

Positive selection to improve quality of farmers seed potato

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Introduction

The major problems faced by the potato farmers in Eastern and Central Africa (ECA) is lack of affordable high quality seeds that has led to lower yields below 10 t*ha⁻¹ as compared to 40 t*ha⁻¹ achieved under proper production systems. The average yield in Burundi, Uganda and Kenya are 2.61, 7.0 and 7.5 t*ha⁻¹, respectively. This is majorly attributed to lack of high quality potato seed seeds among other factors. Positive selection as knowledge intensive method to improve farm saved seed qualities seeks to improve yields at farmers level at a low cost

In most cases small scale farmers are not able to buy the high quality seeds as they have inadequate funds, there is also limited availability of high quality seeds. The high prices and limited availability of quality potato seeds has led to recycling of farmers saved seeds resulting in build up of diseases. Re-using seed potato from farmers own saved seeds reduces yield due to seed degeneration.

Problem statement



Poor quality seeds on the left side and high quality seeds on the right side



Few and malformed tubers indicating symptoms of virus infection



A Technological Solution

Positive selection, was developed to effectively manage the tuber-borne diseases like bacterial wilt and viruses that are transmitted from the plants to tubers. If the tubers are re-planted they produce sick plants, this technology has been successfully promoted and adapted to various farming conditions in Kenya, Uganda and Burundi through the ASARECA-supported quality seed potato project that utilized appropriate practices and technologies to produce and deliver high-quality seed potato through informal seed potato systems.

The Intervention level



Symptoms of bacterial wilt Infected plant beside healthy plant



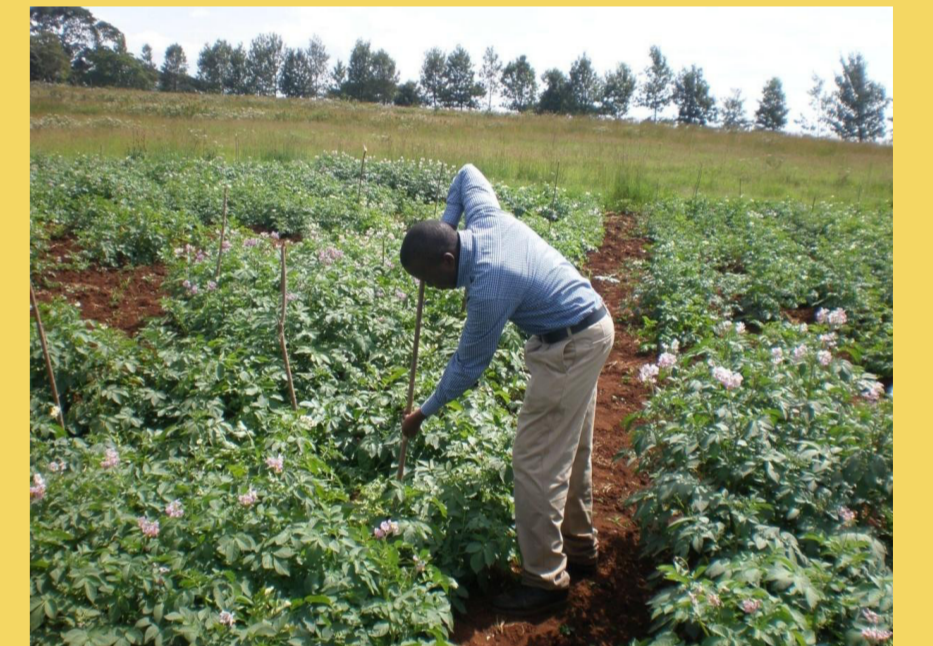
Oozing eyes making soil sticky Oozes comes from vascular ring when cut Rotting begins at the vascular

Positive selection has the principle of selecting healthy looking plants as mother plants for seed potato. It involves;

- Pegging healthy looking plants when the first flowers appear on the crop.
- Checking the health of the pegged plant two weeks later and removing pegs from the plants observed with some diseasesymptoms.
- Harvest the pegged plants one by one.
- Plants with few tubers, mulformed tubers are not selected for seeds.
- Selected seed tubers are stored separately to be used as seeds.
- A regional team drawn from KARI (lead institution), NARO, ISABU, CIP and UNSPPA is implementing the project.



1. Symptoms of virus Leaf roll virus



2. Pegging healthy mother plants



3. Bunchiness



4. Pegged mother plants in the field

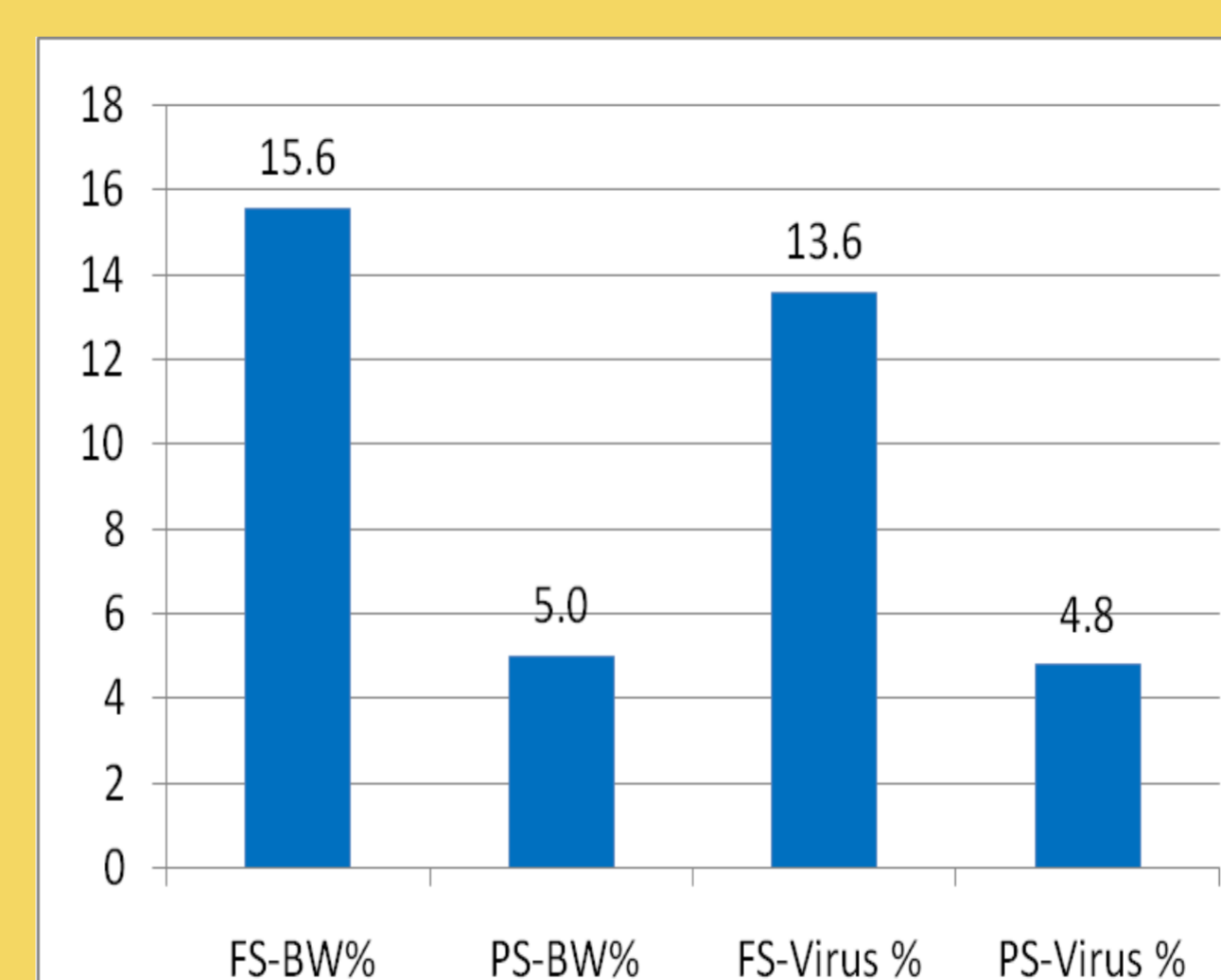
Seed quality is a serious constrain to improved productivity in the potato industry. However there are other factors such as inadequate crop husbandry, insufficient awareness of the impacts of late blight , poor soil fertility, improper storage facilities among farmers are also other factors contributing to improved productivity.

- Yield improvement 30% disease reduction by positive selection.
- In short positive selection is "selecting the best "potato plants as mother plants for the next potato crops. Healthy seeds can be selected by marking healthy plants.
- Due to the cost effectiveness of the training as well as the as adoption of the technology this program has changed the outlook of potato farming especially to small scale famers who cannot afford the high quality seeds.

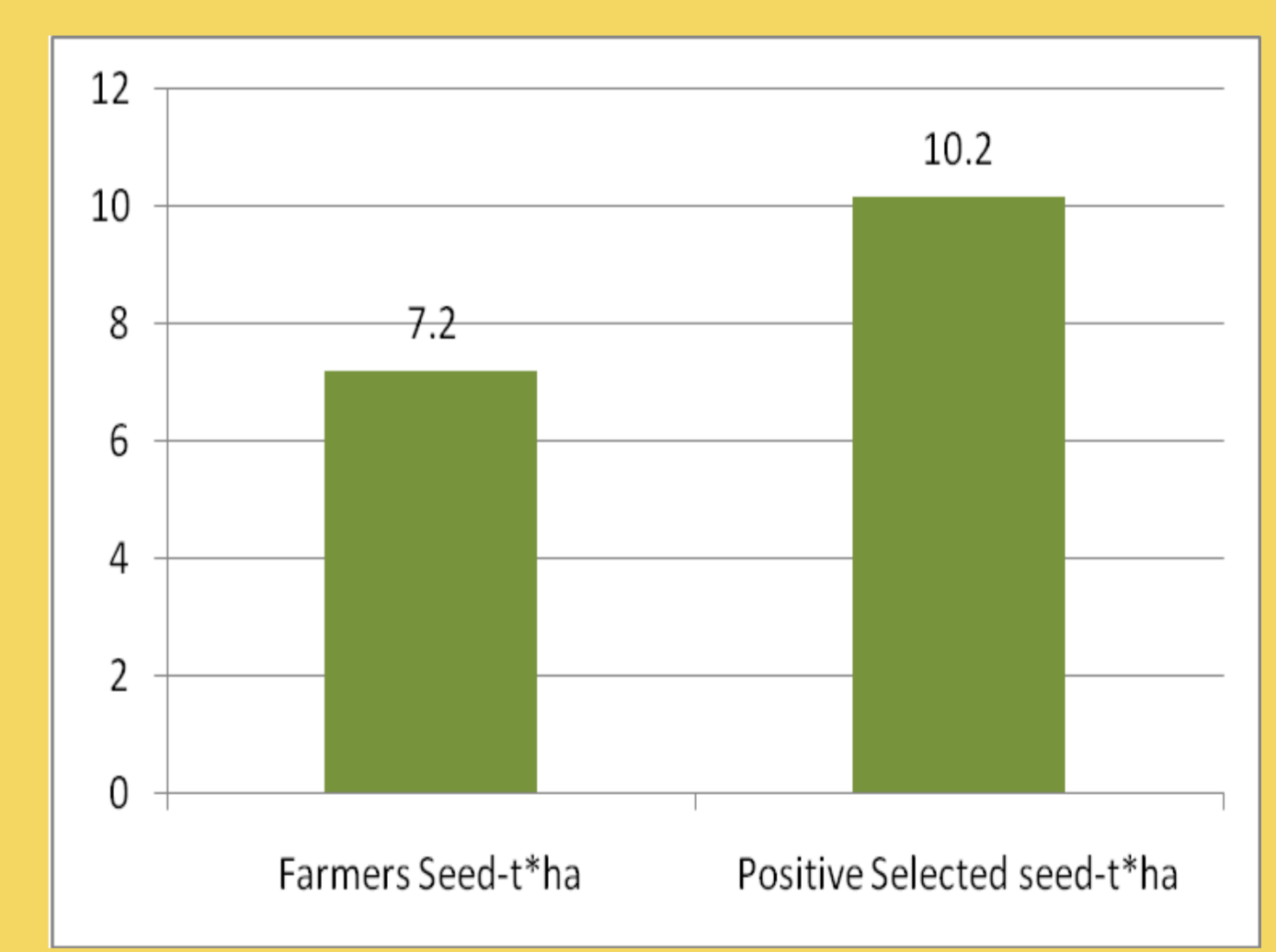
Beneficiaries

- The immediate beneficiaries are the small scale farmers composed majorly of women, men and children. Small scale farmers benefit from the yield increase, reduced labor requirements in disease management practices. The famers also improve their potato seed stock and market by producing high quality seeds.
- Farmers who use large proportion of seed potato from their own harvest can use the technology to fight declining yield as a result of seed degeneration since this concept is easily understood.

Lessons learnt



Bacterial wilt and Virus score test in farmers seed and positive selection seeds



Yields comparison between farmers seed and positive selection seeds