Disease-resistant, adapted and high-yielding sorghums for the disease prone intermediate altitudes in Ethiopia

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Sorghum is a staple food crop for millions of small-holder farmers in Ethiopia. However, the productivity of sorghum has been limited by biotic and abiotic stresses, limited access to improved varieties, traditional farming practices, and poor extension and value chain systems. Plant diseases such as anthracnose and grain mold pose significant challenges to sorghum production in this region, resulting in considerable yield losses. Bako ARC in collaboration with SMIL project made an effort to develop disease-resistant, adapted, and high-yielding sorghum varieties for intermediate altitudes, utilizing the Ethiopian sorghum landraces core collection. In the past decade, Bako ARC explored the Ethiopian germplasm collection for variety development. Two varieties (‘Merera’ and ‘Jabaa’) were released for the intermediate agroecology in Ethiopia. The varieties showed strong resistance to pathogens, and potential to increase yields by up to 46% and 39% compared to local varieties, respectively. Efforts have been made to demonstrate and scale out the ‘Merera’ variety in sorghum-growing parts of Western Ethiopia that show greater yield potential. On going programs to develop varieties from our crossing program will continue at Bako ARC and national programs.

Introduction

Methods

- Large Ethiopian sorghum core collections (n=2010) characterized and evaluated in different breeding systems
- Locations: Bako, Jimma, Asosa and Haramaya
- Intensive evaluations and characterization across testing sites
- Identification sorghum genotypes and evaluated for different breeding objectives
- Potential genotypes that were high yielding and disease resistant were identified
- Sorghum crosses were generated at Bako and Melkassa ARC for further variety release

Results

"Merera" sorghum variety
- Yield advantage = 43%
- Yield potential ~ 5.4 tones ha⁻¹
- Bird tolerant, stay green, disease resistant

"Jabaa" sorghum variety
- Yield advantage = 39.1%
- Yield potential 4.2 ton ha⁻¹
- Early variety, bird tolerant, disease resistant

Conclusions

Development of disease-resistant and high-yielding sorghum varieties with strong extension services has provided a promising solution to the challenges faced by small-scale farmers in the intermediate altitudes of Western Ethiopia.