

INTENSIFICATION OF CORN WITH ONION TO AVOID INFESTATION WITH THE CORN STEM BORER *SESAMIA CRETICA* LED. IN EGYPT.

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Abstract

Onion juice is known to have a repellent effect to female moth of the corn stem borer *Sesamia cretica* Led. Such effect may protect corn from infestation and hence increase the yield. The obtained results indicated that planting corn into onion fields before onion last irrigation was useful since *Sesamia* infestation was greatly reduced to none harmful levels. The onion yield was not affected as well. The corn yield /unit area increased significantly even over corn when was planted alone and treated with the proper insecticide.

INTRODUCTION

Sesamia cretica Led. is one of the main corn stem borers in Egypt. The female moths prefer laying eggs on 3week-old corn plants. Isa and Awadallah (1975) found that corn fields planted before May in the Nile Delta, are severely infested by this pest, and this should thus be avoided.

Awadallah *et.al.* (1984) indicated that onion juice sprayed onto 16 day-old corn plants, reduced significantly the number of *Sesamia* egg - masses. Onion bulb plants which normally exist from January to about mid May and are deprived from irrigation for the last 25 days may repel *Sesamia* females if corn is sown in their fields. Accordingly, the present work was aimed at studying the possibility of intensifying onion fields by corn planting. The effect of such intensification on corn in-

festation by *Sesamia* and the resulting yield of both crops were investigated.

MATERIALS AND METHODS

Two feddans, spaced 300 m apart at Sakha Agricultural Research Station were selected during January 1987. The first field was divided into 25 experimental plots. Each plot consisted of 14 ridges, 50cm apart and 6m long. The plots were transplanted (in double row ridges) by 50 day-old seedlings of the commercial onion variety Giza 20. Data on the outer two border ridges of each plot were not recorded. Normal agricultural practices for onion were followed. Five plots were randomly selected to apply each of the following treatments:

1. Dry corn seeds sown in the bottom of the ridges before the last irrigation of onion.
2. Dry corn seeds sown on the top of the ridges between onion plants before the last irrigation of onion.
3. Water soaked corn seeds sown in the bottom of the ridges a week after the last irrigation of onion.
4. Water soaked corn seeds sown between onion plants on the top of the ridges, one week after the last irrigation of onion.
5. Check, onion without corn.

Corn hills were spread 40 cm apart, resulting in about 20000 plant/ feddan. The last irrigation of onion during which corn was planted, was on April 25, 1987. On the same date the second field was planted with corn on ridges 70 cm apart and hills spaced 30 cm between, leading to the same plant density (20000 plant / feddan) . The open pollinated corn variety Giza 2 was used in both fields. Twenty five days after corn planting irrigation, onion was harvested and the yield of 21 m² (median plot) was weighed and corn plants were thinned to one / hill . Maximum plant height and number of *Sesamia* egg-masses were recorded in a random sample of 50 removed corn plants seedlings per plot in each field. The insect was chemically controlled in half of the field planted with corn only, using the recommended granular insecticide thidan 4% at the rate of 7kg/ faddan just after thinning. Three weeks later, the total number of corn plants per plot, those showing leaf feeding and those

with dead heart symptoms were recorded. Agricultural practices in both fields continued normally until corn harvest. Corn yield of each treatment was assessed by weighing 5 random samples (1/200 faddan each).

Data obtained during 1987 season showed that intensifying corn in onion fields did not affect onion yield. Moreover, the average corn yield in the intensified treatments was significantly higher than with corn alone. A larger experiment was thus conducted during 1989. A field (about one feddan) in the same station was transplanted with onion. Dry seeds of corn were planted on top of the ridges in all experimental plots except in 5 randomly selected ones. Those were left as a check (onion alone). Another half-faddan , 300m away from the first was planted with corn only (other check.). The 1987 procedures conducted to compare *Sesamia* infestation and yield of each crop were followed in 1989 season.

RESULTS AND DISCUSSION

Table 1 shows the average number of *Sesamia* egg-masses per 100 corn seedlings during 1987 season as well as the percentages of corn plants showing leaf feeding and dead heart symptoms . The average number of *Sesamia* egg-masses in the four treatments of corn planted in the onion field did not exceed 2 egg-masses per 100 corn seedlings . The eggmasses were as many as 16.6/100 plants in corn planted alone. corn plants in which leaf feeding occurred , averaged from 1.2% to 1.6% in the intensified field and were as many as 19.2 % in the second field where no insecticide was applied. Insecticidal application reduced leaf feeding to 8.0%. Plants with dead heart ranged from 0 to 0.4 % in the intensified field and reached 1.4 % and 15.6 % in the controlled and uncontrolled corn when was planted alone, respectively.

As it appears in Table 2, onion yield in the four intensification treatments ranged from 44.1 to 46.2kg/ plot and were not significantly different from the check where the yield was 44.3 kg/plot. This showed that onion yield was not affected by corn interplanting before the onion last irrigation.

When dry corn seed were planted on the top of the ridges between onion, the resulting 3week-old seedlings of corn (Table2) were significantly taller (35.9 cm) than those of the other treatments (27.9-30.9cm).

Table 1. Effect of interplanting corn with onion on infestation of corn with the stem borer *Sesamia cretica* Led. (Sakha 1987)

Corn seed status	position on ridge	Insecticide	No. of egg-masses/100 corn plants	Leaf feeding %	Dead heart %
Dry	Bottom	not applied	2.0	1.6	0
Dry	Top	not applied	2.0	1.6	0.4
Soaked	Bottom	not applied	0	1.4	0.4
Soaked	Top	not applied	0	1.2	0.4
corn alone		applied	16.6	8.0	4.4
corn alone		not applied	16.6	19.2	15.6

Table 2. Effect of intensification of onion with corn on the vigour of corn seedlings and yield of both crops. (Sakha, 1987).

Corn seed status	Treatment position on ridge	Insecticide	onion yield kg/plot	Av. height of corn plants 3 weeks-old cm	corn yield kg/plot
Dry	Bottom	not applied	46.2	29.9 b	26.4 a
Dry	Top	not applied	44.1	35.9 a	25.5 a
Soaked	Bottom	not applied	44.2	30.9 b	26.8 a
Soaked	Top	not applied	44.1	29.4 b	27.5 a
corn alone		applied	—	28.3 b	20.3 b
corn alone		not applied	—	27.8 b	13.7 c
corn alone			44.3	—	—

No significant differences were detected between the means followed by the same letter.

Corn yield in the intensified treatments ranged between 25.5 to 27.5 kg/ plot with significant differences between their averages. However, these yields were significantly higher than those of both checks of corn when were planted alone.

The corn plant vigour observed can be interpreted by the effect of certain mycorhyza species which become abundant in the soil of onion fields and stimulate the next crop to absorb certain essential elements.

Results of the 1989 experiment revealed only four *Sesamia* egg-masses in 250 interplanted corn seedlings. the corresponding figure for corn planted alone was 56 masses. Corn plants with either leaf feeding or dead heart symptoms ranged from 3.6 to 7.8 with intensification. These were as high as 56.4% in the second field where no insecticide was applied, and were intermediate (23.4%) with chemical control .

Data in table 3, showed that onion yield was not affected by the intensification system. Corn yield averaged 26.8 kg/plot with intensification, while those of corn alone with and without chemical control averaged 19.1 and 9.5 kg/plot, respectively.

Table 3. Effect of interplanting corn with onion plants on the yield of both crops. (Sakha, 1989).

Replicate	Yield Kg/Plot				
	Onion		Corn	Alone with insecticide	
	Interplanted	Alone	Interplanted	Applied	Not applied
1	46.2	42.7	26.7	18.7	10.1
2	45.6	44.5	29.3	17.6	11.6
3	39.2	37.3	25.0	20.1	7.5
4	38.0	36.6	26.9	21.8	11.2
5	48.6	43.4	26.1	17.3	7.1
Av.	43.3	40.9	26.0	19.1	9.5

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Table 3. Effect of interplanting corn with onion plants on the yield of both crops. (Sakha, 1989).

Replicate	Yield Kg/Plot			
	Onion		Corn	
	Interplanted	Alone	Interplanted	Alone with insecticide
1	46.5	45.7	58.7	48.7
2	42.6	41.8	59.3	47.6
3	37.5	35.3	52.0	50.7
4	38.0	38.6	56.9	51.8
5	48.6	43.4	56.1	47.8
Av.	43.3	40.9	56.0	48.1

تكثيف الذرة مع البصل لتقليل الإصابة بدودة القصب الكبيرة

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من أجل الإستخدام التطبيقي لرائحة البصل الطاردة لاناث فراشات دودة القصب الكبيرة اجري هذا البحث بهدف دراسة تاثير زراعة الذرة الصيفي المبكر قبل الريه الاخيره للبصل علي درجة اصابة الذرة بهذه الافة وعلي المحصول الناتج، ولقد اثبتت النتائج ان التكتيف قد ادي الي ندرة اصابة الذرة بدودة القصب الكبيرة، وعدم تأثر محصول البصل، وزيادة محصول الذرة بدرجة معنوية عن محصول الذرة المنفرد حتي عند مكافحة الافة فيها بالمبيدات.