

Farming Systems Program

Introduction

A primary goal of the Farming Systems Program is the development of methods of land use and crop management that will enable efficient, economic and sustained production of food crops for the humid and subhumid tropics. Research is directed primarily at problem solving the constraints of small farmers, many of whom still rely on bush fallow systems for producing the bulk of the food in the humid and subhumid tropics of Africa and elsewhere. Emphasis is given to developing technologies that are scale neutral so that they can be used by a range of farmers.

Because of the wide range of farming system forms in the humid and subhumid tropics, the program will not develop specific local blueprints for improved methods of land, soil and crop management; rather, the program's concern is to develop and make available preliminary technologies and subsystems that can be modified and adapted by national and regional organizations to the agronomic and economic as well as political conditions of their own areas. Considering the diversity of the farming systems in the Institute's mandate area, baseline data collection and analysis are undertaken to better delineate the major benchmark areas with relevant bioclimatic and soil parameters in relation to prevailing cropping systems. The benchmark sites will be used for determining typologies and testing principles of land and soil management and cropping systems.

The research emphasis of the program is on assisting farmers in the move from the subsistence shifting cultivation and particularly bush fallow systems, to more continuous and productive systems of cultivation with appropriate land and soil management practices, which will maintain soil productivity and minimize soil erosion and soil degradation.

To achieve more impact in the immediate future, the program focused its activities in the following research areas: baseline data collection and analysis, land and soil management and cropping systems.

Cooperative programs have been established in Cameroon and Ghana. Reports of these projects are included in cooperative projects, and individual reports are available from the respective organizations.

Baseline data collection and analysis

Research on baseline data collection and analysis includes the following areas: agroclimatology, soil and land characterization and evaluation and socioeconomic analysis.

Research in 1980 emphasized crop water requirements as well as the development of a soil evaluation system for highly weathered soils in West Africa and studies of soil erodibility. Socioeconomic analyses included food crop and agro-forestry farming systems surveys.

IITA general weather conditions

The nonoccurrence of the late July-August dry season was the dominant feature of the weather in 1980. As with similar cases in 1973 and 1979, the only other 2 of the decade, this feature was again associated with a general shift in rainfall pattern; the second rather than the first season constituted the major rainy season. There were consonant departures in insolation, the heavy rainfall period generally receiving less than normal global radiation. The mean temperatures were comparatively high along with the mean relative humidity while the evaporative demand was lower than the long-term mean. A summary of the main variables is given in Table 1.

Rainfall and evaporation. A streak of rainless days extending back to November, 1979, was broken with a 26.2 mm rain on 14 February. There were 4 other rains before the end of March (Table 1, Fig. 1), and the first quarter of the year was, thus, marked by a pronounced moisture deficit with a -44 percent departure in cumulative rainfall in conjunction with a -7 percent difference in cumulative evaporation.

No rain of substance fell in April, and total rainfall was fully 66 percent below normal. It was a clear case of a "false start" in the rains, causing most of the late March plantings to succumb to drought stress (Fig. 2). Favorable water balance was first established at the beginning