

Effect of Variety and Management Practices on Soil Arthropod Management, Yield, and Aflatoxin Contamination in Peanut Production across Three Geographical Locations of Ghana

A. SEIDU*; Department of Crop Science, Faculty of Agriculture, Food and Consumer Sciences, University for Development Studies, Nyankpala, Tamale, Ghana and Council for Scientific and Industrial Research-Savanna Agricultural Research Institute, Nyankpala, Tamale, Ghana; I.K. DZOMEKU, Department of Crop Science, Faculty of Agriculture, Food and Consumer Sciences, University for Development Studies, Nyankpala, Tamale, Ghana; M. ABUDULAI, J.A. NBOYINE, and F. ANAMAN, Council for Scientific and Industrial Research-Savanna Agricultural Research Institute, Nyankpala, Tamale, Ghana; and D.L. JORDAN, Department of Crop and Soil Sciences, North Carolina State University, Raleigh, NC 27695.

Peanut (*Arachis hypogaea* L.) yields are often low among smallholder farmers in Ghana. To address low yields, field experiments were conducted in the 2020 and 2021 cropping seasons to evaluate the effect of location (Nyankpala, Wa, and Kumasi), variety (Chinese and Sarinut 2), and two approaches to pest management including: 1) traditional farmer practices (FP) and 2) improved practices (IP) on soil arthropod abundance, pod damage, and yield of peanut. Farmer practices consisted of the farmer management such as weeding the field once without any protection, while improved practices comprised an additional weeding, insecticide spray to suppress foliar insects, and applying local potassium-based soaps to suppress arthropods and pathogens. Severity of leaf spot disease, the number of aphids and soil arthropods at harvest, and scarification and pods penetration by soil arthropods were higher on the FP compared with the IP. Pest incidence and damage were higher for Chinese than Sarinut 2. For locations, leaf spots and aphids were higher at Tanina and lowest at Fumesua. Peanut yield and yield related parameters were greater for IP than FP in all trials. Yield was also greater for Sarinut 2 than Chinese. Among the locations, yield at Nyankpala and Fumesua were higher than Tanina. Pearson correlation analyses showed positive relations between grain yield and yield components but negative correlation between grain yield and insect pest populations and damage. Therefore, farmers will obtain optimum yield of peanut with minimum damages when the IP used in this study are adopted, especially with the improved variety (Sarinut 2) regardless of location. The combination of IP and Sarinut 2 proved to be the most effective approach to peanut production in northern Ghana.