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Irish Potato Planting Materials

A practical guide for farmers, multipliers and extension officers in East Africa

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Why this matters

The Irish potato is East Africa's third most important food crop, after maize and bananas. Yet smallholder yields stagnate at 7–10 tonnes per hectare against an attainable 30–40 tonnes. The single biggest constraint is the quality of planting material.

More than 95% of farmers in Kenya, Uganda and Rwanda still plant tubers saved from previous harvests or sourced from open markets — often diseased, mixed in variety, and degenerated through repeated cycles. Understanding the planting-material options is the first step to closing the yield gap.

The eight planting-material options

1. True Potato Seed (TPS)

- What it is: Botanical seeds from the small green berries that form on potato plants after flowering.
- Form: Tiny seeds, similar in size to tomato seed. About 25g plants a hectare.
- Value: Extremely cheap, virus-free, easy to store and ship. A revolution in transport logistics.
- Limit: Offspring are genetically variable; longer to maturity; not yet a mainstream farmer input in the region.
- Status in East Africa: Promoted by the International Potato Center (CIP) for breeders; still pre-commercial for farmers.

2. Tissue-Culture Plantlets (in vitro)

- What it is: Tiny disease-free plantlets multiplied in sterile glass jars on nutrient agar.
- Form: 3–5 cm plantlets in laboratory vessels.
- Value: The cleanest possible material — virus-indexed, the foundation stock for the entire seed system.

- Used by: KALRO Tigoni, ADC Molo, Genetic Technologies, KEPHIS-accredited labs in Kenya; TARI-Uyole and Mtanga in Tanzania; NARO-Kachwekano in Uganda; RAB in Rwanda.
- Limit: Requires lab handling; not for direct field planting.

3. Microtubers

- What it is: Pea-sized tubers (under 1g) induced inside tissue-culture vessels.
- Value: Easier to transport, store and handle than plantlets; dormant; serve as a bridge between lab and field.
- Use: Foundation and pre-basic seed multiplication.

4. Mini Tubers

- What it is: Pea- to marble-sized tubers (1–25g) produced in screenhouses or aeroponic units from tissue-culture plantlets.
- Form: Small whole tubers.
- Value: One generation away from the lab; very high health status; multiplication ratios of 1:30 to 1:50 in aeroponics.
- Used by: Registered seed multipliers — Kisima Farm, Agrico EA, ADC, KALRO Tigoni in Kenya; Mtanga Foods in Tanzania.
- Cost: Higher per tuber, but lower per planted plant than certified seed.

5. Apical Rooted Cuttings (ARCs)

- What it is: Rooted shoot tips taken from tissue-culture mother plants, hardened in nurseries, then transplanted like tomato or kale seedlings.
- Form: Small rooted cuttings with a few leaves, sold from registered nurseries.
- Value: A game-changer in East Africa. One mother plant yields 50–500 cuttings. Disease-free, affordable, and the fastest route to scale.
- Adoption: Heavily promoted in Kenya by CIP, KALRO, Stokman Rozen, Kisima and the National Potato Council of Kenya (NPCK); active pilots in Tanzania, Uganda and Rwanda.
- Yield: Comparable to certified seed when well managed in the first generation.

6. Certified Seed Tubers

- What it is: Whole seed tubers (25–60g, “egg-sized”) produced under formal regulatory inspection.
- Regulators: KEPHIS (Kenya), TOSCI (Tanzania), MAAIF – NSCS (Uganda), RAB (Rwanda), ONCCS (Burundi).
- Classes: Pre-basic → Basic → Certified 1, 2, 3.
- Value: Predictable yields, true-to-type, traceable, formally guaranteed.
- Limit: Bulky (about 2 tonnes are needed per hectare), expensive, and in chronic short supply. Less than 5% of the East African potato area is planted with certified seed.

7. Clean Seed (Quality Declared Seed – QDS)

- What it is: Seed potato multiplied from clean starting material (mini tubers or apical cuttings) under regulator-supervised quality assurance, but at a step below full certification.
- Regulatory frame: Quality Declared Seed under FAO guidelines; recognised in Tanzania, Uganda and Rwanda; gaining ground in Kenya as a category sitting between farmer-saved and fully certified.
- Form: Whole tubers from registered or declared community-based multipliers.
- Value: Bridges the price-and-supply gap. Typically 30–50% cheaper than certified seed, far cleaner than farmer-saved.
- Best fit: Smallholder schemes, cooperatives and last-mile multipliers in Mbeya, Njombe, Kabale, Musanze, Nyandarua and Meru.
- Caution: Quality varies by multiplier — always insist on a recent inspection certificate.

8. Tuber Setts (Cut Pieces)

- What it is: Larger tubers cut into 2–4 pieces, each carrying at least one eye.
- Value: Stretches scarce seed in emergencies.
- Limit: The cutting knife transmits bacterial wilt and viruses across the lot. Not recommended for commercial Irish potato in East Africa.

At a glance: a comparison

Material	Health Status	Cost (relative)	Mult. Ratio	Best For
True Potato Seed (TPS)	Virus-free	Very low	Very high	Research, breeders
Tissue-Culture Plantlets	Highest (indexed)	Highest	Very high	Foundation labs
Microtubers	Very high	High	High	Pre-basic seed
Mini Tubers	Very high	High	1:30 to 1:50	Registered multipliers
Apical Rooted Cuttings	Very high	Low–Medium	1:50 to 1:500	Smallholders, scale-up
Certified Seed Tubers	High (regulated)	High	1:8 to 1:10	Commercial farms
Clean Seed (QDS)	Good (declared)	Medium	1:8 to 1:10	Cooperatives, last mile
Tuber Setts (Cut Pieces)	Risky	Lowest	x2 to x4	Not recommended

The bottom line for East Africa

Two materials are reshaping the regional seed economy: apical rooted cuttings and clean seed (QDS). Together they break the certified-seed bottleneck that has long capped yields.

For smallholders, the practical pathway is straightforward: source clean seed or apical cuttings from a registered multiplier, plant once, save once, then renew every two to three seasons.

For commercial farms, the route remains certified seed of an in-demand variety — Shangi, Sherekea, Unica, Markies, Asante or Dutch Robijn — sourced from a KEPHIS, TOSCI, NSCS or RAB-listed multiplier.

Where to source clean planting material

- **Kenya:** KEPHIS-listed multipliers; the NPCK directory; KALRO Tigoni; Kisima Farm; Agrico East Africa; ADC Molo; Stokman Rozen.
- **Tanzania:** TARI-Uyole; Mtanga Foods; TOSCI-registered multipliers across Mbeya, Njombe and Iringa.
- **Uganda:** NARO-Kachwekano; MAAIF/NSCS-listed multipliers in Kabale, Kisoro and Kapchorwa.
- **Rwanda:** Rwanda Agriculture and Animal Resources Development Board (RAB) Musanze; cooperative multipliers in Musanze, Burera and Nyabihu.
- **Burundi:** ISABU; ONCCS-registered multipliers in Mwaro and Muramvya.

Editor's note

This factsheet is part of Kilimokwanza's Seed Series, a continuing brief on the inputs that decide East Africa's harvest. We welcome corrections, additions and field reports from extension officers, multipliers and farmers. Write to editor@kilimokwanza.org.

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