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Use of Chilli Fences to Deter Asian Elephants - A Pilot Study

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Background

Use of chilli as an elephant deterrent has been experimented in several countries like Kenya (Parker *et al*. 2007; Graham *et al*. 2009a, 2009b), Zimbabwe (Osborn & Rasmussen 1995; Osborn 2002; Osborn & Parker 2002, 2003; Parker & Osborn 2006), Mozambique (Parker & Anstey 2002) and Indonesia (Hedges & Gunaryadi 2009), and has proven to be effective under certain circumstances but not others.

As a part of the human elephant conflict mitigation strategy being implemented in the North Bank Landscape (NBL) in Eastern Himalayan foothills in India, an experiment on the efficacy of chilli based deterrent against elephants was tried for the first time by the NBL Conservation Program of WWF India. The study was conducted in the Sonitpur district of Assam, where elephant depredation is seasonal and occurs during September to January every year.

Material and methods

A sugarcane growing plot (2.2 ha) in Beseria village was selected for the trial. Salient features of the plot were:

- Close proximity to the Arimora Chapori, a Riverine island of river Brahmaputra where elephants congregate and take shelter during the depredation season.
- Close proximity to one of the major raiding tracts of elephants.
- The land had been left fallow due to fear of elephant depredation. Therefore there was a high expectancy that elephants would visit the area.
- Sugar cane is a preferred food of elephants.
- Rather than selecting an individual beneficiary, a cooperative group (Shyamoli Self Help Group) was selected for manpower support and monitoring.

The experiment was conducted during the sugarcane growing season overlapping elephant depredation season (November-December 2005).

Materials used to construct the chilli fence:

- Fresh green chilli
- Rope
- Grease
- Bamboo poles
- White cloth
- Surgical gloves
- Diesel (as thinner)

A locally grown chilli 'bhut jolokia' (*Capsicum frutescens* var. *nagahari*), known to be the hottest chilli in the world was selected for the purpose (Fig. 1). The chilli was purchased from the local market at Tezpur and sun dried in the office terrace. It was later taken to a grinder and powdered.

Chilli paste was prepared by mixing the chilli powder with grease, and diesel was used as a thinner to make the paste soft enough for handling and smearing. The paste was then smeared on ropes (Fig. 2) and white cloths, and put up around the selected plot. Two strands of ropes running at 3' and 5' height were supported by 6' high bamboo poles around the plot (Fig. 3). A total length of 1000 m rope was used. White cloth smeared with the paste was also put up on

Figure 1. *Capsicum frutescens* (bhut jolokia).

the ropes at different places, as elephants are known to be attracted by such colour.

Precautions were taken in handling of the chilli powder and paste by using surgical gloves and masking the face with cloth so as to avoid any direct contact of the chilli or paste with bare skin. The paste was reapplied after two weeks as it was observed that the pungency of the treated ropes reduced when exposed to the elements.

Results

No elephant attacks on the pilot sugarcane plot were recorded during the experiment and contrary to expectations; the closest approach by elephants was 500 m. In the absence of any wild elephant attacks, to test the efficacy of the method, captive elephants were commanded to approach a chilli paste smeared rope. The captive elephants approached the rope but refused to touch the rope. Based on the response of the captive elephants, it can be surmised that wild elephants would be deterred by the chilli paste from breaking such fences. However, as wild elephants did not approach the selected plot, a definitive conclusion of its effectiveness could not be made.

Figure 2. The chilli rope.

The cost of material for putting up the chilli fence for the test plot was nearly Rs. 20,000 (US$ 400) (Table 1). The sugarcane crop yielded 2000 kg of molasses (jaggary or *gur*) with a local market value of Rs. 40,000 (US$ 800).

The cost of the fence was almost 50% of the total value of the produce (excluding the labour and other production costs of the crop).

Conclusion

The cost of chilli was almost 70% of the total cost of the fence. Decreasing the cost of raw material (chilli) or finding an alternative could make it more viable. An additional issue was the loss of pungency of the chilli when exposed to the elements, especially sun and rain. Frequent re-applications are an additional issue as application is labour intensive.

The cost involved in protection of agricultural produce with chilli fences was too high for it to be economically viable, and for its widespread adoption by farmers and communities as a crop protection method.

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Table 1. Break up of the expenses.

Item	Quantity	Unit price [INR]	Cost [INR]
Fresh green chilli	95 kg	150	14,250
Rope	1000 m	2	2,000
Grease	20 kg	85	1,700
Bamboo post	120 nos	5	600
White cloth	12 m	10	120
Surgical glove	10 pairs	30	300
Diesel (as thinner)	10 l	33	330
Total (in INR)			19,300

Figure 3. Erecting the chilli fence.

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Figure 4. The Shyamoli Self Help Group.