Enhancing Potato Seed Production Using Rapid Multiplication Techniques

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Introduction

Potato is regarded as a high-potential food security crop due to its ability to provide high yield and quality product per unit input with a short crop cycle (mostly <120 days). The national average yield at present is approximately 10.5 t/ha, which is lower than the world's average yield of 17 t/ha (Muthoni et al., 2011). The potential of potato crop has not been adequately exploited. The crop is mainly grown at high altitudes of 1,500–3,000 masl by small-scale farmers, who account for over 90% of the production. Most of the production is under rainfed conditions and carried out in scattered patches of intensive small-scale agriculture (McArthur, 1989).

There are a number of production problems. The major ones are unavailability and high cost of seed tubers; lack of well-adapted cultivars to the major agro-ecological zones; suboptimal agronomic practices; the prevalence of diseases and insect pests; and inadequate storage, transportation, and marketing facilities. To address these problems, the Ethiopian Institute Agricultural Research (EIAR)—the then Institute of Agricultural Research—in collaboration with the International Potato Center (CIP), initiated potato research. The research had as its main objectives to

- develop adaptable and high-yielding potato cultivars with good resistance to biotic and abiotic stresses;
- identify the best agronomic practices and storage systems;
- adopt the use of botanical seed as an alternative propagation method;
- develop seed production system in the country; and
- train farmers and other stakeholders.

Among potato production problems, a major bottleneck that contributes to low yield in Ethiopia is the lack of healthy and quality seed tubers in the required quantity and quality (Berga and Gebremedhin, 1994). There is no formal seed system operating for clean/healthy potato seed multiplication and distribution in Ethiopia. Hirpa et al. (2010) reported that potato seed production in Ethiopia is basically informal, which in most cases operates by recycling planting materials

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Enhancing Potato Seed Production Using Rapid:

Potato and Sweetpotato in Africa Jan Low,Moses Nyongesa,Sara Quinn,Monica Parker,2015-10-28 Sweetpotato and potato are expanding faster than any other food crops in sub Saharan Africa There is growing investment in research to address bottlenecks in value chains concerning these two crops and growing interest from the private sector in investing in them This book addresses five major themes on sweetpotato and potato policies for germplasm exchange food security and trade in Africa seed systems breeding and disease management post harvest management processing technologies and marketing systems nutritional value and changing behaviours *Biotechnologies of Crop Improvement, Volume 1* Satbir Singh Gosal,Shabir Hussain Wani,2018-06-22 During the past 15 years cellular and molecular approaches have emerged as valuable adjuncts to supplement and complement conventional breeding methods for a wide variety of crop plants Biotechnology increasingly plays a role in the creation conservation characterization and utilization of genetic variability for germplasm enhancement For instance anther microspore culture somaclonal variation embryo culture and somatic hybridization are being exploited for obtaining incremental improvement in the existing cultivars In addition genes that confer insect and disease resistance abiotic stress tolerance herbicide tolerance and quality traits have been isolated and re introduced into otherwise sensitive or susceptible species by a variety of transgenic techniques Together these transformative methodologies grant access to a greater repertoire of genetic diversity as the gene s may come from viruses bacteria fungi insects animals human beings unrelated plants or even be artificially derived Remarkable achievements have been made in the production characterization field evaluation and commercialization of transgenic crop varieties worldwide Likewise significant advances have been made towards increasing crop yields improving nutritional quality enabling crops to be raised under adverse conditions and developing resistance to pests and diseases for sustaining global food and nutritional security The overarching purpose of this 3 volume work is to summarize the history of crop improvement from a technological perspective but to do so with a forward outlook on further advancement and adaptability to a changing world Our carefully chosen case studies of important plant crops intend to serve a diverse spectrum of audience looking for the right tools to tackle complicated local and global issues **Circular - University of Montana, Agricultural Experiment Station** Montana Agricultural Experiment Station,1915 *Enhancing Seed Production Capacity of Small-scale Farmers* P. Okori,2001 **Generation, Adoption and Impact of Diffused Light Potato Storage Technology in Badula District, Sbi Lanka** , *Montana Grain Inspection and the Federal Grain Standards for Wheat* Alfred Atkinson,C. N. Arnett,Edward H. Riley,Harvey Ellison Murdock,Howard Welch,William F. Schoppe,Milburn Lincoln Wilson,1917 Potato Production Worldwide Mehmet Emin Calıskan,Allah Bakhsh,Khawar Jabran,2022-10-22 Potato is a crop grown on all inhabited continents of the globe It is included in the top five crops of the world used as staple food in several countries and the number of people daily consuming the potato may surpass one billion Despite the high quantities of seed potato produced

worldwide there are yield gaps due to challenges such as abiotic stresses pests climate change and poor production practices A region wide critical analysis of yield declining factors can help formulate management strategies that can improve potato yields Bridging yield gaps in potato will ultimately ensure the role of this crop in securing current and future food security Potato Production Worldwide presents information on this global crop from its history morphology and taxonomy to the growth and development of the potato crop including the latest strategies in addressing today s biotic and abiotic challenges This book identifies the reasons for yield gaps in various potato production regions of the world as well as presenting the best production practices pest management strategies and approaches to deal with climate change from the perspective of potato production Chapters provide important insights into potato production cultures and approaches in the major potato production countries Potato Production Worldwide will be a valuable resource for researchers scientists and students seeking a comprehensive view of successful potato production Provides comprehensive information on the origin history taxonomy morphology ecophysiology growth and development of the potato Addresses production practices including irrigation nutrient management harvesting and post harvest techniques Explores the impact of Abiotic stresses drought chilling salinity etc and their management **Circular** Montana Agricultural Experiment Station,1915 **Advances in Research on Potato Production** Shashank Shekhar Solankey,2025-06-11 Potato Solanum tuberosum L is the world s third most important food crop and the fourth most important food crop in India Potatoes are nutritionally rich fat free gluten free and high in dietary fibre They are also a good source of vitamin C vitamin B6 phenols iron potassium phosphorus magnesium and protein as compared to cereals They are more energy packed than any other popular vegetables and have the ability to combat hidden hunger which is a major global health issue The potato is also considered the king of vegetables due to its versatile uses and is an important staple food worldwide According to the FAOSTAT database 2023 global potato production in 2022 was 375 million tonnes with the top producers being China 95 5 million tonnes and India 56 million tonnes The United Nations declared 2008 the International Year of the Potato IYP to increase awareness of the relationship that exists between poverty food security malnutrition and the potential contribution of the potato in defeating hunger Moreover this magical crop can generate a higher yield compared to the other crops hence it is one of the most notable crops to eliminate hunger and poverty Therefore sustainable potato production is important for food security and social welfare in future climate change scenarios It is important to inform that potatoes have a shallow root system and are highly sensitive to environmental conditions and climate change It is projected that potato yield may decrease up to 32 per cent by 2050 due to increasing temperatures and drought conditions Thus future potato breeding programmes should focus on enhancing abiotic and biotic stress tolerance through the utilization of the natural germplasm conserved in different gene banks along with climate friendly agronomical practices Moreover potato breeding should benefit from the effectiveness and ease of molecular techniques such as marker assisted selection genome wide association studies functional genomics and transgenics The

development of new potato varieties can also be achieved via genetic engineering and genome editing Disease free potato seed production requires the integration of tissue culture methods followed by the production of mini tubers under an aeroponic system As it is a staple food for millions and demand for potatoes will increase in the future which makes this crop suitable for future research Hence the present book is formulated for professionals researchers and post graduate students who is working with advanced production breeding and post harvest technologies on potato crop specially in Indian perspective Circular ,1915 The Potato Roy Navarre,Mark J Pavek,2014-12-15 Potatoes are a staple crop around the world Covering all aspects of botany production and uses this book presents a comprehensive discussion of the most important topics for potato researchers and professionals It assesses the latest research on plant growth such as tuber development water use and seed production covers all aspects of pest management and reviews postharvest issues such as storage global markets and of course nutritional value and flavour Seed Production and Marketing Joseph Frank Cox,George E. Starr,1927 Seed production and marketing Improving varieties by modern methods of breeding The work of crop improvement associations and cooperative seed distributing agencies Special cultural preactices and equipment necessary in growing good seed Growing and marketing seed corn Producing small grains for seed Producing seed of the clovers Producing alfalfa seed Kentucky bluegrass seed production and marketing The production of seed of timothy redtop and other grasses Cotton seed production Growing and marketing seed potatoes Producing seed of field beans soybeans cowpeas and vetch Growing seed of cucumbers melons pumpkins and squashes Growing seed of the crucifers Cabbage Cauliflower Kohlrabi Brussels sprouts kale Collards Turnip Rutabaga Radish chinese cabbage cress horse radish and sea kale Growing seed of solanaceous vegetables tomato pepper egg pant husk tomato or ground cherry wonderberry tobacco Growing seed of garden and canning beans and peas Producing seeds of garden beet and sugar beets swiss chard and spinach Growing seed of carrots parsnip celery parsley and other umbelliferous plants Growing seed and sets of onion leek garlic shallot ciboul or welch onion chives Growing seed of lettuce endive chicory salsify artichoke Growing seed of asparagus okra rhubarb Where the nation s seed is produced **Journal of the Indian Potato Association** ,1998

Annual Report of the Agricultural and Experimental Union Ontario Agricultural and Experimental Union,1925

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Report New Zealand. Department of Agriculture,1916 The Quarterly Bulletin Michigan. Agricultural Experiment Station, Lansing,1927 **Quarterly Bulletin - Michigan State University, Agricultural Experiment Station** Michigan State University. Agricultural Experiment Station,1928 Quarterly Bulletin Michigan State University. Agricultural Experiment Station,1926

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