

3RD GLOBAL FOOD SECURITY, FOOD SAFETY & SUSTAINABILITY CONFERENCE

May 21-22, 2018 | New York, USA

Enhancing the productivity of farmer saved seed yam in Ghana: The Positive Selection Factor

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The nutritional, industrial, pharmaceutical and socio-cultural significance of yam, *Dioscorea* spp. in the West African yam belt is under serious threat. Farmers normally rely on milking of yam for seed for subsequent cultivation. Re-cycling of pests and diseases infested seed yams have resulted in sub optimal yield levels. Virus infected and nematodes infested seed yams have been implicated for the drastic decline in yield. An intervention (Positive selection) introduced by the Community Action in Improving Farmer-Saved Seed Yam (CAY-Seed) project was to reverse the uneconomic yield of yam. Positive Selection (PS) and Farmer Practice (FP); neem leaf powder application 20 g /stand (N_{20}) and no neem application (N_0) were tested on one local variety of yam "Dente" in Ghana from 2016 to 2017 to assess their potential in reducing pests and diseases incidence and increasing yield of seed yam. Each treatment was replicated 4 times in PS and FP target communities respectively. Demonstration plots were established for the target communities on 20 x 20 m plots using mini setts. Mini sett sizes, 30 g each were planted on ridges at 100 cm between and 30 cm within rows. Mini setts were treated with fungicide, ethylene bisdithiocarbamate (Mancozeb) 100g and insecticide, (Lambda Cyhalothrin, 40 ml) in 10 L of water. The treated minisetts were air dried under shade for about 60 minutes and planted. Neem leaf powder was applied at 20 g/plant as soil treatment at planting. Results for two years were pooled together and analyzed using GenStat (12.0). Means were separated using the Least Significant Difference test at ($P < 0.05$). Yam Mosaic Virus (YMV) disease incidence decreased from 38% in 2016 to 31% in 2017 in PS selected communities. However, in FP communities, it increased from 67% in 2016 to 72% in 2017. Severity of YMV was significantly higher in FP communities with a mean score of 2.1 as compared to 1.4 recorded in PS treatments. Neem leaf powder application resulted in significantly low incidence and severity of nematode cracks and severity (6.1% and .1.2) compared with (24.9% and 2.2) for no neem application plots respectively. Similarly, PS plots yielded 8.4 t/ha compared with FP 6.7 t/ha. Thus, PS significantly out-yielded FP practice by 25.37%. Positive selection an environmentally friendly strategy has the potential to increase the productivity of seed and ware yams and re-vitalize the yam industry in Ghana.

Biography

Kingsley Osei has a PhD from the University of Reading, UK (2007). He has 2 MSc degrees from the Royal University of Ghent, Belgium (1999) and Kwame Nkrumah University of Science and Technology, Kumasi, Ghana (2001). Dr. Osei is a Principal Research Scientist with the CSIR-Crops Research Institute (CRI), Kumasi, Ghana. He is a Senior Lecturer in Plant Nematology at the CSIR-College of Science and Technology in Kumasi and currently, the Head of the Plant Health Division of CRI. He has published 35 peer reviewed journal papers, 2 books and 7 manuals. His rich experience in research led to his leading several international projects including BMGF funded YIIFSWA (Country Manager-2014-15) and CAY-Seed (Regional Coordinator). His research interest covers "The employment of Integrated Pest Management (IPM) approaches, the use of antagonistic plants and organic amendments in the management of plant parasitic nematodes, host resistance studies and the application of molecular tools in research".

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