



Research Article

New Rice (*Oryza sativa L.*) demonstration and popularization in Pawe district, Metekel zone, North Western Ethiopia

Tafer Muluaem Emrey* and Desta Abebe Belete

Researcher in Plant Breeding and Genetics, EIAR-Pawe Agricultural Research Center, Pawe, Ethiopia

Received: 17 March, 2022

Accepted: 04 May, 2022

Published: 05 May, 2022

*Corresponding author: Tafer Muluaem Emrey, Researcher in Plant Breeding and Genetics, EIAR-Pawe Agricultural Research Center, Pawe, Ethiopia, Tel: +251-918782835; E-mail: tafer_mulualem@yahoo.com

Keywords: Demonstration; Ethiopia; Pawe; Popularization; Rice

Copyright License: © 2022 Emrey TM, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

<https://www.peertechzpublications.com>



Abstract

Rice is one of the millennium crops that give more attention by the government of Ethiopia to bring food security across the nation. Research has been conducted on rice and released promising rice varieties by Pawe agricultural research center in collaboration with Adet agricultural research center in the past. The objective of this demonstration was to popularize and demonstrate the newly released rice variety i.e. PSBRC92 and to get feedback from the end-users. In the field demonstration, a total of 50 rice producer farmers participated and they have given their own suggestions concerning the new rice variety compared with the check one. The advantages of using the new rice variety over the standard check are early maturity and high quality of resistance to diseases. Farmers' agricultural experts and researchers were discussed fruitfully. Finally, farmers showed their interest to use the new rice variety, if they have got access to get the seed. Generally, all the stakeholders have agreed to do more to maximize and popularization of the new rice variety and the paper will provide some information to the readers about rice variety development research in Pawe as well as in Ethiopia.

Introduction

Rice (*Oryza sativa L.*) is a cereal foodstuff that forms an important part of the diet of more than three billion people around the world [1]. Rice is also an important staple food crop in many Sub-Saharan African countries and it feeds on hundreds of millions of Asians, Africans, and Latin Americans living in the tropics and subtropics [2]. In many developing countries the dietary contribution of rice is 29.3 and 29.1 percent for energy and protein, respectively [3].

To meet the growing needs of the ever-increasing human population, however, rice production must be increased by 40% in the next 25 years [4]. Pinstrup-Anderson (1994) also confirmed that the demand for rice would increase in the future. This increase in rice production must be achieved through the utilization of less land, less water, and fewer agrological and other inputs. Most of the consumers, who depend on rice as their primary food, live in less developed countries. Rice is a strategic component of food security and plays a role to alleviate food shortages in such countries.

Rice was introduced in Ethiopia during the 1970s and has since been cultivated in small but increasing pockets of the country [5]. However, its importance is being well recognized in the country as the area coverage of 18,000 ha and total production of 42,000 tons in 2006 has increased in 2009 to 155,000 ha and 496,000 tons, respectively [6]. It is reported that the potential rice production area in Ethiopia is estimated to be about thirty million hectares [7]. Because the rice plant is highly adaptable to the local environment and human has succeeded in modifying the local agro-ecosystem, rice can now be grown in many different locations and under a variety of climates [8,9].

The rice culture in Ethiopia includes upland rice, grown on well-drained soil, irrigated and paddy rice where the crop grows on pounded paddies that are either rain-fed or irrigated condition. Because the country has the potential to grow this crop, the country's potential for rice production is estimated to be 30 million ha of land [7]. Especially the Gambella region following the Baro River, the Fogera plain around Lake Tana, and Pawe special districts (black soil) are the most suitable

area for rice production. There are also some potential pocket areas in different parts of the country like Boditi area around Arbaminch, Gojeb and Limukosa around Jima, Chefa robit (Shewa robit) in Northern Shewa, and others like Metema and Koladiba are introducing rice by themselves and have already started production without any extension works. Areas around Melka Werner, Melkasa, Jijiga, Alberow dam (an irrigation project at Abobo), and many other areas with agro-ecological similarities are suitable to grow lowland irrigated types where irrigation facilities are available.

Pawe agricultural research center was involved as National Rice Coordinator from 2006 and plays an important role in the expansion of rice in the country in collaboration with the Africa Rice Center (WARDA) and Japan International Cooperation Agency (JICA). As a result, the center developed and released four rice varieties, namely M-55, NERICA-3, NERICA-4, and Superica-1 for the Pawe area and similar agro-ecologies as Upland rice in 2006. The variety Pawe-1 was previously named M-55 for the Pawe area in 1998. Rice production expands to areas like Manbuk, around Assosa Zone and some progress has been observed. Starting from 2009/2010 investors started producing rice at Pawe on a huge land by using heavy machinery. The problem is that the numbers of improved rice varieties were not sufficient for different agro-ecologies with desired qualities. From this point of view, the present study was aimed to show other options or alternatives of rice variety for the end-users i.e. farmers and private companies in rainfed lowland areas in different agronomic parameters and to give out an idea about the progress of rice research at Pawe.

Materials and methods

The demonstration and popularization of the new rice variety were carried out on two farmers' fields in two villages of Pawe district namely; Village-17 and Village-14 during the 2013 cropping season. Pawe is located 575 kilometers away from Addis Ababa with a latitude of 11° 15'N and longitude of 36°05'E at an elevation of 1050 meters above sea level. The mean annual rainfall is 1148.40mm, and the mean minimum and maximum temperatures of the area are 17.06 and 31.47°C, respectively. The area is characterized by its high rainfall with an extended period (April/May to September/October), high temperature, and black soil (version). The new rice variety i.e. PSBRC92 and Pawe-1 as a standard check were sowed in a plot size of 10×10m (100m²) with 20cm spacing between rows and all recommended agronomic practices were properly done. Both rice varieties are categorized under rain-fed lowland rice.

Result and discussion

A field demonstration was organized and responsible stakeholders such as farmers, development agents, district agricultural experts, and researchers were invited to the occasion. In the event primarily participants' farmers and other stakeholders were allowed to see and evaluate the two rice varieties the new (PSBRC92) and the standard check (Pawe-1) (Figure 1). Following this, the rice researcher gave a brief description of the merits of the newly released rice variety in contrast with the standard check. For instance, the

new variety showed disease resistance, good tillering capacity, and early mature characters over the standard once (Table 1). It also differs in its maturity date and is considered an early maturing type i.e. 115-120 days. In the field, participants discussed fruitfully and basic issues in rice farming were raised. In addition, appropriate explanation and elaboration including land preparation as well as sowing were given by the rice research team.

Generally, farmers were preferred and showed their interest to use the newly released rice variety at the end of the demonstration and popularization. Thus, the end-users requested to access the seeds of the newly released rice variety in the upcoming cropping season. Since there is no seed-producing company in the region as well as in the Metekel zone farmers are encouraged to produce the newly released rice variety in a community-based seed multiplication system using a revolving seed that they obtained from the Pawe agricultural research center.

Conclusion

In conclusion, the efforts to develop a new rice variety targeting farmers' demand and friendly to the environment will be continued in collaboration with other governmental or NGOs. This will solve problems that appeared in the rice farming system according to their prioritization. But one thing that should be taken into consideration is that the development of improved rice varieties by itself does not bring the intended objective i.e. increasing rice production and productivity at



Figure 1: Partial view of the demonstration by farmers and other partners.

Table 1: Comparison of the newly released rice variety over the standard check.

Characters	New rice variety(PSBRC92)	Standard check
Diseases/pest	Highly resistant	Moderately resistant
Maturity date	115 to 120 days	140 to 150
Tillering capacity	High	High
Yield	30 – 35q/ha	35 – 40q/ha
Shattering	No problem	High
Lodging	Resistant	Moderately
Seed size	Medium	Medium
Stem strength	Highly strong	Moderately



the household level. So, there is a need to do more on the demonstration and popularization of improved rice varieties by responsible stakeholders. The seed multiplication of the newly released variety also should be given more emphasis to meet farmers' seed demand. This will enable us to meet the desired objectives.

Acknowledgement

The author is thankfully acknowledging the rice research team at Pawe agricultural research center for their unlimited and successful achievement in releasing of new rice variety and for EAAPP for financial support.

References

- Skaria R, Sen S, Muneer PMA. Analysis of genetic variability in rice varieties (*Oryza sativa L.*) of kerala using RAPD markers. *Genet Eng Biotech J.* 2011. 24:1-9.
- Tari DB, Pirdashti HA, Nasiri M. Investigation Some Agronomical Traits of Rice under different Transplanting dates. 2009.
- Sautter C, Poletti S, Zhang P, Gruissem W. Biofortification of essential nutritional compounds and trace elements in rice and cassava. *Proc Nutr Soc.* 2006 May;65(2):153-9. doi: 10.1079/pns2006488. PMID: 16672076.
- Brar DS, Abbasi FM, McNally R, Talag J, Corral M, et al. Molecular Characterization of introgression and alien gene transfer in rice. In: Abstracts. International Rice Genetics Symposium, International Rice Research Institute, Los Banos, Philippines. 2000; 56.
- Gebremeskel BK. Rice Value Chain in Metema District, North Gonder Ethiopia, Challenges and Opportunities for Innovation, M.Sc Thesis, Institute of Regional and Local Development Studies, College of Development Studies, Addis Ababa University, Ethiopia. 2010.
- MoARD (Ministry of Agriculture and Rural Development). Annual report. Ethiopia, Addis Abeba, 2010.
- Ministry of Agriculture and Rural Development (MoARD). National Rice Research and Development Strategy of Ethiopia. The Federal Democratic Republic of Ethiopia, Ministry of Agriculture and Rural Development, Addis Ababa, Ethiopia. 2010; 48.
- Takele A. Analysis of Rice Profitability and Marketing Chain: The Case of Fogera Woreda, South Gonder Zone, Amahara Regional State, Ethiopia, M.Sc. Thesis, Department of Agricultural Economics, Haramaya University, Ethiopia 2010.
- Mandal KG, Misra AK, Hati KM. Rice residue- management options and effects on soil properties and crop productivity. *Food Agric Environ.* 2004; 2:224.

Discover a bigger Impact and Visibility of your article publication with Peertechz Publications

Highlights

- ❖ Signatory publisher of ORCID
- ❖ Signatory Publisher of DORA (San Francisco Declaration on Research Assessment)
- ❖ Articles archived in worlds' renowned service providers such as Portico, CNKI, AGRIS, TDNet, Base (Bielefeld University Library), CrossRef, Scilit, J-Gate etc.
- ❖ Journals indexed in ICMJE, SHERPA/ROMEO, Google Scholar etc.
- ❖ OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting)
- ❖ Dedicated Editorial Board for every journal
- ❖ Accurate and rapid peer-review process
- ❖ Increased citations of published articles through promotions
- ❖ Reduced timeline for article publication

Submit your articles and experience a new surge in publication services (<https://www.peertechz.com/submission>).

Peertechz journals wishes everlasting success in your every endeavours.