Journal of Agrometeorology 8(1) : 123 - 125 (June 2006)

Short Communication

Relationship between gall midge incidence and rice yield under different sowing dates

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Rice (*Oryza sativa L.)* is one of the most important crops of Chhattisgarh State, where rice is mostly grown during *kharif* season (June-October). Sowing of this crop is done right from the onset of monsoon in June and prolonged up to the first fortnight of August. The rice grain yield is mostly dictated by sowing date followed by intensity and duration of monsoon rain and incidence of pest and diseases, which are again controlled by sowing date. Gall midge is one of the major pests of rice in Chhattisgarh State during *kharif* season especially from July to October and severity is much pronounced in September. On an average 25 to 30 per cent damage had been reported due to gall midge incidence (Karthikeyan, 2002 Personal communication). In view of this, the present investigation was carried out to study the relationship between gall midge incidence and rice yield under sowing dates.

Field experiment was conducted during *kharif* 2003 at the Research farm, Department of Agrometeorology, Indira Gandhi Agricultural University, Raipur – (Chhasttigarh), to study the relationship between gall midge incidence and rice yield under different sowing dates. Replication comprised of three sowings (D_1: 30th June, D_2: 15th July and D_3: 31st July) and two treatments (Protected and unprotected). One rice susceptible variety *Kranti* was transplanted as per treatment at a distance of 20 X 15 cm. Recommended dose (100 kg N, 50 kg P_2O_5 and 50 kg K_2O per hectare) of nutrient was applied. Out of which 40 per cent nitrogen and full dose of P2O5 and K_2O was applied as a basal dose at the time of sowing. Remaining 30 kg N was applied 30 days after sowing and 30 kg N at panicle initiation stage. Plant protection measures were taken as per standard package of practices. Meteorological data for the crop growth period were collected from Agrometeorological Observatory installed at experimental site. Similarly, observations on gall midge incidence were also noted. As per the sowing date, the field was divided into 10 spots of one m^2 area in each treatment. At each spot ten plants per m^2 were tagged in ten randomly selected areas and measured number of silver shoots every week in selected plants. After harvest, grain yield was recorded. The influence of different weather parameters viz; maximum

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Table 1: Gall midge incidence in rice experimental field under different dates

Date	D_1 (%)	Date	D_2 (%)	Date	D_3 (%)
4-Sept.	0.2	5-Sept.	1.0	7-Sept.	0.2
8-Sept.	1.5	9-Sept.	1.1	10-Sept.	7.4
15-Sept.	3.3	16-Sept.	1.1	17-Sept.	9.5
22-Sept.	5.4	23-Sept.	9.2	24-Sept.	10.1
29-Sept.	9.4	30-Sept.	10.7	1-Oct.	11.9
6-Oct.	11.2	7-Oct.	15.1	8-Oct.	22.0
13-Oct.	13.2	14-Oct.	16.5	15-Oct.	31.4
20-Oct.	14.8	21-Oct.	19.0	22-Oct.	65.9
27-Oct.	18.9	28-Oct.	22.5	29-Oct.	72.4
5-Nov.	19.2	6-Nov.	23.3	7-Nov.	72.4

Table 2: Incidence of gall midge on rice yield under different dates of planting

	(D_1)		(D_2)		(D_3)	
Plot No.	Peak infestation m^{-2}	Yield (kg ha^{-1})	Peak infestation m^{-2}	Yield (kg ha^{-1})	Peak infestation m^{-2}	Yield (kg ha^{-1})
1	26	2760	21	3160	72	2100
2	16	3200	19	3220	65	2400
3	20	3150	23	3180	65	2390
4	19	3260	1	3680	68	2380
5	21	3100	23	3070	60	2490
6	16	3270	27	2910	76	1820
7	15	3490	25	3070	62	2480
8	18	3130	26	2990	100	1530
9	16	3380	24	3030	70	2160
10	25	2790	27	2560	75	2050
Mean	19.2	3153	23.3	3087	72.4	2180

and minimum temperatures, relative humidity morning and evening and wind speed on the incidence of gall midge under different dates of sowing were worked out

through step-wise regression equations.

Data on gall midge incidence (Table 1) revealed that in D_1 the infestation was less as compared to D_2 and D_3; the first single silver shoot was recorded on 4th September. Peak activity occurred after 29th September.

Gall midge infestation was comparatively high particularly at the later stages of the crop in the third date of sowing. The population increased rapidly and spreading throughout the field.

Effect of gall midge on rice yield

Peak gall midge incidence and rice yield of each plot are given in Table 2. It is seen that the average gall midge damage (Number of silver shoots) in the first date of planting was much lower (19.2) than in the third date of planting (72.4). This was a clear indication that under late planting conditions and at late vegetative stage, the gall midge damage was more likely.

The relationship between gall midge incidence and rice yield for pooled data under different sowing dates were analyzed using regression analysis. The following linear equation was developed.

$Y = 35.605 - 0.1991\ X \qquad (R^2 = 0.896^*)$

Where,

Y = Rice yield (kg ha^{-1})
X = Gall midge incidence

The equation accounted for 90 per cent variation in rice yield with gall midge incidence during entire crop growth period.

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