

DEVELOPMENT OF A MECHANICAL BIRD SCARING DEVICE

Folasayo Titilola Fayose^{1*}, Babatope Albert Alabadan¹, Adesoji Mathew Olaniyan¹, Segun Fakayode¹, Christopher Okonji¹, A.T. Ajiboye², Emmanuel Sunday Ajayi¹, Abraham Olusola Oloye¹, A.G. Ibrahim³

¹ Federal University Oye, Oye-Ekiji, Ekiti State

² University of Ilorin, Kwara State

³ Federal University of Technology, Minna, Niger State

*Corresponding author: folasayo.fayose@fuoye.edu.ng

ABSTRACT: Rice (*Oryza sativa*), is one of the most consumed staple food for most people in the developing countries especially in Asia and West African Sub-region. However, its cultivation is being faced with the menace of bird infestation which has led to its reduced production in Nigeria. Consequently a large proportion of foreign exchange is being spent on massive importation of the commodity into Nigeria. Although efforts have been made in the past to devise ways of scaring these birds, yet manual methods is still the practise. In this study, a mechanical bird scaring devise was developed based on standard engineering principles. The bird scaring device consist of a hopper, a rotating arm with batons fixed on the opposite two dynamically balanced edges, a chute to convey the stone (made of extruded saw dust) to the throwing arm, rotating frame, damper and power transmission systems. Each touch of the stone on the rice stalk will scare the birds. Also, the materials of construction were made of light materials to enhance the propelling ability of the throwing arms and to give room for vibration which assists the letdown of the stones from the hopper. The designed capacity of the bird scarer is 960 throws/hour and the area of coverage is perimeter of 30m.

Keywords: machine design, mechanical bird scarer, rice,

INTRODUCTION

Rice (*Oryza sativa*), is one of the most consumed staple food for most people in the developing countries (Dowling et al., 1998, Chen and Murata, 2002), especially in Asia and West African Subregion. It is a major staple food that has the fastest growing commodity in Nigeria's food basket (Akande, 2003). The demand for rice far exceeds the production which in the last 30 years in Sub-Saharan Africa (SSA) has increased by 70% due mainly to land expansion and only 30% due to increase in productivity (Fagade 2000). Although, Nigeria is the largest rice producer in West Africa and produces about 50% of the rice grown in the sub region. Nevertheless, Nigeria still spends a large proportion of its foreign exchange on the importation of rice because of the high demand and consumption rate. According to USAID MARKETS (2008), total consumption of rice stands at 4.4 million tons of milled rice while annual consumption per capita stands at 29kg.

Of all the problems of rice production, birds scaring tends to be one of the major problems of farmers across the globe and the least discussed in literature. It is also one of the cultural practices in rice production which involves an array of activities aimed at driving away birds from rice during specific period the crop is growing in the field. Due to prevailing bird challenges of rice production in Africa, it has been difficult to achieve the full potential of the existing rice production systems in Africa. According to USAIAD MARKETS (2008) birds are known to be a problem during grain filling or milk stage. This neglect has in effect arrested bird scaring technologies that upgrade the traditional tedious and laborious use of women and children in bird scaring. Bird scaring in traditional African agricultures is an important part of a family's farming activity (Doggett 1957). To this many farmers, in their frustration, resort to hiring shamen and to using fetishes objects in attempts to alleviate damage caused by birds or to divert them.

In spite of the importance of rice in the economy of Sub-Sahara Africa, manual labour still predominates the bird scaring operations. Although the adverse impact of birds on rice has received much international attention in the past and is still generally recognized, nevertheless, little research on bird damage or control is currently conducted. Also, it is known thatbirds easily get used to the use of ultrasonic devices alone. However, whenever something touches the rice stalk or the birds infesting it, the birds will be effectively scared. It is against this