

Effectiveness of Sowing Methods and Fertilizers on the Incidence of Rice Leaf Folder, *Cnaphalocrocis medinalis* Guen.

D. M. Korat**, J. F. Dodia, M. C. Patel and A. R. Pathak

Main Rice Research Station,
Gujarat Agricultural University, Nawagam - 387 540

Introduction of high yielding varieties with intensive cultivation have created a favourable environment for insect pests. Among the various pest attacking to rice crop, the leaf folder (LF), *Cnaphalocrocis medinalis* Guen. is one of the important insect pest in Gujarat. Earlier, it has been recorded as minor pest, but now it has assumed the status of a major pest in the state. Upadhyay *et al.* (1975) reported that an average infestation of 73% of the pest resulted in reduction in grain yield to the extent of 13.68 g/ha.

Influence of fertilizer levels on the incidence of *C. medinalis* has been reported by many workers (Chandragiri *et al.* 1974; Dhaliwal *et al.* 1979; Upadhyay *et al.* 1981, Dhaliwal and Singh, 1985; Rajendran 1985; Saroja *et al.* 1987; Yein and Das 1988; Suresh *et al.* 1991 and Sudhakar *et al.* 1993. However, few (Rajendran 1985, Yein and Das, 1988 and Sathiyandam *et al.* 1991) have assessed the incidence of LF in rice crop having different plant density level of spacing level. No. detailed work has been done on the impact of sowing methods on the LF incidence in Gujarat. Keeping this in mind, the present study

was carried out to evaluate the influence of two sowing methods *i.e.* sprouted seed method and transplanted method and level of two commonly used fertilizers on the incidence of rice LF.

A field experiment was conducted in a split plot design with three replications during *kharif* 1994 and 1995 at the Main Rice Research Station, Gujarat Agricultural University, Nawagam. Two methods of sowing *i.e.* sprouted seed method (M1) and transplanting at 20 x 15 cm (M2) were kept as main plot treatments. Similarly, four levels of nitrogen (50, 100, 150 and 200 kg N/ha) and three levels of phosphorus (0, 25 and 50 kg P_2O_5 /ha) were arranged as sub-plot and sub-sub-plot treatments, respectively. Gross and net plot size were 6.0 x 2.4 and 5.4 x 1.6 m respectively. Variety used for experimental purpose was GR-11 with seed rate of 40 and 20 kg/ha for sprouted and transplanting method of sowing, respectively. Sprouted seeds were sown at the date (first August 1994 and fifteen August 1995 during first and second year if experimentation, respectively) of raising the nursery and trasplating was followed after 25 days of sowing. The entire quantity of P_2O_5 was applied as basal dose at the time of puddling. Nitrogen was applied in 3 split *i.e.* 40% at puddling, 40% at tillering and remaining 20% at panicle initiation stage.

Observations were made during third week of October when incidence of LF was at peak level. Total number of leaves and LF damaged leaves were counted for 10 hills selected at randon from each net plot and expressed in

** Present Address : Associate Research Scientist (Ento.), Main Rice Research Station, GAU, Nawagam-387 540.

TABLE 1

Influence of sowing methods and fertilizer levels on the incidence of rice leaf folder.

		LF Damage (%)		
		1994	1995	Pooled
Sowing method				
	M ₁	30.94 (26.72)*	29.82 (25.67)	30.38 (26.19)
	M ₂	21.30 (13.37)	28.99 (24.44)	25.14 (18.91)
S.E.m.		0.202	0.402	3.11
C.D. at 5%		1.227	NS	NS
C.V. (%)		4.63	8.21	6.88
N	N ₁ 50 kg/ha	22.71 (15.09)	19.64 (11.38)	21.18 (13.24)
	N ₂ 100 kg/ha	24.72 (18.08)	25.66 (18.86)	25.19 (18.47)
	N ₃ 150 kg/ha	27.02 (21.63)	32.67 (29.22)	29.85 (25.43)
	N ₄ 200 kg/ha	30.02 (25.37)	39.64 (40.75)	34.83 (33.06)
	S.E.m.	0.383	0.690	2.763
	C.D. at 5%	1.182	2.126	NS
	C.V. %	6.23	9.96	8.53
	P ₁ 0 kg/ha	26.72 (20.91)	28.91 (24.38)	27.81 (22.64)
	P ₂ 25 kg/ha	26.05 (19.95)	29.53 (25.19)	27.79 (22.57)
	P ₃ 50 kg/ha	25.59 (19.28)	29.78 (25.60)	27.68 (22.44)
	S.E.m.	0.270	0.388	0.255
	C.D. at 5%	0.780	NS	NS
	C.V. %	5.07	6.46	5.90

* Data in parentheses indicate the original value.

NS = Not significant.

percentage. The percentage value was converted to angular value and then subjected to statistical analysis. Data obtained are presented in Table-1.

Observations revealed that sprouted seed method (M1) had more plant population in comparison of transplanted method (M2). Methods of sowing has no influence on the pest incidence. In present study, the non-significant variation in LF incidence between the two

methods of sowing indicated that the plant population/density had no influence on the pest attack. Rajendran (1985), Yein and Das (1988) and Sathiyandam *et al.* (1991) also supported the present findings. Leaf folder damage recorded in different levels of N showed significant impact during 1994 and 1995, however pooled analysis revealed non-significant variation (Table-1). The extent of LF damage increased (from 13.24 to 33.06%) with the increasing doses of nitrogenous

fertilizers (from 50 to 200 kg N/ha). This is in agreement with the finding of Chandragiri *et al.* (1974), Dhaliwal *et al.* (1979), Upadhyay *et al.* (1981), Dhaliwal and Singh (1985), Rajendran (1985), Saroja *et al.* (1987), Yein and Das (1988), Thakur and Mishra (1989) and Sudhakar *et al.* (1993). In contrast to this, Suresh *et al.* (1991) noted that there was no difference in LF incidence with respect to nitrogen levels. The impact of

phosphorus fertilizer on LF damage was not noticed in pooled results. Interaction between year X method (Y X M), year X nitrogen (Y X N) and year X phosphorus (Y X P) were found significant.

Present study concluded that the sowing methods evaluated had no impact of LF incidence, however LF incidence increased with the increasing doses of N fertilizers.

(Received on 10th Sept. 1997)

REFERENCES

- Chandragiri, K. K., R. Velusamy; I. P., Janaki and M. S., Ramkrishnan, 1974. Effect of different levels of nitrogen on rice leaf roller, *Cnaphalocrocis medinalis* Guen. incidence. *Madras Agric. J.* **61** (9) : 717.
- Dhaliwal, G. S., Shahi, H. N., Gill, P. S. and Maskina, M.S. 1979. Field reaction of rice varieties to leaf folder at various nitrogen levels. *IRRN* **47** (3) : 7.
- Dhaliwal, G. S. and Singh, J. 1985. Effect of green manuring and nitrogen levels on the incidence of leaf folder and mole rate in rice. *J. Res. PAU.* **22** (4) : 700-2.
- Rajendran, R. 1985. Influence of varieties, nitrogen and spacing on the infestation by rice leaf folder, *C. medinalis*. *Madras Agric. J.* **72** (10) : 586-589.
- Saroja, R., Jagannathan, R. and Raju, N. 1987. Effect of N nutrition and rice variety on leaf folder, yellow stem borer and grain yield. *IRRN* **12** (5) : 11-12.
- Sathiyandam V. K. R., Logiswaran, G. and Sundarababu, P. C. 1991. Influence of varieties, spacing and pest management on the incidence of three major pests of rice. *Madras Agric. J.* **78** (1-4) : 10-14.
- Sudhakar, G. K., Singh, R.; Thakur, R. B. and Mishra S. B. 1993. Influence of levels and sources of nitrogen on the incidence of leaf folder, *C. medinalis* in different rice varieties. *J. Econ. Res.* **17** (2) : 141-147.
- Suresh, S.; Sathiyandam. V.K.R. and Sundarababu, P. C. 1991. Influence of planting time and nitrogen on the incidence of rice gall midge and leaf folder. *Madras Agric. J.* **78** (1-4) : 104-106.
- Thakur, R. B. and Mishra, S. S. 1989. Effect of different levels of nitrogen and some granular insecticides on stem borer and leaf folder incidence. *J. Entom. Res.* **13** (1-2) : 121-124.
- Upadhyay, V. R.; Desai, N. D. and Shah, A. H. 1975. Extent of damage and varietal susceptibility by rice leaf folder, *Cnaphalocrocis medinalis* in Gujarat. *Pesticides* **9** (5) : 27-28.
- Upadhyay, V. R., Shah A. H. and Desai, N. D. 1981. Influence of levels of nitrogen and rice varieties on the incidence of rice leaf folder. *Cnaphalocrocis medinalis* Guen. *GAU Res. J.* **6** (2) : 115-117.
- Yein, B. R. and Das, G. R. 1988. Effect of spacing and nitrogen levels on the incidence of insect pests in rice. *Pesticides* **22** (10) : 37-40.