

DETERMINATION OF SOME ENGINEERING PROPERTIES OF SWEET POTATO (*Ipomoea batatas*)

Balami, A. A, Adebayo, S. E. and Adetoye, E. Y.
Department of Agricultural and Bioresources Engineering,
Federal University of Technology, Minna,
NIGERIA.
aabalami783@yahoo.com

ABSTRACT

This work presents the determination of some engineering properties of sweet potato, (shape, size, colour, volume, particle density, sphericity, weight, surface area and compressive strength) was determined at moisture contents of 81.2%. Under approved standard laboratory conditions and using standard methods and instruments, experiments were conducted and results were obtained. The highest value of compressive strength for sweet potato when placed in the horizontally and vertically are 7.07 kN and 5.62 kN respectively. In bagging and sorting of sweet potato special care should be taken in placing the sweet potato in a horizontal position due to the compression of the weight of the sweet potatoes when bagged, the maximum values of the Major, Intermediate and Minor Diameter are 70.92mm, 63.01mm and 44.73mm respectively, the minimum values were calculated to be 56.0mm, 29.0mm and 38.77mm respectively, and mean to be 74.33mm, 41.04mm and 38.77mm respectively. These values were used for sorting, grading and construction of sieve to separate the values below the mean obtain. The coefficient of variation of the major, minor and intermediate was gotten to be 20.6%, 15.8% and 16.6% respectively. These results are important for maximum efficiency in designing equipment required for further processing of sweet potato and the reduction of mechanical damage to agricultural produce during postharvest handling and processing.

Keywords: Engineering properties, sweet potato, sphericity, compressive strength

INTRODUCTION

The sweet potato (*Ipomoea batatas*) is a dicotyledonous plant that belongs to the family Convolvulaceae. Its large, starchy, sweet tasting tuberous roots are an important root vegetable (Purseglove, 1991; Woolfe, 1992). The young leaves and shoots are sometimes eaten as greens. Of the approximately 50 genera and more than 1,000 species of Convolvulaceae, *I. batatas* is the only crop plant of major importance – some others are used locally, but many are actually poisonous.

The ever increasing importance of agricultural produce such as sweet potato (*ipomoea batatas*) together with the complexity of modern technology for their production, processing and storage need a better knowledge of engineering properties of these products. It therefore became very necessary to understand the physical principle guiding the response of these agricultural produce so that processes, handling and machine operations can be designed for maximum efficiency and the quality of the final products. The develop nations of the world practice the modern agriculture, which is the use, handling and processing of plants and animal materials by various