

# Positive selection to improve on-farm seed potato management

## TECHNOLOGY DESCRIPTION

Positive selection (or “**Select the best**”) is an efficient and simple technique for improving on-farm seed potato management.

- The best plants (robust and not showing symptoms of key diseases) are marked before and after flowering (Figure 1).
- These plants are harvested and only those with good yield are selected to provide tubers for the next growing season (Figure 2).

This technique is complemented with integrated pest and disease management, and postharvest techniques.



**Figure 1.** Best plants marked in Ecuador



**Figure 2.** Tubers from the best plants selected in Kenya

## LEVEL OF ADOPTION OR USE

In the Andes, the number of beneficiaries that have adopted positive selection has not been estimated, but gross estimates indicate that approximately **3000 farmers** have received training on positive selection since 2007. In Kenya, nearly **28,000 farmers** have received training in positive selection. The **adoption rates** from studies in different counties and interventions in Kenya were between 18 and 52% averaging at **29%** (Gildemacher et al. 2012; Okello and Schulte-Geldermann et al., unpublished). The main reasons for adoption were the ability to produce quality seed at one’s own farm, hoping for increased yields and improving disease management. The main reason for not adopting was drought, significant losses from diseases in particular bacterial wilt and late blight, which meant that many farmers did not harvest enough potatoes for replanting a crop and had to resort to neighbors or the market to purchase seed tubers for planting the next crop. Another important reason mentioned was not having understood the technology, mainly because of absence during training sessions. Adoption levels in 2020 are expected to be approximately 10,000 farmers, assuming similar investment and adoption rates.

## CRITICAL GAPS AND NEXT STEPS

Although positive selection is quite simple and intuitive, dissemination could be problematic, as it challenges the “certified seed replacement paradigm” (Thomas-Sharma et al., 2015) which emphasizes the use of clean seed to manage degeneration. As result, **the scaling strategy need to carefully present positive selection as a technique to complement the use of clean seed, and not to replace it.** The following next steps are proposed:

- Policy change, to promote the use of positive selection, not just certified seed.
- More experiments to test the effect of positive selection in combination with different proportions of certified seed, (e.g., Ochieng et al., 2016).
- Take into consideration other biological and non-biological constraints (such as late blight, bacterial wilt, drought), and market demand of ware potato, when designing new interventions.

## KEY PARTNERS FOR SCALING

**INIAP, PROINPA, INIAF, ADERS, FMARCO, and several NARS, private companies and NGOs in Africa** that participated in the validation and dissemination of positive selection. **CFC, USAID, Irish Aid, McKnight Foundation, IFAD and EU**, that funded the validation and dissemination of positive selection in the Andes and Africa.

## END USERS AND BENEFITS

The end users of this technology are small-scale farmers who usually have low access to high quality seed. As result, they usually keep non-marketable tubers and plant them in the next growing season. But diseases and pests accumulate in the tubers from one generation to the next and, as results, yield is severely affected. This is known as “degeneration”. **Positive selection can increase yields by 30 to 40% compared to regular, non-treated seed.** Also, famers become aware of the impact of good seed potato quality on yield, and the need for regular replenishment of their seed stock with high quality seed from specialized seed growers.

## SCALING STRATEGY

In the Andes (Bolivia, Ecuador, and Peru) and in Africa (Ethiopia, Uganda, Kenya, Rwanda and Malawi) the scaling strategy is through **bilateral projects** that are disseminating positive selection to small-scale farmers, mainly using the farmer field school methodology, each with approximately 20 farmers, who are expected to share their knowledge with other farmers. Moving beyond bilateral projects include involvement with local authorities and schools, so they take positive selection and related technologies in their projects and curricula, respectively.

