UNE ESPECE NOUVELLE DE FIORINIA

"F. PHOENICIS BALACHOWSKY"

SUR LE PALMIER DATTIER AU

SUD DE L'IRAN

Au cours d'une récente mission effectuée dans le sud de l'Iran, M. Ph. Gaillot, assistant au Laboratoire d'Entomologie Générale et Appliquée du Muséum National d'Histoire Naturelle de Paris, a découvert dans l'oasis de Borazdjan (sur la route Chiraze et Bandar-Bouchehr) une nouvelle cochenille appartenant au genre ***Fiorinia***.

Cette cochenille a été étudiée par Balachowsky, éminent entomologiste et Académicien de l'Agriculture de la France et professeur au Muséum National d'Histoire Naturelle de Paris. La description en détail de cet insecte se trouve dans l'Annales de la Société d'Entomologie de France, 1966.

F. phoenicis cohabite avec ***Parlatoria blanchardi*** Targ. et si cette nouvelle espèce est passée inaperçue jusqu' ici, c'est parce qu'elle se confond assez facilement, par son aspect extérieur avec *P. blanchardi*, dont elle accuse sensiblement la même taille, la même forme et la même couleur.

M. Kaussari

PRELIMINARY NOTES ON CONCENTRATE DRIFT SPRAYING OF FUNGICIDES AGAINST TOBACCO BLUE MOLD

BY H. HOLTMANN

Successful control of tobacco blue mold by concentrate drift spraying of fungicides would facilitate control operations whenever they are needed. If the high volumes of water which are applied in conventional spraying, could be dispensed with, larger acreages can be treated in shorter time at lower expenses.

In 1962 *Peronospora tabacina* was reported from North Iran (6). Since chemical control seemed difficult, resistant varieties were found (7) and their cultivation was promoted. During 1967 there were signs that the resistance had broken down. It can be expected for the next year that the tobacco growers have to resort again to chemical control measures.

In view of these facts a few preliminary results will be reported on concentrate drift spraying of fungicides against the blue mold disease.

Some experiences on concentrate spraying fungicides are available (1, 2, 3, 4, 8, 9, 10). Oils or oil mixtures of fungicides have been applied against diseases of a number of crops.

Experiments

Tobacco plants (6–8 leaf stage) were sprayed in a tunnel, deposits were determined as described in a previous paper (5). The paint sprayer with a nozzle of 1.2 mm orifice was used. The temperature ranged from 18 to 21°C and the relative humidity from 40 to 50% during spraying.

The deposited drops were small (MVD = 55–60 microns). The droplet range was narrow, 50% of the drops fell into the size range from 50 to 70 microns. The powder oil mixture and the oil spray showed no differences in their deposit data.

A concentration series of the fungicide oil mixture was applied on three plants of each treatment. The plants were then inoculated. Both sides of each leaf of the test plants were covered by a film of a fresh conidia suspension in distilled water. The plants were kept under 16 – 26° C and high humidity conditions during the infection period (incubation).

When the symptoms of disease could be clearly seen, the final evaluation took place 15 to 21 days after the inoculation. Each leaf was classified as one, two, three or four quarters infected or not infected. The number of infected quarters were related to the total number of leaf quarters and expressed as per cent infection of the 4 lower and 4 upper leaves separately.

Trial No. 1:

Polyram M 80 WP (BASF) was mixed with spindle oil at a ratio of 15 gr+50 ml. The wettable powder–oil suspension was stabile for half an hour.

The results are summarized in table 1.

Table 1. Effectiveness of Polyram–spindle oil mixture applied before infection.

Test No.	1	2	3	4	5	6
dose l/ha	0.552	0.838	1.751	1.940	2.337	—
drops /cm2	742	799	1333	1799	1950	—
I % LL	9	15	6	0	1	48
I% UL	14	49	23	4	3	35

All dosages expressed as l/ha Polyram 80 showed fungicidal effectiveness. The infection rates of the total leaf surface of the lower four leaves (I%LL) was lower than that of the upper four leaves (I%UL). The infection (symptoms of the disease) of the untreated check (test No. 6)was not very severe. No phytotoxicity was observed.

Trial No.2:

1 kg Polyram 80 WP was mixed with 2.5 L of soluble oil and sprayed at six dosage levels (test 1 to 6). These treatments were compared with those of 2 dosage levels test 7 and 8) of soluble oil and an untreated check (Table 2).

Table 2. Effectiveness of Polyram–soluble oil mixture applied before infection.

Test No.	1	2	3	4	5	6	7	8	9
dose l/ha	2.07	1.98	0.99	0.94	0.49	0.37	1.503	0.572	—
drops/cm2	1559	1289	1245	911	535	547	2.81	1.07	—
I%LL	4	6	2	2	17	13	25	19	21
I%UL	17	0	4	0	10	4	23	42	44
No. of treated leaves	24	23	24	20	23	22	24	22	24
No. of affected leaves	15	3	5	10	2	3	0	0	0

18 days after inoculation, a relative low infection rate was evident as the untreated check (test No.9) showed. Dosages higher than 0.9 l/ha of Polyram 80 suppressed the fungus infection considerably, while the lower dosages were less effective. The oil was ineffective, showed no phytotoxic symptoms, however. Already one day after treatment scorched spots were observed on the fungicide oil sprayed leaves. 15 of the 24 leaves of the highest dosage level were affected.

Trial No. 3:

The objective of this test was to check the effectiveness of a deposit 5, 8 or 10 days after application. All plants of three treated groups were sprayed at various

dosages of the same Polyram–spindle oil mixture used in trial No. 1. and the 4th group was treated by spindle oil only. A 5th group was left as untreated check.

After 5, 8 and 10 days one of the three plants of each group was inoculated. The results of table 3 show that the untreated plants (Test No. 5) were highly infected. The spindle oil deposit had no control effect for the inoculation dates 5 and 8 days

Table 3. Effectiveness of Polyram–spindle oil mixture applied several days before infection (inoculation).

Test No.	1	2	3	4	5
liquid applied	Polyr.	Pol.oil	Pol.oil	oil	none
dose l/ha	0.635	0 760	1.750	1.189	–
drops/cm^2	226	374	1170	642	–
Infected 5 days after treatment					
I%LL	50	75	56	94	100
I%UL	38	50	19	81	94
Infested 8 days after treatment					
I%LL	69	88	38	94	100
I%UL	63	69	19	63	69
Infected 10 days after treatment					
I%LL	81	69	69	50	100
I%UL	69	69	38	63	81

after treatment. In the test which was inoculated 10 days after spraying the oil deposits caused a lower infection level (symptoms) than the fungicide–oil mixtures. All the fungicide -oil mixture deposits showed control effect. It decreased with decreasing dosages and with increasing of the period between spraying and spore application. No phytotoxic symptoms were noted on any plant.

Trial No. 4 :

The experimental set up was as in trial No. 2. Test groups 1-6 were sprayed by Polyram-soluble oil and test 7 and 8 by soluble oil and one untreated check group. The plants were infected 3 days after the spraying.

Table 4. Effectiveness of a Polyram-soluble oil mixture applied 3 days before infection inoculation.

Test No.	1	2	3	4	5	6	7	8
dose l/ha	1.17	0.98	0.61	0.52	0.51	0.31	3.32	2.33
drops/cm^2	1641	1106	660	604	754	597	1540	867
I%LL	10	27	83	58	19	85	100	90
I%UL	23	27	54	33	33	60	77	79
No. of treated leaves	23	22	26	28	21	17	20	21
No. of affected leaves	9	0	0	0	2	0	0	0

The evaluation was carried out 15 days after inoculation. The infection level was much higher than that of trial 2 which was conducted concurrently . The plant

surface of the untreated check and of the two oil sprayed groups was covered to an extent of 90-100% for the lower and 70-80% for the upper leaves with blue mold. The plants sprayed by the lower dosage of the fungicide-oil mixture showed a more severe infection than those of the higher doses. A three day old deposit of a 1 l/ha Polyram 80 WP controlled the fungus to a certain extent. As in trial No. 2, the soluble oil did not scorch the tobacco leaves, but there were some spots on the fungicide – oil sprayed leaves.

Trial No. 5:

A programme of testing the modified Holder-Nova sprayer which was described in another paper (5) for application of fungicide-oil mixtures had to be cut short due to time limitation.

Because of the slury type of liquid a nozzle of 2.0 mm orifice and 1.7 cm outer diameter was chosen. In calibration tests an emission rate of 456 ml/mi was recorded for water and 53 ml%mi for the 29% Polyram 80 in soluble oil, the blower hose being held in horizontal position and the tank being non-pressurized. The water was ejected from the nozzle as a 1 cm long jet before it was broken up, while the fungicide -oil mixture was flowing over the flat nozzel cap. The emission rate of the fungicide oil mixture was very low for practical purposes. In spray tests the spraying was repeated three times along the same spraying track in order to achieve the necessary deposit density.

The first performance test showed that a swath range of over 10 m could be achieved. The performance data are similar to those of the second test (Tabl.5). Four tobacco plants were placed in four groups at distances of 4,8,12 and 16 m off the spraying track. Magnesium coated plates were laid out the same way in the test field. The fungicide mixture was sprayed under following weather conditions: 23°C, 45%r.h., 1.4–2.2 m/sec.

Table 5. Effectiveness of a Polyram-soluble oil mixture applied by the Holder Nova before infection (inoculation).

Distance off sprayer m	4	8	12	16
Dose l/ha Polyram 80	0.561	1.874	0.360	0.085
MVD micron	159	140	101	91
50% range micron	79	67	45	26
Drops/cm^2	16	70	34	9
I%LL	63	7	32	93
I%UL	95	18	79	98
No. of treated leaves	36	38	36	35
No. of affected leaves	14	6	2	1

The deposit density curve is very inhomogeneous due to the wide range of the large droplets. The drop density is accordingly very low. A better performance of the Holder sprayer can certainly be achieved as the performance data of the paint spra–

yer indicate. A smaller nozzle orifice in connection with a pressurized tank should yield better results.

The dosage of 1.9 l/ha at the 8m station yielded a remarkable control effect. The lower dosages were not effective. The lower leaves showed a lower infection degree than the upper leaves, also on the untreated plants which were severely infeted. The fungicide-oil mixture inflicted scorching spots on the tobacco leaves. 14 of the treated 36 leaves at the 4 m station showed varying numbers of such spots, the number of affected leaves decreased with decreasing drop sizes.

Summary

A few preliminary tests indicate that fungicides of the wettable powder type can be applied effectively as oil mixtures. Polyram M 80 WP oil mixtures prevented the blue mold infection of tobacco plants. The oils did not cause scorching. The fungicide mixture of spindle oil was also not phytotoxic, while the mixture of soluble oil scorched the tobacco leaves . One test with the knapsack sprayer Holder Nova confirmed the results of the laboratory tests. The performance of the sprayer has to be improved.

The plants of test No. 1 and No. 3 were infected by conidia of the 1966 season and those of all the other tests by conidia of the 1967 season. Both types of blue mold ifections were equally well controlled by the Maneb fungicide oil mixtures.

Acknowledgements

The generous help and advice of Dr. E. Niemann and Eng. N. Zalpoor are greatly appreciated.

References

1. ANONYM: PANS 12, 1966. 75–80
2. BEHLEN, W. : Die Anwendung echter und reiner Wirkstoffnebel zur Obstschädlingsbekämpfung. Ztschr. Aerosol-Forsch. 3, 1954. 27
3. BEHLEN, W. : Hochdruck-Nebel. Berlin 1958 35 pp.
4 FULTON, R. H. : Low-volume spraying. Ann. Review Phytopathology 3, 1965. 175-196
5. HOLTMANN, H. : Concentrate drift spraying of herbicides by knapsack mistblowers. This journal, in press.
6. NIEMANN, E. and ZALPOOR, N. : The occurence of Peronospora tabacina on tobacco in Iran in 1962. Entomologie Phytopath. Appl. Tehran, 21. 1963, 13-25
7. NIEMANN, E. , SCHARIF, G. und EBRAHIM-NESBAT, F. : Resistenzprüfungen von Tabak gegen Peronospora tabacina. Entomologie Phytopath. Appl . Tehran 24 , 1966, 1-12
8. STOBWASSER , H. : Untersuchungen über die Möglichkeit der Vernebelung von fungiziden Plfanzenschutzwirkstoffen. Ztschr. Aerosol-Forsch. 3, 1954. 461-481
9. STOBWASSER , H : Beitrag zur Vernebelung fungizider Pflanzenschutzwirkstoffe im Freiland. Ztschr. Aerosol-Forsch. 5, 1966, 92-100
10. STOBWASSER , H. und MÜLLER, G . : Freilanduntersuchungen über Möglichkeit einer Bekämpfung von Obstschorf Venturia inaequalis und Venturia pirina und Rebenperonospora (Plasmopara viticola) mit Kondensationsnebel. Z. Pflanzenkrankh. u. Pflanzenschutz 63, 1956. 321-333.