

Registration of a Newly Released Bread Wheat (*Triticum aestivum* L.) Variety, ‘Bondena’, for Potential Areas in Southern Ethiopia

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Received date: May 01, 2020; Accepted date: May 18, 2020; Published date: May 26, 2020

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Abstract

Twenty-three bread wheat (*Triticum aestivum* L.) genotypes and two check varieties were evaluated at four Research Stations such as Hossana, Angacha, Kokate and Waka for two years from 2014-2015. Data for grain yield and other important traits were generated from eight environments. Bread wheat genotype coded as ETBW6188 with pedigree name D67.2/P66.270//AE.SQUARROSA(320)/3/CUNNINGGHAM/4/CROC-1/AESQUARROSA(205)//KAUZ/3SASIA and the other bread wheat genotype coded as ETBW6440 and with pedigree name WHEAR/SOKOLL were promoted to VVT (variety verification trial) phase where these two candidate genotypes along with two check varieties such as “Danda” and “Wane” were re-evaluated in the four Research Stations and on farms using large plots for one year, in 2017. After critical evaluation of VVT by national variety realizing committee (NVRC) and group of farmers, the first genotype, coded as ETBW6188 with the pedigree name indicated above, and later given commercial name called “Bondena” was officially released for wider production in optimum areas of southern Ethiopia.

Keywords: Bondena; Variety; *Triticum aestivum*

Introduction

Bread wheat (*Triticum aestivum* L.) originated approximately 10,000 years ago and is arguably the most important plant for humans [1,2]. Although there are large differences in area planted, both hexaploid (*T. aestivum*) and tetraploid (*T. turgidum* L. *subsp. durum* (Desf.) Husn) wheat are grown in Ethiopia and worldwide [3,4]. The wheat production area in Ethiopia has expanded to 1.7 million ha making the country the leader in terms of total wheat production and area covered in sub-Saharan Africa [5,6]. Although total wheat production increased as a result of expansion of planted area and a relative improvement in productivity over the last few years productivity per unit area is still low in Ethiopia [5]. According to the Central Statistical Authority reports, the average national productivity of wheat was estimated at 2.4 tons/ha, which is noticeably lower than the global average of 3.4 tons/ha recorded in 2017 [5,7]. Several reports indicated that wheat production has been negatively affected by both biotic and abiotic stresses. Diseases that include wheat rusts have significantly contributed to low wheat productivity in the country [8-10]. Therefore, strategies need to be put in place to continually develop wheat cultivars combining both high yields and resistant to major wheat diseases.

Methodology

One-hundred and twenty bread wheat lines of CIMMYT origin were tested under observation nursery at Kokate, southern Ethiopia in 2013. Of which 23 genotypes were selected based up on better grain yield and other important traits such as resistance to wheat rusts. On station evaluation of the 23 genotypes along with two standard checks such as Danda and Digalu were carried out using randomized complete block design at Hossana, Angacha, Kokate and Waka in 2014 and 2015. Two bread wheat genotypes, ETBW6188 with pedigree

name D67.2/P66.270//AE.SQUARROSA(320)/3/CUNNINGGHAM/4/CROC-1/AESQUARROSA(205)//KAUZ/3SASIA and the other bread wheat genotype coded as ETBW6440 with pedigree name WHEAR/SOKOLL ETBW6188 were selected due to significantly better mean grain yield and reaction to wheat stem rust across all test environments. In 2017, the two candidate bread wheat genotypes and check varieties, Danda’ and Wane, were evaluated at the four Research Stations and on farms using large plots. Farmers and NVRC evaluated all trials across on stations and on farms and the committee decided the first genotypes coded as ETBW6188 with the pedigree name indicated earlier, and re-named “Bondena”, for official release.

“Bondena”: The Newly Released Bread Wheat (*Triticum aestivum* L.) Variety

“Bondena” is a commercial name given for a newly released bread wheat variety with the pedigree name of D67.2/P66.270//AE.SQUARROSA(320)/3/CUNNINGGHAM/4/CROC-1/AESQUARROSA(205)//KAUZ/-3SASIA. Significantly higher grain yield of 3800-5500 kg/ha was recorded across Research Stations; and a higher average grain yield in farmers’ field ranged from 3500-4400 kg/ha. These grain yield ranges obtained from a variety “Bondena” was significantly higher than respective ranges of average grain yields recorded for check varieties across locations. Evaluation against wheat stem rust revealed moderately resistance (MR) field response with reasonably low disease severity ($\leq 20\%$) across all environments. Molecular analysis showed that variety “Bondena” contained ASR gene (Sr31) and APR gene (Sr58). The variety “Bondena” was released by Areka ARC in 2018, and the Center has given a responsibility to maintain the breeder seed.

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