EVALUATION OF CERTAIN INSECTICIDES AGAINST RICE STEM BORER, CHILO AGAMEMNON BELS. AND RICE LEAF MINER; HYDRELLIA PROSTERNALIS DEEM. IN RICE FIELDS .

A.M. SOLIMAN[1], R.G. ABOU EL-ELA[2], AND M.ABD EL-ALEIM[1]

1 Plant Protection Research Institute, Agricultural Research Centre, Giza, Egypt.

2 Central Agricultural Pesticides Laboratory, Agricultural Research Centre, Dokki, Egypt .

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Abstract

Different insecticides in certain doses and formulations were applied in different timings against the rice stem borer and the rice leaf miner. The obtained data can be summarized as follows :

Rice stem borer : Most of the tested chemicals were highly effective on the borer. Percentages of damage in the treated plots were 2.9 and 3.8% for Fipronil (10 kg/fed), 14.2 and 12.3% for Diazinon (8 kg/fed) in 1994 and 1995 seasons, respectively.

Fipronil at the rate of 10 kg/fed followed by Furadan (6 kg/fed) and Novadrin (1.5 lit/fed) seemed to be the most effective insecticides. They reduced damage by 81.8, 78.1 and 51.3% in 1994, and 71.2, 69.7 and 56.8% in 1995 season, respectively.

Applying insecticides at 50 or 70 days after transplanting was effective in reducing the damage, but at the later timing, insecticides were more effective.

Rice leaf miner: Based on the percentage of the damaged leaf area parameter, Furadan at the rate of 6 kg/fed and Novadrin (1.5 Lit/fed) were the most effective insecticides with the least damage (1.7 and 1.9% in 1994 and 1.6 and 1.7% in 1995), respectively. Dursban (4.5 kg/fed) and Sevin (16 kg/fed) showed intermediate effectiveness.

Based on either infestation parameter or severity parameters, Furadan (6 kg/fed) and Novadrin (1.5 lit/fed) were the most effective insecticides against the rice leaf miner.

INTRODUCTION

The rice stem borer; *Chilo agamemnon* Bles. and the rice leaf miner; *Hydrellia* prosternalis Deem. are very important insects causing great yield losses to rice crop.

The rice stem borer causes damage as plant dead hearts and white heads which reduce rice yield. The rice leaf miner causes transparent leaf tunnels and re-

cently became the major insect on rice.

Pesticide treatments are likely to remain the most important component of integrated pest management (IPM) system for the foreseeable future. Although using insecticides is the last resort in IPM strategy, it becomes the only way for delivering the crop since all IPM tools were exhausted and the damage reached the economic level.

Since the insecticides are still important and the new approach is not to suggest eliminating them, rather to reduce the amounts being used and utilize them wisely in IPM system. Therefore, this work aims at selecting the proper insecticides with the effective dose and the correct timing of application to present the most effective treatment that can be applied against the rice stem borer and the rice leaf miner.

MATERIALS AND METHODS

Experiments were conducted at Sakha Agr. Res. St., Kafr El-Sheikh Governorate during 1994 and 1995 rice seasons. In all experiments rice was sown on mid May and transplanted 30 days later. A complete block design and four replications for every treatment was used, and the plot area was 40 m2. Other agricultural operations were done as usually practised. Spray insecticides were directed 30 cm below the top of the plant using a regular knapsack sprayer provided with one nozzle. Granular insecticides were broadcasted .

A. The rice stem borer

Three experiments were conducted during 1994 and 1995 rice seasons. Giza 180 rice variety was used as a susceptible one for the borer.

Two experiments were carried out during 1994 and 1995 for testing six insecticides as applied once at 50 days after transplanting. The tested compounds were Sevin 5% G (16 kg/fed), Dursban 5% G (4.5 kg/fed), Diazinox 5% G (8 kg/fed), Novadrin 40% EC (2.5 lit/fed), Fipronil 2% G (10 kg/fed) and Furadan 10% G (6 kg/fed). A third experiment was made also in 1995 season for testing nine insecticides applied twice; 50 or 70 days after transplanting. The tested toxicants were Fiprinil 2% G (10 kg/fed), Diazinox 5% G (10 and 12 kg/fed), Diazinon 10% G (6 kg/fed)., Novadrin 40% EC (1.5 lit/fed). Nova 40% EC (1.5 lit/fed), Sevin 5% G (16 kg/fed) and Furadan 10% G (3 and 6 kg/fed).

Samples of 25 hills were randomly selected from each plot (10 days after ap-

plication) to count dead hearts and (10 days before harvest) to count white heads. From dead hearts and white heads, percentage of total damage and then reduction in infestation were determied.

B. The rice leaf miner

Two experiments were conducted during 1994 and 1995 rice seasons. Giza 176 rice variety was used as a susceptible variety for the leaf miner infestation. The tested insecticides were Sevin 5% G (10 and 16 kg/fed), Dursban 5% G (4.5 kg/fed), Diazinox 5% G (8 kg/fed), Furadan 10% G (6 kg/fed) and Novadrin 40% EC (1.5 lit/fed).

Samples of 50 leaves were taken at random from each plot. The percentage of infested leaves was calculated and number and length of mines were counted for severity of infestation (average number of mines/leaf, mean length of mine, damaged area mm/leaf and damaged area percentage) .

RESULTS AND DISCUSSION

A. For the rice stem borer

Results in Table 1 showed the effect of applying certain insecticides against the rice stem borer *Chilo agamemnon* Bles.

Table 1 . Effects of certain insecticides applied once on the rice stem borer.

Treatment	Dose per fed	% dead hearts		% white heads		% damage		% damage reduction	
		1994	1995	1994	1995	1994	1995	1994	1995
Sevin, 5G	16 kg	3.2	2.9	6.4	3.7	9.6b	6.6a	40.0	50.0
Dursban, 5G	4 kg	3.3	2.5	6.4	4.3	9.7b	6.8a	39.4	48.5
Diazinox, 5G	8 kg	3.8	3.2	10.4	9.1	14.2a	12.3b	11.3	6.8
Novadrin, EC	1.5 L	2.8	2.6	5.0	3.1	7.8b	5.7a	51.3	56.8
Fipronil, 2G	10 kg	1.1	1.6	1.8	2.2	2.9c	3.8a	81.8	71.2
Furadan, 10 G	6 kg	1.4	2.9	2.1	1.1	3.5c	4.0a	78.1	69.7
Untreated	-	6.6	4.0	9.4	9.2	16.0a	13.2b	-	-

Values followed by the same letter are not significantly different at 5% as DMRT.

Data revealed that most of the tested chemicals were highly effective on the borer. Percentages of damage were 2.9 and 3.8% for Fipronil (10 kg/fed), 14.2 and 12.3% for Diazinox (8 kg/fed) in 1994 and 1995, respectively .

Results indicated that the most effective insecticides can be arranged as fol-

lows : Fipronil (10 kg/fed), Furadan (6 kg/fed), Novadrin (1.5 lit/fed) and Sevin (16 kg/fed), reducing damage by (81.8, 71.2%), (78.1, 69.7%), and (40.0, 50.0%) in 1994 and 1995, respectively .

The present data agree with those of Isa *et al.*, (1970) for Dursban, Tantawi *et al.*, (1983) for Sevin and Tantawi *et al.*, (1985) for Furadan effects.

Obtained data indicated that the most effective insecticides were in the granular form. As this form is more effective and easier to apply, since it reaches directly to water in rice field without side effects on the natural enemies .

Results in table 2 indicated the effect of certain insecticides at two different timings against the same borer. It can be noticed that granular Fipronil (10 kg/fed) was the most effective one followed by granular Furadan (6 kg/fed) and Novadrin (1.5 lit/fed). The percentage damage was 2.9, 3.7 and 7.6%, respectively when rice was treated after 50 days, while 3.2, 3.5 and 5.6% for treatments after 70 days. Nova (1.5 lit/fed) and Diazinon (6 kg/fed) showed also satisfactory results. Khan and Khaliq (1989) affirmed these findings.

From the mentioned results it could be recommended to apply chemicals 70 days after transplanting since that time is the proper time in which the two dangerous generations of the borer attack rice fields in Egypt (Isa *et al.*, 1970) and Tantawi *et al.*, 1983 and 1985).

Table 2 . Effects of certain insecticides applied at two different timings on the rice stem borer.

Treatment	Dose per fed	% dead hearts		% white heads		% damage		% damage reduction	
		1994	1995	1994	1995	1994	1995	1994	1995
Sevin 5G	16 kg	41.3 a-c	40.2 a-c	3.2	3.0	55.0	52.5	3.0	2.8
Sevin 5G	4 kg	34.5 d-f	35.8 d-f	2.4	2.1	38.9	35.3	2.1	1.9
Dursban, 5G	8 kg	30.8 ef	31.0 ef	3.3	2.1	38.6	35.1	2.1	1.9
Diazinox, 5G	1.5 L	45.5 a	46.8 a	2.3	3.5	56.1	63.7	3.2	3.4
Novadrin, EC	10 kg	33.5 d-f	34.6 d-f	2.3	2.0	35.4	31.0	1.9	1.7
Fipronil, 2G	6 kg	29.3 f	30.4 f	2.1	2.0	31.5	30.0	1.7	1.6
Untreated	-	44.0 ab	43.4 ab	3.4	3.5	73.4	80.9	3.9	4.3

Values followed by the same letter are not significantly different at 5% as DMRT.

B. For the rice leaf miner

Results in Table 3 showed the effectiveness of some insecticides applied once at 30 days after transplanting against the rice leaf miner in 1994 and 1995 rice seasons.

Based on the percentage of the infested leaves parameter, analysis of variance indicated that Furadan, 6 kg/fed (29.3 and 30.4%) followed by Dursban, 4.5 kg/fed (30.8 and 31.0%), Novadrin, 1.5 lit/fed (33.5 and 34.6%) and Sevin, 16 kg/fed (34.5 and 35.8%) showed significant effects in 1994 and 1995, respectively.

Using average number of mines per infested leaf, Furadan (6 kg/fed) followed by Novadrin (1.5 lit/fed), Dursban (4.5 kg/fed) and Sevin (16 kg/fed) gave the best control. Almost, the same trend was followed as based on the damaged area per leaf or damaged area percentage parameters. These data were affirmed by Gregorio *et al.*, (1979) concerning Furadan effect and by Sherif *et al.*, (1991) for Furadan, Novadrin, Dursban and Sevin.

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تقييم بعض المبيدات ضد ثاقبة ساق الأرز وصانعة الأنفاق فى حقول الأرز

على محمود سليمان ١ ، رفعت أبو العلا ٢ ، محمد عبد العليم محمد ١

١ معهد بحوث وقاية النباتات – مركز البحوث الزراعية .

٢ قسم الحشرات – كلية العلوم – جامعة القاهرة .

تناولت هذه الدراسة تقييم عدة مبيدات بجرعات وصور مختلفة وأجريت فى مواعيد مختلفة ضد أهم حشرتين فى حقول الأرز، ويمكن تلخيص النتائج فى الآتى :-

١- بالنسبة لثاقبة ساق الأرز :-

كانت معظم المبيدات المستخدمة ذات تأثير فعال، وقد تراوحت درجة الإصابة بين ٢,٩ ، ٣,٨٪ للفيبرونيل بمعدل (١٠ كجم/ف) الى ١٤,٢ ، ١٢,٣٪ للديازينون بمعدل (٨ كجم/ف) خلال موسمى ١٩٩٤ ، ١٩٩٥ على التوالى.

كان الفيبرونيل (١٠ كجم /ف) ثم الفيوراذان (٦ كجم/ف) ثم النوفادرين (١,٥ لتر/ف) هى أكثر المبيدات خفضا للإصابة حيث وصلت إلى ٨١,٨ ، ٧٨,١ ، ٥١,٣ خلال موسم ١٩٩٤ بينما كانت ٧١,٢ ، ٦٩,٧ ، ٥٦,٨٪ خلال موسم ١٩٩٥ على التوالى.

أوضحت النتائج أن المعاملة بالمبيدات بعد ٧٠ يوما من الشتل أفضل منها بعد ٥٠ يوما فى خفض نسبة الإصابة.

٢- بالنسبة لصانعة الأنفاق :-

عند استعمال النسبة المئوية للمساحة التالفة كمقياس لشدة الإصابة، كان الفيوراذان (٦ كجم/ف) والنوفادرين (١,٥ لتر/ف) هما أكثر المبيدات خفضا للإصابة والتى وصلت الى ١,٧ ، ١,٩٪ خلال موسم ١٩٩٤ وكذلك ١,٦ ، ١,٧٪ خلال موسم ١٩٩٥، كما أعطى كل من الدورسبان (٤,٥ لتر/ف)، السيفين (١٦ كجم/ف) نتائج مرضية أيضا.

وسواء استعملت مقاييس نسبة الإصابة أو شدتها كان كل من الفيوراذان (٦ كجم/ف) والنوفادرين (١,٥ لتر/ف) أكثر المبيدات فعالية ضد صانعة الأنفاق فى حقول الأرز.