

#### 40. Network of experiments to phenotype contrasted sorghum and to model its adaptability in West African environments

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Characterizing the environment, understanding farmers' requirements and evaluating crop responses to the environment is essential to choose which crop or even which variety is better adapted to the farming systems. Crop models can help to direct this choice. However, use of models requires excellent datasets to facilitate their calibration and validation. In West Africa, sorghum is traditionally the lead cereal and staple crop. A high diversity of sorghum varieties is farmed, but detailed data on these varieties in this specific environment is scarce. We aim at addressing this issue by setting up a network of experimentations in West Africa to characterize contrasted sorghum varieties and to assess their adaptability to different agroecological zones of West Africa. These varieties differ with respect to architecture (tall or small), uses (grain, biomass or dual purpose), composition (cellulose, lignin), and phenology adapted to different targeted regions in West Africa. To represent the diversity of the environment, three main sites in three major countries of the region have been chosen to test these ten varieties according to a rainfall gradient: (1) 700mm in Senegal, (2) 950mm in Mali and (3) 1150mm in Burkina Faso. The main crop traits characterized are phenology, number of leaves, plant height, leaf area index, organs biomass and grain yield, all essential data for good model calibration. The first results are (1) a comprehensible database of ten contrasted West African sorghum varieties, all tested in three major sites in West Africa, and (2) calibrated crop models (DSSAT, APSIM and SAMARA). These models will then be used to direct our choice of adapted cultivars to the right environment. Also, calibration of multiple models will enable to assess the uncertainty in the decision we take.