COLOURED WATER TRAPS FOR MONITORING AND MASS TRAPPING OF *TROPINOTA SQUALIDA* SCOP. IN APPLE ORCHARDS AT THE NORTHERN PARTS OF EGYPT.

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Abstract

The attraction of *Tropinota squalida* adults to coloured plastic water traps in the newly reclaimed area of Nubaria was studied during 1988 and 1989.

Results obatined revealed that the adults were attracted in reliable numbres to blue, white , yellow and green coloured traps . Few numbers of adults were attracted to red ones. The mass trapping trials showed that a trap density of 90 blue plastic bassins / feddan captured the highest number of adults . This procedure seemed to be promising in mass trapping the adults of *I. squalida* in apple orchard.

INTRODUCTION

The hairy rose schafer, *Tropinota squalida* Scop., is considered a native species among the Egyptian insect fauna . It is known and recorded in relieves of tombs since the Pharos time (300 B. C.) It has never been mentioned before as a pest attacking economic crops (Willcocks, 1935; Alfieri, 1976). Even wafa and Ibrahim (1956) mentioned it as one of the recorded pollinators for some crops feeding on pollen grains causing slight damage to flowers.

Tropinoto squalida has recently developed to a serious pest on different crops

in the newly reclaimed areas, thus causing considerable damage to fruit trees, as well as to wheat, broad beans and clover.

The attraction of crtain Coleopterous insects to coloured traps was studied by Ladd *et al.*, (1984) and ladd and Klein (1986) . However, very little was known in Egypt about this pest until Ali and Ibrahim 1988 studied its host plant range.

Also, Abou - Bakr *et al.*, (1989) tested the potential of entomogenous nematodes in controlling the adults. Adults of *T. squalida* attracted to water traps cannot fly again when they fall in water because of the relatively heavy hairs on their bodies.

The present study was directed to imvestigate the ability of water trapds for monitoring and mass trapping *I .squalida* in apple orchards.

MATERIALS AND METHODS

Plastic basins 40 cm in diameter and 25 cm high filled with water up to about 15 cm high in different colours (blue, white , yellow , green and red) were distributed up the soil surface in four groups per feddan , each contained 4 basins of each of the tested colours. Trapped *T.squalida* adults were collected twice a week over a period of 4 months starting from January until the end of April .

Since it was previously known that the blue colored trap was more attractive to the insect, an experiment was carried out to determine the reliable trap density/ feddan that would catch the highest number of beetles. This experiment was carried out during the two seasons 1988 and 1989 in 25 feddans cultivated in Nubaria region by the apple variety Anna / 106 . The farm was divided equally into 25 plots (replicates) . Four trap densities , i. e. 20 , 45 , 90 and 135 traps /f were tested in a completely randomized block design. An area of 4 plots were left without traps as a control. Trapped adults were collected weekly , and the mean weekly number was calculated per trap. The untreated plots were checked by young boys (one boy / feddan every day). Beetles were picked up by hand from the flowers daily.

For evaluating the efficiency of the traps , the yield of five apple trees was considered as one sample, and four samples were taken from each treatment. The average yield weight for each treatment was caluclated.

RESULTS AND DISCUSSION

Adult attraction behaviour to different coloured plastic traps

Data obtained during the two seasons 1987 and 1988 are persented in Table 1. The blue basins attracted the highest number of *T. squalide* adults, being 140 ± 7.08 and 138.92± 6.62 beetles per trap in 1978 and 1988, respectively. White, yellow , green and red basins attracted 11.76 ± 1.45 , 5.76 ± 0.79 , 4.23 ± 0.73 and 0.38 ± 0.17 bettles / basin in 1988, and 11.24±1.28, 5.49 ± 0.74, 4.12 ± 0.71 and 0.36 ± 0.15 beetles / basin in 1989. It was clear then that the blue color attracted more insects than the other colors.

Mass-trapping of adults using adequate density trap/feddan

Four different densities of the blue coloured traps (20 , 45 , 90 and 135 traps /f) were tested in an apple orchard to determine the most adequate and applicable mass trapping technique (Table 2) . Although the mean weekly catch / trap differed during the two seasons, yet the average number of adults attracted / trap was about 138 beetles in the treatments 20, 45 and 90 trap /f . On the other hand , a number of 135 trap /f harboured nearly half of this number (70.7+3.78 and 68.2±3.7in 1988 and 1989 , respectively). Collecting beetles by hanbd from the flowers (one boy/f) showed an average number of 447.8 + 13.94 in 1988 and 442.32±14.12 beetles /week in 1989. It could be concluded therefore that placing 90 traps / f was the most suitable density for trapping the highest number of *T. squalida* adults .

The efficiency of blue trap denstity/f

Data in Table 3 showed that placing 20 traps/f was not enough to prevent losses in the yield, thus an averagve yield of 32±0.15 and 35±0.13 kg/5 tree was attained in both seasons, respectively. Using 45 traps/ f increased the yield significantly to 54.9 ±0.09 and 69.03 ± 0.3 kg/ 5 trees on the average in both seasons respectively. The highest yield was attained in case of using 90 traps/f where it reached 99.2±0.18 and 105.4±0.11kg/5 trees in the two seasons. Increasing the trap density to 135/f did not produce more yield than that achieved with 90 traps/f.

In the area where adults were picked up by hand , the yield was 46±0.10 and 57±0.11 kg / 5 trees in the two seasons , thus approximating the yield achieved with 45 traps /f. However hand picking of adults cost more money and effort com-

Table 1. Fluctuation in weekly numbers of *T. squalida* adults as indicated by different colored water traps in apple archard during 1978 and 1988 seasons.

Color of traps		Weekly mean number / trap (13 weeks)													Total	Average
		1	2	3	4	5	6	7	8	9	10	11	12	13		
Blue	A	96	125	137	145	149	165	171	167	165	159	132	117	92	1820	140.00 ± 7.08
	B	98	122	135	143	147	169	168	157	166	153	134	119	95	1806	138.92 ± 6.62
White	A	2	8	9	14	15	17	19	15	19	14	9	7	5	153	11.76 ± 1.45
	B	3	9	9	13	15	19	14	12	13	8	8	5	2	130	10.00 ± 1.31
Yellow	A	2	6	8	9	8	10	9	7	5	2	2	3	2	75	5.56 ± 0.79
	B	3	5	7	8	7	9	9	6	5	2	2	2	1	67	5.15 ± 0.73
Green	A	1	3	5	8	9	8	6	4	3	2	2	2	1	55	4.23 ±0.73
	B	2	2	6	8	7	9	5	3	3	1	1	2	1	51	9.92 ± 0.73
Red	A	0	0	1	0	2	0	1	0	0	0	0	1	0	5	0.38 ± 0.17
	B	0	0	0	2	1	0	1	0	0	1	1	0	0	1	0.46 ± 0.18

A = 1987 and B = 1988

F Value for treatment at 1% = 6.78 (Significant)

L.S.D. between treatments at 1% = 3.47

Table 2. Fluctuation in the mean number of *T. squalida* using different densities of the blue colored traps / f in 1988 and 1989 seasons.

Number of traps/f		Weekly mean of attracted adults / trap throughout 13 weeks													Total	Average*
		1	2	3	4	5	6	7	8	9	10	11	12	13		
20	A	98	128	139	147	157	161	163	167	157	146	127	118	87	1795	138.07±6.74
	B	94	124	141	150	159	163	168	171	155	148	131	119	89	1812	139.40±7.00
45	A	95	131	141	152	163	165	158	168	153	144	123	117	91	1801	138.50±6.80
	B	98	127	138	155	160	164	156	164	155	147	121	114	88	1787	137.50±6.80
90	A	97	126	138	149	168	159	167	164	155	147	121	115	89	1795	138.00±7.00
	B	97	125	142	152	166	168	153	165	158	145	119	117	91	1798	138.30±6.90
135	A	51	60	63	87	84	86	88	84	76	67	63	57	53	919	70.70±3.70
	B	48	62	66	85	87	86	84	78	65	62	58	55	51	887	68.20±3.70
Hand	A	318	387	415	436	467	517	543	586	611	597	349	313	283	5822	447.84±13.94
picked	B	315	389	407	428	459	511	541	589	603	583	338	309	279	5751	442.32±14.12

A = 1987 and B = 1988

* = average / boy/ week

Table 3. Average yield of apples (5 trees in 4 replicates) as indicated by different blue trap densities in 1988 and 1989.

Number of traps/f		Replicate				Total	Average
		1	2	3	4		
20	A	31.54	32.12	31.82	39.35	127.85	32.0±0.15
	B	34.56	35.16	34.87	35.24	193.80	35.0±0.13
45	A	54.81	15.12	54.68	55.11	219.70	54.9±0.09
	B	57.32	56.85	57.25	104.72	276.10	69.03±0.3
90	A	99.62	98.87	99.48	98.74	396.70	99.2±0.18
	B	104.84	105.21	106.68	105.16	421.90	105.4±0.11
135	A	98.98	99.86	99.68	99.23	397.80	99.4±0.17
	B	105.26	105.72	104.15	104.81	419.90	104.9±0.29
Hand picked	A	45.82	46.14	45.76	46.28	184.00	46.0±0.10
	B	56.82	57.17	56.76	57.26	228.00	57.0±0.11

A = 1988 and B = 1989

F value for treatments at 1% = 9.43

L.S.D./ between treatments at 1% = 17.86

pared with water traps .

It could be concluded that using 90 blue basins provided with water as traps for *T. squalida* adults in apple orchards is a convenient procedure for catching the highest number of beetles as well as achieving the highest yield (Tables 2 and 3).

Although the hand picking of adults from the flowers (one worker / f) was apparently effective (397 - 447 adults/week), the damage to the flowers was great and the yield was poor. Thus the blue water traps at the rate of 90/f could be considered as a useful monitoring, collecting and controlling method for *T. squalida* adults in apple orchards in Egypt.

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المصائد المائية الملونة كوسيلة للتنبؤ ومكافحة حشرة جعل الورد الزغبي

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أجريب لأول مرة دراسة لتحديد اللون المناسب لانجذاب الحشرات الكاملة لجعل الورد الزغبي الي المصائد المائية. وأقيمت التجارب بمنطقة النوبارية في أعوام ١٩٨٨ ، ١٩٨٩ وأستخدمت في الدراسة الأطباق البلاستيك ذات الألوان الأبيض ، الأحمر ، الأصفر ، الأزرق ، الأخضر.

ودلت النتائج علي أن الحشرات الكاملة تنجذب إلي الألوان بدرجات متفاوته وكان اللون الأزرق أكثرها جذباً للحشرات يليه الأبيض ثم الأصفر فالأخضر فالأحمر .

ولقد أظهرت الدراسات الحقلية أن أنسب عدد من الأطباق البلاستيك الزرقاء هو ٩٠ طبق للفدان . وثبت أن هذه المصائد وسيلة ناجحة بشكل واضح في مكافحة الافة ، علاوة علي أنها تعتبر وسيلة قياس دقيقة لتعدادها علي أشجار التفاح في مصر .