

The West and Central Africa Semi-Arid Tropics (WCA-SAT)

RRP2: Agricultural diversification and sustainable agro-ecosystems

Enhancing Rainwater and Nutrient-Use Efficiency

This 5-year project, which started in 2004, is designed to address the major constraints encountered by small-scale resource-poor farmers in the Volta Basin, using a systems approach that integrates water-use efficiency, soil and nutrient management, and improved germplasm together with market opportunity identification and capacity building in rural communities.

We carried out several on-farm trials in Burkina Faso and Ghana:

- Integrated soil-water-plant-nutrient management or Savannah/Sahelian Eco-Farm (SEF)
- Fertilizer microdosing
- Combined rainwater and nutrient management
- Soil degradation control.

Results from previous years showed increased crop yields from the improved technologies. Soil amendment with tied-ridging for micro-catchment and water harvesting hold the greatest promise. Conventional tillage with soil amendment was shown to be the best management option for increasing crop yield. The fertilizer microdosing technology increased the efficiency of nitrogen-use by 50%. Yield prediction through the Decision Support System for Agrotechnology Transfer (DSSAT) showed that, by 2035, the amount and distribution of rainfall will pose a high risk to the efficient use of mineral fertilizer in soils with low organic matter. The program enabled us to build a diverse and strong partnership with international agricultural research centers (IARCs), NARS, agricultural research institutes (ARIs), non-governmental organizations (NGOs), and rural communities. We also trained several scientists and technicians in the use of DSSAT model for evaluating technologies under varying management conditions.