In Kenya, seed potato quality is often a major yield constraint in potato production as smallholder farmers use farm-saved seed without proper management of seed-borne pests and diseases. Farm-saved seed is therefore often highly degenerated. The efficiency of positive selection techniques in improving quality of farmers saved seed potato and the performance of subsequent potato crops was investigated from 2011 to 2012 in farmers’ fields in Meru County. Positive selection in farmers seed potato contributed to a 30% reduction in for both bacterial wilt and virus disease incidences. The analysis of mean tuber yield/ha and number of tubers/plant revealed that the seeds obtained through positive selection significantly out-yielded by 58.0% and 34.6% respectively, compared to the farmers saved seed. Therefore, positive selection can contribute to improve quality of farmers saved planting material and potato yields hence an important alternative and complementary technology to regular seed replacement, especially in the context of imperfect rural economies characterized by high risks of production and insecure markets. It does not require cash investments and is thus accessible to all potato producers. It can also be applied where access to high quality seed is not guaranteed. The technology is also suitable for land races and not recognized cultivars that cannot be multiplied formally. Finally, the technology fits seamlessly within the seed systems of Sub-Saharan Africa, which are dominated by self-supply and neighbor’s supply of seed potatoes.