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Pests and Diseases

Effect of fungicides on rust reaction of faba beans.

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Rust caused by *Uromyces fabae* (Pers) de Bary is one of the most destructive diseases attacking faba beans, especially in the northern parts of Egypt. Percentages of infection ranged up to 100 per cent during the 1979/80 growing season (Mohamed *et al*, 1980).

Several fungicides have been used to minimise losses caused by rust (Bekheit 1950, Bekheit *et al* 1951, El Helaly 1939a; 1939b; 1950; Mansour *et al*, 1975), but the disease still remains a problem in faba bean production.

The studies reported here were designed to test the efficiency of some fungicides on the control of rust under both greenhouse and field conditions.

Materials and Methods

Five fungicides were tested for their effectiveness against rust in faba beans. These were Plantvax 20, K W G 0599, Sicarol, Roval and Dithane M 45.

In the greenhouse test, 38 day old seedlings were sprayed with the fungicides either before or after rust inoculation. Fungicides were used at 0.5x, 1x and 2x the recommended dose. Notes were recorded 15 days after rust inoculation, by counting the number of pustules and calculating the average number per leaflet.

In the field test, two experiments were planted, one at Sakha (Kafr El Sheikh governorate) on November 15th, and the other at Nubaria (Beheira Governorate) on October 22nd, 1979. Each plot was 4.8 x 3.5 m in size and each treatment was replicated four times. Fungicides were spray applied four times at two week intervals.

Notes were recorded on disease incidence every two weeks until the end of the experiment. Plants were harvested and threshed, and seeds were weighed for each plot. Data were statistically analysed for percentages of infection and yield.

Results and Discussion

Greenhouse test :

Data in Table 1 show that spraying Dithane M 45, K W G 0599, or Plantvax 20 at any of the doses, one day before rust inoculation, did not permit rust to develop. Rovral application resulted in lower infection than in the unsprayed plots.

Table 1. Average number of pustules per leaflet of faba bean seedlings inoculated with isolate 1 of *Uromyces fabae*

Fungicide	Average No. pustules/leaflet sprayed with concentrations			
	no spray	½ x r.d.[1]	1 x r.d.	2 x r.d.
sprayed before inoculation :				
Dithane M 45	80.1	0	0	0
Rovral	80.1	1.62	0.96	0.12
Sicarol	80.1	0	0	0
K.W.G. 0599	80.1	0	0	0
Plantvax	80.1	0	0	0
sprayed after inoculation :				
Dithane M 45	80.1	28.82	13.41	6.37
Rovral	80.1	63.73	17.50	3.29
Sicarol	80.1	4.94	3.88	0
K.W.G. 0599	80.1	0.25	0.59	0.57
Plantvax	80.1	3.01	1.23	0.49

[1] r.d. equals recommended dose.

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When fungicides were sprayed one day after rust inoculation, the number of pustules varied with fungicide. Numbers were the highest when Rovral was sprayed, and next highest with Dithane M 45. Lower numbers of infection centers were noted when K W G 0599 was sprayed at any dose before rust inoculation, and with Sicarol at the highest dose. The number of infection centers in general decreased with increasing dose of fungicide.

Field test :

Results in Tables 2 and 3 indicate that percentages of infection for all treatments increased as the season progressed. This increase in percentage of infection differed according to the treatment. Traces of infection were observed in certain treatments at Sakha on February 14th when notes were recorded 15 days after the first spray of the fungicides. On March 3rd, about two weeks after the second spray, treatments differed significantly with respect to the percentage of rust infection. Percentages of rust increased but this increase differed according to the treatment. This indicates that fungicides differed with respect to their effectiveness in controlling rust. Also, results indicated that rust infected the plants in the second part of February when environmental conditions were favourable and the host was susceptible. Percentage infection increased again until the end of the season, but this increase differed for these treatments. It was mostly slight for Plantvax 20, K W G 0599, Dithane M 45 and Sicarol. On the other hand, it was high for Rovral and the non-sprayed plots.

At Nubaria, percentages of infection, 15 days after the first spray, were higher than those at Sakha, and ranged from 13.75 per cent to 27.50 per cent. This may be due to earlier planting beside differences in environmental conditions.

Results summarised here indicate that Dithane M 45, K W G 0599, and Plantvax 20 were the best fungicides tested, with respect to their efficiency in controlling rust at both stations. This is in agreement with results obtained from greenhouse tests.

It is suggested that Dithane M 45, which is recommended for rust and leaf spot control, could be further used for the control of faba bean rust until another fungicide proves more effective in decreasing the amount of infection and increasing seed yield.

Table 2. Average percentage of rust at different periods when Giza 3 faba bean plants were sprayed with different fungicides, Sakha 1979/80.

Treatment	Average per cent rust recorded on		
	Feb. 14	March 3	April 7
Plantvax 20	0	5.50	11.00
K.W.G. 0599	0.5	17.75	22.00
Dithane M 45	0	27.50	35.75
Sicarol	0	33.00	35.75
Rovral	0.25	35.75	71.50
Not sprayed	0.75	44.00	94.00

Table 3. Average percentage of rust at different periods when Giza 3 faba bean plants were sprayed with different fungicides, Nubaria 1979/80.

Treatment	Average per cent rust recorded on			
	Jan. 28	Feb. 26	March 9	March 29
Plantvax 20	13.75	24.75	13.75	44.00
K.W.G. 0599	19.75	27.50	46.75	55.00
Dithane M 45	13.75	30.25	33.00	68.75
Sicarol	13.75	38.50	77.00	91.00
Rovral	19.25	46.75	71.50	88.25
Not sprayed	27.50	66.00	88.00	100.00

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