

PRESENT STATUS OF MANAGING RICE GALL MIDGE— *ORSEOLIA ORYZAE* (WOOD-MASON) IN 3-3 1/2 MONTH RICE VARIETIES IN POLONNARUWA DISTRICT

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Polonnaruwa is a major rice growing district. Of the 25,679 ha of the total cultivated extent of rice during 98/99 *maha* in this district, 43.4% was cultivated with short aged (3-3 1/2 month) varieties (Anon 1998). Of the short aged varieties, Bg 300 and Bg 352 occupied 91.6% of the extent. Since short aged varieties are cultivated late in the season and such crops are subjected to severe rice gall midge (RGM) infestation, these two varieties were selected to study the present status of managing RGM in the district. Bg 352 is resistant to RGM whereas Bg 300 is susceptible.

METHODOLOGY

A well prepared questionnaire was distributed among Agricultural Instructors (AIs) of the district. Each AI collected information from 5-6 farmers in her/his area. Questions were asked regarding the variety, date of sowing, date of transplanting, insecticide application, etc. Furthermore, AIs were asked to record the number of hills, number of tillers and number of galls in one square foot. Four such sites were observed in each AI area. Rainfall, maximum and minimum temperature and maximum and minimum humidity were also recorded.

RESULTS

Of the 68 farmers interviewed 40 (59%) cultivated Bg 352 and the balance 41% cultivated Bg 300 (table 1).

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Table 1. Varietal break down of short age rice varieties and RGM infestation during 98/99 *maha* in Polonnaruwa district

Varieties	% farmers cultivating the variety	%farmers reported RGM infestation
Bg 352	59 (40)	37 (22)
Bg 300	41 (28)	50 (14)

Figures within parentheses are actual values.

Of the 28 fields observed with Bg 300, 50% were infested with RGM whereas for Bg 352 only 37% fields were infested. This shows that Bg 300 is more susceptible to RGM than Bg 352. However, Bg 300 was developed as a RGM resistant variety and with the emergence of biotype-2 in 1987, it has become susceptible (Nugaliyadde and Galanihe, 1997).

Sixty percent farmers had established their rice crop within 3rd and 4th week of October while 23 % farmers established after this period which extended up to 3rd week of January (table 2).

Table 2. Weeks of sowing of short-aged rice varieties in Polonnaruwa district during 98/99 *maha* season.

Weeks	% farmers reported planting within the period
September	1-4 4.4
October	1-2 11.8
	3-4 60.3
December	1-2 11.8
	3-4 4.4
January	1-3 7.3

Of the 68 farmers 46 (67%) reported that RGM infestation was less than 01 gall per sq. foot (table 3). However, in some fields it had gone up to 6 galls per 1.0 sq. foot. The thresh hold level under ideal situation when there are around 20 productive tiller per sq. foot is one gall per sq. foot. However, since most farmers are using high seed rates, this figure should be high.

Table 3. Gall midge infestation vs rainfall

Infestation galls/1 sq. foot	rainfall after sowing		Chi-square value
	rain	no rain	
> 1	13.1 (5.3)	9 (16.7)	22.8 **
< 1	8 (15.7)	38 (30.3)	

Chi square Test was used to analyse data. Figures within parenthesis are expected values

** significant at P = 0.01 level.

Of all insecticide applications made during the season, 31% applications were done with insecticides recommended for the control of brown plant hopper (BPH) (table 4) namely Imidachlorprid and Fenobucarb (Anon 1997). Furthermore, 11.5% of insecticide applications were made with carbofuran which is recommended for the control of both RGM and BPH. BPH out break occurred during the previous *maha* season (97/98) may have influenced farmers to use these chemicals. Around forty two percent of the insecticide applications made during the season are insecticides recommended for thrips (table 4). They are dimethoate, carbosulphan, Imidachlorprid, fenthion and fipronil.

Table 4. Insecticide usage for short aged rice varieties during 98/99 *maha* in Polonnaruwa district.

Insecticide usage: Week after sowing	% farmers reported using insecticide during the period	Type of insecticides	% farmers reported using the insecticides
1-4	36 (13)	Pirimiphos methyl	5.3 (4)
4-8	33 (12)	Dimethote	5.3 (4)
9-12	31 (11)	Carbosulphan	22.2 (17)
Rate of Insecticide Application		Imidachloprid	8.9 (7)
Foliar sprays (ml/ha)	% farmers reported using the amount/volume	Fenthion	2.6 (2)
800 — 1000	85 (20)	Fenobucarb	22.2 (17)
1001 — 1500	15 (02)	Tebupenocide	2.6 (2)
Granules (kg/ha)		Fipronil	2.6 (2)
27 — 22	33 (03)	Chlorpyrifos	16.8 (13)
13 — 06	67 (06)	Carbofuran	11.5 (7)
		Insecticide application	% farmers reported
		Applied	53 (36)
		Not applied	47 (32)

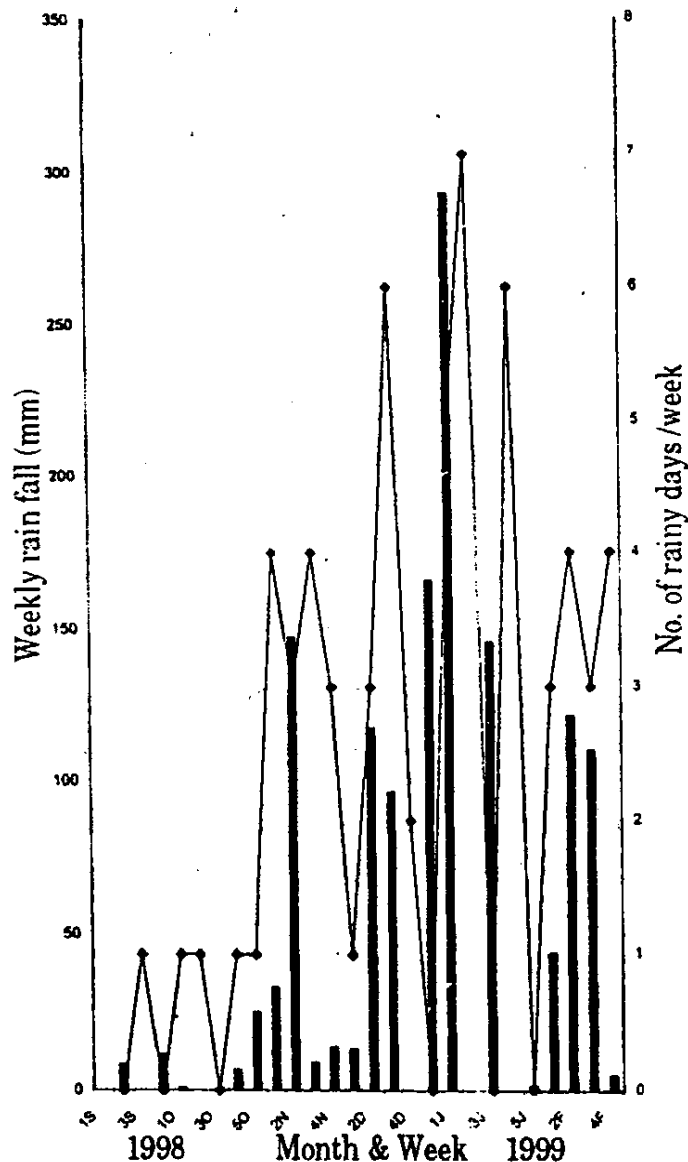
Figures within parantheses are actual values

Only 11.5% insecticide applications were made with carbofuran, the only recommended insecticide used by farmers for RGM control during the season. However, of the 9 farmers who applied granular insecticides, only three had applied recommended dosage whereas others applied lower amounts. These results show that the farmers had not considered RGM infestation as an important problem in Polonnaruwa district.

As far as the timing of insecticide application is concerned, 36% farmers used insecticides within the first three weeks after sowing; thirty three percent farmers starting from 4th week up to 8th week; and 31% after 8th week. Since farmers have given equal importance with regard to insecticide application during different

growth stages of the rice crop, namely seedling, vegetative and reproductive stages, we can assume that there had not been an important pest problem during the season. AIs of the Polonnaruwa district also have confirmed this fact.

Only 53% farmers had applied insecticides whereas 47% did not apply any insecticides at any stage (table 4). According to the results, there is a significant relationship ($\chi^2 = 22^{**}$) between the prevailing of rains within 1-2 weeks after sowing and presence of gall midge infestation (fig 1 & tables 3 and 4).



DISCUSSIONS

The RGM may maintain higher population levels in the wet zone where rice is cultivated twice in the rain fed paddy fields during the *yala* and *maha* seasons (Kobayashi *et. al.*, 1984). Present study also shows that gall midge infestation is low in the Polonnaruwa district, which is in the dry zone of Sri Lanka. Furthermore, Hidaka (1978) reported that RGM does not cause serious damage to rice plants during dry season. This shows that there is a relationship between wet weather and gall midge infestation. According to the present study, there is a significant relationship between rainfall after sowing period and RGM infestation. Nugaliyadde *et. al.* (1987) reported that it is necessary to have high relative humidity in the atmosphere for egg development and movement of neonate larva of RGM from the young leaves to the growing point of the rice plant through leaf bases.

As there is a relationship between the RGM damage and weather parameters, farmers should take precautionary measures for controlling RGM specially when they cultivate susceptible varieties such as Bg 300. Furthermore, it is necessary to create an awareness programme for the farmers in Polonnaruwa district regarding pest management for successful control of gall midge as well as all other important insect pests because more than 66% farmers had applied inadequate amount of granular insecticides for the control of RGM.

It is also necessary to find out the relationship between population of *Platigaster oryzae* and *P. foersteri* with climatic factors when conducting a similar survey in wet zone because Kobayashi *et. al.* (1994) reported that the percentage parasitism by *P. oryzae* and *P. foersteri* was high in wet zone and low in dry and intermediate zones. These parasites are effective in controlling rice gall midge in Sri Lanka.

CONCLUSIONS

RGM infestation was not an important production constraint in Polonnaruwa district during 98/99 *maha*. Nevertheless, as there is a significant relationship between RGM infestation and rainfall

within 1-2 weeks after sowing, farmers can make use of that knowledge to protect their crops in places where infestation is high. Moreover, it is necessary to educate farmers on the importance of integrated crop management for successful control of rice pests as many farmers have not used insecticides systematically. Since RGM is not so important in the Polonnaruwa district, farmers should be pay more attention to more important pests such as BPH, leaf folder and paddy bug.

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REFERENCES

- Anon (1997). Pesticide Recommendation of the Department of Agriculture, Sri Lanka.
- Anon (1998). Data Base, Rice Research and Development Institute, Batalagoda
- Hidaka, T. (1978). Serious incidence of the rice gall midge in the central plane of Thailand, Appl. Ent. 13(4):260-263
- Kobayshi, M and C. Kudagama (1984). Hymenopterous parasitoids of rice gall midge, *Oreseolia oryzae* (Wood Mason) in the *maha* season in Sri Lanka, JARQ, 28:112-116.
- Nugaliyadde, B.M., Tennakoon and C. Kudagama (1987). Insect pest and disease control for successful harvest in rice crop. Govicam Sangarava 31 (1-4): 9-20
- Nugaliyadde, L and D.Galanihe (1997). Development of breeding and selection strategies to incorporate gall midge resistance with high yielding rice varieties, Report submitted to CARP.