

Evaluation of potato harvesting techniques

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Introduction

Potato is produced on areas ranging from 0.5ha to 5ha, using mainly farm saved seed, manual labor and limited input use. Land is prepared using manual methods or supplemented with oxen. The crop is synonymous with steep slopes of Mt Elgon and thus difficult to mechanize. Luckily some expanses of Kween and Kapchorwa are flat enough for mechanization. Planting is done manually and ridges created with hand hoes at first weeding. In Kapchorwa and Kween, potato producers have modified the planting by opening ridges using oxen, placing seed by hand and covering the seed using a log pulled by oxen. Harvesting however is still manual using hand hoes managed by mainly women and children with youth participating mainly at the loading. From the fields the tubers are; loaded into bags and carried on donkeys to the road side ready to be directly loaded onto waiting trucks.

Post harvest loss (20 -25%) is one of the major problems in the potato production. Among this is physical damage, due to the digging (lifting) of the tubers by hoe or local plow. This entails that significant loss is incurred to the small holders that could have helped in nutrition, food security and income generation. Potato yield productivity can be increased if adoption of new varieties is prioritized. However, post harvest loss reduction efforts have not been tailored well. Harvesting loss reduction helps increasing income, achieve food security, and subsequent storage loss reduction. Thus, to reduce harvesting losses, appropriate technologies should be developed and promoted. This study aimed at selecting, evaluating and demonstration diggers that reduce current harvest loss.

Methods

Animal drawn potato digger: The Oxen drawn potato lifter (OPL) was designed on the basis of the groundnut digger and the ordinary ox-plough. The digger is similar to the shape of mouldboard plough. It consists of mild steel box frame, a V-shaped ridger type share was provided to dig out the tubers. The lifter rods are attached behind the share. These lifter rods are spaced to allow the clods and residual material/tubers to drop while operating the implement. The tubers along with ridge is then collected manually. For operation, a pair of bullocks pulls the implement; the flat piece attached to the share tip penetrates in the soil and harvested crops along with the soil lumps slide over the mouldboard.



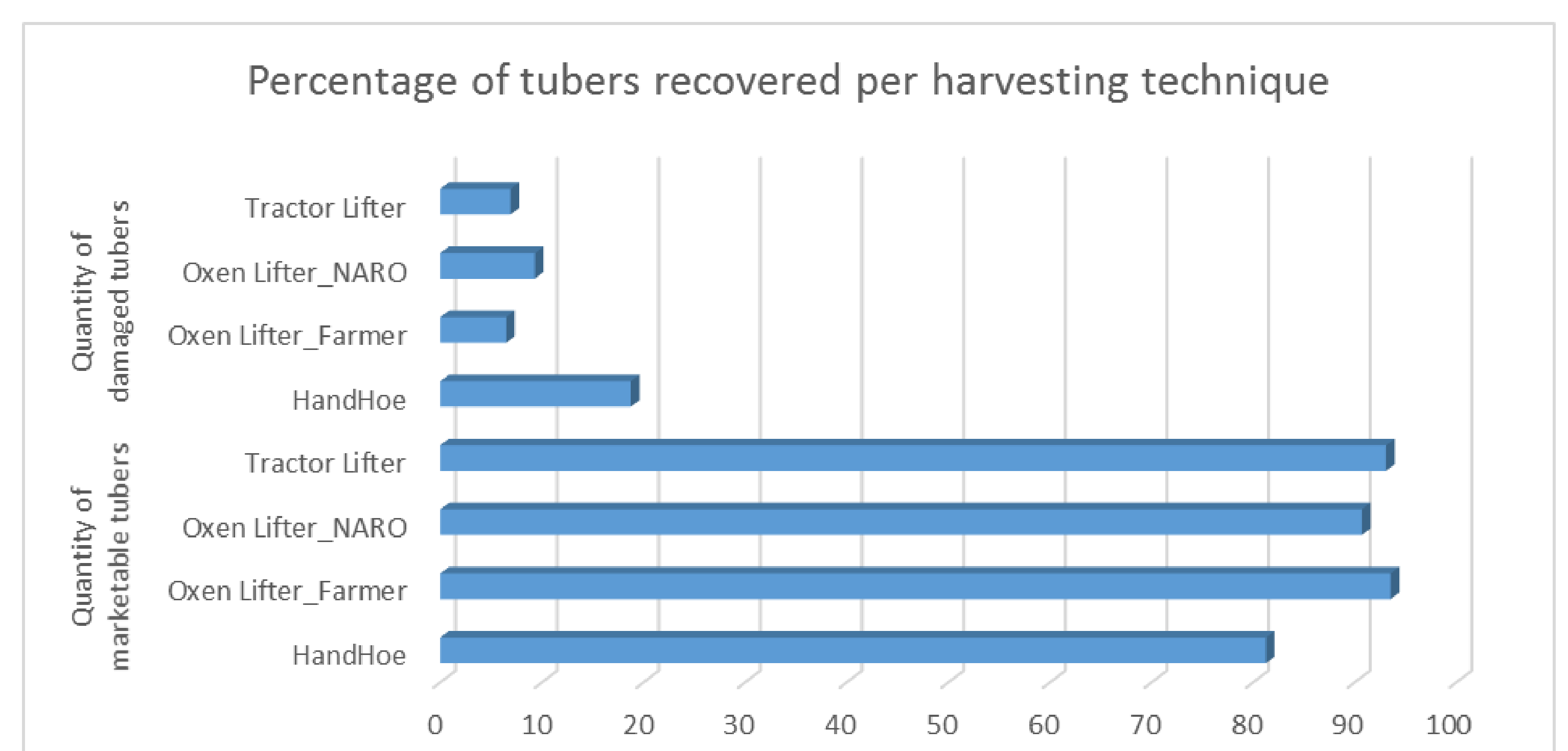
Tractor drawn potato harvesters: The harvester gently lifts the potato which is then vibrated to separate the tubers from the soil. The tubers are laid gently on the surface to facilitate easy bagging thus ensuring 100% of the potato grown is saleable. The Italian made SP50V single row single sieve potato lifter has a reduced size, equipped with discs and a vibrating share facilitates the penetration into the soil. This machine alters a preliminary separation of soil from potatoes, conveys the products to a sieve, which separates them by shaking. The SP SUV must be applied to three point linkage of tractors.

Two ox-drawn potato lifters and a tractor potato lifter were evaluated against the common hand hoe harvesting method in Kween District, Kaptoyoy Sub County, Kapkoch parish in Serwero village.



Results

- **Hand hoe harvesting left a lot of tubers in ground, requires 25 people for 6 hours on an acre thus women might lose the social and economic benefits of food and money**
- **Ox-drawn harvester is more adaptable, less damage, animals and drivers need to understand what is going on and Ox-drawn lifter technology is good and faster (3hours) as compared to local hand hoe harvesting**
- **Tractor drawn harvester, works faster (2hours) but requires technical know how, clean stone/stump free field and crop should have been planted in straight lines with good spacing and equal ridges**



Hand hoe Harvesting



Ox-drawn potato harvester designed by NARO and modified by Farmer



Exposed tubers in furrow after ox-drawn harvesting