EFFECT OF PLANT TRAP, *ECHINOCHLOA CRUS-GALLI* ON STEM BORER, *CHILO AGAMEMNON* BLES. INFESTATION IN RICE FIELDS .

ALI M. SOLIMAN

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

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Abstract

Graminaceous weed; *Echinochloa crus-galli* is one of the most favourable hosts for rice sem borer. So, it was tested in rice field as a plant trap for decreasing the insect damage. The reduction in damage reached 49.1% and 32.4% in rice sown in recommended and late date, respectively, when the rice : weed was 12:2 rows. Rice : weed ratio more than 6 : 8 rows increased borer damage in rice fields. So this weed can be used in rice field as a tool of (IPM) system to reduce borer infestation, but to some extent. Also, eradication of this weed during winter time may reduce the borer damage in rice of the following season. This plant trap should be collected from rice field before flowering, and easily destroyed with machines, used as animal food, treated with insecticides or maintained as a sanctuary for the natural enemies.

INTRODUCTION

Rice is one of the most important crops in Egypt and the world. The rice stem borer *Chilo agamemnon* Bles. is one of its major pests in Egypt which causes great losses in the yield. Side effects of the insecticidal control caused increased interest in search for new tools for insect control through what is called (IPM) system. Plant trap is a very safe, cheap, easy and effective tool in this system. Graminaceous weed : Echinochloa crus-galli is one of the most favourable alternatives for rice stem borer infestation. Being so, it may be used as a plant trap in rice field.

This study mainly aims to evaluate using the weed ; Echinochloa crus-galli as a plant trap in rice field to decrease rice stem borer damage on rice plant, on condition that the weed is collected from rice field before flowering to avoid seed rice pollution.

MATERIALS AND METHODS

To investigate the effect of plant trap of graminaceous weed found in rice fields namely Echinochloa crus-galli on rice infestation with the rice stem boer, two experiments were conducted at Sakha Agric. Res. St., Kafr El-Sheikh Governorate in 1994 rice season. Randomized complete block design with eight treatments in four replicates was used, and plot area was 40 m2. In order to obtain high borer infestation, susceptible rice variety (Giza 180) was used. Rice and grass were sown for the first experiment at the recommended date (mid May), and were sown for the second one at late date, (mid June). Thirty-day old seedlings of rice and E.crus-galli were transplanted in ratios of 14 :0, 12:2, 10:4, 8:6, 6:8, 4:10, 2:12 and 0:14 rice to grass rows. The whole experimental field received the recommended agronomic practices with no insecticidal control. A sample of 25 rice hills was pulled at random from each plot (60 days after transplanting for dead hearts and 10 days before harvest for white heads investigation). Percentages of dead hearts and white heads were recorded and percentage of total damage was then calculated.

RESULTS AND DISCUSSION

Table 1 (a) and (b) showed the effects of Echinochloa crus-galli, as a plant trap, on C.agamemnon infestation in rice field, cultivated on two sowing dates.

Table 1(a) showed this effect at recommended sowing date. It can be noticed that rice plants in plots infested with the weed in ratio 12:2 received the least borer damage (2.8 %) as compared with the check (14 :0 ratio) plot free from weed, which received 5.5% damage. Nagative effects were achieved in borer damage by using the weed in rice plots of ratios 12:2, 10:4 and 8:6 compared with the check plot (14:0). The negatively effective treatments (12:2,10:4 and 8:6) caused reduction in percentage damage reaching 49.1, 27.3 and 20.0%. Considerable rates of borer infestation were attracted to the rice plants by the weed used at the ratios 6:8, 4:10 and 2:12. However, these positive effects did not significantly differ from the check damage (5.6, 5.8, 6.1 and 5.5%, respectively). These increases in rice plant damage, in spite of using the weed, may be because of the heavy weed in rice field that attracts more borer moths from outside the treated plot to cause more damage than the plots which have less weed plants.

Table 1(b) includes data which are somewhat in agreement with and affirm

those in table 1 (a). It can be noticed that the infestation of rice stem borer in the rice planted in the late date was more than that in the recommended date. These findings seem to be of great importance. It can be reported that graminaceous weed, E.crus-galli may play a significant role as a good tool in the integrated pest management of the rice stem borer through the ecosystem of this pest. On one hand, it can be considered a good host for the carry over of the pest from one season to another. As so, eradication of this weed during winter time (rice is summer crop) may reduce infestation with the pest for the following season. On the other hand, this weed can be used as a plant trap in rice field but to some extent. This is backed by the fact that occurrence of E.crus-galli among rice field decreased rice infestation with rice stem borer. These findings indicate that it is possible to divert the colonizing insect population to a trap crop, where weed can be easily collected and destroyed with machines, used as animal food, treated with insecticides or maintained as a breeding medium for the natural enemies. It is important to note that weed should be collected before flowering to avoid seed rice pollution by weed seeds.

These data are in line with Tantawi (1981) who stated that rice stem borer attacks many hosts, and E.crus-galli is one of the most favourable hosts. Tantawi *et al.* (1986) also reported that rice fields infested with E.crus-galli received low borer infestation. Joenje (1991) showed the same result.

Table 1. Effect of *Echicochloa crus-galli* as a plant trap on *C.agamemnon* infestation.

(a) At recommended date (mid May)

No.	Treatment Rice : Each.	% D.H.	% W.H.	% of damage in rice	% of reduction in damage
1	14 : 0 (check)	1.5	4.0	5.5cd	0.0
2	12:2	0.7	2.1	2.8a	49.1
3	10:4	1.3	2.7	4.0b	27.3
4	8:6	1.6	2.8	4.4bc	20.0
5	6:8	1.6	4.0	5.6cd	-
6	4:10	1.6	4.2	5.8d	-
7	2:12	2.0	3.1	6.1d	-
8	0:14	-	-	-	-

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

(b) At late date (mid June)

No.	Treatment Rice : Each.	% D.H.	% W.H.	% of damage in rice	% of reduction in damage
1	14 : 0 (check)	1.5	5.6	7.1bc	00.0
2	12:2	1.5	3.3	4.8a	32.4
3	10:4	1.7	3.3	5.0a	29.6
4	8:6	2.1	4.0	6.1b	14.1
5	6:8	2.2	4.9	7.1bc	00.0
6	4:10	2.3	5.1	7.4c	-
7	2:12	2.3	5.0	7.3c	-
8	0:14	-	-	-	-

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

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تأثير المصيدة النباتية (حشيشة الدنيبة) على الإصابة بثاقبة ساق الأرز فى حقول الأرز

على محمود سليمان

معهد بحوث وقاية النباتات – مركز البحوث الزراعية – الدقى – مصر .

تعتبر الحشيشة النجيلية (حشيشة الدنيبة) واحدة من أفضل العوائل لثاقبة ساق الأرز وإزالتها فى موسم الشتاء يقلل من إصابة الأرز بالثاقبة فى الموسم الجديد، وقد تم اختبارها كمصيدة نباتية للحد من الإصابة بثاقبة ساق الأرز فى حقول الأرز، وقد وصل خفض الإصابة الى نسبة ٤٩,١٪ فى الارز المنزرع فى الميعاد الموصى به (منتصف مايو)، والى نسبة ٣٢,٤٪ فى الأرز المنزرع فى الميعاد المتأخر (منتصف يونيه) عندما زرعت الحشيشه الى الأرز بنسبة ١٢:٢ صف، ولكن عندما زادت نسبة الحشيشة الى الارز ٦:٨ زادت نسبة الاصابة بالثاقبة، ولذلك يمكن ان تستعمل هذه الحشيشة كعنصر من عناصر المكافحة المتكاملة فى خفض الاصابة بالثاقبة ولكن فى حدود معينة وعلى ان يتم ازالتها من الحقل قبل الازهار والتخلص منها بسهولة (بما فيها من يرقات) إما بالطحن او الرش بالمبيدات او كغذاء للحيوان او تركها معرضة للأعداء الحيوية.