



## Sawdust as an Organic Amendment on Uptake of Herbicide Residues by *Amaranthus dubius* in Contaminated Soil

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### ABSTRACT

Herbicide use and varieties have greatly risen during the past few years. As a result of this, concern over potential health effects such as cancer, birth deformities, reproductive issues, tumours, and harm to the liver, kidneys, and nervous system is on the rise. This has an impact on the environment because the misuse of herbicides contaminates the soil, water, and air; harming the local ecology and other living things vital to preserving ecological balance. This study investigated the effect of sawdust as an organic amendment on the mobility of herbicide residues in contaminated soil, in which Chinese Spinach (*Amaranthus dubius*) was grown. Sawdust from Doka (*Isobertinia doka*), African Mahogany (*Khaya senegalensis*) and Beach Wood (*Gmelina arborea*), were used in a randomized complete block design. A composite sample of topsoil (110 kg) and sawdust compost (10 kg) was used. 120 kg of topsoil without sawdust compost was also used as control. *Amaranthus dubius* was planted in the potted mixtures and 120 ml of herbicide (Glyphosate 41% SL) was diluted with 5 litres of water and was applied to all treatments at an equal rate after sowing. Gas Chromatography Mass Spectroscopy (GCMS) analysis of the active ingredient in the glyphosate 41% SL indicated that the quantity of Isopropylamine was 34.093 ppm. The highest mean of Isopropylamine (32.75 ppm) was found in the control treatment without sawdust amendment, as compared with other samples. The chemical herbicide was detected, at negligible rates, in *Amaranthus dubius* grown in the soil amended with *Gmelina arborea* (10.49 ppm) and *Khaya Senegalensis* (8.93 ppm). The concentrations in *Amaranthus dubius* from the two amended soils were significantly lower than that of the control (22.56 ppm) without compost treatment. However, no herbicide was detected in the vegetable raised on soils amended with compost made from *Isobertinia doka* species.

### 1. Introduction

According to research, majority of farmers use synthetic pesticides to manage weeds in an effort to minimize, or completely eliminate yield losses and maintain excellent product quality [1]. For more than 50 years, chemical herbicides have aided in the preservation of crop, human, and animal health. However, due to a lack of resources, herbicide management in underdeveloped nations is frequently insufficient. This is

especially true in nations where laws are not properly followed, and farmers frequently lack appropriate knowledge about safe handling practices [2]. Many African nations, including Nigeria, struggle with lax import regulations, inadequate instruction on the proper use of herbicides, inappropriate donations and pushy sales tactics, subpar storage and stock management, pressure to build emergency supplies, and a lack of safe preservation technology [3]. Despite the fact that most farmers are inclined to use herbicides, many are ignorant

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