Identification of Farmer’s Preferred Durum Wheat (*Triticum durum* L) Varieties in Southeastern Ethiopia

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Abstract
Participatory varietal selection (PVS) of durum varieties was conducted at Selka and Ilu Sanbitu kebeles in southeastern Ethiopia. Four released durum wheat varieties were evaluated on two farmers’ fields per kebele (lowest administrative unit). Using farmers’ selection criteria, cv Utuba was ranked first by male and female farmers at Ilu Sanbitu; while at Selka cvs. Mangudo and Utuba were ranked first by male and female farmers, respectively. Mean seed yield of Utuba was the highest (3.6 t ha⁻¹) among the cultivars, and at Selka its yield was 5.6 t ha⁻¹. Both female and male farmers participated in PVS and selected Utuba followed by Mangudo.

Key words: Durum wheat, farmers’ selection, PVS, seed yield, biomass yield

Introduction
The shortcomings of conventional and centralized plant breeding to address the enormous diversity of environmental conditions and end users’ needs have been recognized (Morris and Bellon 2004). Participatory crop improvement involving farmers has been found an effective tool in variety selection. Participatory plant breeding and participatory variety selection (PVS) are proposed as a solution to the problem of fitting the crop to a multitude of both target environments and users’ preferences (Ccicarelli et al. 1996, 1997, 2000; Walker 2006). In PVS, farmers are exposed to finished or nearly finished breeding materials to select the germplasm that meets their needs.

The project aimed at introducing, identifying, and diversifying durum wheat varieties with participatory varietal evaluation. Moreover, attempts were made to establish local seed production by organizing farmers into seed producer cooperatives to complement the seed provision of the formal sector.

Objectives
The main objectives of PVS were:
- To identify high yielding, farmer and industry preferred durum wheat varieties for scaling out
- To initiate decentralized seed production by mobilizing farmer groups
- To strengthen the capacity of development partners, seed producers, and farmers.

Materials and Methods
PVS on durum wheat was conducted in the Africa Rising project sites at Selka and Ilu Sanbitu kebeles in Sinana district during the 2015/16 cropping season. In each kebele, two farmers participated in hosting the PVS trails for variety evaluation and selection. The experiments were planted on 25 m² (5 m × 5 m) for each treatment. In each kebele, one group each of female and male farmers were organized for the selection and the members were selected randomly from nearby experimental sites. Farmers in the community also participated in the selection process through guided visits and field days to the trial sites. Four released durum wheat varieties were used for PVS: cvs. Mangudo, Ginchi, and Utuba from Debre Zeit ARC; and cv. Tate from SARC.

A group of female and male farmers participated in the selection and ranking of varieties. Criteria used for selection included crop stand, plant height, maturity, lodging resistance, disease tolerance, tiller number, spike length, kernel number, grain yield, and marketability.

Matrix ranking was used, based on criteria identified through brain storming with farmers. Ranking was made in groups with score values of 1 (very poor) to 5 (excellent) during the middle and end of the crop cycle.

Results and Discussion
Both female and male farmers selected Utuba at Ilu Sanbitu (Figures 1 and 2). Both male and female farmers gave high score values to both Mangudo and Utuba at Selka. Based on mean score values, both male and female farmers selected Utuba followed by Mangudo at both locations. A similar approach was used for malt barley PVS in mother and grandmother trials in northern Ethiopia (Ayewa et al. 2013).

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The highest seed yield was for Utuba (5.4 t ha⁻¹) compared to durum and bread wheat varieties at Selka and Ilu Sanbitu (Figure 3). Similarly, the highest mean biomass yield was for Utuba, with 14.3 and 7 t ha⁻¹ at Selka and Ilu Sanbitu, respectively (Figure 4).

Disease severity was recorded on durum wheat at Selka kebele, where tan spot and yellow rust were observed. Disease severity differed among genotypes (Figure 5). Tan spot disease severity was in the range of 5–30% and yellow rust of 10–50%. Tan spot severity was the lowest on Utuba (5%) followed by Mangudo and Tate (10%) and highest on cv. Ginchi (30%). Yellow rust severity on bread wheat was 50%, but only Ginchi was attacked by yellow rust (10%) among the durum wheat varieties.

**Conclusion**

Farmers’ involvement in selection is important in identifying varieties suitable for sustainable intensification and diversification of cropping systems. Accordingly, durum wheat cv. Utuba ranked first in both kebeles and is recommended for cultivation in the district. Efforts are underway to scale out the new durum wheat variety through the ongoing Africa Rising project.

**References**


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For more information, please contact: Dr Irfan Afzal, General Secretary, PSPA, Department of Agronomy, University of Agriculture, Faisalabad, Pakistan; e-mail: secretary@pspalliance.org

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