Tropentag, September 17-19, 2018, Ghent

"Global food security and food safety:
The role of universities"

Are Improved Varieties Playing their Part in Yield Gap Reduction? Evidence from Sorghum Production in Mali

Lokossou Jourdain[1], Hippolyte D. Affognon[2], Singbo Alphonse[3]

[1] *International Crops Research Institute for the Semi-arid Tropics (ICRISAT), Agricultural Economics, West and Central Africa Research Program, Mali*
[2] *International Crops Research Institute for the Semi-arid Tropics (ICRISAT), Technology Uptake, Mali*
[3] *University Laval, Agricultural Economics,*

Abstract

Sorghum is a strategic crop to improve food security in the semi-arid tropic region. In Mali, it is the second most important crop after millet in term of harvested area. It is produced mainly for the consumption of households and the surplus if it exists is sold to obtain cash for other households' needs. Therefore, during the last decade, most of food security policies implemented in Mali, including development and dissemination of improved varieties were focused on sorghum production. Despite all efforts, sorghum yield is still low (less than 1 $^{ton}/_{ha}$) and the gaps compared to the potential yield in research stations (3–4 $^{tons}/_{ha}$) are high and required more attention. Using a recent yield gap conceptual framework, this paper redefined the benchmark for yield gap analysis in Mali and check the robustness of the relationship between yield gap and improved varieties adoption. It applies a propensity score matching approach on 547 observations from sorghum plots and related households to account for endogeneity and selection bias. Data show evidence that irrespective of the region, the potential yield of sorghum in the current production conditions in Mali is 1999 $^{kg}/_{ha}$ ($\pm$ 3.8). This benchmark represents the mean yield of the top 5 % best performing plots/farmers. Consistently to the conceptual framework used, any failure to perform at this level could be explained by farmers and/or plots characteristics including the type of variety used. The mean yield gap estimated is 57 % and 55 % respectively for non-adopters and adopters. Against all expectation, there is no significant impact of improved varieties adoption on yield gap reduction, suggesting that improved varieties fail to express their potential in current production conditions. These findings challenge all actors in sorghum production enhancement as improved varieties are always expected to improved productivity and reduce yield gap. There is no doubt about the high yield potential of improved varieties. Therefore, the effectiveness of required conditions for improved varieties' good performance should be checked and attention should also be pay to the quality of seed used by farmers as they used to recycle seed from previous harvests for several years.

Keywords: Improved varieties, Mali, Sorghum, Yield gap

Contact Address: Lokossou Jourdain, International Crops Research Institute for the Semi-arid Tropics (ICRISAT), Agricultural Economics, West and Central Africa Research Program, Bamako, Mali, e-mail: j.lokossou@cgiar.org