

Out-Scaling Improved Peanut Production Packages in Southern Ghana

G. BOLFREY-ARKU*, S. ARTHUR, M.B. MOCHIAH, J.Y. ASIBUO, A. AGYEKUM, and D. ABINTERA, Council for Scientific and Industrial Research - Crops Research Institute, Kumasi, Ghana; D.L. JORDAN and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC 27695; and D. HOISINGTON and J. RHOADS, Feed the Future Innovation Lab for Peanut, University of Georgia, Athens, GA 30602.

The introduction of the USAID Feed the Future Peanut Mycotoxin Innovation Laboratory (PMIL) project in Ghana resulted in the development of improved peanut varieties with tolerance to pests and diseases as well as technologies for sustainable yield increase that included post-harvest handling of peanut. The current project Peanut Innovation Laboratory (PIL) in Southern Ghana focuses on pest, disease and crop production packages. One of the main production challenges is the sustainable management of pests (weeds inclusive) and diseases; which often is challenging for female, small-scale farmers. To disseminate and out-scale outputs from these projects to contribute to Ghana's realization of SDG Goals 1-5, a demonstration field was set up with farmers at Ayigbe in the Wenchi District of the Bono Region in 2021. The treatments included Nkatse kokoo, a popular local peanut variety and three improved varieties (Yenyawoso, Crops Dehyee and Crops Agbeyiye). These varieties were evaluated in production packages: 1) high input (HIP) of preemergence herbicide followed by one manual weeding, application of NPK and calcium fertilizers, and fungicide application; 2) medium input (MIP) of two manual weedings, application of NPK, and local soap; 3) low input (LIP) of two manual weedings and the application of local soap; and 4) farmer practice (FP) of one manual weeding. Each variety and package system was replicated three times. Farmers identified pests and their impact on peanut growth and development, timely intervention of treatments, and when and how to use pesticides judiciously for health and environmental safety. Data were recorded on pest and disease incidence and severity, farmers' acceptance of each system and variety, and then pod yield. Data were subjected to ANOVA with means separated using Tukey's test ($p \leq 0.05$).

Thirty-two farmers (10 males and 22 females) benefited from the field demonstration. All the farmers preferred the HIP and MIP for pest and disease management. Farmers normally associate defoliation of leaves to physiological maturity of the pod and not to the effect of leaf spot disease. They therefore expressed amazement on seeing green leaves on peanut plants subjected to HIP and MIP. Generally, all three improved varieties outperformed the local variety under all the systems. Yenyawoso and Agbeyiye were the preferred choice by 96% and 92% of farmers present, respectively. These two varieties had an overall acceptance of $\geq 93\%$ for females and 90% for males. The variety Dehyee and the local variety Nkatse kokoo were accepted by 56% and 28 % of the farmers, respectively, and were the least preferred by women ($\leq 53\%$) females and males ($\leq 60\%$). Pod yield of Yenyawoso or Agbeyiye was 4.9 and 3.0 tons/ha under HIP; 3.2 and 1.1 tons/ha under MIP; 1.9 and 0.7 tons/ha under LIP; and 1.3 and 0.5 tons/ha for the FP. Yield of Nkatse kokoo was < 0.5 tons/ha for all the systems. Female preference for particular variety were based on high yield, tolerance to insect pests and disease, and ability to suppress weeds, hence the choice of Yenyawoso and Agbeyiye. Outflow from the field demonstrations catalyzed farmers to request seed for their next season cultivation of which we obliged by giving them some quantities. It seems obvious from the outputs that this approach of participatory field demonstrations of system inputs for peanut production to farmer groups could be more efficient for technology dissemination for adoption, capacity building (knowledge and skills enhancement) and out-scaling of research recommendations, which may eventually contribute to the actualization of the SDG goals for the different gender groups.

