



2013 AWARD Fellow
Joy Geraldine Adiele

Position	Research Scientist
Institution	National Root Crops Research Institute (NRCRI)
Country	Nigeria
MSc	Natural Resources Management State University of New York, College of Environmental Science and Forestry (SUNY-ESF), 2011
Mentor	Dr. Anthony Ano, Assistant Director Planning, Monitoring, and Evaluation, NRCRI, Umudike.

Research area: Management of short fallows using leguminous cover crops and developing living cover crop systems for sweet-potato crop production in Nigeria.

Joy Geraldine Adiele is an ambitious woman who aspires to replenishing soil fertility in order to increase root and tuber crop production to feed the growing population in Africa, and combat soil degradation. She dreams of attaining a top-level United Nations position, where she believes she could make a difference to ensure the sustainable use and preservation of natural resources.

Adiele was raised by her grandmother in a village in southeastern Nigeria, where they grew cassava, intercropped with maize, melon, yam, and cocoyam. During secondary school, Adiele combined studying with petty trading and working in farms to help earn her keep. "It was difficult, but I knew that it was better to go hungry, if need be, as long as I could be able to go to school," she recalls.

Ultimately, Adiele made it to university, obtained a BSc in Geography, and was employed as an agricultural meteorologist with the NRCRI. There she observed that both farmers and scientists constantly complained that the soil was degrading quickly and not supporting their crops and experiments. "For years, the farmers and researchers were experiencing low crop yield, and all fingers pointed to the soil," she explains.

Motivated to provide a solution, Adiele decided to obtain formal training in soil resources management. With a fellowship from the Ford Foundation International Fellowship program, she obtained an MSc in Natural Resources Management at SUNY-ESF.

Adiele's research is testing the use of two different leguminous cover crops, called *Mucuna pruriens* var. *utilis* and *Pueraria phaseoloides* to replace natural regrowth fallow—mainly elephant grass (*Pennisetum purpureum*). They were seeded in fields during the growing season to provide cover and nourish the soil, prevent invasiveweeds, and reducesoilerosion. Thecovercropsalsoreducedtheamountandvelocityofwater flow from the fields, limiting environmental risk to waterways and downstream ecosystems from the runoff.

Adiele is comparing the root and percent cover systems of her cover crops with those of the invasive elephant grass that normally takes over during fallow periods. The dominating elephant grass produces

an average of 219 root numbers per plant, which devastates soil fertility. The cover plants, with fewer, but longer roots, improved the soil structure and benefitted soil microbiological functions.

Past studies have focused only on how cover crops can nourish the soil. However, Adiele is looking at larger natural resource management issues. “Constant application of fertilizers is costly and hostile to the environment,” she says. “With this method we are addressing the causes of soil infertility, and putting in place a system that can help keep the soil fertile for the next generations.”

Adiele stresses the importance of going back to basics in the quest for restoring and improving soil fertility. It is a lesson she learned from her training in the United States, which she shares with her colleagues and farmers. “My professors taught me that good soil is not a miracle, but a product of deliberate best soil management practices,” she says. “Often end users are looking for quick fixes—short-term results that come from the application of fertilizers—but you have to teach them to think longer term and to pamper and nurture the soil back to a fertile state.”

Adiele plans to pursue a PhD program in biochar soil management. She wants to investigate the effects of biochar amendment on infertile and polluted agricultural soils in Africa. Biochar is a form of charcoal produced through the thermochemical process of biomass under low oxygen conditions known as pyrolysis. This special charcoal could be produced from burning organic waste products from fields, forests, weeds, grasses, or animal products. Application of biochar to soils has been identified as a technology that can rejuvenate soil fertility, stabilize organic carbon, and reduce greenhouse gas emissions. Biochar technology involves collection, transport, and processing of biomass feedstocks, as well as production and testing of biochar, and the use of energy co-products (gas, oil, or heat), and soil application.

Adiele says the biochar system has the potential to provide jobs and revenue for rural people. “Smallholder farmers, especially women, need to find new business opportunities to boost their farm incomes or supplement their incomes from part-time non-farm sources,” she asserts. “Biochar technology could raise productivity, boost rural development via job opportunities, and improve environmental stewardship.”

Adiele sees the AWARD Fellowship as helping to accelerate her progress toward achieving her goals. She expects the training and mentoring to strengthen her advanced science, science writing, and leadership skills, and to open new opportunities for increasing her visibility and promotion potential. “It is clear that I am going to learn and become connected more quickly and at a higher level than I would have otherwise,” she says. For this determined scientist, it is a critical boost indeed.

Adiele is one of a growing number of African women agricultural scientists who have won an AWARD Fellowship. AWARD is a career-development program that equips top women agricultural scientists across sub-Saharan Africa to accelerate agricultural gains by strengthening their research and leadership skills through tailored fellowships. AWARD is a catalyst for innovations with high potential to contribute to the prosperity and well-being of African smallholder farmers, most of whom are women.

AWARD is generously supported by the Bill & Melinda Gates Foundation, the United States Agency for International Development, the Alliance for a Green Revolution in Africa, and Agropolis Fondation. For more information, visit www.awardfellowships.org