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COMPARATIVE EFFICACY OF SOME TRAP FOR CONTROLLING PORCUPINES, WILD BOARS AND OTHER VERTEBRATE PESTS

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The present research studies "Comparative efficacy of some trapping techniques to control porcupine, wild boar and other vertebrate pests" was carried out in three rural sites i.e. Chak No. 33/J.B, 126/J.B and 197/J.B. of Faisalabad Division, during 2002. In all the cases, the efficacy of the traps was found to enhance significantly by using different attractants. Selection of attractant was another impotent decision. Normally the material used to lure the animal was not naturally present in the field as crop e.g. maize grains were used when it was not sown in the field as crop etc.

Under present studies, three types of traps namely Panel Trap, Fahad Trap and Loop Trap were tested in the fields. Relative efficiency of each trap was measured in capturing the animals to reduce damage on maize, wheat and sugar cane crops caused by porcupines, wild boars and other vertebrate pests. The Panel trap was found to be the most efficient with trapping rate of 70.83%. However for porcupine, its design was reshaped and trap floor was built with wire gauze to arrest their escape. New shape of the Panel trap was found to be excellent in restricting escape of the porcupines by burrowing through the trap floor. The Panel trap is little costly whereas Loop trap is the most economical, simple and easy to handle with a relatively efficiency of 53.84%. Efficiency of Fahad traps was 48.57%.

Results of present study revealed that the efficacy of Panel trap was found to be the maximum followed by Loop and Fahad trap.

Key words: Panel trap, loop trap, Fahad trap, efficiency

INTRODUCTION

The use of pesticide has become inevitable for controlling invertebrate and vertebrate pests on farmlands and for stored agricultural products. But keeping in view the tremendous use and consequently ever increasing percentage of accidental deaths due to pesticide poisoning, it has become more important to look for some safer methods of pest control Chaudry (1994). In this connection, Non-chemical i.e. mechanical as well as biological methods are considered environment friendly and free from adverse affects. Hence there efficacy need to be investigated to chose the one economical, safe and much effective.

No province of Pakistan is free from the depredation of vertebrate pests especially the field rats, porcupine and wild boar, which in many cases cause sever economic losses. Shafi (1990) reported that field rats destroyed rice crop worth Rs. 193 million while the losses to wheat crop was about Rs. 472 million. Sugar cane and groundnut crops were also severely damaged by rat, porcupine and wild bore and the economic losses were estimated to be Rs. 534 million. Bird caused annual losses of over Rs. 500 million to wheat, maize, millet, sunflower and fruits. Pika, voles and porcupines caused Rs. 25 million damage to apple orchards and forest plantations. Altogether, it was estimated that vertebrate pests caused economic losses directly or indirectly to the tune of Rs. 1893 million annually based on the production statistics of crops for the year 1984-85, Govt. Support Prices. The author further added that by the use of chemical pesticides, 20 to 30% higher yield of paddy was obtained in Sindh and Punjab (Shafi 1990). Rodent population in sugarcane decreased by 70 to 90% and 1-to 8-cost/benefit ratios was obtained. Control trials conducted in wheat field in Punjab and Sindh, using anticoagulants and recently developed acute poison gave 38% higher yield of wheat crop. Trials conducted at the University of Agriculture, Faisalabad showed that higher mortality to wild boar could be achieved with Temik ($C_7H_{14}N_2O_2S$) by using different kinds of bait material. Almost 80 to 90% of the wild boars were killed during poison trails (Khan, 1990).

No doubt at present the use of chemical pesticides has become inevitable to control vertebrate pests but its toxicity and other side effect cannot be denied or ignored. As quoted by Yaqub and Quayyoom (1988). The U.S. World Resources Institute revealed that pesticides caused estimated deaths of 10,000 people and 40,000 illnesses per year worldwide. They further added that at UN Seminar in 1984 at Nairobi, it was disclosed that as many as 3,70,000 people suffered from poisoning and 10,000 died due to pesticides each year. In another report from WHO, 500,000 people were poisoned each year and 5000 died due to pesticide use (WHO, 1975).

Precautionary measures in using the poisonous chemicals are hardly taken care which resulted in serious incidents and even deaths. The situation is rather more sever in cotton, sugarcane and rice growing belts (Chaudry 1994, Khan 1998). On the bases of these facts, use of chemicals as pesticides cannot be advocated at any cost. The situation justify the need for research on non-chemical methods i.e., mechanical devices to control vertebrate pests for the safety of human being and other useful fauna.

In the present research studies on entrapping techniques were tested for controlling the population of pestiferous mammals like wild boar, jackal and porcupine. It was man as well as environment friendly project.

MATERIALS AND METHODS

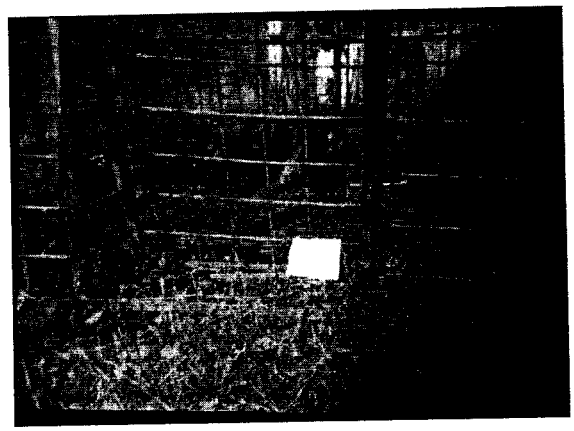
Traps are mechanical devices commonly used against mammalian pests and rodents to control their population in the cropped area (Hussain 1990, Khan, 1990, Zhao *et al.* 1992 and Khan *et al.* 2002).

Population of each specific wild mammalian pests were estimated at each study site and then fabricated traps i.e., panel trap, Fahad trap and loop traps were placed on active trials of the animals like Wildboar (*Sus screfa*) Jackal (*Canis aures*) and Porcupine (*Hystrix indica*) in the cultivated areas adjoining thickets. Ultimately percentages of entrapped mammalian pests were used to certify the effectiveness of each device (Khan 1990).

Where needed necessary modifications were made in these trapping devices to enhance their efficacy during field use. Testing and standardization of each device was made on the bases of their working efficacy and reduction in pest population on selected site. Different traps tested during this intensive field study of one month are discussed as under.

Panel Trap

Panel trap was set along canal sides in Chak No. 33/JB, 12 km away from Faisalabad city. Detailed survey was conducted in the area in order to estimate the population of all the mammalian pests using footprints and track count methods. The trap was erected on the sensitive sites and close to along the dens. Boiled maize was used as attractant and roosted loaf of bread (locally called paratha) was used in the trap to click the trigger for entrapping the pest. The trap was placed active on animal trails in the evening to capture the animals efficiently because all of them remain active at night. The attractant used during trapping play a vital role in guiding the animal pests towards the trap. The maize grains were systematically spread from den to the trap, which led them to the sight where they were ultimately entrapped.



Fahad Trap

This trap was set in the canal side plantation of Jhang Branch along the cropped area near Chak No. 197 named Bokhri. The trap was set active in the evening along the animal trails in the study area. The jaws of the trap were modified from arc shaped to rectangular shape in order to reduce the height of the trap.

Loop Trap

It was made from flexible steel wire and was erected in the form of loop on the animal trials tightly tied up with trees or other fixed set of poles in the evening. This trap was set along canal side plantation in the area of Chak No. 26/J.B. The experiment continued for fifteen days to evaluate trapping efficacy of the trap.

RESULTS AND DISCUSSION

Panel trap

The Wild boar (*Sus scrufa*) and porcupine (*Hystrix indica*) were found as the most populated pests in areas of Chak No. 33/J.B. During field survey, population of the animal was recorded. There were twenty-three adult porcupines damaging the maize crop. With the help of panel trap, on the very first day, four (4) animals were captured including three wild boars and one Porcupine.

The results revealed that the use of panel trap could give 70.83% success. Moreover it was found to be rather economical in case of heavy pest populations.

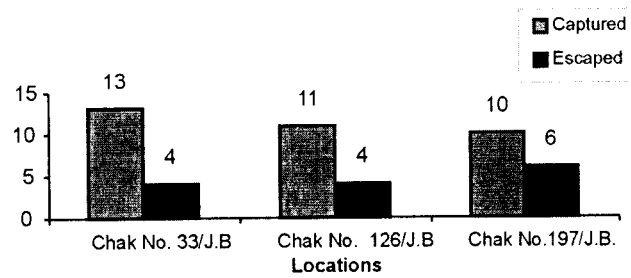


Fig. 1. 15 days efficacy of Pannel Trap.

$$\text{Efficiency} = \frac{\text{No. of animal captured}}{\text{Escaped} + \text{captured animals}} \times 100$$

$$= \frac{34}{48} \times 100$$

$$= 70.83\%$$

Fahad Trap

According to survey of the area, there was almost 8 to 10 porcupine, which was regularly visiting the crop field of maize in Chak No. 197 located in Faisalabad division.

The trap was set active at night for fifteen days along the animal trails in the area but no animal was captured. However, twice the porcupines disturbed the trap without being caught. This indicated that Fahad trap was not suitable for capturing porcupine. On the last day of observation, a Jackal was trapped which was found dead next day. To make the trap effective for porcupine capturing, its jaws shape was change from arc to rectangular in shape modified it. The modified Fahad Trap was effective up to 48.57% since 17 out of 35 animals were captured latter on within fifteen days. Though difficult to fabricate being little technical but the trap was found to be economical and easy to transport.

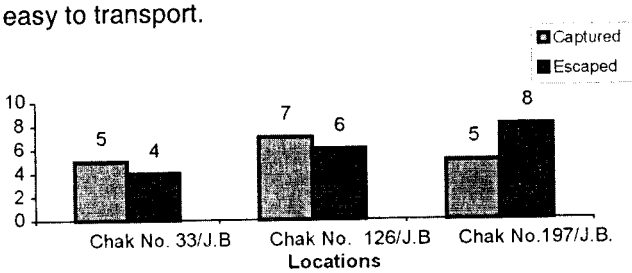


Fig. 2. 15 days efficacy of Fahad Trap.

$$\text{Efficiency} = \frac{\text{No. of animal captured}}{\text{Escaped} + \text{captured animals}} \times 100$$

$$= \frac{17}{35} \times 100$$

$$= 48.57\%$$

Loop Trap

Loop trap was tested in Chak No. 26/J.B. The area was also located in Faisalabad division. Being close to canal side plantation the area was said to be rich in mammalian pests. During testing trails of the device, two porcupines and one Jackal was captured. The animals were caught alive and were killed later on by local farmers. Loop trap set singly was found less effective. As during experiment these were erected in row (tied up with a string) so these proved to be highly effective. This trap was found to be economical to fabricate. Proper installation of the trap was proved to play a key role in successful trapping.

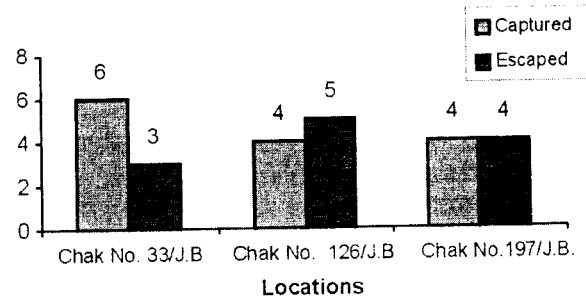


Fig. 3. 15 days efficacy of Loop Trap.

$$\text{Efficiency} = \frac{\text{No. of animal captured}}{\text{Escaped} + \text{captured animals}} \times 100$$

$$= \frac{14}{26} \times 100$$

$$= 53.84\%$$

Zhao 1992 and Khan 2002 has reported that loop traps made from the hairs of hours tail have been effectively used for capturing francolins (partridges both black and grey) were effective but their efficacy was found to depend mainly on selection of proper site for setting the trap.

The panel trap gave very encouraging results. On the bases of field data, this trap can be recommended for large-scale pest control especially against porcupine and wild boar. During present study, it was observed that porcupine could escape by digging below the walls of panel traps. Therefore a wire guaze sheet was fixed to make floor of the trap, which successfully arrested their escape, by digging under floor of the trap site. Khan (1990) also used this trap for wild boar control with very encouraging results when 8 animals were captured at one time. In addition, utility of this kind of trap was also certified by Hussain (1990). As for as efficacy of Fahad trap is concerned, it was not found to be very effective against porcupine because no animal was captured with the help of this trap. But to some extent it was found useful against Jackal, which indicated that long legged animals like cats, wild boars and Jackals could easily be captured as compared to short-legged animals like porcupine. Of course, the modified Fahad trap was also found effective against porcupine.

The major reason for loop trap to be less effective against porcupine was the presence of scattered and thin vegetative cover and less number of porcupine in the study area. Otherwise it was reported to be very effective in dense vegetative cover, which might provide feed and shelter to pests (Khan 1990) and make them rather careless during moving around. Use of attractants like boiled maize, chopped vegetables and fruits was observed to further enhance the efficacy

of loop trap if properly placed. On the bases experience gained during these studies, it is recommended that the user of these traps must be well aware of the ecology of each animal pest. Feeding habit and general behavior of the pests is very important to improve the trapping rate. Activities of the pests must be noted for many days to decide about locations for setting the trap. This is prerequisite for achieving proper control of pest population in the locality.

REFERENCES

Chaudry, A.A. 1994. Conservation of biodiversity. Taking care of the future. Natura, 21(1): 2-5.

Chaudry, A.A. 1994. Conservation of biodiversity. Taking care of the future. Natura, 21(1): 2-5.

Hassain, I. 1990. Trapping, Netting and Scarring techniques for bird control In "A Training Manual on Vertebrate Pest Management". Editors. J.E. Brooks, and E. Ahmed. I. Hussain, S. Munir and A.A. Khan. A. GOP/USAID/DWRC, Vertebrate Pest Control Project National Agricultural Research Centre, Pakistan, Agricultural Research Council, Islamabad, Pakistan. pp. 187-191.

Khan, M.H. 1990. Non-Chemical methods of wild boar control in "A Training Manual on Vertebrate Pest Management". J.E. Brooks, E. Ahmad, I. Hussain, S. Munir and A.A. Khan. Editors A. GOP/ USAID/DWRC. Vertebrate Pest Management Control Project. NARC. PARC, Islamabad– Pakistan.

Khan, R.A., S. Hafeez and M.A. Habibullah. 2002. Conventional netting techniques and their efficacy: A threat to small birds in Pakistan. Indus J. Sci., 1(3): 298-300.

Shafi, M.M. 1990. A Review of Vertebrate pest problems in Pakistan and their impact on agricultural economy in "A Training Manual on Vertebrate Pest Management." Editors: J.E. Brooks, E. Ahmad, I. Hussain, S. Munir and A.A. Khan. A GOP/USAID/DWRC-Vertebrate Pest Management Control Project. National Agricultural Research Centre, Pakistan, Agricultural Research Council, Islamabad, Pak. pp 1-7.

Statistical data published in 1984-85 under Government Support Prices.

World Health Organization. 1975. Ecology and control of vectors in public health. 21st report Expert Committee Insecticide Tech. Rep. Ser. 561. Geneva. Switzerland, pp. 35.

Yaqub, M. and M.A. Quayyoom. 1988. Production, pollution and pigeon-holing: Pollution problems and environmental problems in Pakistan. Univ. of Agric. Faisalabad. pp. 1-144.

Zhao, Z.J., J. Wu and S. Zhang. 1992. A traditional method for humanity the durian patridge (perdix dauuricae suschkini) in China. Gibier Faune. Sauvage 9: 831-835.