1902.

NEW ZEALAND.

JOINT AGRICULTURAL, PASTORAL, AND STOCK COMMITTEE:

REPORTS ON THE ORCHARD AND GARDEN PESTS BILL, TOGETHER WITH MINUTES OF EVIDENCE.

(Hon. Mr. ORMOND, Chairman.).

Presented to the House of Representatives, and ordered to be printed.

ORDERS OF REFERENCE.

Extract from the Journals of the Legislative Council.

THURSDAY, THE 3RD DAY OF JULY, 1902.

Ordered, "That Standing Order No. 162 be suspended, and that a Select Committee be appointed to consider all matters pertaining to agricultural and pastoral industries and stock, with power to sit and confer with any similar Committee that may be appointed by the House of Representatives, and to agree to a joint or separate report; with power to call for persons, papers, or records: to consist of ten members—viz., the Hon. Mr. Bowen, the Hon. Major Harris, the Hon. Mr. Johnston, the Hon. Mr. T. Kelly, the Hon. Mr. W. Kelly, the Hon. Mr. McLean, the Hon. Mr. Ormond, the Hon. Mr. A. Lee Smith, the Hon. Mr. L. Walker, and the mover."—(Hon. Mr. W. C. WALKER.)

Extracts from the Journals of the House of Representatives.

TUESDAY, THE 8TH DAY OF JULY, 1902.

Ordered, "That a Committee be appointed, consisting of ten members, to consider all matters pertaining to agricultural and pastoral industries and stock, with power to sit together with any similar Committee which may be appointed by the Legislative Council, and to agree to a joint or separate report; the Committee to have power to call for persons, papers, and records; three to be a quorum: the Committee to consist of Mr. Bollard, Mr. Buddo, Mr. Hardy, Mr. Lawry, Mr. Lethbridge, Mr. T. Mackenzie, Mr. Massey, the Hon. Major Steward, Mr. Symes, and the mover."—(Hon. Mr. DUNCAN.)

FRIDAY, THE 11TH DAY OF JULY, 1902.

Ordered, "That the Orchard and Garden Pests Bill be referred to the Joint Agricultural, Pastoral, and Stock Committee."—(Hon. Mr. DUNCAN.)

REPORTS.

ORCHARD AND GARDEN PESTS BILL.

THE Joint Agricultural, Pastoral, and Stock Committee, to whom was referred the Orchard and Garden Pests Bill, have the honour to report that they have carefully considered the said Bill, and recommend that the Bill be allowed to proceed, with the amendments shown in the attached copy.

26th August, 1902.

THE Joint Agricultural, Pastoral, and Stock Committee have the honour to report that they recommend that the evidence taken by them on the Orchard and Garden Pests Bill be laid on the table and be printed.

17th September, 1902.

MINUTES OF EVIDENCE.

WEDNESDAY, 20TH AUGUST, 1902.

Mr. W. A. BOUCHER examined.

1. *Hon. the Chairman.*] What is your name?—W. A. Boucher.
2. What is your occupation?—Fruit Instructor.
3. You have been in charge of the experimental orchard?—Yes, sir.
4. For how long?—For two years. The size of the orchard (the Otahuhu Experimental Orchard) is about 2 acres. The work of the first season consisted of spraying solely for the codlin-moth, with the result that at the end of the season 38 per cent. of the fruit was absolutely sound. During the winter following the first season the pruning was taken in hand, to be followed later, about this time last year, with spraying for the fungi diseases, and the spraying for the codlin-moth commenced in November. Prior to the Department taking the orchard in hand the trees had been neglected for a number of years. In the first place, they had been well cultivated in order to give them rapid growth; then afterwards came a time of neglect, followed by a time when the orchard was used for dairy purposes, and stock turned in. So that at the time when the Department took the place over many of the lower limbs of the trees had been destroyed and the trees had grown almost beyond reach, considerably increasing the cost of all orchard operations. The trees were sprayed eight times in all during the season, and several different mixtures were used with a view to testing during the same season, and under the same general conditions and upon the same varieties, all the arsenical sprays. This was approved of by the committee as important experimental work. The sprays tested were as follows:—Paris green: 1 lb. to 200 gallons saturated solution of lime-water; cost—Paris green 1s., lime 5d.—total cost, 1s. 5d. per 200 gallons. Arsenic and soda No. 1: 1 lb. white arsenic, 2 lb. washing-soda, to 700 gallons of lime-water; cost—arsenic 6d., washing-soda 2d., lime 1s. 5½d.—total cost per 700 gallons, 2s. 1½d. Arsenic and soda No. 2: 1 lb. white arsenic, 4 lb washing-soda, to 400 gallons of lime-water; cost—arsenic 6d., washing-soda 4d., lime 10d.—total cost per 400 gallons, 2s. 1d. Arsenite of lead: 1 lb. arsenite of lead, 1½ lb. of treacle, to 12 gallons plain water; cost—arsenite of lead 1s., treacle 1½d.—total cost per 12 gallons, 1s. 1½d. Resin mixture: 1 lb. washing-soda, 1½ lb. resin, to 2 gallons water; cost—washing-soda 1d., resin 4½d.—total cost per 80 gallons, 5½d. In addition to these I used arsenite of lime; but I found the arsenite of lime scorched the foliage, and I ceased to use it after one spray. The sprays that were effective and that I am prepared to recommend are Paris green, and arsenic and soda No. 1. Arsenic and soda No. 2 also scorches the foliage. The net result from the Paris green was a fraction over 90 per cent. of fruit free from the moth, and the result of the arsenic and soda No. 1 a fraction over 95 per cent. free from the moth. The cost of spraying overgrown trees, 20 ft. apart, 108 trees to the acre, would be—labour 8s. 4d.; material, using arsenic and soda, 4d.; or a total of 8s. 8d., or, using Paris green, which is slightly more expensive, 9s. 1d. This is at the rate of 1½ acres per day, and a man and boy could spray from 1½ to 3 acres, according to the number of trees to the acre and the size of the trees. The cost of spraying, including material, of a well-kept orchard would be, per acre—labour, 4s. 2d.; material, 5d.; or a total cost of 4s. 7d. But the cost of spraying will vary according to the size and spread of the trees, the material used, the spraying appliances available, the number of the trees to the acre, the contour of the land, and weather at the time of spraying. On account of the excessive rainfall that sometimes occurs during the spraying season I have found it necessary occasionally to add an adhesive mixture to the ordinary sprays to prevent their being washed off before their action has been effected. For this purpose I added a small quantity of resin mixture to the Paris-green solution, with very satisfactory results. Taking everything into consideration, I consider the results were entirely satisfactory, for the orchard was selected by a committee of Auckland fruit-growers as being the worst that they could find, and on the occasion of the first visit of the committee one member to demonstrate how badly infected the orchard had been took his penknife, and, lifting the loose bark from the macrocarpa shelter-belt, showed the dormant grubs hidden there in numbers. At the same time it was possible to find the codlin grubs in the decayed wood, and under the rough bark of the apple-trees themselves. The property was selected by the committee and offered to the Department on that account. Under ordinary circumstances, in a well-kept orchard four or five sprays would be all that would be necessary, but in an orchard so badly infested I found it necessary to spray eight times the first season to reduce the numbers of the moths. But I propose to gradually each season reduce the number of sprays. Great care was exercised by the committee in making a careful count. The tree was selected by themselves, and all the apples carefully gathered, each apple always being carefully examined for traces of the codlin-moth, and all apples showing traces were set out on one side as "mothed." The question has been brought up regarding the effect of the pigs upon the count of fruit, but the pigs only did the work that would otherwise have been accomplished by hand, for in no well-conducted orchard would a grower leave the apples lying beneath the trees throughout the entire season to increase the trouble in the orchard for the following season. The pigs were merely allowed to gather up for themselves what would otherwise have been gathered up and carried to them, thus saving the labour of gathering up the fruit. The orchard was open to any member of the committee throughout the entire season, and at my invitation they visited the orchard from time to time, but on no occasion could they find any considerable percentage of infested fruit upon the trees themselves. And of necessity the fruit must become infested upon the trees before it can fall to the ground for the pigs to gather it up. So that I do not see that the gathering of the fallen fruit by the pigs affected the percentage of sound fruit when it came to the final count of the fruit on the tree. If there had been any large percentage of codlin-moth I think that members of the committee would have discovered it upon

the tree, but I feel assured that if any member were present here to-day he would admit that at no time during the season were they able to find any considerable percentage of infested apples upon the trees. I have endeavoured to treat the committee in a perfectly honourable manner all through, and I think the Auckland committee admit it themselves. With regard to spraying, I commenced spraying in November and continued until the early part of April.

5. *Hon. the Chairman.*] What extent was the orchard?—Two acres.

6. Was it entirely an apple-orchard or were there other fruits?—It was entirely apple.

7. Have you had any practice with mixed orchards?—We have a mixed orchard at Henderson. I have had experience.

8. And is the codlin-moth as injurious to other fruits—pears, for instance—as well as apples?—Yes; some varieties of pears are particularly affected by the codlin-moth.

9. Has this orchard been cultivated during the time you have been experimenting on it?—Yes; it was cultivated the second season.

10. What sort of cultivation?—Ploughing, and digging round the trees where it was necessary and where the plough could not reach.

11. Half of the orchard or all of it?—Half of the orchard.

12. I did not follow exactly how you arrived at the different results in the orchard where you treated the trees differently. How do you arrive at the effect one spray would have in one case as compared with the other? The grubs continually go back to the trees and fruit?—No, sir, the grub attacks the fruit at once.

13. Do you mean that there are several successive broods during the season?—That is a matter that is open to question. In my opinion, practically there is no second brood. The majority of the grubs remain dormant during the winter months, but develop into moths and infect the fruit the following season.

14. If that were so what would be the use of bandages? Are not bandages to catch the grub when it falls?—By catching the grubs of one season those grubs are prevented from developing in the following season.

15. I am talking of while the season is going on?—As far as one season is concerned, I do not consider that the bandages have any appreciable effect upon the percentage of the fruit saved during that year.

16. Do you not think, if the bandages were not there, they would travel up and get into the fruit?—The same grub does not enter the fruit a second time.

17. Have you any experience of the grub destroying almost entirely the fruit in the store-house?—Yes; but that is from the undeveloped eggs of the codlin-moth which are dormant upon the fruit at the time the apples are placed in the store.

18. Why do you say that it is admitted that the grub never enters the fruit a second time: is it your own opinion?—Yes; that is my experience.

19. You named the cost at about 4s. 2d. per acre: that is of a single spraying?—Yes, in well-cultivated orchards.

20. What does it mean—two men?—That is a man and a boy and a horse.

21. *Mr. Massey.*] Have you anything in the way of a balance-sheet to show the cost of the operations as compared with the fruit saved?—Yes, we have.

22. Will you put it in to the Committee?

Balance-sheet read and handed in as follows:—

OTAHUHU ORCHARD.

First Season (only Part of Year—viz., October–April).

	£ s. d.		£ s. d.
Labour, horse-hire, &c., for spraying ..	8 13 6	Sale of sound clean apples (infested apples given away for pig-feed: no sale for them)	23 12 9
Tools, appliances, &c.	4 5 0	Tools, &c., on hand £4 5 0	
Spraying-materials	1 2 7	Less 10 per cent. wear-and-tear .. 8 6	
Fruit-cases, cartage, &c.	3 16 0		3 16 6
Rent for six months	7 10 0		
	£25 7 1		£27 9 3

Second Season (Whole Year).

	£ s. d.		£ s. d.
Labour, horse-hire, &c., for cultivation, pruning, spraying, &c.	70 8 1	Balance from last year	2 2 0
Tools and appliances	16 13 9	Sale of sound apples	6 13 3
Spraying-materials	3 4 9	Apples (sound) sent to South African contingents—52 cases at 5s.	13 0 0
Fruit-cases, cartage, &c.	13 19 2	Tools, appliances, &c. .. £16 13 9	
Rent for year	15 0 0	On hand from last year .. 3 16 6	
		20 10 3	
		Less 10 per cent. wear-and-tear 2 1 0	
			18 9 3
Approximate cost of cartage	£1 1 0	Spraying-materials, fruit-cases, &c., on hand	2 17 0
		Apples (sound) now in cool-stores—191 cases at 7s.	66 17 0
	£120 6 9		£109 18 6

23. So it has not been what you call a commercial success as yet?—No; taking an orchard like that you could not expect it.

24. You think it will probably be a commercial success next year?—I anticipate it will be much better.

25. On that account you want to keep on for another year?—Yes.

26. In your statement I do not notice the percentage of sound fruit in the second year?—The second year, the sprays that I am prepared to recommend, as the result of the experimental work, gave a fraction over 90 per cent. free from moth for Paris green, and for arsenic and soda a fraction over 95 per cent. free from the moth.

27. So that the average was a little over 90 per cent.?—Yes.

28. Is it not a fact that fruit that dropped from the trees was eaten by the pigs?—Yes.

29. Is it not a fact that infected fruit drops from the trees?—Yes.

30. Was the infected fruit so eaten by the pigs that were running through the orchard?—Yes.

31. On that account the percentage of fruit would be less?—A proportion of fruit that drops from the trees is not infected. A considerable proportion of sound fruit drops that is not infected.

32. What proportion would you say?—We gathered up a quantity of the fruit that had dropped from the trees last year, and the count that I made gave precisely the same results from the fallen fruit as from the fruit gathered from the trees. In gathering up the fruit and counting it over we got the same amount of clean fruit from the ground and the same percentage of codlin-moth as in the fruit gathered from the trees.

33. That is to say, there was the same percentage of sound fruit that had fallen from the trees as the fruit you had got from the trees themselves: was not that extraordinary?—I do not think so. We have some illustrations which I might show to you which will illustrate the point I want to emphasize. The apples were absolutely overcrowded on many trees. You can see by these illustrations that the apples were actually crowding themselves off the trees.

34. Do you consider that you have had experience in other countries?—Yes.

35. In what country?—In California.

36. Do you consider the climate of Auckland is as suitable for spraying all fruit-trees as the climate of California?—There are difficulties, but comparing the spraying of the present day with the spraying that was done years ago there are vast improvements. I have been making careful inquiries myself into the spraying that was done for the codlin-moth. As far as I can learn, Paris green was used exclusively; consequently, as there are many different grades and qualities of Paris green, and as some grades scorch severely while other grades may be used successfully without scorching, the results in many cases were wholly unsatisfactory. Moreover, as far as I could learn of the spraying with Paris green in the early days, in no case was lime used to mitigate the caustic effect of the Paris green. The advancement that has been made in spraying of late years will lead to an altogether different condition of things.

37. *Hon. the Chairman.*] What proportion of lime is there?—A bushel of lime to 700 gallons of water.

38. *Mr. Massey.*] Are the results of spraying in a climate like Auckland as satisfactory as in the climate of California?—There is more difficulty.

39. Did you try bandaging in the orchard?—Yes, sir.

40. Did you find the result of bandaging satisfactory?—I have not tried it exclusively, only in connection with spraying.

41. You referred to the trees being overgrown when you went there: did you know the owner of the orchard previous to its being taken over by the Department?—No.

42. Did you know the appliances he used there?—No.

43. Have you had any experience with the Strawsoniser?—No.

44. Do you know that the Strawsoniser will reach to the top of tall trees?—I have been told so.

45. Are you aware that the previous occupier of the orchard used the Strawsoniser?—Yes, I have heard so.

46. Are you aware that he abandoned it because he was unable to make it a commercial success?—Yes.

47. Will you give us the names of the members of the committee that were appointed to supervise while the work was going on?—Messrs. H. Sharp, J. Parr (Waikumete), W. E. Lippiatt (Otahuhu), W. C. Thompson (New Lynn), J. G. Kay (Birkenhead), W. Will (editor, *Weekly News*), G. L. Peacocke (editor, *Farmer*).

48. They were all practical men, were they not?—Yes.

49. You understand that the committee dissented from the first report of the chairman?—Yes.

50. You are of opinion that another season is necessary in order to prove conclusively whether the experiments are satisfactory or not?—I consider that the results this season are eminently satisfactory.

51. You require another season?—Another season will show a different result as far as the commercial aspect is concerned.

52. How many years have you been here?—About six years.

53. In those six years have you not understood that the codlin-moth varies? It is very much worse in some seasons than in others?—Yes.

54. Do you know whether last year was one of those seasons?—I do not think so, sir; in the orchards that I visited the codlin-moth was quite as abundant.

55. Would an unsually wet season have any effect on the codlin-moth? Would it make it more numerous or destroy it?—I think a wet season would help to reduce it.

56. You think that a wet season helps to reduce it?—Yes.

57. *Mr. Bollard.*] When you took over the orchard it was in a very bad condition, and it has taken you about two years to bring it into proper order?—Yes.

58. Do you consider now that you have a fair orchard?—Yes.

59. From a commercial point of view do not you think the orchard itself would pay for another year, and that the cost could be fairly counted now for the coming season?—The cost for the coming season will be decidedly less.

60. From the commercial standpoint the fair test would be for the present season?—Yes.

61. And on that account you think it would be necessary to go on for another year, and that the coming year would be the real test from a commercial standpoint?—Yes.

62. *Mr. T. Mackenzie.*] You think it is absolutely necessary to have this Bill passed in the interests of fruit-growing in New Zealand?—Yes.

63. *Mr. Symes.*] Are you quite satisfied with the practical test?—Yes.

64. It is only the commercial test that you think should be tried for another year?—Yes.

65. *Hon. Mr. W. Kelly.*] Have you read the Bill?—Yes.

66. Do you think it would be an injury to Auckland?—It would cause a certain amount of hardship, but in the future interests of the industry I do not see how it can possibly get along without a Bill. It is really in the interests of the whole of the colony as against the hardships that may occur in any individual instances for the time being. In remedying the evils of the past, one cannot overlook the fact that there must be some hardship. We have to consider the future of the industry as a whole for the whole of the colony.

67. *Hon. Mr. T. Kelly.*] I understand it would cost about £1 5s. per acre for those sprays?—Yes.

68. What time do you commence spraying as a rule, and what condition are the trees in—just after the fruit has set?—Yes.

69. And at intervals of fifteen days after that?—Yes; that is, for an orchard that has been really badly infested for years.

70. Then, with regard to the commercial success of an orchard, I suppose it depends upon the man who has it?—Yes.

71. *Hon. Mr. Duncan.*] Are you clear on the matter that in using the usual spray that you have stated here that it is capable of clearing an orchard?—Yes, sir.

72. Then, with regard to the hardship that would occur in the meantime to those that had infected orchards, what do you reckon it would amount to? What extra amount would they require to comply with the Act, or to comply with cleaning their orchards similarly to what you have stated you have done?—It would be a difficult matter to estimate that. It would differ in every case.

73. You might estimate the average. What do you think it would cost you?—We might take it from our own reports, although the expenses in our own cases have been greater on account of the difficulty of getting skilled labour. I have reckoned really, on the whole, that the expenses have been three-fourths more than they should have been. The difficulty at Otahuhu has been in getting skilled and expert labour. I started last season with a man and got him into the way of doing the work I required, but lost him, and in the middle of the season I had to start again with another man and get him into the way of doing the work. This means that while the man is learning he is losing time, compared with the man who is accustomed to the work.

74. Now, as a practical man, supposing, for instance, this Bill was put into effect, in the course of six years hence would it be a disadvantage to the owner of the orchard who complied with the Act or an advantage to him?—A decided advantage, sir.

75. Supposing that the orchard was badly infected to start with?—Yes, it would be a decided advantage.

76. Then, did you take any notice of the difference in the orchards where the pigs were put in? You said the pigs were put on one-half?—Yes.

77. What was the difference then in the percentage, one from the other?—The percentage of fruit gathered from the trees?

78. Yes?—There was practically no difference between the percentage of fruit gathered from the trees on the half where the pigs were and that under cultivation.

79. Did you gather anything as to whether you would prefer the ploughing or the pigs? Which do you think would be the best? You were treating it both ways?—For my part I should prefer the cultivation. It is what I have generally advocated, thorough cultivation in every orchard. Still there are cases where a farmer is keeping a number of pigs, and they might just as well, as a matter of economy, be kept in the orchard.

80. *Mr. Buddo.*] In this return you have made here it refers entirely to Otahuhu: have you any experience in connection with the tests and experiments with fruit-trees in the South Island?—No.

81. Was this Otahuhu orchard infected with the ordinary apple-scale and woolly aphis?—With the woolly aphis and mealy bug, but not with the mussel scale.

82. Then, those experiments you made there were almost entirely in the direction of dealing with the codlin-moth?—Yes.

83. I presume you are aware that in the South Island the mussel scale is the enemy of the apple: can it be controlled by spraying?—Yes; but not by Paris green or such sprays that we use for the codlin-moth, but by other sprays.

84. Are you of opinion that the scale and woolly-aphis blight could be equally well dealt with by special treatment in the South Island as the codlin-moth is dealt with in the North Island?—Yes, I have no doubt about it.

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