

## Pest and Environmental Specific Application of Ultrasound in Pest Control

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### ABSTRACT

In an earlier work [1] and [2], it was advocated that electronic pest control devices should be pest specific as well as environmental specific in order to fortify them against habituation, a phenomena that has stirred controversies which affect smooth implementation of such devices. Weaver birds were selected as the specific/targeted pest while Doko community of Niger State, Nigeria is the specific environment for this work. Ultrasonic testing for determining the suitability of ultrasonic pest control devices for a specific location was deployed. This involves the use of independent equipment such as: 12 volt car battery, 500 watt inverter, signal generator, power amplifier and five ultrasonic transducers. Transmission frequencies between 5 kHz and 50 kHz was used for broadcast in selected weaver bird infected farms while observing the behaviour of the birds and computing the bird-flight, bird-return and the feeding-test data across the entire frequency band. Observation from the computed field data reveal that ultrasound at 25 kHz and 35 kHz effectively deterred the birds for the first three weeks, followed by a partial repulsion in weeks four and five, and finally became ineffective beyond week five. Recommendation was made for the design of an ultrasonic type of electronic pest control device operating between 25 and 35 kHz while intermittently incorporating local bird scaring parameters into the design consideration to effectively deter the rampaging weaver birds as well as delay habituation in the locality.

**Keywords:** Weaver birds, ultrasound testing, bird-flight, bird-return, mass flight.

### Aims Research Journal Reference Format:

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## 1. INTRODUCTION

The idea of pest control in modern day agriculture is multifaceted. It transits beyond the traditional/conventional methods such as chemical, biological, genetic control methods as well as cultural practices and physical pest control methods to other unconventional methods such as the integrated pest control and the electronic pest control. Electronic pest control devices refer to several types of electrically powered devices designed to repel pests. This work focuses on the ultrasonic type of electronic pest control devices. It is designed and constructed to emit ultrasound which is sound of frequency above 20 kHz [3]. This value of frequency is inaudible to the human ear, but when targeted at pests, it makes them uncomfortable within the area of coverage thereby repelling them away from the area without affecting the environment and non target organisms including man. Sound (or noise) is traditionally used to chase swarms of birds and rodents away from farms. Also, broadcast of alarm and mimicry of predator have also been used [4]. Human ear is sensitive to mechanical vibration ranging from 20 Hz to approximately 20 kHz which is called the audible range. Differences, however, exist for various animals which have audible ranges mostly beyond that of humans. All of these ideas have been harnessed to put forward this novel pest control method that is cheap, eco-system and environmentally friendly and has no known risk to human [5].