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PARLIAMENT OF TASMANIA.

CODLIN MOTH ACT:

REPORT OF CHIEF INSPECTOR.

Presented to both Houses of Parliament by His Excellency's Command.



CODLIN MOTH ACT.

Office of Chief Inspector, Hobart, 26th June, 1888.

I HAVE the honor to furnish for your information the following interim Report upon the working of "The Codlin Moth Act, 1887," to 30th April, 1888.

SIR

You are aware that, without any desire upon my part, I was appointed by the Government Chief Inspector under this Act; at the same time I distinctly informed you that I was not a scientist in the habits of the Codlin Moth, but that I would use my best endeavours to enforce the provisions of the Act.

Twenty-two Fruit Districts were gazetted on the 6th day of January, and the 17th day of that month fixed by Proclamation as the time when elections should be held to appoint Fruit Boards, to be composed of seven fruitgrowers.

Eleven Boards were duly elected upon that date, the remaining eleven being unable to take advantage of the operation of the Act, chiefly on account of the required number of fruitgrowers failing to attend at the places named for holding the elections: this I attribute to the pressure of harvesting business preventing the presence of those interested.

I suggested the propriety of taking advantage of the 10th Section of the Act, giving the Governor in Council power to extend the time for holding elections in the districts that had failed to elect Fruit Boards on the 17th January. This was done, and, by Proclamation, 20th February was the day fixed for holding election. Eight Boards were elected upon that day—the Fruit Districts of George Town, Wellington, and the Midland declining to elect Boards. Wellington desires an alteration of the boundaries.

For the Midland Fruit District—comprising the Municipalities of Oatlands, Ross, and Campbell. Town—Mr. Tasman Morrisby has been appointed Inspector and Collector.

I have previously informed you that in all nineteen (19) Fruit Boards have been formed. As these are subject to my direction, I do not anticipate occupying a very enviable position, particularly when I find that the mode of destroying the pest is as much disputed as is the extirpation of rabbits.

From my present brief experience of the Board system, I am not disposed to predict so successful an issue will follow as is desirable. The machinery is unmanageable, and the opinions expressed by Members of the different Boards so varied, that unanimity cannot prevail; hence the instructions given to Inspectors acting under the Boards will be in direct contradiction to views held by certain members of that body.

Already instances have arisen which will defeat the object of the Bill.

The means adopted to ascertain accurately the clean, infected, and badly infected districts are most unsatifactory on acount of some Boards declining to appoint an Inspector to thoroughly perform the necessary district inspections. As a matter of fact, the appointment of an Inspector means the levy of a district rate for supervision, and to avoid this tax the Members of some Fruit Boards takes upon themselves the duty of Inspectors. In districts such as these, I have requested the Chairman of the Board to signify to those Members acting as Inspectors the necessity of furnishing me with a monthly report of the inspections made, similar to that which I have required to be returned in districts where paid inspectors have been duly appointed to perform the work. I beg respectfully to state that I consider an Inspector will be hampered in carrying out hisduties, and his independence of action considerably modified, under the Board system, more so than if he were under the control of a single directing power, who has no other object than to protect and foster the fruit or any other industry. I therefore cannot but think that the present method will render this Act, as also "The Rabbit Destruction Act" of 1887, inoperative.

I beg to draw your attention to an extract in my Report under "The Scab Act." for this year, which tells forcibly against the good supposed to be effected under the Board system, and is headed "Local Government and the Vermin Boards."

I am not sufficiently well informed in the habits of the Codlin Moth to say how many broods there may be in a season, nor have I the opportunity to study the different stages of growth. From conversations I have held upon several occasions with Mr. Morton, the Curator of the Hobart Museum, I am informed that he will during the coming season endeavour to determine, if possible,. the number of broods this family of moths produces.

Viewing the ravages committed by this pest, it is a question requiring very grave consideration if it will not be advisable, and an ultimate benefit to orchardists, to attack the grub before it leaves the fruit. The delay in picking infected fruit allows the grub to escape and hide in winter quarters, taking refuge in old buildings, fences, hedges, also in the rubbish and long grass, which is found, I am sorry to say, in numberless neglected gardens. Consequently the moth in the following season again causes destruction and loss to the fruitgrowers, when the grub should have been destroyed in and with the fruit of the previous season.

I strongly recommend the Government of the day to encourage this growing industry, and to enact most stringent laws to prevent the extension of the Codlin Moth. The source of danger most to be apprehended to the fruit industry is the spread of the pest. I propose to treat with the danger of introduction of the grub to coast ports and inland orchards.

The introduction of old fruit cases from infected places into coast or channel ports which are not—or only slightly—infected is a most objectionable proceeding. Districts thus circumstanced should have the power to prevent the master of any steamer or craft from landing fruit cases of any description under a heavy penalty, unless accompanied with a certificate guaranteeing the cases freefrom Codlin Moth grub, and further, that they had been immersed in boiling water under the supervision of the Inspector at the port of shipment. Then, and only under these conditions, shall the Inspector acting under the Board at the port of entry allow the cases to be landed into his Fruit. District.

The production of fruit must be protected beyond the mere consideration of freight. I say this advisedly, with the knowledge before me that a master of a coasting steamer prevented an Inspector from examining fruit or cases on board his steamer. Certainly his interests should be identical with the district from which he obtains his freight.

To provide for the immersion of *all cases*, I would recommend the erection of a vat in a convenient place, wherein all exported or infected cases or fruit could be treated by immersion in boiling water, a small charge being made per case to liquidate the cost of construction and main-tenance.

The extension of the pest inland is, I feel certain, an every-day occurrence, and is distributed in. the following manner :—Fruitgrowers forward consignments to the various firms of merchants in Hobart, who receive and store the fruit until a favourable opportunity for disposal takes place. The fruit so stored possibly may be infected and contain the grub, which, not caring to be disturbed, leaves the case and secretes itself in old or new bags, as the case may be. These bags, when forwarded into the country for the reception of grain, thus carry the grub, which remains to develop in due season into the moth, which attacks the orchards, and remains in possession.

It therefore behaves those interested to make perfect the law dealing with this pest. I believe the object can be attained if the extension is prevented by immersion of all cases leaving Hobart, and the strict supervision of all fruit entering the markets, stores, jam preserving companies, &c., and inspection of fruit for exportation, which, if found to be infected, should be at once taken to the public vat for immersion.

Considerable difficulty has been experienced in administering "The Codlin Moth Act" from the fact that Inspectors have no power to enter into and examine either fruit or cases in stores in and around Hobart to detect infected fruit if it has been there conveyed. In many instances those dealing in fruit have offered the Inspector every facility to perform his duty, but this is effected only upon sufferance. An amendment is absolutely necessary to the Act, giving power to the Inspector, upon production of his authority, to enter all stores, railway sheds, jam preserving establishments, shops, and any place or building wherein fruit is stored. Another power is also necessary,—viz., the right of an Inspector to enter upon any steamboat or vessel of any description to open cases and inspect fruit.

I beg clearly to inform you that in administering the Act my written instructions to the Inspector appointed to work under me are that no prosecutions shall take place until the whole circumstances of the case are placed before me in writing. The Inspector acting in and about Hobart had instructions to visit all markets, shops, and stores, and inform the occupants not to exhibit or expose for sale infected fruit. If atter this caution the law is defied, prosecution under the Act will be and has been resorted to.

I append a letter from this Inspector (Mr. J. Hall), in which there is a comparative table of the yield of fruit from several of the principal gardens in Hobart, which shows the heavy destruction of fruit by the ravages of the Codlin Moth during the last two years.

A return of acreage, showing area under orchard, clean and infected, in 11 of the Fruit Districts, is also added. From the remainder no return has been received, in many of them no Inspector having been appointed.

I have the honor to be, Sir, Your most obedient Servant,

THOMAS A. TABART, Chief Inspector.

The Hon. the Treasurer.

NOTE.—My reason for underlining the words *all cases*, at p. 4, is the fact that many new cases are constructed in stores that have contained infected fruit, and also knowing that the timber used in construction is stacked in these places, which, without doubt, contains the grub, which has sought shelter there after escaping from the infected fruit. It will be necessary to immerse, all through the year, cases leaving Hobart. This precaution must be taken on account of old fruit cases being forwarded to coast or channel ports when the early potato crops are coming into the market. By this process a large percentage of the risk of infection will be prevented.

RETURN of Acreage, showing Area of Orchards, Clean and Infected, so far as supplied by the various Boards.

Fruit District.	Acres.		TOTAL.
1. Upper Derwent 2. North West Bay 3. West Devon 4. Huon, Central and South 5. Glenorchy 6. Ringarooma 7. Launceston 8. Gordon 9. Port Cygnet 10. Huon, North 11. Midland	Clean. 652 149 228 1140 218 180 285 259 700 802 200	Infected. 293 21 37 1043 14 1445 4 280	$\begin{array}{r} 945\\170\\265\\1140\\1261\\194\\1730\\259\\700\\806\\480\end{array}$

SIR, I HAVE the honor to forward you the following figures obtained from some of the principal owners of Gardens in the Hobart District, showing the amount of destruction caused by the Codlin Moth during the last season :---

APPLES.			
	- ```		[,] bushels.
Mr. James Dalton, Adelaide-street	1886	•••	100
	1887		-50
	1888		5
Mr. John Brosnahan, Wellington Buildings	1886		250
	1887		100
	1888	•••	Nil.
Mr. M'Cauly, Adelaide-street	1886		400
	1887		35
· .	1888		Nil
Mr. P. Johnston, Adelaide-street	1886		200
	1887		72
	1888		Nil
Mr. Coverdele Devev-street	1886	•••	100
III. Outoralio, Davoj-bitost minimumini	1887	•••	50
	1007	•••	71:1
	1000		⊥ ¥2ℓ.

I am of the opinion the dry season has been favourable to the working of the moth, which will account for the almost total destruction of apple crop this season in the Hobart District.

During the last few months a large quantity of old and useless trees have been cut down, including several large pear trees over twenty feet in height. It being almost impossible to gather the infected fruit, cutting down is the only effectual means of dealing with them, and must greatly assist in exterminating the Codlin Moth.

I am, Sir,

Your obedient Servant,

HENRY HALL, Inspector Hobart District.

To the Chief Inspector Codlin Moth Act.

For the information of orchardists, I purpose to give an outline of the different modes of dealing with the Codlin Moth adopted by the Agricultural Department of the University of California.

The horticulturists of California, aided by the Government of the United States, wisely expend a large sum annually in the interests of American agriculture and horticulture; hence legislation is enacted and enforced that personal sloth and ignorance shall not inflict loss upon the community in which this exists.

Herewith I furnish the reported results of experiments made under the immediate supervision of the Professor of Agriculture and his assistants. This report is dated November 19th, 1887, and is signed C. J. Wickson.

" Spray Treatment.

"During the summer of 1887 careful observations have been made of the efficacy of spraying with arsenical compounds, and of the 'band' treatment, for the reduction of the Codlin Moth (Carpocapsa pomonella).

"This insect appeared in the University orchard a few years ago, and during last year was very abundant. The success reported by Professor S. H. Forbes, State Entomologist of Illinois, in spraying with Paris green for the destruction of the 'larva' as soon as it begins to feed in the calyx of the apple, and similar good results reported by several Californian apple-growers, suggested that a series of experiments with arsenic and its compounds should be made in the University orchard, when more time could be given to an accurate account of the results.

"The State Inspector of Fruit Pests, W. G. Klu, who was making similar experiments upon his own farm, was invited to prescribe the applications to be made. He did so, and assisted personally in the preparation and application of the poisons. Application was made of three substances—white arsenic, Paris green, and London purple—and each in different strengths.

"The white arsenic was dissolved in hot water, while the Paris green and London purple were kept as thoroughly stirred as possible while being drawn up by the pump. The drenching of the trees was quite complete, the spray being especially directed upon the clusters of fruit which, in most

cases, were still upright, so that the drops of the liquid were caught and held in the calyx end. There was, of course, much difference in the size of the fruit, as the orchard comprises a large collection of summer, fall, and winter fruit. Trees were selected, however, as carefully as possible which had the fruit in the best stage of growth, say from the size of a pea to that of a small marble, at the time of the first spraying. In most cases three applications were given, all within thirty days from? (before) 31st May. During that period the records of the University Meteorological Observatory show that rain was experienced but once, and then only one-twentieth of an inch fell, and in the month of June there was but a sprinkle even less in amount; so that the weather was. perfect for the retention of the poison in the fruit.

"The University orchard is planted with two rows of trees of each variety, and in these experiments one was sprinkled and the other reserved for treatment, so that a comparison, each tree with one of its own variety and age, could be made. The orchard was guarded in such a way that no outside interference could be had with the fruit.

"Twice a week all the fruit which fell from the sprayed trees and from the check trees unsprayed was examined, and careful entry made in a book, prepared for the purpose, of all worms found in the fruit, of all fruit from which the worms had escaped, and the number of worms found under the bands of sack-cloth which were placed upon all the trees.

"This method of procedure was faithfully carried out until November 1st, when all the remaining fruit was removed from the trees, examined for worms, and the experiments closed.'

The report here supplies a summary of results in tabular form, and from this table we extract the following main facts. Comparing the number of grubs found in the fruit and under the bands on treated and untreated trees, whether pears or apples, the percentage of gain in the case of treated trees was in favour of using Paris green -

lb. to 160 gallons of water, 71 per cent.
lb to 320 gallons of water, 54 per cent.
lb to 160 gallons of water and 2 lbs. soap, 50 per cent.

Using London purple :--

"1st spraying: 1 lb. to 160 gallons, 2nd and 3rd ditto, 1 lb. to 320 gallons water, gain $16\frac{s}{3}$ per cent. Using for the 1st spraying 1 lb. to 80 gallons water, and 1 lb. to 220 gallons for the second, the gain was 59 per cent.'

Experiments were also made with white arsenic in proportions of 1 lb. to 320 gallons of water, 1 lb. to 480 ditto, and 1 lb. to 640 gallons with soap; but with regard to these experiments Mr. Wickson says :-

"In the case of the white arsenic the record of worms is so small and the results so contradictory, in that the stronger wash gave a percentage of loss, while the weaker gave a percentage of gain; the inference is that the worms were not on hand to be killed. Undoubted allowance must be made for chances of this kind in all experiments including only a tree or two.

"One Codlin Moth is said to deposit anywhere from 50 to 200 eggs, and so a single moth by presence or absence might produce a great difference in an experiment. When the pest is abundant there is of course less danger of such results.

"By spraying with London purple two varieties of pear and one of apple were badly injured, while two other kinds of apple suffered a little damage, and the fruit and foliage of three varieties of pear were damaged.

"Those sprayed with Paris green were apparently uninjured."

To quote again from the Report :---

"These applications were all made to affect the first brood of the moth. The figures representing amount of infected fruit are all small, for in Berkeley, as in most places along the coast at least, the first brood of the moth was unusually small this year. This fact would not necessarily interfere with the percentage of gain by treatment.

"The percentage of gain from the Paris green and London purple treatment must be considered very satisfactory, and the stronger applications, barring the injury to foliage, produce the best results; in the case of Paris green, the application of a wash of 11b. to 160 gallons of water giving a clear gain of over 70 per cent. of good apples and pears without injury to foliage or fruit."

The "Band" treatment :--

" In order to determine some points about the efficacy of banding apple and pear trees for the destruction of the larvæ of the Codlin Moth, an accurate record has been kept in the University orchard during the past season. The bands were put on early, and consisted of strips of old sacks. The strips were five or six inches wide, and the ends were allowed to lap, the bands being secured by

a string tied round the middle so as to furnish crevices both at the upper and lower edges to accommodate worms coming from either direction. All these bands were removed on a certain day in each week, the larvæ counted and killed, and the bands replaced. At the same time all fallen fruit was gathered, examined for worms or to see if worms had escaped, and records of these facts kept separately.

"A summary of the observed results shows that while 2704 apples and pears were found from which worms had escaped, there were found under the bands but 1188 or 44 per cent. The remaining 56 per cent. includes worms which found resting-places elsewhere, or perished.

"The assistant who kept the record of this experiment assures me that he believes many of these were eaten by birds, which were always working over the ground while he was in the orchard.

"The others must have concealed themselves under clods to spin the cocoons, for there is no loose bark on the trees and no rubbish or fences in which they might hide.

" It would seem from this experiment that the bands catch less than half the grubs which gain access to the fruit, and yet the destruction of this proportion of fully fed and healthy larvæ must be considered very satisfactory.

"As all the losses by birds or other enemies of the worm, by accident, and by other agencies which destroy insect life, must be taken from the percentage of worms not found under the bands, it will be seen that the old method of treatment is still one of the most effective that can be employed."

THOMAS A. TABART, Chief Inspector.

WILLIAM THOMAS STRUTT, GOVERNMENT PRINTER, TASMANIA.