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## Can the Push–Pull Technology Reduce Stem Borer Damage and Increase Sorghum Yield in Western Somaliland?

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### Abstract

Sorghum is a key crop for the livelihood of millions of smallholders in Africa. In Somaliland the cereal serves as a main staple crop, it provides fodder for livestock and additional income. However, lepidopterous stem borers regularly cause major yield losses.

The “push-pull” technology is an ecological approach to minimise stem borer damage and increases cereal and fodder yields while providing additional benefits. The intercropping strategy involves pullplants (grasses as *Brachiaria* sp.) that attract stem borer moths and, on the other hand, the repellent intercrop *Desmodium* sp., which drives them away from the cereal crop (“push”).

The performance of the push-pull technology in terms of stem borer control, sorghum grain yield and fodder production was compared with the farmers’ practice of sorghum production (broadcast sole crop) in a field trial with block design in Gabiley Region, Somaliland. Stem borer infestation (number of stem borers inside and outside the plants) and damage (leaf damage, number of damaged plants, attacked and dead growing points, and stem borer entry holes) were assessed, and sorghum grain and stover yield as well as *Brachiaria* production measured.

Practically no *Desmodium* (*Desmodium intortum*) germinated. Nevertheless, the push-pull technology still provided an effective control of stem borers by significantly reducing infestation and leaf damage ( $p < 0.001$ ). Sorghum grain yield was significantly higher in the push-pull than in farmers’ practice plots (+49% and +146% in terms of fresh and dry weight). Also sorghum stover production was significantly higher in the push-pull system than under farmers’ practice (+10% and +42% in terms of fresh and dry weight). The additional fodder produced by *Brachiaria* (4434 kg ha<sup>-1</sup>) in the push-pull system is particularly attractive to farmers in Somaliland, where livestock is the backbone of farming and economy. To satisfy the farmers’ interest in the technology and prepare for dissemination, future research should focus on ways to assure availability of *Desmodium* and *Brachiaria* planting material and methods for better establishment of *Desmodium* under field conditions. Overall, this trial has shown that push-pull offers a valuable option for sustainable intensification of Somaliland’s agriculture, may contribute to food and fodder security and enhance resilience and livelihoods.

**Keywords:** Push-pull, somaliland, sorghum, stem borer