

## PRODUCTIVITY OF HONEYBEES IN OIL PALM INTEGRATED SYSTEM IN NIGER- DELTA OF NIGERIA

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### ABSTRACT

*For two consecutive years in Abbi, Delta State of Niger-Delta of Nigeria one, two and three beehives were integrated in oil palm plantation to determine optimum productivity of the oil-palm honey bee farming system. The fresh fruit bunch (economic yield) of the oil palm was statistically similar at 0, 1, 2 and 3 bee hive(s) per hectare. The honey yield were statistically similar for each bee hive/kg/ha while the total honey yield/production was significantly higher in the order of three > two > one bee hive/ha. Result obtained in this study indicates that productivity of oil palm plantation + three Beehives/ha which produced more honey is recommended.*

**Keywords:** African honeybee, economic yield. honey-yield, oil palm

### INTRODUCTION

Honey is sucked nectar, saccharine exudation of plants, modified by honeybees and stored in beehive (s). It is rich in albumen, amino acid, ascorbic acid, copper, folic acid, fructose, glucose, iron, maltose, nicotinic acid, nitrogen, sodium, sucrose, vitamins B1, B2, B5, C4, D and K (Ayansola, 2003). It is used as tonic food, promotes growth, maintains acid - base balance of the body, has antibiotic properties and used for spiritual and mystical purposes (Holy Bible, 2000; Ayansola, 2003; Ayodele and Onyekuru, 2005)

Most honey is sourced from honeybees in the wild. Honeybees and tree crops especially flowering plants has a symbolic relationship. The flowers provide nectar, a carbohydrate food for the bees, which is a raw material for honey production, while the bees in turn pollinate the flowers which enable the plant to reproduce. The demand for honey supersedes its supply in the tropics especially in Nigeria. This makes honey expensive beyond the reach of the poor resource persons. These short-falls are partially augmented with importation and adulteration of the original honey with burnt sugar. This short-fall and sharp practice of adulteration can be circumvented by adopting apiculture/bee keeping in tree crop plantation. Crops such as oil palm, rubber, cocoa and kolanut have been suggested for integrated system Apiculture. Bee keeping creates employment and regular source of income for the farmer.

Regrettably, however, Bee keeping/Apiculture is unexplored in Nigeria especially Niger-Delta region of southern Nigeria which has a lot of trees and tree crops. Consequently, this has necessitated this research work with objective as to evaluate the productivity of Honeybee in Oil palm plantations in Niger-Delta region of Nigeria.

### MATERIALS AND METHODS

The study was conducted from 2005 to 2007 in a 20 years old plantain in Abbi. Abbi is located at 05o 43N and 06o 15E of the equator, and in Ndokwa West Local Government Area of Delta State, in Niger Delta of Nigeria. It is in the rainforest zone, which is characterized by wet season between April to September/October in the year.

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The experiment was designed in Randomized complete block design with 3 replicates. Each plot measured 36m x 48m containing 30 palm trees. The treatment were

T1 Palm tree alone

T2 Palm tree + 1 Bee hive

T3 Palm tree + 2 Bee hives

T4 Palm tree + 3 Bee hives

The total plot size was 2.0736ha with a total of 360 palm trees. A Kenyan top bar bee hive(s) (Paterson, 1988), was constructed and attached to the middle palm in each plot according to the treatments. The hive stand(s) were coated with spent lubricant to protect the colony from insect/ants. Honey collected from *Apis mellifera odansonii* (African bee) were introduced in the month of February 2006 and in 2007. Honey yield from African bees' colony/colonies was harvested periodically.

The Fresh Fruit Bunch (FFB), the economic yield was harvested from each of the experimental plots, as they were observed ripe in 2006 and 2007 respectively. The honey yields were harvested twice yearly. These economic yields (FFB and honey) were subjected to analysis of variance (SAS, 1996) and treatment means separated using Duncan Multiple Range test (Duncan, 1955).

## RESULTS AND DISCUSSIONS

### ECONOMIC YIELD OF OIL PALM

The FFB of oil palm as influenced by bee keeping in hive(s) is presented in Table 1.

The FFB was not significantly influenced by Bee in beehives ( $P > 0.05$ ) in years of study. This could be adduced to Honeybees not restricted to certain palm for nectar utilization and pollination since pollination in oil palm was mainly by insects especially *Elaeidobius* weevils (Jacquemard, 1998). The factors for FFB production of oil palm can be soil nutrient, rainfall and sunshine (Jacquemard, 1998) rather than pollination from the honeybees alone. Since the palm plantation was in favorable environment, could have resulted in no

Table 1: Economic yields of oil palm in oil-palm-Bee farming system

Treatments	t/ha/yr
T1 Oil-palm plantation alone	29.83 a
T2 Oil palm plantation + Bee live	29.84 a
T3 Oil palm plantation + 2 Bee hives	29.80 a
T4 Oil palm plantation + 3 Bee hives	29.79 a
Mean	29.81

Values with similar alphabets are not significantly different at 5% level of probabilities using Duncan Multiple Range test.

significant difference in FFB of oil palm trees with or without Bee hive(s). The FFB yield of 29.79-29t/ha/yr is higher than 7.5-15t/ha/yr of some states in Africa and higher than average of 23t/ha of Cote d' Ivoire but lower than economic yield in Malaysia (Jacquemard, 1988). Similarly, Redshaw and Siggs (1993) reported a lower yield of 23.0-26.0t/ha/yr with 143 plants per hectare.

### HONEY PRODUCTION

The honey yields in oil palm - Bee integrated farming systems of 2 years are presented in Table 2. The honey production per hive was statistically similar for 1 or 2 or 3 bee hive(s) per hectare per annum. It ranged from 17.60 to 19.05kg. However, the honey yield was in the order of 1 beehive > 2 beehives > 3 beehives. The Honey yield agrees with Morton (2001) who reported an average yield of 0-110 pounds (0-45.75kg) per colony and also

reported higher yield of 56 pounds (25.40kg) for 2000 and 60 pounds (27.26kg) in Southeast of United Kingdom. Similarly, Thimann and Manrique (2002) reported honey yield of 17-26kg/hive in colonies in Brazil for each of 2 harvests per annum which is lower than Venezuelans average yield of 20kg/colony (Manrique and Piccirillio, 2001).

The total honey yield was observed highest in 3 beehives per hectare per annum and was significantly higher than ( $P < 0.05$ ) the yield of 2 or 1 beehive per hectare per annum (Table 2). The higher yield can be adduced from strong colonies having larger number of forager

Table 2: Honey yields in oil-palm-Bee farming system

Treatments	Honey yield (Kg /hive annum)	Honey (Kg/ha/annum)
T2 1 Bee hive + Oil palm plantation	19.05a	38.10c
T3 2 Bee hives+ Oil palm plantation	18.10a	72.40b
T4 3 Bee hives+ Oil palm plantation	17.60a	106.00a
Mean	18.25	72.17

Values with similar alphabets are not significantly different at 5% level of probabilities using Duncan Multiple Range test.

bees with available palm plantain and other flowering plants. This congruent Ferrar (1993) who reported that Beekeeper's main interest is to maintain healthy and strong colonies, which results in higher honey yield.

## CONCLUSIONS

This study has therefore shown that 3 bee hives in oil palm plantation significantly out yielded 2 or 1 bee hive(s) per hectare per annum in honey production is thus recommended in oil palm plantation is a steady source of income from apiculture, since it does not depreciate the yield of oil palm.

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