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Effect of the use of *Tithonia diversifolia* on the growth parameters of groundnut (*Arachis hypogaea*) and the nutritional and health quality of its grains

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Abstract

Peanut (*Arachis hypogaea*) is cultivated in the world because of its richness in oil, proteins, fibers, minerals, vitamins, antioxidants, biologically active polyphenols. It is both a cash crop and a food crop, and gives rise to multiple forms of production and processing. But the common droughts, the excessive use of chemical fertilisers, as well as the lack of seeds and infrastructures, in particular for the drying and the storage of crops, are an environment conducive to the infestation of peanuts by *Aspergillus flavus*. exposing consumers to aflatoxin contamination. This work aims to study the effect of *T. diversifolia* la on the germination rate, the incidence of *Aspergillus flavus* and on the growth parameters of peanut kernels. The experiment on the study site was conducted on an experimental field of 725.75m^2 of cultivable area in a split plot layout; with the main factor being the amendment and the secondary factor being the spraying. Amendment with *T. diversifolia* powder 40 g/plant, NPK 10 g/plant and control soil without amendment, while spraying was done with aqueous extract of *T. diversifolia* 2 %, liquid digestate of *T. diversifolia* 20 % and 0.1 % NPK solution every 14 days. During field experimentation parameters such as; plant height (cm), number of branches per plant, number of pods, number of grains per pod, weight of 100 fresh grains (g), fresh and dry grain yield (t/ha) have been recorded. Peanut kernels from plants that received *T. diversifolia* in different forms gave the best results regarding: plant height (50±0.2 cm), number of branches (18±1.00), number of pods/plant (25.50±1.0), 100-grain weight (45.30±3.00g), fresh grain yield (2.56±0.14 t/ha) and dry grain yield (1.17± 0.05 t/ha). Bio-fertilisers also gave the best results regarding: lipid content (50 %), total sugar (30 %), polyphenols (10,239 mg/100g), flavonoids (21,388.89 mg/100g), dry matter (91. 61 %), and ash (5 %); germination power (91 %); and the incidence of *A. flavus* (30 %). In conclusion, the aqueous extract, powder and digestate based on *T. diversifolia* improve growth parameters, nutritional quality, germination, and reduce the incidence of *Aspergillus flavus* of peanut kernels and can be used in the formulation of bio-fertilisers.

Keywords: *Aspergillus flavus*, bio-fertilisers, germinative power, peanut, *Tithonia diversifolia*

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