

# Influence of Cassava Mill Effluent on the Growth Rate of Two Selected Arable Crop Species (*Zea mays* and *Vigna unguiculata* L)

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## Abstract

Hydrogen cyanide is the dominant element in cassava mill effluent with several toxicological implications. Physiochemical analysis was carried out on the soil samples gotten from three different cassava tuber processing mills located at Amaoba, Umuarigha I, and Umuarigha II in Ikwuano Local Government area of Abia state. The parameters investigated were pH, nitrogen, phosphorous, organic carbon, organic matter; others were the sodium, calcium, potassium and magnesium contents. All the afore-mentioned parameters were also analyzed for control sample. The result showed that there was an increase in soil pH, nitrogen and magnesium content of the cassava mill soils. The effect on plant growth rate was studied using maize and cowpea as test crops. The number of leaves, stem girth and length was recorded for a period of eight (8) weeks. The result after eight (8) weeks showed that the growth rate of seedlings on the soil of the three different cassava mills was rapid more than that of the control. This research shows that the cyanide content of the cassava mill effluent had a stimulatory effect on the parameters measured and could serve as an efficient source of nutrient to the soil and thus to crops, making it an alternative to mineral fertilizers.

Keywords:

Cassava mill effluent; Hydrogen cyanide; *Zea mays*; *Vigna unguiculata* L

## Introduction

Cassava (*Manihot esculenta* Crantz, synonymous with *Manihot utilissima* Rhol) belongs to the family Euphorbiaceae. It is mainly a food crop whose tubers are harvested between 7-13 months based on the cultivars planted. The tubers are quite rich in carbohydrates (85-90%) with very small amount of protein (1.3%) in addition to cyanogenic glucoside (Linamarin and Lotaustiallin) [1,2]. The high carbohydrate content makes cassava a major food item especially for the low income earners in most tropical countries especially Africa and Asia [3]. The edible tubers are processed into various forms which include chips, pellets, cakes and flour. The flour could be fried to produce garri or steeped in water to ferment to produce fufu when cooked [4,5]. Cassava is one of the over 3000 types of plants that produce cyanogenic compounds [6,7] releases hydrogen cyanide (HCN) upon hydrolysis. This process of HCN production is known as cyanogenesis and makes cassava a potential toxic food to humans [8].

Fermentation is one of the oldest and most important traditional food processing and preservation techniques. Food fermentations involve the use of microorganisms and enzymes for the production of foods with distinct quality attributes that are quite different from the original agricultural raw material. The conversion of cassava (*Manihot esculenta* Crantz syn. *Manihot utilissima* Pohl) to garri illustrates the importance of traditional fermentations.

Cassava tubers are rich in starch (20-30%) and, with the possible exception of sugar cane, cassava is considered as the highest producer of carbohydrates among crop plants. Without the benefits of modern science, a major

## A Uf]UgUbXA YhcXg

### Gi XnlfYU

The study was conducted by random collection of soil samples from three selected cassava mills (Amaoba, Umuarigha I and Umuarigha II) within Ikwuano L.G.A of Abia State.

Ikwuano is a local government area with its headquarters at Isiala Oboro. It has an area of 218 km<sup>2</sup> and population of 137,933. Ikwuano falls with latitude of 050 270 N and longitude of 070 340 E. It is characterized by bimodal rainfall, high temperature 290-320 with relative humidity. The people are known for agricultural and marketing activities while the soil texture is sandy loamy.

### GUa d'YW`YM]cb#dFY]a ]bUfngc]`UbUng]g

Preliminary soil analysis was carried out on both soil samples of the three different cassava mill sites and control sites to determine the physicochemical properties of the soil. Soil samples were randomly collected from the three different cassava mill sites at 15 cm depth.



Result (Table 5) show that stem girth (maize) had no significant difference on the first week and from the third week to the eighth week there was a significant difference in the stem girth of the samples from the control.

Treatments	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
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8 | ggcb

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