Research Notes

This section contains short communications on practical research or relevant information on agriculture or seed science and technology.

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 cvrs. *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 (Ceccarelli 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.

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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 m^2 (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 (Aynewa et al. 2013).

Figure 1. Participatory variety selection by male (A) and female (B) farmers

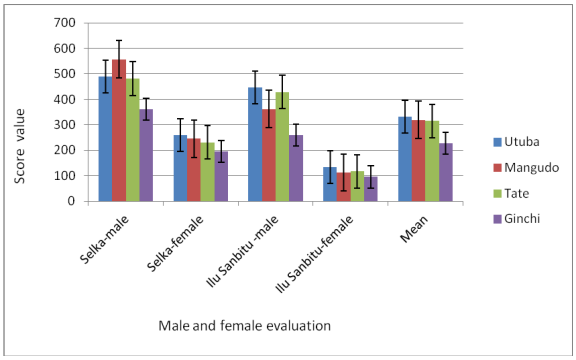

Figure 2. Selection score values of farmers (female and male) for durum wheat genotypes (bars indicate SEM)

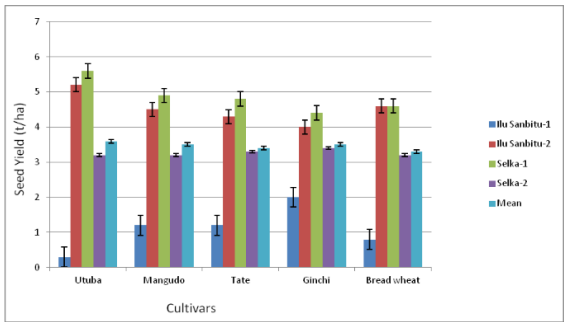

Figure 3. Mean grain yield of cultivars evaluated at Ilu Sanbitu and Selka kebeles (bars indicate SEM)

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).

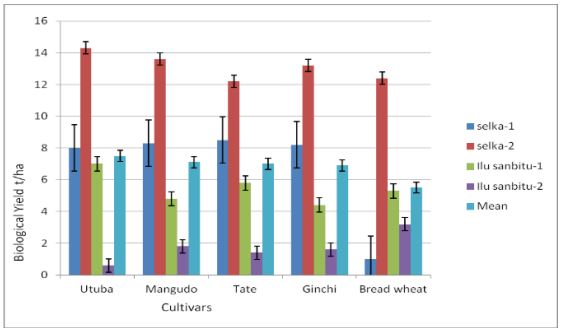

Figure 4. Mean biological yield of cultivars evaluated at Ilu Sanbitu and Selka (bars indicate SEM)

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. *Ginch*i (30%). Yellow rust severity on bread wheat was 50%, but only *Ginchi* was attacked by yellow rust (10%) among the durum wheat varieties.

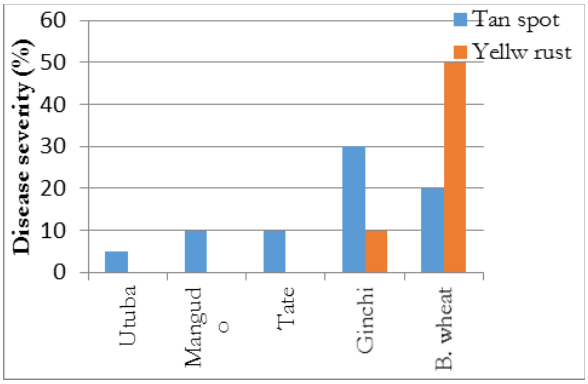

Figure 5. Disease severity on durum and bread wheat cultivars at Selka kebele

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

Aynewa, Y., T. Dessalegn and W. Bayu. 2013. Participatory evaluation of malt barley and other agronomic traits at Northern Ethiopia. *Wudpecker Journal of Agricultural Research* 2(8): 218–222.

Ceccarelli, S., S. Grando and R.H. Booth. 1996. International breeding programs and resource-poor farmers: crop improvement in difficult environments. Pages 99–116 *in* Participatory plant breeding (P. Eyzaguirre and M. Iwanaga, eds). Proceeding of a workshop on participatory plant breeding, 26–29 July 1995, Wageningen, Netherlands.

Ceccarelli, S, E. Bailey, S. Grando and R. Tutwiler. 1997. Decentralized, participatory plant breeding: a link between formal plant breeding and small farmers. New frontiers in participatory research and gender analysis. Pages 65–74 *in* Proceedings of an International Seminar on Participatory Research and Gender Analysis for Technology Development, Cali, Colombia.

Ceccarelli, S., S. Grando, R. Tutwiler, J. Baha, A.M. Martini, H. Salahieh, A. Goodchild and M. Michael. 2000. A methodological study on participatory barley breeding: I Selection phase. *Euphytica* 111: 91–104.

Morris, M.L. and M.R. Bellon. 2004. Participatory plant breeding research: Opportunities and challenges for the international crop improvement system. *Euphytica* 136: 21–35.

Walker, A. M. 2006. FTIR micro spectroscopy as a tool for evaluating the digestibility characteristics of cereal grain fed to ruminants. M.Sc. Thesis, Department of Animal and Poultry Science, Saskatoon, SK, Canada.

Meetings and Courses

Announcements of national, regional, or international conferences, meetings, workshops, meetings and training courses appear in this section.

Conferences

First International Agrobiodiversity Congress (IAC 2016)

The IAC 2016 will be held in New Delhi, India, during 6–9 November 2016. Bioversity International and the Indian Society of Plant Genetic Resources organized the conference. The IAC 2016 Organizing Committee invites all interested authors to submit abstracts for presentation within the IAC 2016 themes. Submissions are sought for oral and poster presentations and can be made via the Abstract Submission portal http://in.eregnow.com/ticketing/register/iac2016

Abstracts will only be published if the author has registered and paid before the author registration deadline of **31 July 2016**. You may register using the online system http://lpti.iceindia.in/ei/getdemo.ei?id=227&s=_47K0WFAGR. All enquiries regarding abstracts for IAC 2016 should be emailed to abstract@iac2016.in

2nd Pakistan Seed Congress

Pakistan Seed Promotion Alliance (formerly Pakistan Seed Academy) a unique forum of stakeholders from national and multinational seed companies, public seed sectors and farmers' associations, is organizing the 2nd Pakistan Seed Congress 21–22 November 2016 at Faisalabad in collaboration with the University of Agriculture Faisalabad, Federal Seed Certification and Registration Department, Seed Association of Pakistan and Crop Life Pakistan. The theme of the congress is *Seed Security for Sustainable Agriculture* which focuses on the availability and access to adequate quantities of quality seed and planting materials of crop varieties by the farming community. Key players of public and private seed sectors along with policy makers will help in discussing all possible initiatives to improve seed security in the country. More than 1000 seed industry professionals, farmers, faculty, students and foreign delegates are expected to gather to share their expertise and knowledge for ensuring quality seed production in the country and across the globe. An exhibition of seeds and seed conditioning, warehousing and storage-related equipment will be displayed during the congress.

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

AFSTA Congress 2017

The next AFSTA Congress will be held in Dakar, Senegal, from 28 February 2017 to 2 March 2017, and preparations are already in full swing. For more information, please contact the AFSTA Secretariat at afsta@afsta.org

ISF World Seed Congress 2017

The ISF World Seed Congress 2017 will take place in Budapest, Hungary on 22–24 May 2017. Registration will open on 10 Jan 2017 at 11:00 h (GMT) and close on 3 May 2017 at 13:00 h (GMT). More than 1000 seed industry professionals are expected to gather to discuss global issues facing the seed industry. For more information, visit the website at www.worldseedcongress2017.com