



**BUSITEMA
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**FACULTY OF ENGINEERING
AGRO-PROCESSING ENGINEERING DEPARTMENT**



**DESIGN AND CONSTRUCTION OF A STRUCTURE
FOR COMMERCIAL SPROUTING OF SOLANUM
POTATO SEEDS.**

By

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A research project presented in partial fulfillment of the requirements for the award of the degree of Bachelors of Science in Agro-processing Engineering of Busitema University.

June, 2014.

DECLARATION

I, Akankwasa Joseph, hereby declare to the best of my knowledge that this project report is an outcome of my own work and that it has not been presented for any academic award in any university, college or higher institution of learning. Throughout the work I have acknowledged all sources in its compilation

Akankwasa Joseph

Signature 

Date... 10/06/2014

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APPROVAL

This final year project report has been submitted to Faculty of Engineering for examination with approval of my supervisor.

SUPERVISOR

Eng. Odogola Richard Wilfred

Signature:

Date:

DEDICATION

I dedicate this report to my dear parents Mr. and Mrs. Byaruhanga Africano whose love, care, support, encouragement, patience and belief in me got me this far. May the Almighty God reward you abundantly.

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I am so grateful to God the Almighty who has seen me through the years and who by his grace I keep shining.

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ABSTRACT

Potato (*Solanum tuberosum*) plays a significant role in the food and economic requirements of Ugandans. It has high tuber yield to land area ratio, which lessens the environmental impact of agriculture of an increasingly crowded and hungry world (Saunders, 2007). The demand for potatoes particularly in urban areas provides a market opportunity for potato growers. However, lack of readily affordable certified seed of suitable improved varieties greatly hampers production (Saunders, 2007). High quality seed is a prerequisite to profitable potato production (Kabira et al., 2006). For almost two decades the potato seed system, has lacked an organized and sustainable arrangement for seed multiplication, a challenge, which renders the potato production chain incomplete. Most basic seed is directly used to produce ware potatoes by majority of the farmers instead of further multiplication to certified seed (KARI Tigoni Centre, 2003).

In Uganda, seed potato supply is dominated by farmer-based informal seed system. The formal potato seed system is a single, organized, seed production programme, handled by Ministry of agriculture agencies in the seed development, production and certification (Crissman et al., 2009). When the seed production and distribution system is considered, the chain has a weak inter-phase between multiplication and distribution, arising from lack of funds and institutions to advance the breeders to pre-basic, basic and certified seed for regular distribution (Saunders, 2007). The development of a formal sector emphasized on aspects of production of certified seed and currently, there is a commercially oriented marketing system that does not reach the majority of farmers (Crissman et al., 2009).

Uganda has the institutional framework needed for a formal system, but lacks enforcement and the economic backing to ensure high quality seed. The use of high quality seed can contribute significantly to increased crop productivity as envisioned in the specific strategies on agriculture in Uganda Vision 2040 (Republic of Uganda, 2012). Increased potato production through provision of high quality seed, can bring about the "green revolution-type" actions required to reduce the high levels of poverty and unemployment experienced in Uganda (Republic of Uganda, 2010). High quality seed ensures increased potato productivity, which would transform agriculture for improved livelihoods through agricultural value chain. The aim of this project was to highlight the progress of the attempts to complement and strengthen the existing seed potato system by designing and constructing a structure for commercial sprouting of *Solanum* potato seeds. This is projected to increase the availability of certified potato seed through an organized, formal and informal arrangement with interested growers for a sustained production in the highland regions of the country where *Solanum* potatoes are grown most.

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ACRONYMS

3G	-	Three Generations Potato Project (USAID funded)
ASARECA	-	Association for Strengthening Agricultural Research in Eastern and Central Africa
CIP	-	International Potato Centre
DRC	-	Democratic Republic of Congo
FAO	-	Food and Agricultural Organization of the United Nations.
IITA	-	International Institute of Tropical Agriculture
KARI	-	Kenya Agricultural Research Institute.
KAZARDI	-	Kachwekano Zonal Agricultural Research Institute
kg	-	Kilogram
M	-	Metre
MAAIF	-	Ministry of Agriculture, Animal Industry and Fisheries
Mm	-	Millimetre of rainfall
Mt	-	Metric ton
NARO	-	National Agricultural Research Organization, Uganda
NPRC	-	National Potato Research Centre, Tigoni Kenya
PRAPACE	-	Eastern and Central African Irish Potato and Sweet Potato Network
t/ha	-	Metric ton per hectare
UNSPPA	-	Uganda National Seed Potato Producers Association
USAID	-	United States Agency for International Development

CHAPTER ONE

1.0 INTRODUCTION.

For ages, solanum potato tubers for seeds have been locally prepared by disinfecting with lantana camara, neem, ash, marigold, tephrosia and eucalyptus tree leaves to repel pests and store on top of dry grass for the next planting. In this chapter, the need for a structure for commercial sprouting of solanum potatoes is defined. This chapter further stresses the objectives, the justification, research questions and the scope of the project, as these provide way forward for onward project sections.

1.1 Background.

Irish potatoes are a starchy tuber crop from the perennial solanum tuberosum of the solsnaceae family. They are the world's most widely grown tuber crop and the fourth largest crop in terms of fresh produce after rice, wheat, and maize (Catalyst Uganda, 2012). They are grown in highland and cool temperature regions that receive regular rainfall. They do best in loose, well-drained and slightly acid soil. Poorly drained soils often cause poor stands and low yields, while heavy soils can cause tubers to be small and rough.

Most potato production in Uganda is currently concentrated in southwest and western region, particularly in Kabale and Kisoro districts, though some potatoes are also produced in - Kapchorwa, Nebbi and Mbale districts. Due to its short cropping cycle and very high yield potential, potatoes farmed under good agronomic practices can be a valuable and an extremely profitable crop for households' food security and income enhancement.

The demand for solanum potatoes in Uganda is increasing rapidly, particularly in urban areas, thus providing market for potato growers. However, inadequate availability of high quality seed at competitive price and of suitable varieties is constraining production of the crop. Currently 85% of the solanum potato seed are produced locally by individual households and by farmers groups. As a result of the high demand for chips, a fast food in urban areas, crisps and cooked potatoes, there is overwhelming need for increased production of solanum potatoes.

The very limited supply and hence inadequate availability of quality seed potato is a major constraint throughout Eastern Africa according to USAID, (2011). Seed quality determines the yields (Adipala *et al.*, 2000) and accounts for 40% of commercial potato production costs and hence profitability of the potato sector (Tindimubona *et al.*, 2000). At a seed rate of 2.5 metric tons per hectare, the potential potato requirement is 207,500 mt if all the farmers were to use improved seed during any one season and yet only about 1600 mt are injected into the market each season. Thus increase in seed potato production will go a long way to improve the productivity of the potato sector by increasing on the yields per seed and quality of the ware potatoes. Further, seed growers are assured of a market and hence improved incomes and increasing food security in the country.

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