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## Performance of metiram 70% WDG (dithiocarbamate) on the infection and yield loss associated with tikka disease of groundnut (*Arachis hypogaea* L.) in West Bengal

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Assessment of plant infection and yield loss induced by tikka disease of groundnut caused by *Cercospora arachidicola* and *Phaeoisariopsis personata* with the application of chemical fungicides were made for two seasons. The chemical fungicides and their doses were, metiram 70% WDG (dithiocarbamate) @ 1.0, 1.5 and 2.0 kg ha<sup>-1</sup>, chlorothalonil 75% WP @ 1.0 kg ha<sup>-1</sup> and mancozeb 75% WP 2.0 kg ha<sup>-1</sup>. Fungicides were applied as a foliar application for 2 times where metiram 70% WDG @ 2.0 kg ha<sup>-1</sup> significantly reduced disease severity in comparison to other treatments indicating lowest disease severity in the tune of 25.65% and 21.19% during 2002 and 2003, respectively. Significant increase in pod yields *i.e.* 59.45% and 72.97% were also recorded with this treatment in both the seasons. Yield loss of 37.28% (2002) and 41.18% (2003) in untreated plots indicated the importance of tikka disease as a major constraint for cultivation of groundnut in West Bengal.

**Key words :** Dithiocarbamate, groundnut, metiram, tikka disease, yield loss

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### INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is an important oilseed crop and now the crop is gaining popularity among the growers of West Bengal. In West Bengal, the crop is grown mostly during *kharif*, *rabi* and summer seasons and in recent years farmers of this state are very much interested to grow oilseed crops particularly sunflower and groundnut for their suitability in crop rotation. It is expected that the area under this crop will gradually increase further for stable income. Increasing in area and year round cultivation of groundnut has simultaneously increased the chances of outbreak of various diseases. Among the fungal diseases leaf spot or tikka disease caused by *Cercospora arachidicola* and *Phaeoisariopsis personata*, is one of the most important causing great loss though estimation of yield loss due to this disease has not been assessed in the state. Mc Donald (1985) and Sesay (1992) have reported that both the diseases caused considerable yield loss particularly when

appeared early in the season. If fungicidal control is not used in time the loss due to the disease may be upto 60% as it was observed with some commercially grown cultivars (Chattopadhyay and Sastry, 2003). Considering the importance of tikka disease studies have been made to test the efficiency of metiram 70% WDG in different doses and its impact on the crop yield along with two other fungicides.

### MATERIALS AND METHODS

Field experiment was conducted to assess the infection rate with fungicidal spraying and yield losses induced by tikka disease of groundnut at Regional Research Station, Gayeshpur, BCKV during *kharif* 2002 and *rabi* 2003 seasons using the cultivar JL-24 under normal package of practices. The experiments were laid out in RBD, replicated at 20 sq. m area. The fungicides used were metiram (dithiocarbamate) 70% WDG @ 1.0 1.5 and 2.0 kg ha<sup>-1</sup>, chlorothalonil 75% @ 1.0 kg ha<sup>-1</sup> and

mancozeb 75% WP @ 2.0 kg ha<sup>-1</sup>. The treatments were given as foliar application at two times, first at 50 days after sowing (DAS), after the appearance of initial symptoms of disease and subsequent spray was given at 65 DAS using a high volume knapsack sprayer with a spray volume of 500 l ha<sup>-1</sup>. The plots sprayed with plain water served as control. Observation on the infection as PDI (Percentage Disease Index) was measured by selecting 10 plants randomly from each plots at 80 DAS. The percentage disease index was calculated by using the standard evaluation scale of 0-9. Pod yields were also recorded accordingly after the harvest and analysed statistically. Projected yield loss in control over treatment was recorded as percentage. Increase in pod yields in each of the treatment over control was also recorded to find out the effectiveness of different fungicides.

## RESULTS AND DISCUSSION

Results of the assessment of plant infection with fungicidal spraying and yield loss under natural disease pressure in *kharif* 2002 and *rabi* 2003 are presented in Table 1. From Table 1, it appeared that the infections measured as PDI in all the treatments in *kharif* 2002 were significantly lower than the disease severity recorded in untreated check (42.44%). Least disease severity (25.65%) was recorded with application of metiram 70% WDG @ 2.0 kg ha<sup>-1</sup> followed by 25.87% and 28.14% when the same chemical was used @ 1.5 and 1.0 kg ha<sup>-1</sup> respectively. Whereas other two treatments, mancozeb 75% WP and chlorothalonil 75% WP @

1.0 and 2.0 kg ha<sup>-1</sup> the respective PDI values were 26.98 and 25.86 per cent. The groundnut pods yield was directly related with the severity of the disease. Lower disease severity has significantly increased pods yield as recorded 18.21 and 17.92 q ha<sup>-1</sup> when metiram 70% WDG was applied @ 2.0 kg ha<sup>-1</sup> in both the seasons. An estimated 37.28% and 42.18% yield loss was observed in control plots in respect to the treatment of metiram 70% WDG @ 2.0 kg ha<sup>-1</sup> in *kharif* and *rabi* season trials. Mancozeb 75% WP and chlorothalonil 75% WP were also found to be effective to control the leaf spot but performance of metiram 70% WDG was more in reducing the disease severity and increasing the pods yields. In this study metiram 70% WDG, a dithiocarbamate fungicides, was used at three doses (1.0, 1.5 and 2.0 kg ha<sup>-1</sup>) to find the comparative effectiveness of the chemicals between the dosages. It appeared from the two seasons trials that percentage of disease incidence and pod yield varied significantly within the three doses and minimum PDI was observed with two times spray of metiram @ 2.00 kg ha<sup>-1</sup>. Based on the results it may be concluded that reducing the dose of metiram in the tune of 1.0 kg ha<sup>-1</sup> will also be effective similar to chlorothalonil and mancozeb @ 1.0 and 2.0 kg ha<sup>-1</sup>.

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**Table 1 :** Performance of three fungicides against tikka disease of groundnut during *kharif* 2002 and *rabi* season of 2003

Treatments	Dose (kg ha <sup>-1</sup> ) (formulation)	Percentage disease index (PDI)		Pod yields (q ha <sup>-1</sup> )		% yields increase over control		% yields loss in control over treatment	
		<i>Kharif</i>	<i>Rabi</i>	<i>Kharif</i>	<i>Rabi</i>	<i>Kharif</i>	<i>Rabi</i>	<i>Kharif</i>	<i>Rabi</i>
Metiram 70% WDG	1.0 kg	22.35 (28.14)*	16.66 (24.03)	15.13	14.26	32.48	37.64	24.52	27.34
Metiram 70% WDG	1.5 kg	19.16 (25.87)	14.81 (22.61)	17.39	16.12	52.27	55.59	34.33	35.73
Metiram 70% WDG	2.0 kg	18.98 (25.65)	13.07 (21.19)	18.21	17.92	59.45	72.97	37.28	42.18
Chlorothalonil 75% WP	1.0 kg	27.00 (27.83)	20.73 (25.86)	13.89	12.14	21.62	17.18	17.78	14.06
Control	—	44.55 (42.44)	29.25 (32.73)	11.42	10.36	—	—	—	—
SEM ±	0.364	0.430	0.334	0.489	—	—	—	—	—
CD (P = 0.05)	1.090	0.104	1.000	1.180	—	—	—	—	—

\* Figures in the parenthesis indicate replicated transformed angular values.

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