

Co-designing sorghum-based cropping systems with rotations to improve soil fertility and yield in Burkina Faso

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Farm households in Burkina Faso face many challenges including poor soil fertility, climate variation and land constraint due to migrants arrived from the North of the country. Low soil fertility prevents farmers from achieving food self-sufficiency and food security. The present study aims at co-designing and testing in a participatory setting, sorghum-based cropping systems to improve soil fertility and yield as soil infertility was mentioned by farmers as their main constraint. Researchers and farmers suggested three rotations which were tested in on-station trials in two contrasted communities. The experiment was designed following a fisher block with four repetitions. In the first year, cowpea, mucuna and crotalaria were grown in sole crop system. In Tanvousse, all the plots received organic manure 2.5t/ha and in Nagreankoudogo all the plots received NPK, 75kg/ha with localized application. Cowpea and mucuna biomass were harvested but crotalaria biomass was left in the plot. For the second year, sorghum was grown in all plots with the same conditions of fertilization, therefore, we had sorghum preceded by cowpea (T1), sorghum preceded by mucuna (T2), sorghum preceded by crotalaria (T3). During the growing season, two participatory evaluations were conducted. Results showed that T1, T2 and T3 produced respectively 900 kg/ha, 900 kg/ha and 800kg/ha of sorghum grains in Tanvousse and 2100 kg/ha, 1900 kg/ha, and 2100 kg/ha in Nagreankoudogo. Striga impact was recorded because farmers consider it as fertility indicator. For striga impact in "striga/100 sorghum plants", T1, T2 and T3 got respectively 72, 140, 55 in Tanvousse and 180, 60, 65 in Nagreankoudogo. At the flowering stage, farmers first choice was T2 in Tanvousse and T1 in Nagreankoudogo. At the maturity of sorghum, farmers first choice was T1 in both communities which also got the highest yield in both communities. Farmers opinion seems to be context dependent.