

## Exploration of sorghum genetic variability for adaptation to intercropping with cowpea - case study in Burkina Faso -

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The ecosystem services provided by intercropping have been clearly demonstrated. The association of two or more crops in a same field allows to produce more grain per unit area than the component crops grown in pure stand. In particular, sorghum-cowpea intercropping is both a traditional and a promising way for the intensification of smallholder's fields in soudano-sahelian conditions. In the present study, we aimed to explore prospects of dedicated breeding for improvement of sorghum adaptation to intercropping through the characterization of genotype by cropping system interactions within sorghum germplasm and of specific adaptation traits.

From a larger collection, 30 sorghum varieties were selected based on 2-year data with the aim of retaining the greatest possible diversity while selecting the most adapted varieties to pedoclimatic conditions. The experimental design was a split plot with three replications evaluated over two cropping seasons in 2020 and 2021 in Gampela experimental station near Ouagadougou. For each variety, the elementary plot was divided into one subplot where the variety was cultivated in pure stand and one subplot where the variety was cultivated in a substitutive intercrop alternating one row of sorghum with one row of cowpea. A unique cowpea tester variety was used. Overall, thirty agro-morphological traits were measured.

Genotypic effects were highly significant for most traits. Year and genotype x year effects were highly significant. In both years, a significant correlation was observed between yield in intercrop and in pure stand ( $R^2 = 0.36$  in 2020 and  $R^2 = 0.57$  in 2021), very few occurrences of significant genotype x cropping system interactions among all studied traits and no significant effects of sorghum genotypes on cowpea grain yield were observed. However, the behavior of some varieties that depart from this global trend will be analyzed. Implications for the implementation of breeding strategies targeting intercropping systems will be discussed.