



RESEARCH NOTE

Perception survey on Nilgai, *Boselaphus tragocamelus* (Pallas, 1766) incidence in crop land ecosystems around rural Jaipur, Rajasthan

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ABSTRACT: A study was conducted to understand the crop raiding by the blue bulls, *Boselaphus tragocamelus* in Chomu tehsil of Jaipur Rural district (Rajasthan) through a perception survey on crop damage and management measures practiced. The Socio-cultural sentiments and legislations rendering safety to the blue bulls irrespective of their interface in crop ecosystems revealed more of passive deterrent measures compared to the active deterrent measures followed by farmers during the study.

Keywords: Blue bull, deterrent, Chomu

The Blue Bull or Nilgai (*Boselaphus tragocamelus* Pallas, 1766) is the largest and highly adaptive antelope in India. In its wide range of distribution from the foothills of Himalayas to presence in 16 states of the country viz. Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir (now union territories), Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Uttar Pradesh, Uttarakhand, Jharkhand, West Bengal, the nilgai occurs in human dominated landscapes and crop fields in addition to protected areas (Chauhan, 2011). Due to loss of their natural habitat agricultural crop damage by nilgai is reported from different cropland ecosystems spanning India with suggestions on numerous management measures to minimize crop damage (Singh, 1995; Chauhan, 2011). Several reasons are attributed to the pestiferous activities of blue bull, such as rapid increase in population consequent to a ban on hunting and trapping, protection bestowed by the Wildlife Act of 1972, lack of natural predators, deforestation, overgrazing of grasslands by livestock, and religious protection given by Bishnoi (Sridhara, 2006).

Goyal and Rajpurohit (2000) have reported nilgai crop damage in Jodhpur. The nilgai were found in agricultural areas for foraging, trampling, resting in field and daily movements which are causing wide damage to the majority agricultural crops (Meena, 2017). Meena *et al.* (2014) reported indigenous measures developed by farmers to curb the menace of nilgai in district Rajsamand, Rajasthan, India. The present study was undertaken considering minimal reports from the selected study area in rural Jaipur. The objective of the present survey was to understand the perception of farmers about the damage

caused by nilgai and management measures undertaken to mitigate crop loss in and around Cheethwari village of district Jaipur, Rajasthan. Nilgai are spotted causing crop damage and farmers have devised measures to manage the herds.

The farmers thriving on agrarian economy grow Rabi and Kharif crops, harvesting crops for own consumption as well selling in market also. According to survey we found that farmers are facing problem (damage to crops, and economic losses) from the Nilgai. The populations of Nilgai increase in agricultural area due to lacks of predators. Adequate information on the population and eco-behavioural aspects of conflicting or co-existing fauna is essential for devising any strategy to mitigate crop damage by such fauna. On the other hand, cropping pattern and demographic details including the socio-economic status of the farmers also need to be understood. Considering this, the present survey was undertaken to gauge the situation in selected parts of the study area and to further the approach in future.

Study Area: The present survey was undertaken in 13 villages viz. Cheethwari (27°09'02.7"N 75°48'53.1"E), Basa (27°10'23.1"N 75°48'19.9"E), Samode (27°12'20.9"N 75°49'00.1"E), Sultanpura (27°10'49.4"N 75°47'47.5"E), Risani (27°07'08.8"N 75°48'04.2"E), Bilochi (27°07'08.8"N 75°48'04.2"E), Morija (27°09'08.1"N 75°45'32.5"E), Hathnoda (27°12'25.0"N 75°45'51.0"E), Kushalpura (27°11'14.7"N 75°48'14.7"E), Samarpura (27°09'51.8"N 75°50'17.0"E), Isarwala (27°08'49.4"N 75°50'56.1"E), Anantpura (27°07'50.3"N 75°45'32.3"E), Ghatwada (27°10'47.8"N 75°52'57.1"E), in Chomu tehsil, District Jaipur, Rajasthan (India). In

the study area, farmers grow different seasonal crops as follows.

- **Rabi crops:** wheat (*Triticum aestivum*), barley (*Hordeum vulgare*), pepper (*Capsicum annum*), mustard (*Brassica campestris*), garlic (*Allium sativum*), carrot (*Daucus carota*), onion (*Allium cepa*), cabbage (*Brassica oleracea var. capitata*), cauliflower (*Brassica oleracea var. botrytis*), raddish (*Raphanus sativus*), pea (*Pisum sativum*), gram (*Cicer arietinum*)
- **Kharif crops:** sorghum (*Sorghum vulgare*), bajra (*Pennisetum sp.*), broom-corn (*S. vulgare*), maize (*Zeamays*), cucumber (*Cucumis sativus*), watermelon (*Citrullus lanatus*), bhendi (*Abelmoschus esculentus*), tomato (*Solanum lycopersicum*), eggplant (*Solanum melongena*), moong (*Phaseolus mungo*), ground nut (*Arachis hypogeal*), Sesame (*Sesamum indicum*), Guar (*Cyamopsis tetragonoloba*).
- Vegetables cultivated include, tomato, pea, chilli, brinjal, cabbage, cauliflower are cultivated throughout year. Study areas are widely practiced agricultural areas and has wild patched of bushes and trees.
- Prominent flora of the landscape are khejri (*Prosopis cineraria*), ber (*Zizyphus mauritiana*), ker (*Capparis deciduas*), vilayti babool (*Prosopis juliflora*), kikar (*Acacia nilotica*), and raunja (*Acacia leucophloea*), Sisso (*Dalbergia sisso*), munja (*Saccharum munja*), kair (*Capparis dessidua*), milkweed (*Calotropis gigantean*, *C. procera*), *Euphorbia caducifolia* (thor danda), ashwagandha (*Withania somnifera*).

During the present study random surveys were conducted during December 2018 to June 2019, in winter and summer season in the study area to assess the crop damage caused by nilgai and the measures taken by farmers. A structured questionnaire was designed to obtain information from ninety one farmers (seven from each village) with prior consent. Direct field observation was undertaken all through during different times of the day.

Demographic details of interviewees: Diverse category of land holding farmers (socio-economic strata) are part of the perception survey viz. Landless: 2, Marginal: 9, 1-2 Hectares: 20, 2-4 Hectares: 34, 4-10 Hectares: 24, more than 10 Hectares: 2. The survey provides perspectives of the genders (65 are Male and 26 are female) and different age groups viz. 30 - 40 years of

age (16 farmers), 41-50 (27), 51-60 (43 farmers).

Of the total ninety one farmers interviewed 73 (80%) harvest and used their crops for household consumptions and market sale, 18 farmers (20%) grow crops for household consumption only. Destruction of crop parts (fruits, flowers, leaves, roots and whole plants) by feeding and trampling by hooves accounts to 20-25% (11 farmers), 15-20% (61 farmers), 10-15 % (19 farmers) less compared to 50-60% losses suffered in other parts of the country (Meena *et al.* 2014). The nilgai 'harem' comprises of a bull, 2-10 cows and their young (Dharakumarsinhji, 1959) or 4-20 individuals (Goyal and Rajpurohit, 2000), the number of spotting the herd by farmers is well within this range, 27 farmers responded 1-3 individuals, 42 responded (3-6), 16 (6-9) and 6 of them responded (9 or more nilgai) being spotted. Indirect Signs of the animals on fields was spotting their Dung or their vocalization. Although the species is diurnal, majority of the farmers (63.7%) observed crop raiding by nilgai in the dusk-night time phase compared to dawn-noon phase (36.3%). In the field area, indirect sign of nilgai are in form of their excreta (dung).

In addition to crop depredation, crop trampling also causes damage and crop loss. Crop protection strategy of farmer in the study area is guarding their crops in the field day and night frequently. For this strategy farmers use following two measures:

- **Passive deterrent Measures:** Passive deterrent measures followed by farmers in the study area are viz. scare crow (78 responses), fencing of wooden twig of *Prosopis cineraria*, *Acacia nilotica*, *Zizyphus* spp. and *Morus alba* (69), Iron wire fencing and mesh netting (81) (fig.1), but none resorted to use of toxicants, fumigants, solar fencing or trenching. Babul (*Acacia nilotica*), ber (*Zizyphus* sp), vilayati kikar (*Prosopis juliflora*), Munja (*Saccharum munja*) are grown as bio-fence
- **Active deterrent measures:** The common active deterrents measures include Guarding and driving away by vocalization by farmers (47 responses), driving away by drum sound (20), bursting crackers (16), driving away using fire (6) (Fig.2) but none responded to pelting stones and scare shooting.

In the study area passive measures practiced more compared to active measures is indicative of the tolerance of farmers and the minimized hostilities against nilgai. This despite the nilgai listed Least Concern (IUCN) and category III of the Indian Wildlife Protection Act. Interaction with farmers revealed use of short term indigenous techniques and also those widely practiced

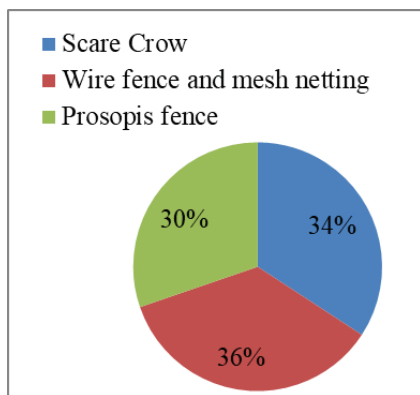


Fig 1. Passive deterrent measures recorded during the survey

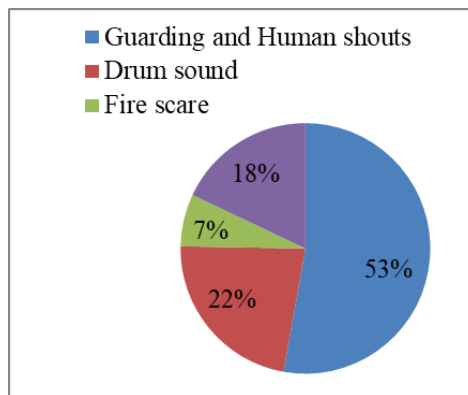


Fig 2. Active deterrent measures recorded during the survey

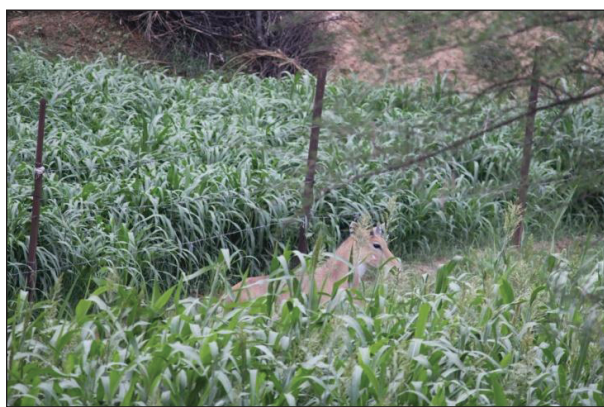


Fig. 3. Nilgai spotted in Sorghum field in Cheethwari village

in most parts of the country as measures to prevent crop damage by nilgai (Fig. 3-5). In addition, there are mitigatory measures suggested by earlier workers (Singh, 1995; Chauhan, 2011). However, future studies on population dynamics, movement and crop depredation by nilgai in the selected areas needs to be undertaken.

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