

ACTIVITY OF THE SELECTIVE FEEDING BLOCKER INSECTICIDE (PIMETROZINE) ON THE CONTROL OF THE BOLL WEEVIL, *Anthonomus grandis*, IN COTTON.

G. Papa

F. J. Celoto

R. L. Nanuci

V. B. Montoro

J. A. Zanardi Jr.

R. K. Stropa

Paulista State University, UNESP

Ilha Solteira, SP, Brazil

Abstract

Two experiments in completely randomized experimental design were installed, being one in Laboratory and one in Greenhouse conditions with objective of verifying the activity of the Selective Feeding Blocker Insecticide (Pymetrozine) on the control and behavior of the boll weevil. In laboratory, boll weevil adult were put in plastic tubes covered internally with cotton leaves treated with the insecticide (doses at g a.i./ha) Pymetrozine (50, 100 and 200), chlorantraniliprole + thiamethoxam (90), endosulfan (700), beta-cyfluthrin (12.5) and untreated. Inside of each tube was confined 5 adults bolls weevil that walked on the treated leaves for the period of one hour. After this period, the insects were put in Petri dish and were observed as for the locomotion behavior and mortality for 10 days, being attributed notes in agreement with a pre-established scale. It was verified that the insecticide pymetrozine affected significantly the locomotion of the insects that moved slowly and without coordination. In greenhouse, 10 adults bolls weevil were confined in vases containing a cotton plant involved with fabric cage. The plants were sprayed with the insecticide pymetrozine at the doses of 1000 and 1250 g a.i./ha (drench application) and at the doses 100 and 200 g a.i./ha (foliar application) and with the insecticide beta-cyfluthrin at the dose 12,5 g a.i./ha (foliar application). It was verified that to the 7 days after the application, treated plants with pymetrozine at the dose of 200 g a.i./ha presented 18% of floral buds damaged, while on the plants control (untreated) the percentage of buds damaged was of 100%.

Introduction

Cotton is cultivated in more than seventy countries worldwide. The main purpose of cotton production is related to the need of fibers and seeds. Currently, cotton crop in Brazil occupies an area of approximately 1.4 million of hectares (3.5 million of acres). The Brazilian central-west region is responsible for 64% of the production of cotton, followed by the southeast region with 30% and the south with 15%. The modern agriculture no admits the use of chemical products of broad-spectrum action that usually cause undesirable effects to the agricultural ecosystem as pest resurgence, change of the status of secondary pests for primary, besides the impact to the environment with intoxication problems in animals and human. Among the pests of the cotton, the boll weevil became one of larger economical importance in Brazilians cotton regions. The damaged in cotton are the abnormal fall of floral buds and flowers that impede the opening of the fruits, destroying them internally, because a single structure can shelter several larvae. Due to the attack of the boll weevil, the plants loses the boll, it presents great vegetative development, it is quite grown leaves, but without production. Developed initially for the control of sucking insects, the selective feeding blocker insecticide affects the alimentary behavior of the insects. The action is fast, provoking the immediate stoppage of the feeding due to the blockade neural of the mouthparts of the insect. Its no have knockdown effect. The insects stay alive, walk on the plant, but it no feed more. The action about the alimentary behavior is irreversible. The death of the insect happens for starvation few days after the application of the insecticide. The mode of action of this chemical group is not still completely identified; however, it was verified there to be selective action about several natural enemies and a significant reduction in the transmission of persistent virus for sucking insects. The current technological progress in the chemical insecticides and the need of substitution of the old insecticides groups as pyrethroids and organophosphates has been providing to the introduction of safer molecules and more appropriate formulations insecticides for use in the agriculture, contributing to a more rational management in the control of pests and larger safety to the growers. Two experiments were installed, being one in Laboratory and one in Greenhouse conditions with objective of verifying the activity of the Selective Feeding Blocker Insecticide (Pymetrozine) on the control and behavior of the boll weevil

Materials and Methods

Two experiments were carrying out in Ilha Solteira/SP/Brazil. The used experimental design was completely randomized. In Laboratory of Entomology of the Unesp (São Paulo State University) adult boll weevils were confined in plastic tubes covered internally with cotton leaves (Fig. 1) treated with the insecticide (Table 1). Inside of each tube was confined 5 bolls weevil that walked on the leaves for the period of one hour. After this period, the insects were put in Petri dish and were observed as for the locomotion behavior and mortality for 10 days, being attributed notes in agreement with a pre-established scale of notes (Table 2). In greenhouse 10 adult boll weevils were confined in vases containing a cotton plant involved with cage. The plants were sprayed with the insecticides (Table 3) in two ways: foliar and drench. Efficiency evaluations were accomplished 7 days after the application, being counted the number floral buds damaged in each plant.

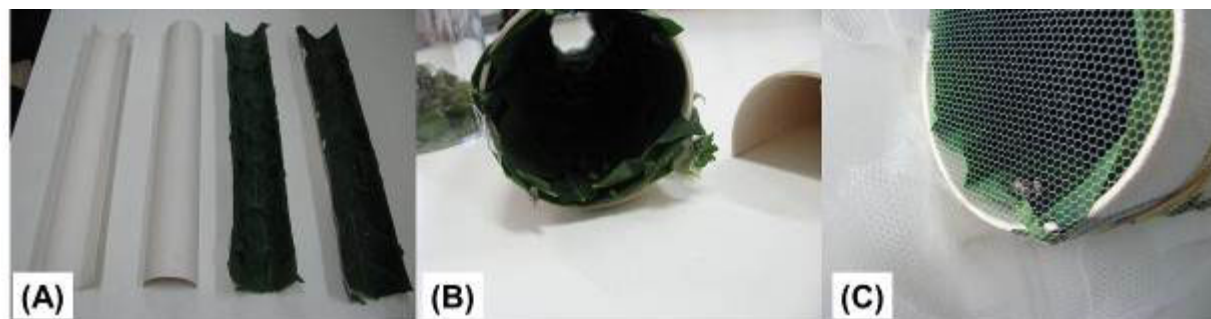


Fig. 1. Tubes cut longitudinally, covered with treated cotton leaves (A), parts of tube covered with leaves (B), tube with closed extremity to impede the escape of the bolls weevil (C).

Table 1. Treatments. Generic name, trade name and doses of the insecticides for boll weevil control. Ilha Solteira/SP/Brazil. January/2011.

Treatments	Doses (g a.i./ha)	Doses (c.p./ha)
1. Testemunha	--	--
2. Pymetrozine (Chess 500 WG)	50	100 g
3. Pymetrozine (Chess 500 WG)	100	200 g
4. Pymetrozine (Chess 500 WG)	200	400 g
5. Chlorantraniliprole + Thiamethoxan (Voliam Flexi)	90	300 mL
6. Endosulfan (Thiodan EC)	700	2000 mL
7. Betacifluthrin (Bulldock 125 SC)	12,5	100 mL

Table 2. Scale of notes attributed to adults boll weevil after contact to treated cotton leaves

Note	Description
0	Dead boll weevil
1	Boll weevil with abdomen returned upward, with few movements in the legs.
2	Boll weevil with slow movements and without coordination
3	Boll weevil walking, with normal movements.

Table 3. Treatments. Generic name, trade name and doses of the insecticides for boll weevil control. Ilha Solteira/SP/Brazil. January/2011.

Treatments	Doses (g a.i./ha)	Doses (c.p./ha)	Mode application
1. Testemunha	--	--	
2. Pymetrozine (Chess 500 WG)	1000	2000 g	Drench
3. Pymetrozine (Chess 500 WG)	1250	2500 g	Drench
4. Pymetrozine (Chess 500 WG)	100	200 g	Foliar
5. Pymetrozine (Chess 500 WG)	200	400 g	Foliar
6. Betacifluthrin (Bulldock 125 SC)	12,5	100 mL	Foliar

Results and discussion

In Laboratory trial it was verified that the insecticide pymetrozine affected significantly the locomotion of the insects that moved slowly and without coordination, with prominence for the dose of 200g a.i./ha that it provoked the largest effect on the adults boll weevil locomotion (boll weevil with abdomen returned upward, with few movements in the legs or with slow movements and without coordination). (Fig 2).

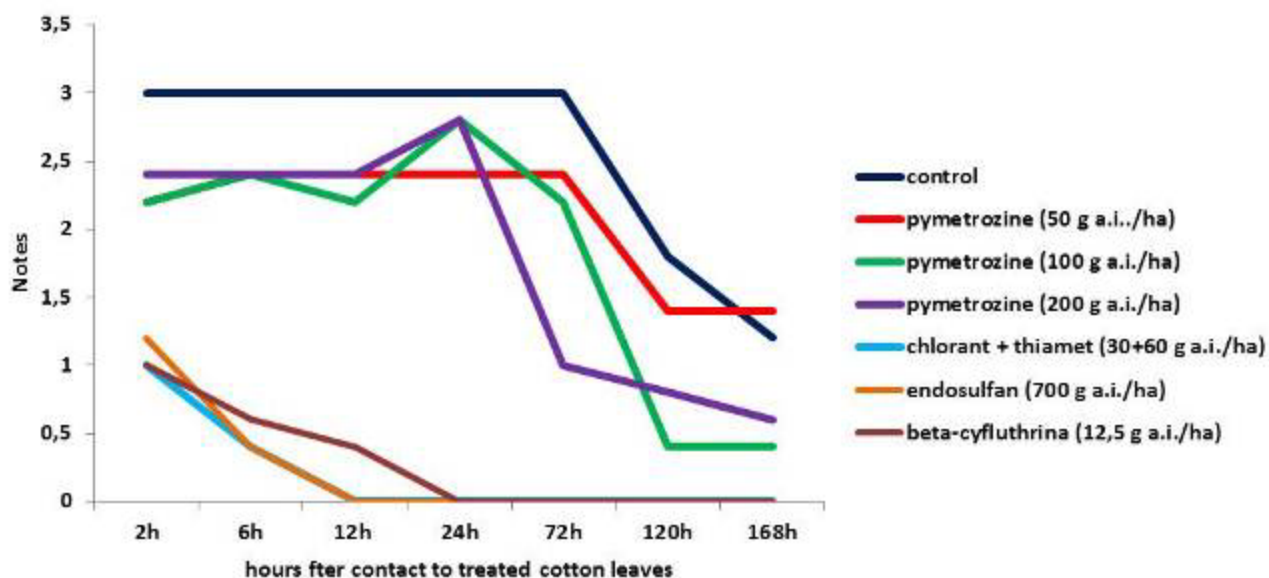


Fig. 2. Notes averages (Table 2) of locomotion behavior of adult boll weevils, after walk for one hour in cotton leaves treated with insecticides

In greenhouse trial it was verified that to the 7 days after the application, treated plants with pymetrozine at the dose of 200 g a.i./ha (foliar application) presented 18% of floral buds damaged, while on the plants control (untreated) the percentage of buds damaged was of 100% (Fig. 3).

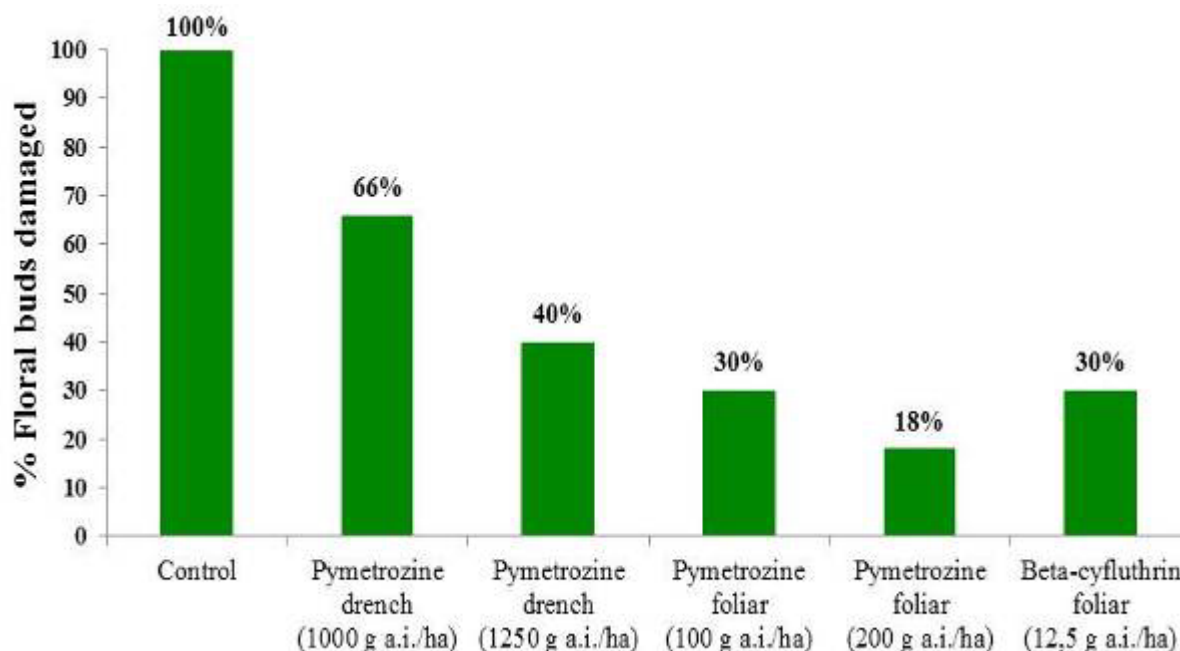


Fig. 3. Percentage of floral buds damages by the adults boll weevil, in cotton plants cultivated in vases, 7 days after the insecticides application.

Conclusion

The insecticide pymetrozine affected significantly the locomotion of the adults boll weevil that moved slowly and without coordination and was efficient on the protection of the cotton floral buds against the attack of the boll weevil

Disclaimer

Mention of a trade name or specific equipment does not constitute a guarantee or warranty by the USDA or Brazilian government and not imply its approval to the exclusion of other products that may suitable.

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