

**CONFIRM 2F AND TRACER AS AN USEFUL  
ALTERNATIVE FOR IPM AGAINST  
BOLL WORM, TOBACCO BUDWORM  
AND BEET ARMYWORM IN COTTON  
IN NORTHERN MEXICO**

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**Abstract**

Control of bollworm, tobacco budworm, and beet armyworm larvae was tested in Northern Mexico in Chihuahua State, Delicias, City under experimental conditions from July to September 1997 with the insect growth regulator insecticide Confirm 2F and Tracer (spinosad), a result of bacteria fermentation and its class is Naturalyte. Both bioinsecticides are novel products and environmentally safe. Confirm 2F was applied under experimental conditions to cotton at 500, 750, and 1000 cc/ha and Tracer at 125 cc/ha. Confirm 2F had good and fast control of bollworm and budworm larvae (See table 7). L1 – L2 were killed 3 to 5 days after treatment by the 3 Confirm 2F dosages. Tracer had better control since it killed all larvae 3 days after treatment. However, L3 larvae (see table 8) were killed within 5-8 days by Confirm 2F. Larvae L4-L6 needed 8-15 days to be affected (Table 9).

The main beneficial insect present was *Chrysopa*. It was not affected by those insecticides, and that was important for biological control of aphids. In general, Tracer and Confirm 2F are a good choice for IPM for the cotton grower.

**Introduction**

The beet armyworm in Mexico, historically has been a sporadically destructive pest of cotton. However, from 1992 to 1996 it emerged as a serious pest in Northern Mexico. The bollworm and tobacco budworm in Northern Mexico have been frequent pests in the cotton-producing areas. These three pests have been reported to have some degree of resistance to pyrethroids and organo-phosphate insecticides and affect beneficial insects present in cotton which could cause increased aphid and mite populations. For this reason, many insecticides failed to provide satisfactory control. The persistence of that problem has evoked an interest by chemical companies to find other chemical groups in order to avoid resistance. Therefore they produced a growth regulator and bioinsecticide in order to provide good control of lepidopterans and substantially reduce impact on natural enemy populations which help to control pests.

**Material and Methods**

This study was conducted in the cotton region located in Delicias, Chihuahua, Mexico during 1997.

The treatments using Confirm 2F and Tracer are shown in table 1. Each treatment had 4 replicates, and was applied by backpacker, one application, with 2-6 budworm and bollworm larvae in the terminals of 15 cotton plants and 1-6 groups of beet armyworm larvae.

**Conclusions**

- Confirm 2F and Tracer gave good control of bollworm, tobacco budworm and beet armyworm
- Dosage for Tracer was 125 cc/ha versus bollworm, tobacco budworm, and beet armyworm
- Dosage for Confirm 2F was 330 cc/ha versus beet armyworm and 500 to 750 cc/ha versus bollworm and tobacco budworm
- L1 to L2 larvae best results and fastest control
- Safe to predatory and beneficial insects that help to control aphids and mites
- Safe to honey bees
- Low ecological effect
- Low human and mammalian effects

**References**

Teran-A.P. and Vargas, 1997 Response to the Beet armyworm from Southern Tamaulipas, Mexico, to Insecticides INIFAP-CIR, Proc. Beltwide Cotton Conference.

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Table 1. Number of bollworm and tobacco budworm larvae by 15 terminals in cotton plant, Delicias Chihuahua Mexico- Facultad de Ciencias Agrícolas y Forestales. Univ. Autónoma de Chihuahua. 1997

TREATMENTS	CC/HA	Days after Treatment				
		0	3	5	8	15
CONFIRM 2F	500	3	1	0	0	0
CONFIRM 2F	750	2	0	0	0	0
CONFIRM 2F	1000	6	1	0	0	0
TRACER	125	3	0	0	0	0

Table 2. Number of terminals damaged by bollworm and tobacco budworm larvae in 15 cotton plants. Delicias Chihuahua Mexico- Facultad de Ciencias Agrícolas y Forestales. Univ. Autónoma de Chihuahua. 1997.

TREATMENTS	CC/HA	Days after Treatment				
		0	3	5	8	15
CONFIRM 2F	500	3	1	0	0	0
CONFIRM 2F	750	5	0	0	0	0
CONFIRM 2F	1000	7	1	0	0	0
TRACER	125	4	0	0	0	0

Table 3. Number of squares damaged by bollworm and tobacco budworm larvae in 15 cotton plants. Delicias Chihuahua Mexico- Facultad de Ciencias Agrícolas y Forestales. Univ. Autónoma de Chihuahua. 1997.

TREATMENTS	CC/HA	Days after Treatment				
		0	3	5	8	15
CONFIRM 2F	500	1	2	1	0	0
CONFIRM 2F	750	4	3	2	1	0
CONFIRM 2F	1000	6	1	0	0	0
TRACER	125	3	0	0	0	0

Table 4. Number of bollworm and tobacco budworm larvae in squeres in 15 cotton plants. Delicias Chihuahua Mexico- Facultad de Ciencias Agrícolas y Forestales. Univ. Autónoma de Chihuahua. 1997.

TREATMENTS	CC/HA	Days after Treatment				
		0	3	5	8	15
CONFIRM 2F	500	1	2	1	0	0
CONFIRM 2F	750	3	3	2	0	0
CONFIRM 2F	1000	4	1	0	0	0
TRACER	125	2	0	0	0	0

Table 5. Number of beet armyworm larvae group in 15 cotton plants. Delicias Chihuahua Mexico- Facultad de Ciencias Agrícolas y Forestales. Univ. Autónoma de Chihuahua. 1997.

TREATMENTS	CC/HA	Days after Treatment				
		0	3	5	8	15
CONFIRM 2F	500	1	1	0	0	0
CONFIRM 2F	750	1	0	0	0	0
CONFIRM 2F	1000	1	0	0	0	0
TRACER	125	6	0	0	0	0

Table 6. Number of squares damaged by bollworm and tobacco budworm larvae in 15 cotton plants. Delicias Chihuahua Mexico- Facultad de Ciencias Agrícolas y Forestales. Univ. Autónoma de Chihuahua. 1997.

TREATMENTS	CC/HA	Days after Treatment				
		0	3	5	8	15
CONFIRM 2F	500	1	2	1	0	0
CONFIRM 2F	750	4	3	2	1	0
CONFIRM 2F	1000	6	1	0	0	0
TRACER	125	3	0	0	0	0

Table 7. Number of bollworm and tobacco Budworm larvae L1-L2 in 15 cotton plants. Delicias Chihuahua Mexico- Facultad de Ciencias Agrícolas y Forestales. Univ. Autónoma de Chihuahua. 1997.

TREATMENTS	CC/HA	Days after Treatment				
		0	3	5	8	15
CONFIRM 2F	500	3	2	0	0	0
CONFIRM 2F	750	2	0	0	0	0
CONFIRM 2F	1000	7	1	0	0	0
TRACER	125	4	0	0	0	0

Table 8. Number of bollworm and tobacco budworm larvae L3 in 15 cotton plants. Delicias Chihuahua Mexico- Facultad de Ciencias Agrícolas y Forestales. Univ. Autónoma de Chihuahua. 1997.

TREATMENTS	CC/HA	Days after Treatment				
		0	3	5	8	15
CONFIRM 2F	500	0	4	2	0	0
CONFIRM 2F	750	5	5	4	1	0
CONFIRM 2F	1000	3	2	1	1	0
TRACER	125	1	0	0	0	0

Table 9. Number of bollworm and tobacco budworm larvae L4-L6 in 15 cotton plants. Delicias Chihuahua Mexico- Facultad de Ciencias Agrícolas y Forestales. Univ. Autónoma de Chihuahua. 1997.

TREATMENTS	CC/HA	Days after Treatment				
		0	3	5	8	15
CONFIRM 2F	500	2	3	2	4	0
CONFIRM 2F	750	1	0	4	1	0
CONFIRM 2F	1000	1	3	6	2	0
TRACER	125	0	0	0	1	0