

Growth and Yield Response of Peanut to Pest and Crop Management Packages in Ghana

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Peanut peasants in Ghana realize yields of up to 76% lower than the minimum potential yield of 2.5 metric tons/ha. The shortfall is attributable to use of varieties without adequate tolerance to diseases, low quality seed, delays in planting, limited fertility and low soil pH, negative impacts of weeds and other pests, ineffective drying and storage practices, and limited financial resources to invest in inputs to address these issues. Most pest and crop management recommendations addressing these have not been developed into production packages for adoption by farmers in Ghana. Three experiments were conducted in Ghana at Kumasi, Tamale, and Wa in the Ashanti, Northern, and Upper West Regions of Ghana, respectively, to ascertain the benefit of pest and crop management packages on peanut growth, pest reaction, and yield. These packages were included in three-year rotation trail. Treatment factors included 2 levels of peanut variety [the improved variety Yenyawso and the traditional variety Chinese] and 3 levels of input systems [low input package (LIP) that included high quality seed, timely planting, and 1 manual weeding; moderate input package (MIP) that included high quality seed, timely planting, 2 manual weedings, 3 applications of local soap and application of NPK fertilizer 3 weeks after planting (WAP); and high input package (HIP) that included high quality seed, timely planting, pre emergence application of pendimethalin followed by 1 manual weeding, 2 applications of fungicide (azoxystrobin plus difenoconazole), application of NPK at 3 WAP, and application of calcium fertilizer at 6 WAP]. A wide range of data were recorded associated with pests and crop response. Cost for all inputs was recorded to enable cost: benefit analysis. Data were analyzed with Statistix 9 data analysis software; ANOVA was generated and means separated by SED at 5%. At 3 WAP, weed density was reduced by 58 to 70% in Kumasi, 75 to 84% in Tamale, and 61 to 73% in Wa in the HIP compared with the LIP. When data were pooled over locations, weed density was reduced by approximately 28% for both varieties in the HIP compared with the LIP. Severity of leafspot disease was lower when in the HIP for both varieties compared with the MIP and LIP; severity was lower in the MIP compared with the LIP. Peanut plants were taller for the variety Chinese in the MIP and HIP at 6 WAP compared with the LIP. In Kumasi, kernel yield of Chinese was greater for the HIP (1.7 metric tons /ha) followed by the MIP (1.2 metric tons/ha) and then the LIP (0.7 metric tons/ha). Kernel yield of Yenyawoso at Tamale was greater in the HIP (2.4 metric tons/ha) followed by the MIP (1.7 tons/ha) and then the LIP (1.2 metric tons /ha). Likewise, kernel yield of Chinese was greater in the HIP (1.8 metric tons/ha) compared with the MIP (0.8 metric tons/ha) and LIP (0.6 metric tons/ha); yield was greater for the MIP than the LIP. At Wa, peanut kernel yield for both Yenyawoso and Chinese was greater for the HIP (1.4 or 1.7 metric tons/ha, respectively) followed by the MIP (1.1 or 1.2 metric tons/ha, respectively), and the LIP (0.8 or 0.8 metric tons/ha, respectively). When data was pooled over locations, When pooled locations, both Yenyawoso and Chinese produced greater kernel yields in the HIP (1.7 and 1.7 metric tons/ha, respectively) followed by the MIP (1.3 and 1.1 metric tons/ha, respectively), and the LIP (1.0 or 0.7 metric tons/ha, respectively). Haulm yield was higher in the HIP compared with LIP or MIP for both the traditional variety Chinese and the improved variety Yenyawoso at all locations