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Effects of fungicides use in wheat fields on the damage caused by house sparrow *Passer domesticus niloticus* (Passeriformes: Passeridae) at Assiut Governorate

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Abstract:

This experiment was carried out during the ripening stages of wheat crop. The trial was aimed to evaluate the effectiveness of different application rates of punch 40% EC., recommended for controlling some wheat pests, as repellent compounds. Two schedules of spray programme were performed to protect wheat spikes from birds, e.g. house sparrow *Passer domesticus niloticus* (L.) (Passeriformes: Passeridae), attack and reduce birds damage. The results revealed that there were significant differences among concentrations of punch. The highest protection performance was exhibited by using the recommendation rate of pesticide for controlling pests. The protection indices (PI%) of tested fungicides were when applied punch (18.75 cm^3/100L.water). The following highest protection indices was attained by applying the second concentration for punch (12.50cm^3/100L.water). The lowest values of protection indices were when applied (6.25 cm^3/100L.water). The results showed that increasing the rate of punch application, resulted to increasing of repellency and protection performance to the wheat spikes during ripening stage.

Introduction

The house sparrow *Passer domesticus niloticus* (L.) (Passeriformes: Passeridae) enjoys a world-wide distribution and affects a variety of habitat types under a wide range of climatic conditions. Now, the house sparrow is thought to be one of the important vertebrate pests for cereal crops, human habitations and wildlife in Egypt. During certain seasons of the year it forages in the cropland in large numbers. Such foraging flocks damage the standing crops to a great extent. Damage caused by house sparrow birds is one of the problems facing many farmers in Egypt. However, the amount of crop lost, and the economic damage sustained is largely unquantified. As the house

sparrow has great predilection for maturing seeds, it inflicts great damage on the maturing crops of wheat. Infect, sparrows damage to wheat crop represents a serious problem as the losses reach up to 14% of the yield (Soliman, 1993.; Wilson *et al*., 1995 and Omar, 2005).

On the other side, it is considered as natural enemies to harmful insects when they feed on them in considerable amounts. In this study, our aim was to reduce the damage caused by house sparrow birds attack for the wheat plants. Due to the nature of these birds and the speed of movement, they are struggling in various ways from the rest of agricultural pests, such as: fishing net, or by noise forced to flee, the destruction of nests, the cultivation of crops on non-economic important crops to feed them, Lack of grain storage in the open, and the use of pesticides is the most effective in the rapid elimination of the lesion, but the wrong use with increase in the number of times of use, and high concentrations of some has led to increased pollution levels, and the accumulation of harmful pesticide residues in human food in the soil and the environment surrounding it

The present work was done in the farm of Faculty of Agriculture, Al-Azhar University in Assiut Governorate in order to study the punch (fungicides) was tested to evaluate it repellency effects on house sparrow birds during of the ripening stages of wheat under field conditions.

Materials and methods

This study was executed at the farm of the Faculty of Agriculture, Al-Azhar University at Assiut Governorate during 2016. The experiment included the chemical control of the house sparrow birds during of the ripening stages. Punch was tested to evaluate it repellency effects on house sparrow birds. The chemical compound was tested at three rates of concentration. Table (1) indicated that the trade, common, chemical names and rate of application of tested compound.

Table (1): Tested compound.

Trade name	**Common name**	**Chemical name**	**Rate of application**
Trade name	**Common name**	**Chemical name**	**Rate of application**
'Punch' (40%EC)	Flusilazole	Bis(4-fluorophenyl) (methyl)(1H-1,2,4triazol-1-ylmethyl) sailane (IUPAC).	1.18.75cm³/100 L. Water * 2. 12.50 cm³/100 L. Water 3. 6.25 cm³/ 100 L. Water

*** According to the technical recommendation of the Ministry of Agriculture and Land Reclamation, Egypt.**

Punch fungicide used and their rates of application were designed here under each of levels as well as the recommended rate, according to the technical recommendations of the Ministry of Agriculture and Land Reclamation, Egypt. Full coverage of the wheat crops with Punch was secured using a knapsack sprayer fitted with one nozzle. The five replicates of the check treatment were sprayed with water only.

An area of about half feddans was divided into plots, each of (1/400feddan). The experiment was arranged in split-split plot design with planting method as a main plot treatment, chemical treatment as a subplot and spray program as a sub-sub plot treatment.The field experiment

included 4 treatments (3 rates of concentration + control) each treatment was replicated five times and tested in two programmes of pesticide applications at wheat plants against house sparrow birds. Samples of fifty plants were taken from the studied field crops of each chemical method in order to estimate the efficacy of various chemical methods .

The damage assessment and protection index (PI) in all experimental plots (treated and untreated spikes), were used as criteria to evaluate the effectiveness of the tested fungicides and application programmes on repellency potential and protection of wheat spikes against house sparrows attack. Protection index (PI) was also calculated by the equation adopted by **(Inglis and Isscson., 1987)** as follows:

$$\textbf{Protection Index (PI)} = \frac{A - B}{A} \times 100$$

Where: (A) = mean damage percentage in untreated plots.

(B)= mean damage percentage in treated plots.

Statistical analysis :

Data obtained were statistically analyzed using a randomized complete block design. Means were compared according to Duncan's Multiple Range test, at 0.05 level of probability.

Results and discussion

1.Field experiments :

Bird repellents to protect seeds are a potentially impotent of integrated vertebrate pest management strategies (Avery *et al*., 1993). This experiment was carried out during the ripening stages of wheat. The trial was aimed to evaluate the effectiveness of different application rates of punch 40%EC., recommended (According to the technical recommendation of the Ministry of Agriculture and Land Reclamation, Egypt.) for controlling some wheat pests, as repellent compounds. Two schedules of spray programme were performed to protect wheat spikes from birds attack and reduce birds damage.

1.1. One- spray programme schedules:

The protection indices (PI%) were calculated after different post-treatment intervals from fungicide applications in one- spray programme Protection indices after 3-day represents the initial, after 7-day the actual and after the rest intervals the residual effects of Punch as bird repellents. Data in Table (2) and Figure (1) indicated different patterns of persistence/ degradation behavior with each of the three tested concentrations of Punch on the ripening stages of wheat against the house sparrow birds. Generally, the results revealed significant differences among concentrations of punch. The highest protection performance was exhibited by using the recommendation rate of Punch for controlling pests. The protection indices (PI%) of tested fungicide was (96.25%) when applied Punch (18.75 cm^3/100L.water). The following highest protection indices (84.5%) were attained by applying the second concentration for Punch (12.50 cm^3/100L.water). The lowest values of protection indices were (33.41%) when applied Punch (6.25 cm^3/100L.water).

Generally, the results revealed that no significant differences between the first and second concentration while the significant difference were found between the concentrations pervious and the third concentration of punch. The highest protection performance was exhibited by using the recommended rate of Punch for controlling pests.

1.2. Two- spray programme schedules:

The statistical analysis of data representing the protection indices (PI%) resulted from applying two- spray

programme schedules, are presented in Table (2) and Figure (1). The obtained results supported the former data regarding the tested rates of the different fungicide applications. Field repellency and subsequently protection performance of wheat spikes from house sparrows attack were noticeably differed according to the chemical structures, rates of application and post-treatment intervals.

The protection indices after applications of two-spray programme schedules may be demonstrate the importance of the second application of Punch for enhancing the protection potential and expanding the protection period to wheat spikes against attack of house sparrows. In respect to the protection indices achieved by the tested Punch of post-treatment intervals, data in Table (2) and Figure (1) indicated that the highest protection indices for wheat spike (97.50%) when applied (18.75 cm^3/100 L. water) concentration. The following highest protection indices (87.50%) were attained by applying the second concentration for punch (12.50cm^3/100 L. water). The lowest values of protection indices were (47.41%) when applied (6.25 cm^3/100L.water) concentration. Generally, the results showed that increasing the rate of Punch application, resulted to increasing of repellency and protection performance to the wheat spikes during ripening stage.

Rizvi *et al*. (2002) in Pakistan showed that mithiocarb grain bait at 0.1% proved to be highly effective in repelling sparrows and may function as an ideal crop protection against bird invasion. Gabr (2005) used laboratory and field experiments for conducting the repellent and toxic effect of five pesticide compounds against the house sparrow, *Passer domesticus niloticus*, in Beni-Suef Governorate, Egypt. Both no-choice and free choice feeding tests in the laboratory showed that pirimicarb (carbamate compound) was the most repellent pesticide, followed by chloropyrifos, diazinon (organophosphorus compounds) and cyphenothrin (Pyrethroid), while propineb compound (carbamate) was the least repellent one. Eman-Tolba (2006) studied the effectiveness of different application rates of certain pesticides, recommended for controlling some wheat pests, as repellent compounds against the house sparrow, *P. domesticus niloticus* (L.). Kennedy and Connery (2008) evaluated seed treatments for the control of crow damage to seed and seedling in winter and spring wheat in field trials from 2004 to 2007. Treatments included six fungicides, three insecticides, a product marketed as a bird repellent and three potential repellents. Various rates of selected compounds were investigated. Winter wheat was sown in December and spring wheat in late-January to mid-February. Omar (2010) revealed that spraying on wheat plants during ripening stages by sumi-eight with a rate of (35 cm^3/100 L. water) resulted in significant high protection indices. But the middle protection indices were obtained by using the one insecticide compounds (Malathion) with a relatively high rate of applications (150 cm^3/100 L. water), comparing with the control during 2007 and 2008. He found that, the repellency effects enhanced with increasing of pesticide concentrations were studied. The protection indices were exhibited by using high, middle and low rates of applications, 50 cm^3, 100 cm^3 & 150 cm^3/ 100 L. Water and 11.6 cm^3, 23.3 cm^3 and 35 cm^3 / 100 L. water, for malathion and sumi-eight.

Table (2): Average protection indices (PI %) after different post-treatment intervals, induced from application of punch (40%EC) with different in one and two programme during wheat ripening stages, Assiut Governorate.

Concentrations	Avg. (PI%) at post-treatment intervals		Mean
	One- spray programme	Two- spray programme	
18.75 cm^3/100 L. Water	96.25%a	97.50%a	96.88%a
12.50 cm^3/100 L. Water	84.50%a	87.50%a	86.00%a
6.25 cm^3/100 L. Water	33.41%b	47.41%b	40.41 %b
Mean	71.39%a	77.47%a	

*** Means with each examined week for treatments followed by the same letter are not significant differences at the 0.05 level probability.**

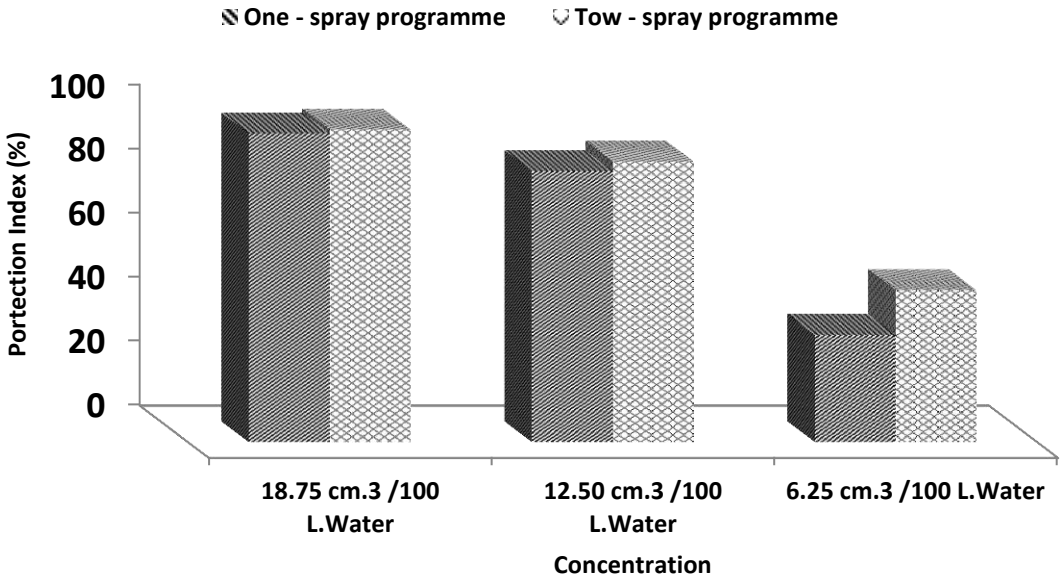

Figure (1): Average protection indices (PI %) after different post-treatment intervals, induced from application of punch (40%EC) with different in one and two programme during wheat ripening stages, Assiut Governorate.

References

Avery, M.L.; Cummings, J. L.; Decker, D. G.; Johnson, J. W.; Wise, J. C. and Howard, J. I. (1993): Field and aviary evolution of low-level application rates of methiocarb for reducing bird damage to blueberries. Crop Protection., 12 (2): 95-100.

Eman-Tolba, F.M. (2006): Ecological studies on house sparrow, *Passer domesticus niloticus* (L.) and its control in Assiut Governorate. Ph. D. thesis faculty of Agric., Assiut University.

Gabr, W. M. (2005): Testing the repellent effect of some pesticides against house sparrow for protecting field crops. Egyptian Journal of Agricultural Research, 83(3): 1179-1189.

Inglis, I.R. and Isscson, A.J. (1987): Development of a simple scaring device for wood- pigeons, *Colume palumbus*. Crop Protec., 6: 104-108.

Kennedy, T. F. and Connery, J. (2008): An investigation of seed treatments for the control of crow damage to newly sown wheat. Irish Journal of

Agricultural and Food Research, 47: 79–91.

Omar, M. M. A. (2010): Studies on some wild birds in Assiut with special reference to harmful birds and its control. Ph.D. Thesis., Faculty of Agric., Al–Azhar University.

Omar, M.M.A. (2005): Ecological and biological studies on some wild birds M.Sc. Thesis Fac. Agric., Al – Azhar University.

Rizvi, S.W.A. ; Perevz, A. and Ahmed, S.M. (2002): Evaluation of methiocarb 50%-WPas test repellent against the house sparrow (*Passer domesticus* L.). Turk.J.Zool., 26: 131-135.

Soliman, A.M.A. (1993): Studies on arthropods associated with the harmful birds and their nests at Kafr El - Sheikh governorate. M. Sc. Thesis Fac. of Agric. Zagazig University.

Wilson, B.M.; Jelany, I.; El-Deeb, H.I. and Soliman, A.H. (1995): Bird damage assessment to different crops at Kafr El-Sheikh Governorate, middle delta, Egypt. Int. Conf. of pest control, Mansoura, Egypt.