This Bill is in accordance with the teachings of all science.

MISCELLANEOUS EXTRACTS.

THE CODLING-MOTH. The eggs are laid on the young fruit at the blossom end, in the cup left by the fallen flower, and in about a week or ten days the larva hatches. Egg-laying continues about

two weeks, so that the danger period for codling-moth is from three to four weeks after the blossoms fall. As soon as all the blossoms are off and the fruit has fairly set and still points blossom end up, make your first spraying.

PLUM CURCULIO. The first spraying should be made *before* the trees are in bloom, and at least three sprayings should be made afterwards. *Never spray trees while in bloom.* (Bulletin of New Jersey Expt. Station, April 4, 1892)

At last fruit-growers and bee-keepers are getting into right relations with each other. The numerous discussions which have taken place regarding the value of bees as fertilizers of fruit blossoms and of those blossoms of plants grown for their seeds, and regarding the alleged damage to fruit by bees have led to close observation and careful experimentation, the results of which show that the interests of these two classes of producers conflict but in trifling respects—that, in fact, bee keepers and fruit growers are of great help to each other and even indispensable if each is to obtain the best results in his work.

Bee-keepers have never complained but that the growing of fruit in the vicinity of their apiaries was a great benefit to their interests; hence their position has been merely a defensive one, the battle waxing warm only when poisonous substances were set out to kill off the bees, or when fruit-growers sprayed their orchards with poisonous insecticides during the time the trees were in blossom, or again when efforts were made to secure by legislation the removal of bees from a certain locality as nuisances. Fruit-growers at first relented when close observation and experiment showed that wasps bit open tender fruits, birds pecked them, they cracked under the action of sun and rains and hail sometimes cut them, the bees only coming in to save the wasting juices of the injured fruit. The wide publicity given to the results of the experiments made under the direction of the United States entomologist and published in the report of the Commissioner of Agriculture for 1885, have no doubt contributed much to secure this change among fruit-growers. But now it would appear that the bees have not only been vindicated, but that in the future fruit-growers are likely to be generally regarded as more indebted to bee-keepers than the latter are to the fruit-growers, for the amount of honey the bees secure from fruit blossoms comes far short of equalling in value that part of the fruit crop which many accurate observations and experiments indicate is due to the complete cross-fertilization of the blossoms by bees. The observations and researches of Hildebrand, Muller, Delpino, Darwin and others, as well as the excellent explanation of the subject in Cheshire's recent work, have gone far to prove how greatly blossoms depend upon the agency of bees for their fertilization and hence for the production of seeds and fruits. (*Insect Life, April, 1892.*)

