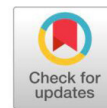


**Research Article****Open Access**

# Reduction of Rose- Ringed Parakeet (*Psittacula krameri*) damage in sunflower crop in Telangana

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**Abstract**

The main bird pests of sunflower crops are rose-ringed parakeets, which can cause 20 to 50% damage and up to 90% damage in isolated regions. The 12 different species of parakeets are found all over the nation, and the rose-ringed parakeet (*Psittacula krameri*) is the most devastating bird pest in horticulture and agriculture. The rose-ringed parakeets (*Psittacula krameri*) are serious bird pests to the sunflower crop under unprotected conditions. This is mainly due to the under-crop diversification and promotion of oil seed crops leading to the increasing area of sunflower cultivation. It was observed that a high number of parakeets and other bird populations around the farmers fields and experimental crop field areas at VPM office and damaging field crops under unprotected conditions. In this study different bird control measures were implemented during Kharif-2022 season in the sunflower crop at the AINP on VPM office farm, Rajendranagar, Hyderabad, Telangana state. The results of the experiment reveal that the sunflower crop protected by different methods recorded highest (1650.40 Kg/ha) in the castor oil spray plot followed by egg solution spray (1419.62Kg/ha), salt solution (1366.25 Kg/ha), ribbon (1345.90 Kg/ha) compared with unprotected control (1196.72 Kg/ha). It is suggested that various types of control measures such as castor oil, egg solution, salt solution spray, and ribbons have protected the sunflower crop, particularly during the seed setting stage to till the harvest of the crop.

**Keywords:** Sunflower crop, Damage, Parakeets, Birds, Rajendranagar, Telangana State and Eco-friendly management

**Introduction**

Bird damage to agriculture is a widespread issue that probably dates back to the beginning of crop production. In India, sunflower is a significant edible oilseed crop. The cultivation of the sunflower crop has extended to many Indian States as a result of improvements in production technology for high-yielding varieties, reliable seed production, and profitable prices. In India, during yasangi (Rabi) 2022-23 sunflower crop occupied 0.587 lakh hectares

(1.451 lakh acres) as against 0.885lakh ha (2.187lakh acres) during the same period in 2021-22. Karnataka 0.430 lakh ha (1.063lakh acres), Tamil Nadu 0.036 lakh ha (0.089 lakh acres), Telangana 0.030 lakh ha (0.074 lakh acres), Andhra Pradesh 0.028 lakh ha (0.069lakh acres) and Odisha 0.025 lakh ha (0.062 lakh acres) were major sunflower growing states in India [6]. The sunflower crop, like all other crops, is vulnerable to assault by a variety of avian pests. The rose-ringed parakeet (*Psittacula krameri*) and the house crow (*Corvos splendens*) are classified as harmful birds because they cause significant damage [7]. The main bird pests of sunflower crops are rose-ringed parakeets, which can cause 20 to 50% damage and up to 90% damage in isolated regions. The 12 different species of parakeets are found all over the nation, and the rose-ringed parakeet (*Psittacula krameri*) is the most devastating bird pest in horticulture and agriculture. In orchards, gardens,

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and other agricultural areas, they are frequently spotted in flocks and frequently close to human habitations. They attack the crop in large groups, cause significant harm, and are known to waste a lot more food than they consume. From the milky stage onward, till harvest, there is bird damage. In captivity, a single parakeet consumes approximately 15.0 g of sunflower seeds each day, giving an indication of the crop's overall loss. In remote regions, crop damage to sunflowers can vary from 10 to 60%, while on large tracts of land, it is only 3 to 5%. Sunflower growers often regard a damage threshold of 5% to be economically significant and bearable [4].

The crow forages throughout the day in small flocks on farm crops, cattle farms, and residential areas. It is an omnivore by nature. The primary food sources for crows include leftover food from kitchens, fruits that have fallen in gardens, and stored grains. Crow damage to growing sunflower was estimated by [3] to be 70% in an unsecured condition at Ludhiana, India. It was obvious that there had been more harm at the seedling stage than at the mature stage. In recent years the parakeet (granivorous) bird pest problems have increased in the sunflower crop, particularly in southern and northern Telangana zones. With the introduction of sunflower, an unconventional oil seed crop in Telangana, it became clear that the rose-ringed parakeet was a serious pest. The rose-ringed parakeet (*P.krameri*) and House crow (*C.splendens*) are the common bird pests of oil seed crops in Rajendranagar, Hyderabad [10-11]. Although the damage season lasts until harvest in October, 75% of it happens within 2.5 weeks of petal fall [2]. Due to fluctuating farming patterns and the sporadic availability of wetlands for roosting, damage levels are locally varied, both within and between years. Other growers, recognizing the value of sunflowers in their crop rotation, have opted to use cultural practices. As foliar repellents have just recently been tested on sunflowers, it is too soon to tell whether this strategy will ultimately result in a useful product. Uncertainty in the repelling research findings on foliar rice certainly suggests that expectations for the sunflowers should be moderated. However quantitative evaluation of bird depredation to oil seed crops in the Telangana Zone is lacking. The present study was planned to develop and evaluate eco-friendly bird management practices which are economically and ecologically feasible under the Integrated pest management component.

## Materials And Methods

The study was carried out by following Randomized

Block Design (RBD), an experimental sunflower field during the Kharif season of June 2022 to October 2022 in the AINP on VPM office premises ( Fig.1) situated at the Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad, India (Latitude 17°19' N; Longitude 78°23' E; altitude 543 m above MSL). Sunflower seed (GK-2002) was sown in 0.072 ha area with three replications during the Kharif season of 2022 AINP on VPM office premises at, Rajendranagar, Hyderabad. Each plot was 8m in length and 5 m in width with a row-to-row spacing of 60 cm and plant-to-plant spacing of 30 cm in an average of 22,222 plants per acre. Recommended agronomic practices were followed like application of FYM (8t/ha), NPK fertilizers, and pre-emergence herbicide Pendimethalin (30%EC) @ 5 ml/L water and for the control of grass weeds applied Fluroxypyr ethyl (9%EC) @ 1.25 ml/L of water in between rows of sunflower crop in the month of August. To control bird pest damage in sunflower crops, five treatments (Table.1) were imposed in three replications i.e., T<sub>1</sub>-Ribbon, T<sub>2</sub>-Castor Oil (25ml/L), T<sub>3</sub>-Salt solution (25ml/L), T<sub>4</sub>-Egg solution spray (25ml/L), T<sub>5</sub>-Control. All these five treatments were imposed at the time of the milky stage of the ear heads to till the harvest of the crop with a frequency of weekly intervals. Observations were recorded regarding the bird's occurrence and their damage pattern at the time of sprouting seedlings to crop maturity stages. Yields were recorded in each treated plot and untreated control plot during the month of October and the calculated percent increase of yield over the control, was converted to Kg/ha and also compared the treated yield with the untreated yield.

**Table 1:** Treatment details and particulars

Treatments	Particulars
T1	Ribbon
T2	Castor oil@ 25ml/lit
T3	Salt solution@ 25ml/lit
T4	Egg spray@ 25ml/lit
T5	Control

## Results

The Parakeets and house crows are serious bird and animal pests of sunflower crops under unprotected conditions. They cause damage particularly when the crop was in the germination stage and followed by the seed setting stage to the ripening stage (till harvest of the crop). The parakeets removed the seeds from the receptacle of the head inflorescence and fed on the



tender cotyledons by removing the seed coat. They damaged the sunflower grains when the crop is in the milky stage and continued to cause damage up to the maturity of the grains. Different treated sunflower fields cause little damage compared to the control.

The sunflower seeds which are treated with the castor oil @ 25ml/L of water showed the highest germination percentage (65.28%), followed by egg spray (56.62%), salt spray (52.82%), ribbon (47.66%), and in control (40.66%) (Table.2). The above findings confirm that the sunflower seeds treated with castor oil help less preferred by the parakeets due to the repellent tendency of the castor oil. The seed-eating birds were observed to attack the unprotected crop during the morning and evening hours every day after the seeds attain the milky stage. Bird damage to border rows was high compared to the inner and middle of the rows. Sunflower seed damage on the upper part of the head was more than the lower part of the head indicating the top of the sunflower head is easier to birds attack. In the different treated fields, a group of 10-27 parakeets and 5-10 crows were occasionally observed (Fig.2) in the vicinity of the field due to protection.

Among the five treatments (Table.3) sunflower seed yield was recorded highest (1,650.38<sup>a</sup>Kg/ha) in the castor oil spray plot followed by egg solution spray (1,419.63<sup>b</sup>Kg/ha), salt solution (1,366.25<sup>c</sup> Kg/ha), Ribbon (1,345.90<sup>d</sup>Kg/ha) compared with unprotected control (1,196.72<sup>e</sup>Kg/ha) above findings are in agreement with earlier reports by [9]. It is quite clear the seed damage was drastically reduced in the protected sunflower field due to less damage by birds.

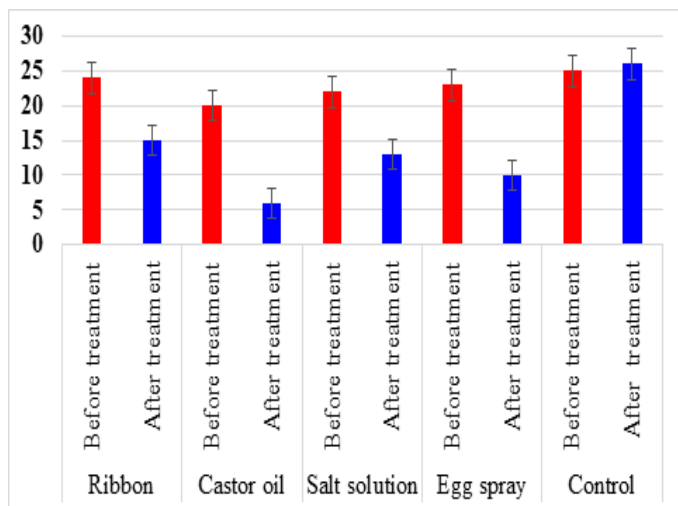
**Table2:** Observations on germination percentage along with different treatments

S.no	Treatments	Germination %
1	T <sub>1</sub> - Ribbon	48.00
2	T <sub>2</sub> - Castor oil	65.29
3	T <sub>3</sub> -Salt solution	52.82
4	T <sub>4</sub> -Egg spray	56.62
5	T <sub>5</sub> -Control	40.66
6	<b>Mean</b>	<b>52.68</b>
7	<b>SED</b>	<b>0.85</b>
8	<b>CD 5%</b>	<b>1.88</b>
9	<b>CV%</b>	<b>2.29</b>

**Fig.1:** Experimental sunflower field along with Parakeets damage

**Table: 3** Observations on Yield in Kg/ha along with different treatments

S.no	Treatments	Yield in Kg/ha	Percentage increase of yield over control
1	T <sub>1</sub> - Ribbon	1,345.90 <sup>d</sup>	12.47
2	T <sub>2</sub> - Castor oil	1,650.38 <sup>a</sup>	37.91
3	T <sub>3</sub> -Salt solution	1,366.25 <sup>c</sup>	14.17
4	T <sub>4</sub> -Egg spray	1,419.63 <sup>b</sup>	18.63
5	T <sub>5</sub> -Control	1,196.72 <sup>e</sup>	-
6	<b>Mean</b>	<b>1395.77</b>	-
7	<b>SED</b>	<b>30.70</b>	-
8	<b>CD 5%</b>	<b>67.61</b>	-
9	<b>CV%</b>	<b>03.11</b>	-



**Fig.2:** Number of birds recorded in different treatments

**Discussion**

Rose-ringed parakeets and house crow caused considerable damage to the sunflower crop in the control plot at AINPM on VPM, Rajendranagar, Hyderabad, Telangana state. This is supported by [7], who reported that birds caused considerable damage to the sunflower crop at Ludhiana (Punjab). The depredation to sunflower seeds by parakeets in the college research farm control field was found to be more than 70% compared to that with other treated fields. This is supported by [5], who reported that the bird damage to the sunflower field was 97% at Hyderabad, Telangana State. Earlier [8] reported that the sunflower crop was damaged 52% by bird pests in the arid environment at Jodhpur (Western Rajasthan). In the present study damage to sunflower crops by bird pests in the different treated fields such as castor oil spray> egg solution spray> salt solution spray>

ribbon tiedfields was found to be very less compared to that of control fields. This is supported by [1], who reported that bird damage to sunflower seeds was very less in Sacramento Valley, California (USA). It reveals that bird pest damage to the unprotected sunflower crop at the milky stage of the crop-to-seed hardening stage indicates the crucial period at which it needs to be protected.

**Conclusion:** The great mobility of foraging bird flocks poses the greatest challenge to developing and deploying an effective program of bird-damage management. So we need to follow the integrated approach for effective management of birds in the field and horticultural crops.

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**References**

- [1.] Avery, M. L. and Dehaven, R.W. (1984). Bird damage chronology and feeding behavior in two sunflower fields, Sacramento valley, California. Proceedings of XI In: Vertebrate pest conference, March 6<sup>th</sup> to 8<sup>th</sup>, 223-228pp.
- [2.] Cummings, J.,L. Guarino, J. L, Knittle CE. 1989. Chronology of blackbird damage to sunflowers. Wildlife Society Bulletin 17: 50–52.
- [3.] Dhindsa, M.S. and Saini, H.K. (1994). Agricultural ornithology: an Indian perspective. *Journal of Bioscience*. 19, 391–402.
- [4.] Linz GM, Homan HJ. 2010. Use of glyphosate for managing invasive cattail (*Typha* spp.) to protect crops near blackbird (Icteridae) roosts. *Crop Protection* 30: 98–104.
- [5.] Mehrotra, K. N. and Bhatnagar, R.K. (1979). Status of economic ornithology in India. Indian Council of Agricultural Research, New Delhi, India. 1-79.
- [6.] PJTSAU-Outlook. (2022-23). Yasangi (Rabi) 2022-23, Pre-harvest price forecast report of four crops. Agricultural market intelligence Centre,

- Rajendranagar, Hyderabad. 1-8.
- [7.] Ramzan, M and Toor, H.S. (1975). Damage to maize crop by rose ringed parakeet *Psittacula krameri* (Scopoli) in Punjab. *Journal of Bombay Natural History Society*, 70: 201-204.
- [8.] Rana, B. D and Idris, M. (1991). Evaluation of bird depredations to standing crops in an arid environment. *Pavo* (1-2): 61-66.
- [9.] Reddy, V. R and Gurumurthy, P. (2002-03). Reducing bird and animal pest damage in two sunflower fields with neylon nets and bird scarers. *Pavo* 40 & 41: 79-82.
- [10.] Reddy, V.R. (1998a). Bird damage to maize crop on the students research farm at Rajendranagar, Hyderabad, Andhra Pradesh. *Pavo* 36 (1-2): 77-78.
- [11.] Reddy, V.R. (1998b). Studies on damage to sorghum by the by rose ringed parakeet *Psittacula krameri* (Scopoli) at Rajendranagar, Hyderabad, Andhra Pradesh. *Pavo* 36 (1-2): 79-80.