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# Utilization of *Trichogramma evanescens* West. to control the lesser surgarcane borer, *Chilo agamemnon* Bles. in sugarcane fields in Egypt. 5 - An approach towards large scale release

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## Summary

Successful biological control trials have been practiced in Egypt since 1984 to control the major insect pest in sugarcane fields, the lesser sugarcane borer, *Chilo agamemnon* **Bles.** (Lepidoptera : Crambidae), by releasing mass reared *Trichogramma evanescens* **West.** early in the season, during May and June. The sugarcane area treated with *Trichogramma* increased gradually from 5 to 500 feddans (approximately 200ha) in the 1989 season. Experience gained in developing and adapting techniques of mass rearing, adjusting number of parasitoids released per feddan, deciding proper time of release and number of applications in the field. The results obtained indicated : (1) a subsequent increase in the rate of parasitism after the release all over the growing sason and (2) up to 60 % reduction in the rate of infestation by the pest at harvest time.

## Introduction

Sugarcane is the main crop for sugar production in Egypt. Its cultivated area reaches 250.000 feddans (approximately 100.000ha) annually. The lesser sugarcane borer, *Chilo agamemnon* **Bles.** (Lepidoptera : Crambidae) is the major p of this crop in this country. It causes considerable loss in yield's quantity (10 to 20%) and quality. **El-Sherif** (1974) and **Isa** (1979) recorded the egg parasitoid, *Trichogramma evanescens* **West.** as the most efficient biocontrol agent against this pest in sugarcane fields in Egypt, especially during the period between August and October, when percentages of parasitism between 80 and 90% can be found.

The present paper summarizes the results of five year (between 1984 and 1989) of field experiments do to test the efficiency of mass reared *Trichogramma* to control *C.agamemnon* in sugarcane fields in Egypt (**Abbas** *et al*, 1987 & 1989 ; **El-Heneidy** *et al*, 1989 & 1990).

## Methods and techniques

*Mass-rearing of Trichogramma. Ephestia kuehniella* **Zell.** and *Sitotroga cerealella* **Oliv.** eggs were used as factitious hosts for mass-rearing of *T.evanescens*. Mass-rearing techniques and preparation of the parasitoid for releases are described in **Hassan** (1981) and in **Abbas** *et al* (1987).

*Field experiments*. Field experiments to test the proper number of parasitoids released per feddan, the time of release, the method and the number of release applications were carried out in sugarcane fields at Menia Governorate, Upper Egypt, between 1984 and 1989.

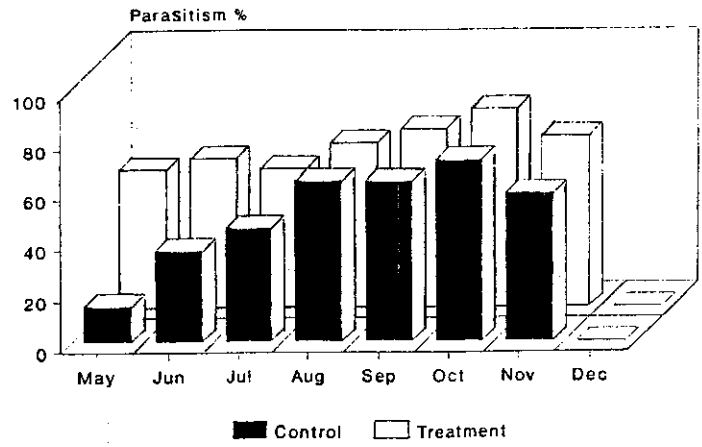


***Figure 1** : Monthly averages percentage of parasitism by Trichogramma evanescens West. on Chilo agamemnon Bles. in treated and in control (natural parasitism), at Menia Governorate, Egypt, during the 1987-1989 seasons.*

*Release evaluation.* Evaluation of the effect of release applications was undertaken by weekly estimating the percentage of parasitism throughout the growing season as well as the rates of *C.agamemnon* infestation at harvest time.

## Results

*Percentage of parasitism.* The first *Trichogramma* release was usually made when the first *C.agamemnon* egg masses were found on sugarcane plants, mostly during May. In the treated fields, the percentage of parasitism reached five and two times the control (natural parasitism) during May and June, respectively, and remained relatively high till the end of the season (Fig.1).

*Release experiments and evaluation.* Results of the five seasons of treatment (1984 to 1989) are summarized in Table 1. These results demonstrate an increase in treated areas, a decrease in the number of parasitoids released per feddan and a significant reduction in the rate of *C.agamemnon* infestation at harvest time. The best result is observed by repeated release applications in the same fields during successive seasons.

Large scale release of *Trichogramma* to cover the infested sugarcane areas in Egypt is the major task of the current work.

| Season | Treated area (feddan) | Rate of parasitoids per release per feddan | No. of releases per feddan | % of reduction in infestation |
|---|---|---|---|---|
| 1984/1985 | 5 | 46000 | 1 | 28 |
| 1985/1986 | 5 | 30000 | 3-6 | 55-61 |
| 1987/1988 | 20 | 20000 | 3-5 | 35-49 |
| 1988/1989 | 100 | 20000 | 1 | 36-65 |
| 1989/1990 | 500 | 15000 | 1 | 40-66 |

***Table 1** : Results of different experiments of releasing Trichogramma evanescens West. in sugarcane fields in Egypt during the 1984-1989 seasons.*

## References


**Abbas M.S.T., A.H. El-Heneidy, S.I. El-Sherif & M.M. Embaby** 1987. On utilization of *Trichogramma evanescens* **West.** to control the lesser sugarcane borer, *Chilo agamemnon* **Bles.** in sugarcane fields in Egypt. I. Pilot studies. *Bull. Soc. Ent. Egypt.* (in press)

**Abbas M.S.T., A.H. El-Heneidy, M.M. Embaby & M.A. Ewiese** 1989. On utilization of *Trichogramma evanescens* **West.** to control the lesser sugarcane borer, *Chilo agamemnon* **Bles.** in sugarcane fields in Egypt. 3. Three-wave release technique. *Bull. Soc. Ent. Egypt.* (in press).

**F' 'leneidy A.H., M.S.T. Abbas & M.M. .ıbaby** 1989. On utlization of *Trichogramma evanescens* **West.** to control the lesser sugarcane borer, *Chilo agamemnon* **Bles.** in sugarcane fields in Egypt. 2. Proper technique and numbers of release. *Arab. J. Plant Prot.* 7 :153-158.

**El-Heneidy A.H., M.S.T. Abbas, M.M. Embaby & M.A. Ewiese** 1990. on utllization of *Trichogramma evanescens* **West.** to control the lesser sugarcane borer, *Chilo agamemnon* **Bles.** in sugarcane fields in Egypt. 4. Sugarcane ratoons and parasitism. *Bull. Soc. Ent. Egypt.* (in press).

**El-Sherif M.A.** 1974. Biological control of the sugarcane borer, *Chilo agamemnon* **Bles.** by field distribution of the egg-parasite, *Trichogramma evanescens* **West.** *PhD Thesis. Cairo University.* 195 pp.

**Hassan S.A.** 1981. Massenproduktion und Anwendung von *Trichogramma*. I. Produktion des Wirtes *Sitotroga cerealella* **Oliv.** *Entomophaga.* **26** : 339-348.

**Isa A.** 1979. Studies on sugarcane borers in Egypt. *Final report of PL-480 Project (1974-1979).*