

**EFFICIENCY OF THE LAND TRAP COLOURS USED FOR  
CONTROLLING THE LAND SNAIL *Monacha cantiana*  
(Montagu) UNDER FIELD CONDITIONS of  
KAFR EL-SHEIKH GOVERNORATE**

**Okka, M.A.**

**Plant Protection Res. Inst. Agric. Res. Center Sakha -  
Kafr El-Sheikh**

**ABSTRACT**

The present work was carried out at Kafr El-Sheikh Governorate, Fuwa district to study the efficacy of colour of the land traps for controlling the land snail, *Monacha cantiana* (Montagu) in the Egyptian clover field, *Trifolium alexandrinum* (L.) during the spring of 2003.

Results revealed that, the white land trap gave highest percentage of the collected snails (23.58%), followed by the green, blue, yellow, orange and violet traps (17.44, 15.09, 14.34, 12.14 and 10.46%, respectively). Whereas, the red land trap showed the least category (6.94%).

**INTRODUCTION**

Recently, the land snails, *Monacha* sp., became a real threat to fruit trees, vegetable crops and ornamental plants in Egypt. It cause economic damage to several host plants. These snails attack Egyptian clover *Trifolium alexandrinum* and by the snails secrete a characteristic odour on clover foliage which is not accepted by cattle (Kassab and Daoud, 1964, Bishara *et al.*, 1968, El-Okda, 1981 and 1984). The mean damage caused by *M. cantiana* to fresh plants of the Egyptian clover *T. alexandrinum* (L.) was found to be about 5.65% (5.082 tons/feddan) of four consecutive cuttings (Okka, 2003).

Many workers had draw the attention to control the land snails by traditional chemical pesticides (Crowell, 1967; Smith, 1967; El-Okda, 1978, 1984; Miller *et al.*, 1988 and Okka *et al.*, 1996), by plant extracts (Kloos & McCullough, 1982; Ghamry, 1994; Ghamry *et al.*, 1994; Sharshir *et al.*, 1996; Okka, 1997 and El-Deed *et al.*, 1999) and by specific molluscicides and other

compounds recommended for the control of terrestrial gastropods. However, their use in high concentrations has toxic effects on man and livestock and caused environmental pollution (El-Wakil and Radwan, 1991). Thus we are in need a new the present work is an attempt to control the snails with improved effectiveness safety method, by using.

The mechanical method for controlling the land snails was applied by using land traps, the damp sacking, straw-rice bands and palm leaf with two fermentative attractants (Okka, 1998).

The objective of the present investigation was to study the effect different colours of the land traps were used in order to attract the highest numbers of snails.

### MATERIAL AND METHODS

Experiments were carried out during the spring of 2003 in half feddan in the shape of rectangle (30 x 70 meters) planted with the Egyptian clover *Trifolium alexandrinum* (L.) at Fuwa district, Kafr El-Sheikh Governorate. Seven colours of the experimental land traps (white, green, blue, yellow, orange, violet and red) were evaluated for attracting the land snails to control it.

The type of trap was plastic case and each colour was replicated four times.

Each trap was plastic case rectangle shape (1.0 x 0.5 meters) inside it one kg straw-rice to keep on the humidity soil.

Sugar cane juice is attractive to snail, addendum fractions from yeast (50 gm yeast per one liter) Gerard (1971) and Okka (1998). Therefore, this attractant was used in the present work.

The traps placed on the field belt arrangements with repetition and an equal distance between each trap (6.14 meters). Small vessels (7.8 cm in diameter and 3.5 cm in height) containing sugar-cane juice were placed underneath land trap. The attractant was changed every week to avoid fermentation and microbial growth (Okka, 1998).

Traps placed post-cutting and irrigation for one week, two times (4<sup>th</sup> the first week from 20 to 26 April and 5<sup>th</sup> the second week from 22 to 28 May without irrigation at end crop and examined three times weekly). Individuals of *M. cantiana* accumulated underneath traps were recorded every two days. The

animals were handily collected from all parts of the trap and soil surrounded and counted in plastic cases at midday-sun whereas, the collected snails were burning (Okka, 1998).

Data was statistically analysed using F-test.

### RESULTS AND DISCUSSION

Results in Table (1) indicate the weekly mean numbers of the land snail, *M. cantiana* underneath the different colours of traps and their percentages as related to the total numbers of collected snails.

#### The first week (the 4<sup>th</sup> post-cutting):

Data in Table (1) show that, the white trap recorded the highest mean numbers of *M. cantiana* (703.25 individuals). The green trap came in second category (472.0 snails). While, the weekly mean numbers of the land snail accumulated below blue, yellow, orange and violet traps were (384.75, 359.25, 339.25 and 334.00 individuals respectively). No significant differences were found between the last four colour traps. Whereas, the red trap recorded the lowest mean numbers (214.50 individuals). Generally, there were highly significant variations between different trap colours.

**Table (1):** Mean numbers of land snail *M. cantiana* found underneath the traps with different colours and their percentages as related to the total number collected snails.

Trap colours	First week		Second week		Total	
	Mean	%	Mean	%	Mean	%
White	703.25 a	25.05	307.50 a	20.79	1010.75 a	23.58
Green	472.00 b	16.82	275.50 ab	18.63	747.50 b	17.44
Blue	384.75 c	13.71	262.00 ab	17.72	646.75 c	15.09
Yellow	359.25 c	12.80	255.25 b	17.26	614.50 c	14.34
Orange	339.25 c	12.09	181.25 c	12.26	520.50 d	12.14
Violet	334.00 c	11.90	114.25 d	7.73	448.25 c	10.46
Red	214.50 d	7.57	83.00 d	5.61	297.50 f	6.94
F	71.3		31.17		98.7	
LSD 5%	53.23		45.74		67.26	
LSD 1%	72.53		62.32		91.62	

**The second week (last post-cutting at end crop without irrigation):**

From the data listed in Table (1) the weekly mean numbers of the land snail were (307.5, 275.5, 262.0 and 255.25 individuals) under white, green, blue and yellow traps as well as (181.25, 114.25 and 83.0 individuals) under orange, violet and red traps, respectively. No significant differences were found between of each of the first three colours and late two colours and also, green, blue and yellow. While, there were highly significant variations in the traps of each white, green, blue, yellow and between three other colours, orange, violet and red. There was highly significant different of orange and between violet and red traps. Whereas, there was significant variations of white and between yellow traps (Table 1).

In general, the total mean numbers of the land snails accumulated underneath white and green traps were (1010.75 and 747.50 animals), followed by blue, yellow, orange and violet (646.75, 614.50, 520.50 and 448.25 animals, respectively), and finally, red land trap where the lowest number of the land snails was obtained (297.50 animals). Whereas, the highly significant differences were found between traps, except, the blue and yellow, which had insignificant variations between them. The total numbers of collected and burned land snail *M. cantiana* were 17143 individuals.

In conclusion, the present results are in agreement with El-Okda (1980), 5% wetted methomyl bran baits were monthly used as land mollusca traps and were laid beside the trees or in middle of sample square before sunset. Land snails accumulated on baits were recorded after 60 hr. baiting at sun-rise, and also, it is urged for heaping berseem bands for at least 12 hr. post-cutting. *Monacha* sp. snails underneath bands might be collected and excluded (El-Okda, 1984). However, Okka (1998) reported that, the use a mechanical method for controlling the land snail *M. cantiana* by land traps, the damp sacking and straw-rice with sugar cane juice gave highest percentage of collection snails, followed by sacking and straw-rice with black strab molasses.

Early in 1927, Basinger indicated that, implemented a successful eradication campaign against the white snail *Helix*

*pisana* at Lajolla, California, employing the following tactics: burning, then hand picking snails in environmentally sensitive areas. Slugs can be trapped under pieces of damp sacking Hunter, 1968. Beer and cider are attractive to slugs; apparently some fractions from yeast are responsible Gerard, 1971.

#### REFERENCES

- Basinger, A.J. (1927). The eradication campaign against the white snail *Helix pisana* at LaJolla Calif. Monthly Bulletin Dept. of Agric. State of California. 26(2): 51-76.
- Bishara, S.I.; M.S. Hassan and A.S. Kalliny (1968). Studies on some land snails injurious to agriculture in U.A.R. Rev. Zool. Bot. Afr., LXXVLL, (3-4): 239-252.
- Crowell, H.H. (1967). Slug of snail control with experimental poison baits. J. Econ. Entomol. 60: 1048-1050.
- El-Deeb, H.I.; H.A. Zedan; S.M. Abd El-Ail and H.L. Mohammed (1999). Toxicity and biochemical studies on the terrestrial snail, *Monacha contiana* treated with some natural products and pesticides. 2<sup>nd</sup> Int. Conf. of Pest control, Mansoura, Egypt, Sept., 1: 1-12.
- El-Okda, M.M.K. (1978). Mesurol pellet bait as a control agent for terrestrial snails and slugs at Alexandria region, A.R.E. Agric. Res. Rev., Egypt. 56: 197-202.
- El-Okda, M.M.K. (1980). Land snails of economic importance on vegetable crops at Alexandria and neighbouring regions. Agric. Res. Rev., Egypt, 58: 79-85.
- El-Okda, M.M.K. (1981). Locomotion activity and infestation abundance of certain terrestrial mollusca in fruit orchards. Alexandria Provinc, A.R.E. 4<sup>th</sup> Arab Pesticide Conf., Proc. Tanta Univ., 2: 279-287.
- El-Okda, M.M.K. (1984). Land mollusca infestation and chemical control in El-Ismaelia Governorate. Agric. Res. Rev. Egypt, 62: 88-91.
- El-Wakil, H.B. and M.A. Radwan (1991). Biochemical studies on the terrestrial snail *Eubania vermiculata* (Muller) treated with some pesticides. J. Environ. Sci. Health, B. 26 (596); 479-489.

- Gerard, B.M. (1971). The effects on slugs of methiocarb, metaldehyde and aldrin used in potatoes. A.R.C. Slugs Research Conf. Cardiff. 1971.
- Ghamry, E.M. (1994). Local cruciferous seeds having toxic effects against certain land snails under laboratory conditions. J. Appl. Sci., 9(3): 632-640.
- Ghamry, E.M.; Kokab, Y. Amer and Yvonne, S. Moharb (1994). Effect of certain plants extracts on two land snail species in Egypt. Zagazig J. Agric. Res. 21(4): 1357-1361.
- Hunter, P.J. (1968). Studies of slugs in arable ground. Malacologia, 6, 369.
- Kassab, A. and H. Daoud (1964). Notes on the biology and control of land snails of economic important in the U.A.R. Agric. Res. Rev., Egypt, 42: 77-98.
- Kloos, H. and F.S. McCullough (1982). Plant molluscicides: A Review Planta Med. 46: 195-208.
- Miller, E.; S. Swails; D. Swails; F. Olson and R.T. Staten (1988). White garden snail *Theba pisana* (Muller) efficacy of selected bait and sprayable molluscicides. J. Agric. Entomol., 5(3): 189-197.
- Okka, M.A. (1997). Feasibility of using plant extracts as a control methods for land snail *Monacha cantiana* (Montagu) under laboratory conditions. J. Agric. Sci. Mansoura Univ., 22(12): 4637-4642.
- Okka, M.A. (1998). Land traps as a mechanical method for controlling land snail, *Monacha cantiana* (Montagu) under field conditions. J. Agric. Sci. Mansoura Univ., 23(9): 4011-4017.
- Okka, M.A. (2003). Land snail *Monacha cantiana* (Montagu) injurious to Egyptian clover at Kafr El-Sheikh Governorate. J. Agric. Res. Tanta Univ., 29(2): 283-290.
- Okka, M.A.; F.A.M. Ahmed and F.A. Sharshir (1996). Efficacy of certain pesticides against the land snail *Monacha cantiana* (Muller) found on some orchards under laboratory conditions. Fourth Arabic Conf. for Horticultural Crops, El-Minia, 903-910.

- Sharshir, F.A.; F.A.M. Ahmed and M.A. Okka (1996). Plant extracts as a mean for controlling the land snail *Monacha cantiana* (Muller) under laboratory conditions. J. Agric. Res. Tanta Univ. 22(3): 400-406.
- Smith, F.F. (1967). Controlling insects of flowers. Slugs and snails. U.S. Dept., of Agric. Wash. Inform. Bull., 237-11.

فعالية المصايد الارضية الملونة فى مكافحة القواقع الارضية  
*Monacha cantiana* (Montagu) تحت ظروف الحقل  
فى محافظة كفر الشيخ

محمد عبدالحميد عكه

معهد بحوث وقاية النبات - مركز البحوث الزراعية - سخا -  
كفر الشيخ

أجرى هذا البحث فى ربيع ٢٠٠٣م على مساحة نصف فدان أبعاده (٣٠ × ٧٠ متر) منزرع بالبرسيم المصرى بمركز فوه بمحافظة كفر الشيخ ، وذلك بهدف خفض تعداد القواقع الارضية موناكا كانتايا وبالتالي تقليل الضرر الناتج عنه باستخدام المصايد الارضية الممثلة فى اكياس بلاستيكية مستطيلة الشكل (١,٠ × ٠,٥ متر) بداخلها كيلو جرام واحد من قش أرز للمحافظة على رطوبة التربة. وهذه الاكياس ذات اللون مختلفة عددها سبعة هى: الأبيض ، الأخضر ، الأزرق ، الأصفر ، البرتقالى ، البنفسجى والأحمر ، مع وجود عصير قصب متخمر (٥٠ جم خميرة لكل لتر) يوضع فى اوانى بلاستيكية صغيرة تحت المصيدة وتستبدل اسبوعيا. ورتبت هذه المصايد على محيط قطعة التجربة بتوزيع تكرارى بين المصيدة والاخرى (٦,١٤ متر) وتم وضعها بعد الحش والرى مرتين لمدته اسبوع فى كل مرة ، الاولى بعد الحشة الرابعة من ٢٠-٢٦ ابريل. والثانية بعد الحشة الخامسة من ٢٢-٢٨ مايو نهاية المحصول بدون رى. وتفحص المصايد ثلاث مرات اسبوعيا كل يومين وقت الظهيرة ويجمع القواقع باليد وتعد فى اكياس بلاستيك وتحرق. ويمكن تخليص أهم النتائج المتحصل عليها فيما يأتى:

١- المصيدة ذات اللون الابيض اعطت اعلى نسبة مئوية لتجميع القواقع تحت المصايد وكانت ٢٣,٥٨% بمتوسط اجمالى لتعداد القواقع لكل مصيده ١٠١٠,٧٥ قوقع.

- ٢- المصيدة ذات اللون الاخضر تأتي فى المرتبة الثانية واعطت نسبه مئوية لتجمع القوقع تحت المصايد كانت ١٧,٤٤% بمتوسط اجمالي لتعداد القوقع لكل مصيده ٧٤٧,٥ قوقع.
- ٣- المصايد ذات اللون الازرق والاصفر تأتي فى المرتبة الثالثة بنسب مئوية ١٥,٠٩ و ١٤,٣٤% بمتوسط اجمالى لتعداد القوقع لكل مصيدة ٦٤٦,٧٥ ، ٦١٤,٥ قوقع على التوالي.
- ٤- فى المرتبه الرابعة تكون المصايد ذات اللون البرتقالى والبنفسجى وكانت النسب المئوية لتجمع القوقع تحت المصايد ١٢,١٤ ، ١٠,٤٦% بمتوسط اجمالى ٥٢٠,٥ ، ٤٤٨,٢٥ قوقع لكل مصيدة.
- ٥- المصايد ذات اللون الاحمر تأتي فى المرتبه الاخيرة بنسبه ٦,٩٤% وبمتوسط اجمالى ٢٩٧,٥ قوقع لكل مصيده وكان التعداد الكلى للقوقع فى نهاية البحث الذى تم جمع وحرقه ١٧١٤٣ قوقع. وينصح الباحث باستخدام المصايد ذات اللون الابيض والاخضر والازرق والاصفر حيث انها اكثر فعالية فى جذب وتجميع القوقع للتخلص منه.