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Fodder trees (book review)

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THE EFFECTIVENESS OF 2,4-D IN PREVENTING PRE-HARVEST DROP OF NAVEL ORANGES

APPLICATIONS AT DIFFERENT CONCENTRATIONS AND IN COMBINATION WITH BORDEAUX MIXTURE

By N. J. HALSE, B.Sc. (Agric.) Research Officer.

AN experiment was carried out to test the suitability of combining a 2,4-D hormone spray, to prevent mature fruit drop of Navel oranges, with a routine fungicidal spray of Bordeaux mixture. The hormone was tested at two concentrations. The results of the experiment indicated that under the conditions tested the 2,4-D spray could not be successfully combined with Bordeaux mixture and the concentration of 20 parts per million was superior to 10 parts per million. The lower concentration may be equally effective with a high rate of spray application.

In a previous investigation carried out in this State (1) into the pre harvest drop of Navel oranges it was found that the 2,4-D spray to reduce the drop was effective when combined with a copper oxychloride fungicidal spray. This agreed with Californian work (2) where the hormone was found to be compatible with copper sprays. However, in the previous investigation in this State the fall of mature fruit was not heavy on any treatment so the hormone was not severely tested and the hormone spray was not combined with Bordeaux mixture. Following work done in New Zealand (3) where the presence of copper reduced the effectiveness of the hormone spray it was decided to carry out a further investigation under local conditions.

SITE

The experiment was carried out on the property of Mr. N. Fox, South Chittering. The trees were healthy Washington Navel oranges carrying a good crop. A few weeks prior to the commencement of the experiment all trees were sprayed with Bordeaux mixture.

EXPERIMENTAL DETAILS

Five treatments were included in the experiment.

A.—No spray.

B.—Sprayed with 10 parts per million 2,4-D.

C.—Sprayed with 10 parts per million 2,4-D + Bordeaux.

D.—Sprayed with 20 parts per million 2,4-D.

E.—Sprayed with 20 parts per million 2,4-D + Bordeaux.

The sprays were applied from a power spray at the rate of two gallons per tree on June 12. The ethyl ester of 2,4-D was used and spray concentration is given as the ester not as free acid equivalent.

The experiment was laid out on a latin square design with four trees in each plot. This meant there were 20 trees in each treatment.

From June 18 until the fruit was harvested the oranges were picked up and counted from beneath the trees at approximately weekly intervals. They were divided into sound and unsound fruit; the latter category included split oranges and oranges attacked by fungi which had caused them to fall from the tree.

Harvesting was commenced on August 13. The fruit from all the trees was picked and counted by August 20.

The progressive increase in numbers of sound fruit falling from the trees is shown in Table 1. It can be seen that particularly in the treatments from which the drop

was heavy there was a reduction in the rate of drop in the last few weeks of the experimental period.

Table 1.

Total number of sound fruit below trees.

Date	A	B	C	D	E
June, 18	38	22	15	10	13
June, 24	89	28	42	15	69
July, 1	231	111	197	53	190
July, 8	243	109	217	37	122
July, 15	561	264	468	120	235
July, 23	689	336	663	159	339
July, 30	632	320	709	194	399
Aug., 6	585	316	661	227	406
Aug., 12	489	284	444	197	326
Total	3,557	1,790	3,416	1,012	2,099

The average number of fallen fruit per tree and the percentage of the original crop at the beginning of the trial period that this represents are shown in Table 2. The difference in ratios between the two sets of figures is due to the differences between the original numbers of fruit on the trees at the commencement of the trial period.

Table 2.

Sound fruit fallen.

	Average number per tree	Average percentage of crop
A.—No spray	178	23.7
B.—2,4-D at 10 ppm	89.5	15.7
C.—2,4-D at 10 ppm + Bordeaux	171	20.4
D.—2,4-D at 20 ppm	50.5	8.3
E.—2,4-D at 20 ppm + Bordeaux	105	16.5

Least significant difference at 5% level = 52.7

Least significant difference at 1% level = 70.2

The difference between the two concentrations of 2,4-D and the effect of combining the hormone spray with Bordeaux mixture are shown in table 3.

Table 3.

Average No. fruit fallen from tree.

2,4-D spray (average treatments B and D)	70
2,4-D spray + Bordeaux (average of treatments C and E)	138

Difference significant at 1% level.

2,4-D at 10 ppm (average of treatments B and C)	130
2,4-D at 20 ppm (average of treatments D and E)	78

Difference significant at 5% level.

As well as the sound fruit, counts were made of the unsound fruit fallen from the trees. The average number per tree varied from 15 to 25 in different treatments, but there were no significant differences between the treatments.

DISCUSSION OF RESULTS

An examination of the weekly counts of sound fallen fruit in Table 1 shows that the difference between treatments showed up almost immediately at the commencement of the trial and was maintained until the end of the trial period. This suggests that the effect of the spray will last for at least two months under local conditions. It is not likely that any benefit would be derived from applying the spray much earlier than June as the number of sound fruit falling at this time was very low.

As can be seen in Table 3 the effect of applying the 2,4-D in combination with Bordeaux mixture was to cause an increased fruit drop compared with the treatment with the same hormone strength applied without Bordeaux. It seems likely that the Bordeaux has a detrimental effect on the hormone but further work is necessary to establish this as the reason for the observed effect.

Table 3 also shows the difference between the two concentrations of spray. The higher concentration of 20 ppm was more effective in reducing fruit drop than the lower concentration. The most effective concentration is probably related to the volume of spray applied to the trees. In this experiment the trees, which were well-grown, were sprayed with two gallons per tree. If a greater volume of spray had

been used the difference between concentrations might not have shown up. This has been the experience in other orchards where no increased benefit has been obtained from higher concentrations than 8 ppm, but the volume of spray applied was over 500 gallons per acre.

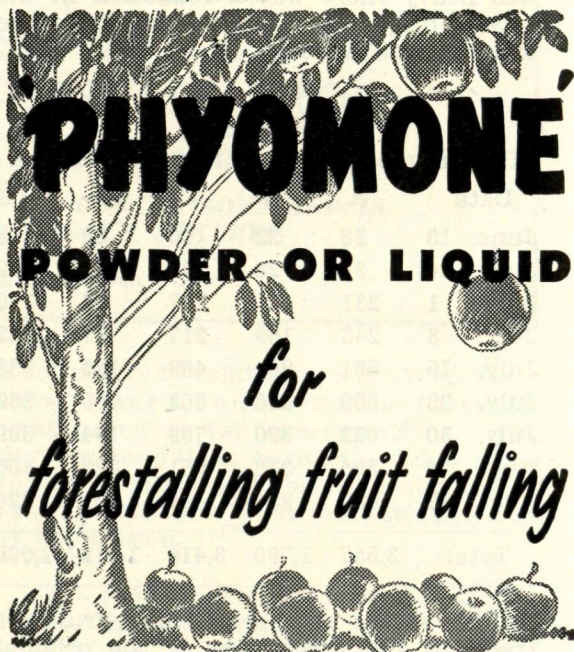
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FODDER TREES

A BOOKLET issued by the Imperial Bureau of Pastures and Field Crops, Aberystweth, commences with the following sentence, "It is a humbling fact for grass pasture experts to realise that probably more animals feed on shrubs and trees, or on associations in which shrubs and trees play an important part, than on true grass or grass-legume pastures . . ."

Major H. A. Corbet, formerly Deputy Master of the Royal Mint in Perth, and a well-known writer and broadcaster on horticultural topics, has long urged Australians to pay greater attention to the preservation of the many native trees and shrubs which provide nutritious and palatable "top feed" in many of our arid and semi-arid areas.

He asks, "Shall we treat this fodder as a wasting asset to be exploited until exhausted, or shall it be recognised as an estate to be conserved and developed?"

In his pamphlet entitled "Fodder Trees," a second edition of which was recently published, Major Corbet makes a plea for research into the best strains and varieties of edible trees and shrubs and a vast re-planting campaign. He suggests that many

fodder trees could be included in wind-breaks or shelter belts as a standby in drought years, and urges experimental work to determine the best methods of making top-feed available without destroying the trees.

Reckless cutting in drought years, overstocking and bushfires have already destroyed many thousands of these valuable trees.

With official assistance from various forestry and agricultural departments, Major Corbet has compiled a list of 44 species of native and introduced fodder trees which may be worthy of attention.

His 20-page pamphlet "Fodder Trees" is available from Perth booksellers, price 5s., post free.