

# Nurserymen and Fruit Growers on Fumigation

THE question of fumigating nursery stock is one of increasing importance. San Jose scale is spreading in the province of Ontario. It will extend the area of its depredations if adequate steps are not taken to control it. The value of fumigation as a means of doing this is a point upon which there is a diversity of opinion. To learn the conclusions of practical men regarding the matter, THE CANADIAN HORTICULTURIST submitted the following list of questions to leading nurserymen and fruit growers: "Do you consider fumigation of nursery stock to be a necessity? Does it kill all the insects and scale that it is claimed to do? Can you cite instances where it has injured the trees? What do you think of dipping the trees in a lime-sulphur wash as a substitute for fumigation?" Here are some of the replies:

## OPINIONS OF NURSERYMEN

"Do I consider fumigation of nursery stock a necessity?" writes E. D. Smith, M.P., Winona, Ont. "If it were not for the excessive cost of an absolutely thorough inspection, I should say the inspection, accompanied by the destruction of all trees on which scales were found, would be more satisfactory to the nurserymen. At any rate, it would to me, as our losses under that system would be nothing. The objection to depending upon that system, however, entirely, is that no inspection can be thorough, no matter what the cost. Inspectors have told me that no matter how often they may go over a block of trees, whether it is fruit trees or nursery stock, if scale is there at all they are never sure they have found the last one, and I can well believe this, as it is such an infinitesimally small thing it may be so easily hidden. The objection to fumigation lies chiefly in the delay that it causes in the handling of the trees, making it necessary that they shall be out of the ground greater lengths of time than they would be without it. An exhaustive experiment, conducted on my grounds by W. N. Hutt, formerly of the Dept. of Agric., Toronto, convinced me that there is no damage done by fumigation. Mr. Hutt was furnished by me with a large quantity of nursery stock of almost every variety of fruit trees and bushes. Some of these were not fumigated at all. Some were fumigated with the ordinary strength, some with double strength, and some with treble strength. Others were fumigated wet, as it was supposed that the damage was caused by fumigating the stock wet. These trees were planted in a row on my grounds, and the growth watched during the season. In the fall a certain synopsis was made of the results, and it showed that there were no greater losses in one lot than in another. The trees that were fumigated even with treble strength, and those that were fumigated wet showed no greater percentage of loss than those that were not fumigated at all. Consequently, although I was a firm believer up to that time that fumigation was disastrous, I could not but conclude that fumigation did no damage to the trees of itself. Nevertheless, we have had very much greater losses since fumigation started than before, and I can only account for it on the assumption that the trees were damaged by the greater length of time they are obliged to be out of the ground."

"As to dipping the trees in lime and sulphur wash," continued Mr. Smith, "it would be out of the question. The quantities that are handled and the disagreeable nature of the operation would make it impossible. I have often thought that something of that nature might be done, dipping in whale-oil soap, for instance. I am not sure whether this would damage the roots or not. If it would not damage the roots, a whole load of trees might in some mechanical

manner be lowered into a large vat, and, after becoming saturated, lifted and allowed to drain. Experiments would first have to be made as to whether these solutions would damage the roots or not. If so, then this method would be impracticable, and every tree would have to be taken by the roots and dipped individually, which would be too expensive and too nasty an operation."

C. W. F. Carpenter, Winona, Ont.: "The fumigation of nursery stock is a decided benefit to the trees in the eradication of the San Jose Scale or other scales. I cannot say definitely that it will kill every single scale, as I have not personally made any tests along this line. I do not think it necessary where there is not any scale in a radius of several miles of nursery stock, to have same fumigated, especially when inspectors have gone over the stock and pronounced it free from scale. There is no doubt, however, that fumigation is a thorough insecticide. The only stock that fumigation will injure are peaches and cherries, which in the last few years, since fumigation has been in force, have been injured from said procedure. It is almost impossible, especially in the case of sweet cherries, to get them fumigated in the spring in a perfectly dormant condition, as the buds of this stock swell very early. This is where the danger lies in fumigation. If trees are in a proper condition and perfectly dormant, there is not the slightest injury done to them, but a decided benefit, as it frees the tree from insects. Dipping trees in sulphur solution is almost out of the question from a nurseryman's standpoint. It would be possible for the planter to do this; but where we handle tens of thousands of trees yearly it would be impossible."

Joseph Tweedle, Fruitland, Ont.: "Fumigation does pretty thorough work, but the fumigated trees make a very feeble start into growth. I planted fumigated peach trees last spring, and they did not start to bud for 6 weeks to 3 months, although they were in an excellent condition when planted. I pointed this out to the nurseryman who paid me a visit in midsummer and examined my trees. He said he was very dissatisfied, as it was the general complaint; and he thought with myself that dipping with lime and sulphur is much better for the health of the trees, as this treatment has been so effectual in the orchard. It would be a wise move if the Government would legislate to make the change, or at least give us an option to use either method we might choose. I much prefer to use the lime and sulphur as a substitute for fumigation, it being just as effectual and much safer for the trees."

A. G. Hull & Son, St. Catharines, Ont.: "Fumigation of nursery stock is a wise precaution. It is effective when thoroughly done. No injury is done to apple, pear or plum trees, but cherry, peach and ornamentals are more or less injured when so treated. There is a difference of opinion, however, regarding the question. Some planters prefer stock that has not been fumigated. Dipping the trees in the lime-sulphur wash would be the surest and safest method. It would cover every doubt."

Morris & Wellington, Fonthill, Ont.: "Dipping trees in lime and sulphur wash would not be practicable for large nurserymen, as the short season for handling large quantities of stock would not give them time to perform the work thoroughly. Fumigating would, perhaps, injure peaches and other stock with tender roots, if applied full strength. To avoid this, we fumigate such stock in our frost-proof cellars during the winter, while the roots of the trees are heeled in the soil. In this way we have not noticed any injurious effects from fumigating."

Brown Brothers Company, Ltd., Browns' Nurseries, Ont.: "There can be no doubt as to

the necessity for fumigation where scale or other pests actually exist; but there is a great amount of work done in this line where there was not even a suspicion of a scale. There is no way of determining absolutely beforehand whether or not the work is necessary. Fumigation of stock coming from the States, which has already been fumigated and is so certified by certificate on the package or car, should be prevented. Could not provision be made for the acceptance of authentic foreign certificates of fumigation?"

"Certain classes of stock are much more susceptible to injury by fumigation than others; but it is difficult to see how the dose can be adjusted to suit certain stocks. Dipping trees in lime-sulphur wash seems to be an entirely impracticable process, especially where many thousands of trees are handled. It would be extremely disagreeable and dirty, on account of the nature of the mixture, and it would be difficult to procure men for such work, even if it were practicable. The present process, aside from possible damage to stock, is the most thorough, effective and expeditious."

## WHAT FRUIT GROWERS SAY

A. O. Telfer, Ilderton, Ont.: "Fumigation of nursery stock should be certain death to all insects. The lime-sulphur wash might be safer but not as sure a remedy."

W. H. MacNeil, Oakville, Ont.: "I am of the opinion that dipping trees in the lime-sulphur wash to kill insects would also kill the buds."

Milton Backus, Chatham, Ont.: "For several years I have imported young stock from New Jersey, and its vitality has been badly injured by fumigation. Coming from there it gets fumigated twice. By the best American authorities the practice is considered injurious to young stock in particular. Dipping the trees in the lime-sulphur is preferable."

C. M. Honsberger, Jordan Station, Ont.: "Fumigation does not do all that is claimed for it, except at the risk of killing the trees or plants so treated. My opinion is that dipping in lime and sulphur before the trees are prepared for planting is preferable to fumigation."

F. S. Wallbridge, Belleville, Ont.: "The fumigation of nursery stock is more a question for chemical experts than for fruit growers. Fumigation can be, and sometimes is, overdone, the stock being subjected to a longer fumigation, with probably a greater quantity of fumigating material than should be the case. There would be no bad results from fumigation if it were done carefully and properly, but the danger is that it may not be attended to in that way. Fortunately we are not troubled with the San Jose Scale in this locality, and we do not know what effect fumigation has upon the scale. Dipping the trees in a lime and sulphur mixture is, I believe, far preferable to fumigation. The danger from the lime and sulphur is practically nil, and it certainly has a cleansing effect upon the trees. If the experts at the Experimental Farm consider it just as effective for the scale, it should be adopted without hesitation in lieu of the fumigation."

Geo. E. Fisher, Burlington, Ont.: "Fumigation is more reliable for destroying insect life than any other treatment. While it is not an absolute necessity, except with the San Jose Scale, it is always desirable if carefully conducted. No animal life can resist an exposure of 40 minutes in a gas-proof compartment containing gas from one-quarter of a gramme of cyanide of potash to each cubic foot enclosed, at which strength it is used in fumigating nursery stock. It is questionable, however, if the gas has any effect upon eggs. The proportions and quality of chemicals recommended by the Dept. of Agric. will give satisfactory