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Rice Yields Traditionally Obtained from Plantings in High-Latitude Areas

Mary Olumayowa*

Department of Pure and Applied Botany, College of Biological Sciences, Federal University of Agriculture Abeokuta, Nigeria

Introduction

Since rice provides energy and protein for human, its quantity and quality requires major attention. Although these two factors could be improved by biotechnological approaches but there are key constraints on production of this economical crop worldwide. Rice pests and diseases cause annually significant loss of rice production. Several insects attack rice including Rice Water Weevil, Rice Stink Bug, Fall Armyworm, Chinch bug, Mexican rice borer, sugarcane borer, grasshoppers, Blister Beetles and Leafhoppers [1]. This is only the half problem because many pathogens also cause severe damages as blast, Rice yellow mottle virus and Bacterial blight. Several biotechnological approaches are adopted to increase quality and quantity of rice as well as its resistance to pests, diseases and environmental stresses. These approaches have now increased quality and quantity of rice production by transfer of economically important traits from genus/species barrier into the rice gene pool, manipulation of target trait without disruption to the non-target regions of the rice genome and shortening the breeding cycle. These advantages come from several techniques including DNA marker technology for enhancing precision in rice breeding, genetic engineering for transferring agronomical, useful traits across species barrier that cannot be achieved by conventional means and Application of genomic tools for identifying new and useful genes/alleles [2]. Apart from the above mentioned aspect, efficient and safe control of rice pests and diseases are undergoing to prevent any exotic yield loss. Although spraying by chemical insecticides is the main tactic to eliminate presence and damages of pests but several other tactics along with biotechnological control are used by farmers. Because of rising concerns on environmental pollution, resurgence, resistance and emerging of secondary pests caused by synthetic chemicals, researchers and farmers are seeking for safer and more efficient tactics such as using insect growth regulators, bio-control agents, sanitation and etc. For example, we have conducted several experiments to elucidate physiological efficiency of Andrallus spinidens and stem borer in Iran where it has been resistant to diazinon as common used insecticide there. Taken collectively, importance of rice not only as a food but also as income leads to bring pile of researches as well. On the other hands, RR intends to publish complete, reliable and recent sources of information as original articles, review articles, case reports, short communications and etc. RR is proud to announce that first number of journal has successfully been published in 2013 and it wants to continue its way to reach a great reputation among researchers around the world. The submitted manuscripts will be rigorously and rapidly reviewed by experts in rice science [3]. Editorial board of RR is eagerly to have high-quality research results. Cereals are one of the important foods for growing population of human. Approximately 50% of consumed calories by the whole population of humans depend on wheat, Rice and maize. Although rice has the second place because of planted area but it serves as the most important food source for Asian countries mainly in south- east parts where it is an economic crop for farmers and workers who grow it on millions of hectares throughout the region. Historically, rice was cultivated 10000 years ago in the river valleys of South and Southeast Asia and China since it served as the most important food for people [4]. Although Asia is the main place of rice cultivation but it was harvested in other continents like Latin America, Europe, some parts of Africa and even USA. Milling rice paddy removes the husk and bran layer to produce white rice. Rice is best milled at 13–14% moisture content. Best results are attained when the process is completed in a number of stages. Grain temperatures should not exceed 45°C during the process. An efficient mill removes the husk (20%), the bran or meal (8–10%), and leaves 70% as white rice. Rice grown in irrigated systems should attain 60% white rice as head rice (unbroken, white kernels) and rain fed systems 40–50% as head rice. Rice is milled in several ways. Hand pounding using a mortar with a pestle results in very high numbers of broken rice and leaves brown rice. Cleaning of the husk is done by winnowing. A one-step milling process where the husk and the bran are removed in one pass and white rice is produced directly from the paddy. The single-pass rice mill is an adaptation of the Engleberg coffee huller. This process results in many broken kernels, low white rice recovery, and head rice yields less than 30%. The fine broken's are often mixed in with the bran and the ground rice husk [5]. A two-step milling process where the husk and the bran are removed separately. These mills are often called compact rice mills and, in many countries, have superseded the Engleberg mill. The two-stage mill has separate hulling and polishing processes. Rubber rollers remove the husk and the brown rice is polished with a steel friction whitener. These mills have a capacity of 0.5–1 t/hour paddy input and are often used for custom milling in rural areas. The milling performance of the compact rice mill is superior to the single-pass huller with milling recoveries normally above 60%.A multi-stage milling process where rice passes through a number of different operations [6]. The milling process in larger commercial mills combines a number of operations and produces higher quality and higher yields of white rice from paddy rice. The process involves Pre-cleaning the paddy prior to milling, Removing the husk or outer layer from the paddy, polishing the brown rice to remove the bran layer, Separating the broken grains from the whole kernels, Bagging the milled rice and Managing the by-products. The value of milled rice in the market is determined by a number of physical and chemical characteristics, and the consumers, which will vary within and between countries. The degree of milling or amount of the brown rice removed affects the color of white rice and often the price. Under-milled rice absorbs water poorly, does not cook well, and is normally cheaper. Head rice percentage or % broken. Head rice also includes broken kernels that are 75–80% of the whole kernel. High head rice yield is one of the most important criteria for measuring milled rice quality. High-quality rice normally has less than 5% broken. This characteristic is a combination of varietal physical characteristics

***Corresponding author:** Mary Olumayowa, Department of Pure and Applied Botany, College of Biological Sciences, Federal University of Agriculture Abeokuta, Nigeria, Tel: +02124734566, E-mail: jnsr@iiste.org

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and the degree of milling [7]. During milling, the whitening and polishing process greatly affects the whiteness of the grain and its transparency Chalkiness. Grain appearance is affected by the amount of chalkiness or white belly. Chalkiness is caused by interruption of the final grain filling. Though chalkiness disappears upon cooking, excessive chalkiness often downgrades the quality and reduces milling recovery. Environmental conditions such as temperature during ripening influence gelatinization temperature. There is normally a preference for rice with intermediate gelatinization temperature [8]. The amylose content of rice usually ranges from 15–35%. High-amylose rice has high volume expansion; grains cook dry, are less tender, and become hard upon cooling. Low-amylose rice cooks moist and sticky. Intermediate-amylose rice is preferred in most rice-growing areas of the world. Gel consistency measures the tendency of the cooked rice to harden on cooling. Varieties with a softer gel consistency are preferred if rice is to be consumed after cooling or if cooked rice with higher degree of tenderness is desired. Water availability largely determines the potential crop yield. For a crop to continue to grow, the water supply needs to be similar or a little above evaporation. Good water control increases crop yields and grain quality as well as improving the efficiency of other inputs such as fertilizer, herbicide, and pesticides. To maximize water-use efficiency, maintain the bunds, Level the fields, Puddle the fields where possible, Use direct-seeding techniques, Use short-duration crops, and Harvest on time [9]. Good-quality water is necessary to maximize crop growth. The rice plant is susceptible to salinity especially at the seedling stage and during the panicle development stage from panicle initiation to booting. Symptoms of salt toxicity include firing of leaves and reduced dry matter production. The effects of high salinity during panicle development are less obvious as there is little leaf effect, but florets and grain numbers per panicle are reduced greatly reducing yield. Most soils provide only limited amount of nutrients to the crop, therefore fertilizers need to be applied to increase grain yield. In some cases, fertilizers are also added to improve the soil's physical condition. Weeding after panicle initiation may also be important to prevent weeds shedding seeds in future crops.

Conclusion

Effective weed management Ploughing and harrowing in fallow should be undertaken at least two weeks apart or after rain. Good land levelling reduces weed growth because most weeds have trouble germinating under water. Select varieties which have early vigour. Use clean rice seed which is free of weed seeds. Apply permanent water early weeds cannot germinate under water. First weeding begins within weeks after establishment and the second in other weeks. Weed before fertilizer application. Using herbicides identify the weed correctly and use the appropriate herbicide as recommended on the label. Spray when the weeds are small. Apply pre-emergence herbicides after planting prior to establishment. Apply post-emergence herbicides after emergence being careful of crop damage. Herbicides are poisonous; if they are not used properly they can cause health and environment problems. Label them clearly and keep them out of children's reach. Always use protective clothing when spraying. Do not wear raincoats when spraying as this increases sweating.

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Conflict of Interest

None

References

1. Mercer K L, Perales H R (2010) Evolutionary response of landraces to climate change in centers of crop diversity. Evol Appl US 3: 480-493.
2. Giandomenico Corrado, Rosa Rao (2017)Towards the genomic basis of local adaptation in landraces.
3. Gibson RW (2009). A review of perceptual distinctiveness in landraces including an analysis of how its roles have been overlooked in plant breeding for low-input farming systems. Econ Bot NY 63: 242-255.
4. Drechsel P, Dongus S (2009) Dynamics and sustainability of urban agriculture: Examples from sub-Saharan Africa. Sustain Sci UN 5: 69-78.
5. Smit J,Nasr J (1992)Urban agriculture for sustainable cities: using wastes and idle land and water bodies as resources.Environ Urban US 4: 141-152.
6. Mark S J, Michael J L, Thoreau R T, Nicholas C (2015) Attenuation of urban agricultural production potential and crop water footprint due to shading from buildings and trees. Environ Res Lett UK 10: 1-12.
7. Karanja N N, Njenga M, Prain G, Kangâethe E, Kironchi G,et al (2010). Assessment of environmental and public health hazards in wastewater used for urban agriculture in Nairobi, Kenya. Trop Subtrop Agroecosystems USA 12: 85-97.
8. Lado C (1990) Informal urban agriculture in Nairobi, Kenya: problem or resource in development and land use planning?. Land use policy EU 7: 257-266.
9. Ravi D, Prakash A (2012) Production and applications of artificial seeds: a review. Int Res J Biological Sci USA 1: 74-78.