

RESPONSE OF CABBAGE APHID, *Brevicoryne brassicae* LINNAEUS TO CERTAIN CULTURAL MEASURES ON THE INFESTATION LEVELS OF CANOLA CROP IN SOHAG REGION

Salman, A. M. A.¹ and H. E. Sakr ²

1- Plant Protection Department, Faculty Of Agriculture, South Valley University, Sohag.

2- Plant Protection Department, Faculty of Agriculture, Shoubra El-Khima, Ain Shams University, Cairo.

ABSTRACT

The effect of some agricultural practices such as farmyard manure, first irrigation, space of planting and phosphorus fertilization level on the infestation of canola plants with the cabbage aphid, *Brevicoryne brassicae* L. was studied at the Experimental Farms of South Valley University at Sohag, during 2003 / 2004 and 2004 / 2005 growing seasons. Results revealed that the number of *B. brassicae* was significantly increased at 45 kg chemical nitrogen plus farmyard manure than at 15 or 30 units / feddan of chemical nitrogen during the two seasons. The canola plants which irrigated at 45 and 60 days as a first irrigation harboured highly significant numbers of *B. brassicae* compared with the plants irrigated at 15 or 30 days. Results show also that the population density of *B. brassicae* was significantly increased when using 10 and 15 cm planting space and by increasing phosphorus fertilization levels during the two seasons of study, the high rate of phosphorous fertilization led to the significantly increasing of the population density of *B. brassicae* regardless of using 20 cm space of planting and 45 kg P/feddan.

Keywords: *Brevicoryne brassicae* L., farmyard manure, space of planting, phosphorus fertilization, first irrigation, canola plant.

INTRODUCTION

Canola plants, *Brassica napus* L. has always been an important of canola oil is derived from the seeds. It is widely used in salad dressings, margarines and shortenings and can also be used as a cooking oil as a source of good fat. Canola plants in sohag region are usually infested with various insect pests which threaten the yield. The most economically important pest is the cabbage aphid, *Brevicoryne brassicae* Linnaeus causes seed yield losses, yield components, oil content and oil quality either directly by feeding or indirectly through their role as vectors of plant viruse (Lerin, 1995, Brown *et al.*, 1999, Schliephake *et al.*, 2000 and walsh and Jenner, 2002) . Also it is the most abundant and important aphid species on canola crop (Ellis and Farrell, 1995 and Rohilla *et al.*, 1996, Ellis *et al.*, 1999 and Saha *et al.*, 1999). Many authors fulfilled interesting work upon the use agricultural practice to manipulate the aphid populations, (Soliman *et al.*, 1985, Pasol *et al.*, 1985, Abou Said and Draz, 1989, Ahmed *et al.*, 1992, Helaly *et al.*, 1994, Burgess *et al.*, 1996, Khattak *et al.*, 1996, Van Emden, 1996, Abou – Aiana *et al.*, 1997, Almaicohi *et al.*, 1997, Saha *et al.*, 1999, Campbell and Ridout, 2001, Ettay and Moshe 2001 and Siman, 2002).

Therefore the subject of the present work was carried out to evaluate the response of cabbage aphid, *Brevicoryne brassicae* L. to farmyard manure, first irrigation, space of planting and phosphorus fertilization levels.

MATERIALS AND METHODS

Three experiments were conducted during two successive seasons (2003 / 2004 and 2004 / 2005) at the Experimental Farm of Faculty of Agriculture, Sohag, South Valley University.

1- Effect of farmyard manure on the infestation of canola plant by the cabbage aphid, *Brevicoryne brassicae* L.

This experiment was included five treatments farmyard manure; farmyard manure + 15 kg N Urea (46.5 %); farmyard manure + 30 kg N Urea; farmyard manure + 45 kg N Urea (Recommended); and 45 kg N Urea, design with four replicates. The plot size was 10.5 m². Seeds were sown of November 5 and 7 during both seasons. Bactol variety was used at a seed rate of 3 kg / feddan. Farmyard manure was applied during soil preparation at a recommended rate (20 m³ / feddan). Chemical nitrogen fertilizer was added in the form of Urea (46.5 %) and applied in three equal doses before the first, second and third irrigation times. Normal recommended cultural practices were followed uniformly, and insecticides were entirely avoided. For each considered treatment, five random branches of flowers were visually examined at 3 – 4 days intervals during the beginning of flowers.

2-Influence of first irrigation on the population densities of the cabbage aphid, *Brevicoryne brassicae* L.

The experiment was laid out in a complete randomized block design with four replications. Each plot was 10.5 m². Seeds of bactol variety was sown of November 5 and 7 during both seasons at a seed rate of 3 kg / feddan. Nitrogen fertilizer was used in the form of Urea (46.5 % N) and applied in two equal doses before the first and second irrigations. Regular cultural practices as recommended for canola production were applied and no pesticides treatments were applied. The water regime was after 15, 30, 45 and 60 days throughout the growing seasons. Samples of five branches of flowers were taken randomly twice in week from each plot.

Samples were kept in polyethylene bag until they were examined in the laboratory. Cabbage aphid were counted at 3 – 4 day interval till the end of experiment.

3- Impact of space of planting and phosphorus fertilization levels on the population density of *Brevicoryne brassicae* L. infesting canola plant.

A split plot design with four replicates was used in this experiment. The plot size was 10.5 m². During the two successive seasons 2003 / 2004 and 2004 / 2005, four seeds of canola plant, bactol variety were sown on one side of the ridge at 10, 15 and 20 cm hill spacing (main plots) . Seeds were sown of November 5 and 7 during both seasons, respectively. After complete

emergence, plants were thinned to two plants per / hill. The three rates of phosphorus fertilization (15, 30 and 45 kg P₂O₅ feddan) were distributed in the sub – plots. Regular cultural practices were applied as recommended for canola plant production and no pesticides treatment were applied. Samples of 5 branches of flowers were randomly taken twice in week from each plot during the beginning flowers until end of season, These samples were kept in transparent polyethylene bags and transferred to the laboratory for counting the cabbage aphid on the same day.

The data obtained were statistically analyzed using " F " test, means were compared using L. S. D. at 5 % level of probability.

RESULTS AND DISCUSSION

1-Effect of farmyard manure on the infestation of canola plant by the cabbage aphid, *Brevicoryne brassicae* L.

Data presented in Table 1 show that the effect of farmyard manure on the infestation of canola plant by cabbage aphid, *Brevicoryne brassicae* L.

Results show that population density of *B. brassicae* L. was significantly higher on fertilized canola plants with farmyard manure plus 45 kg N (Urea 46.5 %) than canola plants fertilized only with farmyard manure or 45 kg N (Urea 46.5 %) during the two seasons. Also results indicate that the infestation of *B. brassicae* was increased significantly at a rate of 45 kg N (Urea 46.5 %) plus farmyard manure as compared with other chemical nitrogen added to farmyard manure showed the increasing with *B. brassicae* populations during both seasons with an average of (358.8 and 385.8) Individuals, respectively. These results are in agreement with those obtained by Broadbent *et al.*, (1952) who found that the highest populations of aphids on potato plants achieved by dung, ammonium sulphate and superphosphate. Bogoleanu *et al.*, (1977) found that the greenbug, *Schizaphis graminum* on wheat plants was found to be most abundant on the plants fertilized by chemical nitrogen fertilizer plus farmyard manure. Siman (2002) who found that the infestation of *R. padi* and *S. graminum* were increased significantly at a rate of 75 kg N (Urea 46.5 %) plus farmyard manure as compared with other chemical nitrogen added to farmyard manure.

Table (1) : Effect of farmyard manure on the infestation of canola plants by cabbage aphid, *Brevicoryne brassicae* L. during 2003 / 2004 and 2004 / 2005 seasons.

Treatments	Avg. no. aphids / 5 branches of flowers	
	2003 / 2004	2004 / 2005
Farmyard manure	296.3 D	302.8 D
Farmyard manure + 15 kg N	308.3 C	316.5 C
Farmyard manure + 30 kg N	340.0 B	367.5 B
Farmyard manure + 45 kg N	358.8 A	385.5 A
45 kg.	297.3 D	306.3 D
L. S. D.	4.44	6.28

Means followed by the same letter are not significantly different at 5 % probability level.

2- Influence of the first irrigation on the population density of cabbage aphid, *Brevicoryne brassicae* infesting canola plants.

Statistical analysis of the data presented in Table 2 showed that population density of *B. brassicae* significantly affected by prolonging the first irrigation in both seasons. It is evident that the highest numbers of *B. brassicae* were recorded at 45 and 60 days (275 – 326 and 393.8 – 525.0 individuals 5 branches of flowers) during 2003 / 2004 and 2004 / 2005 seasons. This may be attributed to the increasing of the essential amino acids in the plants at this stage that leads to increase the infestation of canola plants with the pest. Our finding of this study are agreement with those obtained by Wearing (1968) who mentioned that the fecundity of *Brevicoryne brassicae* increased with water shortage as a result of the enrichment of phloem sap with nitrogen compound.

Table (2) : Influence of the first irrigation on the population density of cabbage aphid, *Brevicoryne brassicae* L. infesting canola plants during 2003 / 2004 and 2004 / 2005 seasons.

Irrigation intervals	Avg. no. aphids / 5 branches of flowers			
	2003 / 2004		2004 / 2005	
15	167.5	D	198.8	D
30	196.3	C	274.8	C
45	275.0	B	393.8	B
60	326.0	A	525.0	A
L. S. D.	25.85		25.56	

Means followed by the same letter are not significant different at 5 % probability.

Abou Said (1987) stated that sugar beet plants were heavily infested with *Scrobipalpa ocellatella* and *Teromothinus brevirastris* when prolonging the irrigation. Burgess *et al.*, (1996) reported that the infestation of *Brevicoryne brassicae* increased with water deficit. Siman (2002) who found that the broad bean plants which irrigated as 50 and 65 days as a first irrigation harboured highly significant numbers of *Aphis craccivora* compared with the plants irrigated at 20 or 35 days.

3- Impact of planting space and phosphorus fertilization levels on the population density of *Brevicoryne brassicae* L.

3.1 -Planting space :

Data presented in Table 3 show the effect of the planting space on the population density of *B. brassicae* on canola plants during 2003 / 2004 and 2004 / 2005 seasons (Average numbers / 5 branches of flowers on three different planting spaces (10 , 15 and 20 cm.). Results obtained show that the population density of *B. brassicae* on canola plants was highly significant when using 10 and 15 cm planting space (the average numbers were 815.0 and 532.9 individual / 5 branches of flowers during 2003 / 2004 season and 966.67 and 619.17 individual / 5 branches of flowers during 2004 / 2005 season compared with 20 cm planting space during both seasons with an average 416.3 and 492.5 individuals / 5 branches of flowers) . Our results agree with Way and Heathcote (1966) who found that the increasing in broad bean plants led to increase in the numbers of *Aphis fabae*. Helaly *et al.*,

(1994) stated that the abundance of *Aphis gossypii* Glover and *Tetranychus* Spp was significantly affected by space of planting. Slman (2002) who found that the population density of *A. craccivora* on broad bean plants was highly significant when using 10 and 20 cm planting space compared with 30 cm planting space.

Table (3) : Impact of planting space and phosphorus fertilization levels on the population density of *Brevicoryne brassicae* L. during 2003 / 2004 and 2004 / 2005 seasons.

Planting space (cm)	P – Levels (P ₂ O ₅ kg/fed.)	Avg. no of aphids / 5 branches of flowers	
		2003 / 2004	2004 / 2005
10	15	716.3 C	762.5 C
	30	793.8 B	987.5 B
	45	935.0 A	1150.0 A
Mean		815.0 A	966.67 A
15	15	387.5 EF	487.5 E
	30	516.3 D	625.0 D
	45	695.0 C	745.0 C
Mean		532.92 B	619.17 B
20	15	267.5 G	315.0 G
	30	350.0 F	416.3 F
	45	416.3 E	492.5 E
Mean		344.58 C	407.92 C
All average of P-levels (P₂O₅ kg/fed.)	15	457.1 C	521.67 C
	30	553.37 B	676.27 B
	45	682.1 A	795.83 A
L.S.D. at 0.05	Planting Space	20.64	26.10
	P – levels	22.64	26.10
Planting Space X P - levels		40.20	45.20

3.2-Phosphorus fertilization levels :

Data presented in Table 3 shows the response of canola plants to the infestation with cabbage aphid at different rates of phosphorus fertilization during 2003 / 2004 and 2004 / 2005 seasons. In general the infestation with the cabbage aphid increased significantly with an increase of phosphorous rates during both seasons (Average numbers / 5 branches of flowers on three rates of phosphorus fertilization (15 , 30 and 45 kg / P₂O₅ feddan) . Our results show that the population density of *B. brassicae* on canola plants was significant when using 45 kg / P₂O₅ feddan during two seasons compared with 15 and 30 kg / P₂O₅ feddan. Our findings are in agreement with Baker and Tauber (1951), who revealed that high rates of phosphorus fertilization are favourable conditions to the green peach aphid, *Myzus persicae* infestation.

Abdel – Rihim *et al.*, (1984) found that superphosphate increased the fecundity of *Sitobion avena* on wheat plants. Similar results obtained by Hassanein (1994) and Slman (2002), who reported that phosphorus fertilization increased the infestation of broad bean plants with *Aphis craccivora*. On the other hand, Sharaf and Nazer (1983), Omer *et al.*, (1993) and El – Rafie (1999) stated that the use of P₂O₅ fertilizer improved the

Salman, A. M. A. and H. E. Sakr

development of the tomato plants, that leads to encouragement white flies migration to infest the healthy plants. Meanwhile, Saha *et al.*, (1999) revealed that applying potash at 45 kg / ha lead to the highest aphid, *Lipaphis erysimi* (Kalt.) incidence on canola plants.

3.3-Interaction between space of planting and phosphorus fertilization levels :

Data also presented in Table 3 show the interaction between space of planting and phosphorus fertilization levels. Results showed that there was significant interaction levels during 2003 / 2004 and 2004 / 2005 seasons. It is evident that canola plants sown on 10 cm and received P at a rate of 45 kg / feddan harboured the highest numbers of *B. brassicae* during both seasons as compared with other treatment (Average numbers 935.0 and 1150.0 individuals / 5 branches of flowers) . Our results agree with slman (2002) who reported that broad bean plant sown on 10 cm and recived P at rate of 45 kg / feddan received the highest numbers of *Aphis craccivora*.

Generally, thus, it could be recommended that using 15 – 20 cm planting space, first irrigation at 15 – 30 days from planting date, 15 – 30 Kg phosphorus and 45 Kg nitrogen fertilization and preventing the canola crop.

REFERENCES

- Abdel – Rihim, M. M., Honbru, N. and Pasol, P. (1984) : The effect of chemical fertilizers applied to wheat plants on the prolificity of the species *Macrosiphum* (Sitobion) *avenae* (F.) (Homoptera : Aphidoidea) . Buletinul de protectia plantelor No. 1, 37 – 39.
- Abou – Aiana, R. A., Abo Salem, M. B. and Draz, K. A. A. (1997) : Effect of irrigation depth and interval on population densities of some piercing and sucking pests on sunflower plants. J. Agric. Sci. Mansoura Univ., 22 (8) : 2737 – 2743.
- Abou Said, A. M. (1987) : Studies on the insects of sugar beet at Kafr El – Sheikh Governorate, Thesis of Ph. D. Fac. Of Agric. Tanta Univ.
- Abou Said, A. M. and Draz, K. A. A. (1989) : The effect of irrigation intervals in two sugar beet varieties on the population densities of the major prevalling pests at Kafer El – Sheikh area 3rd Nat. Conf. of Pests & Dis. Of Veg. & Fruits in Egypt and Arab Count. Ismailia Egypt, PP. 231 – 236.
- Ahmed, S. A., Ali, A. M. and Salman, A. M. A. (1992) : Influence of Potato Varieties, Nitrogen fertilization and plant growth regulations on the infestation level of *myzus persicae* in Potato fields. 11th Trimenal conference of the European Association for Potato Research, Edinburgh, UK 8 – 13th July.
- Almaicohi, A. A., Aldryhim, Y. N. and Alsuhaibani, A. (1997) : Effect of different rates of nitrogenous fertilization and irrigation on population density of *Aphis gossypii* (Glover) (Aphididae : Homo ptera) on two ornamental plants. Arab Journal of plant protection, 15 (1) : 10 – 15.

- Barker, J. S. and Tauber, D. E. (1951) : Development of green peach aphid as affected by nutrient deficiencies in the host, *mastrurtiaum* J. Econ. Entomol., 44 : 125.
- Boguleanu, G., Nica, F. and Nica, N. (1977) : Dynamics of the entomofaunei on several varieties of wheat grown on different basal dressings. *Analele Institutului de Cercetari Pentru Protectia Plantelor*, 12, 157 – 162.
- Broadbent, L., Gregory, P. H. and Tinsley, T. (1952) : The influence of planting date and manuring on the incidence of virus diseases in potato crops. *Ann. Appl. Biol.*, 39 : 403 – 529.
- Brown, J., McCaffrey, J. P. Harmon, B. L., Davis, J. B., Brown, A. P. and Erickson, D. A. (1999): Effect of late season insect infestation on yield, yield component and oil quality of *Brassica napus*, *B. rapa*, *B. juncea* and *Sinapis alba* in the pacific Northwest region of the united states. *Journal of Agricultural Science*, 132 : 3, 281 – 288.
- Burgess, A. J., Warrington, S. Allen, W. L., Dias, J. S., Crute, I. and Monteiro, A. A. (1996): Cabbage aphid (*Brevicoryne brassicae* L.) "Performance" on oilseed rape (*Brassica napus* L.) experiencing water deficits; roles of temperature and food quality. *Acta Horticulturae*, No. 407, 499 – 505.
- Campell, C. A. M. and Ridout, M. S. (2001): Effect of plant spacing and interplanting with oilseed rape on colonization of dwarf hops by the damson hop aphid, *Phorodon humuli*. *Entomologia Experimentals et Applicata*, 99 : 2, 211 – 216.
- Ellis, P. R. and Farrell, J. A. (1995): Resistance to cabbage aphid (*Brevicoryne brassicae*) in six brassica accessions in New Zealand New Zealand, *Journal of Crop and Horticultural Science*, 23:1, 25 – 29 .
- Ellis, S. A., Oakley, J. N., Parker, W. E., and Raw, K. (1999) : The development of an action threshold for cabbage aphid (*Brevicoryne brassicae*) in oilseed rape in the UK. *Annals of Applied Biology*, 134 : 2, 153 – 162.
- EI – Rafie, K. K. (1999) : Effect of different rates of (N, P, K) fertilizers on *Bemisia tabaci* (Genn.) infestation on tomato and its effect on the yield. *Egypt J. Agric. Res.*, 77 (3) : 1067 – 1072.
- Ettay, N. and Moshe, C. (2001) : Effect of nitrogen fertilization on *Aphis gossypii* (Homoptera : Aphididae): Variation in size, color, and reproduction. *Journal of Economic Entomology*, Vol. 94, No.1 : 27 – 32.
- Hassanein, S. S. M. (1994) : Effect of some crop management practices on populations of certain insects infesting broad bean plants at Khattara region, Egypt, *Zagazig. J. Agric. Res.* 21 (6) : 1807 – 1816.
- Helaly, M. M., Hassanein, S. S. M., Metwally, E. M., Desukey, W. M. H. and Al – Shannaf, H. M. H. (1994) : Effect of certain agricultural practices on the population density of some cotton pests. *Zagazig, J. Agric. Res.* 21 (6) : 1817 – 1828.
- Khattak, S. U., Khan, A., Shoh, S. M., Zeb, A. and Iqbal, M. M. (1996) : Effect of nitrogen and phosphorus fertilization on aphid infestation and crop yield of three rapeseed cultivars. *Pakistan Journal of Zoology*, 28 : 4, 335 – 338.

Salman, A. M. A. and H. E. Sakr

- Lerin, J. (1995) : Assessment of yield losses caused by insects in winter oilseed rape, a critical review. Bulletin, OILB, SROP, 18 : 4, 95 – 101.
- Omar, H. I., H., Haydar, M. F. and Afifi, F. M. L. (1993) : Effect of NPK and their combinations as soil fertilizer on tomato infestation with certain insects. Egypt J. Agric. Res., 71 (1) : 195 – 205.
- Pasol, P., Abdel – Rihim, M. M. and Hondru, N. (1985) : Influence of winter wheat varieties and some cultural practices on the population level of the species *Macrosiphum* (Sitobion) *avenae* F. (Homoptera : Aphididae). Buletinul de Protectia Plantelor, No. 1 – 2 , 37 – 44 .
- Rohilla, H. R., Harvir, S., Yadava, T. P. and Singh, H. (1996) : Seasonal abundance of aphid pests on rapeseed mustard crops in Hayana. Annals of Agric. Bio. Research, 1 : 1 – 2, 75 – 78.
- Saha, C. S., Kanchan, B. and Baral, K. (1999) : Effect of dates of sowing and potash levels on incidence of mustard aphid, *Lipaphis erysimi* (Kaltenbach). Environment and Ecology, 17 : 1, 211 – 213.
- Schliephake, E., Graichen, K. and Rabenstein, F. (2000) : Investigations on the vector transmission of the Beet mild yellowing virus (BMV) and the Turnip Yellowing virus (TUYV). Zeitschrift, feur. flazenkrankheitenund. pflanze nschut z., 107 : 1, 81 – 87.
- Sharaf, N. S. and Nazer, J. K. (1983) : Effect of N, P and K soil fertilizers on population trends of the tobacco whitefly *Bemisia tabaci* (Genn.) (Homoptera, Aleyrodidae) and the incidence of tomato yellow leaf curl virus in tomatoes in the Jordan valley. Agric. Res. J., Univ., of Jordan, 1 : 13 – 24 .
- Slman, F. A. A. (2002): Effect of some agricultural practices on the population density of cowpea aphid, *Aphis craccivora* Koch infesting broad bean plants in upper Egypt. Assiut Journal Agricultural Science, Vol. 33, No. 3, 13 – 20.
- Soliman, M. A., Moftah, E. A. M. and Abdel – Naby A. A. A. (1985): Relation of certain cereal aphids to wheat plant density and nitrogen fertilization. Minia, J. Agric. Res. & Dev. 7 (2) :399 – 409.
- Van Emden, H. F. (1996) : Studies on the relations of insect and host plant. III. A comparison of the reproduction of *Brevicoryne brassicae* (Homoptera : Aphididae) on brussels sprout plants supplied with different rates on nitrogen and potassium. Entomol. Exp. Appl. 9 : 444 – 460.
- Walsh, J. A., and Jenner, C. E. (2002) : Turnip mosaic virus and the quest for durable resistance. Molecular plant pathology, 3 : 5, 289 – 300.
- Way, M. J. and Heathcote, G. D. (1966) : Interactions of crop density of field beans, abundance of *Aphis faba* scop., virus incidence and aphid control by chemicals. Ann. Appl. Biol., 57 (3) : 409 – 423.
- Wearing, C. H. (1968) : Response of aphids to pressure applied to liquids diet behind parafilm membrane, longevity and larviposition of *M. persicae* (Sulzer) and *B. brassicae* L. feeding on sucrose and sinigrin solutions. New Zealand J. Sci., 11 :105 – 121.

استجابة حشرة من الكرنب لبعض العمليات الزراعية على مستويات إصابة محصول الكانولا بمنطقة سوهاج

أحمد محمود على سالماني^(١) ، حامد الدمرداش صفير^(٢)

(١) قسم وقاية النبات - كلية الزراعة بسوهاج - جامعة جنوب الوادي .

(٢) قسم وقاية النبات - كلية الزراعة بشبرا الخيمة - جامعة عين شمس .

يعتبر محصول الكانولا من أهم المحاصيل الزيتية ، ومصدرا هاما من مصادر استخلاص الزيوت النباتية في العالم حيث يحتل المرتبة الثالثة من حيث كمية إنتاج الزيوت النباتية بعد زيت النخيل وزيت فول الصويا ، كما أن زيت الكانولا من أفضل الزيوت النباتية عند استخدامه في تغذية الإنسان حيث يحتوى الزيت على ٦ % فقط من الأحماض الدهنية المشبعة ، ٩٤ % أحماض دهنية غير مشبعة . لذلك تتعرض زراعات الكانولا خلال هذه الفترة لهجوم واسع النطاق من حشرة من الكرنب والتي تسبب أضرار بالغة للمحصول نظرا لتغذيتها على الأوراق والشماريخ الزهرية والقرون وإفراز الندوة العسلية التي تؤدي إلى جفاف الأزهار والقرون نتيجة لنمو لفطر العفن الأسود .

لذلك فكان لزاما دراسة استخدام بعض الإجراءات الزراعية وهي (السماد البلدي وريه المحياه ، والسماد البلدي ، ومسافة الزراعة والتسميد الفوسفورى ، على إصابة نباتات الكانولا بهذه الآفة بمنطقة سوهاج خلال موسمين زراعيين متتاليين هما ٢٠٠٣ / ٢٠٠٤ ، ٢٠٠٤ / ٢٠٠٥ وقد دلت النتائج المتحصل عليها إلى ما يلى :

عند إضافة السماد البلدي إلى مستوى ٤٥ وحدة أزوت من سماد اليوريا أدى إلى زيادة معنوية فى تعداد حشرة من الكرنب على نباتات الكانولا وأن نباتات الكانولا التي أعطيت رية المحياه على ٤٥ ، ٦٠ يوما من الزراعة أدت إلى زيادة معنوية بتعداد حشرة من الكرنب من النباتات التي أعطيت رية المحياه على ١٥ ، ٣٠ يوما من الزراعة وعند زراعة نباتات الكانولا على مسافة ١٠ ، ١٥ سم أدى إلى زيادة معنوية بتعداد حشرة من الكرنب كما أن زراعة نباتات الكانولا على مسافة ٢٠ سم وتسميدها بأعلى معدل سماد فوسفاتى بمعدل ٤٥ كجم / فدان كان له الأثر فى الزيادة المعنوية للإصابة بحشرة من الكرنب خلال موسمى الدراسة .

ونستخلص من ذلك بهذه التوصية لمزارعى محصول الكانولا بمحافظة سوهاج بأنه يجب عدم الإطالة الشديدة لرية المحياه مع التقليل بقدر الإمكان من التسميد الأزوتى عند إضافة السماد البلدي وكذا السماد الفوسفاتى وتجنب تراحم النباتات مما يترتب عليه زيادة الإصابة بحشرة من الكرنب لنباتات محصول الكانولا .