Example Commercial Potato Cultivar Improvement Program featuring New Line Development and New Line Evaluation

SEASON[1]	ACTIVITY
1	Cross parent lines to generate 150-200 populations; true seed is created (~200 seeds per fruit)
2	Grow true seed in greenhouse; a single tuber is harvested from each of 30,000-40,000 seedlings. No selection except perhaps against disease-infected plants.
3	Grow tubers in single row plots with 3-5 plants in unreplicated trial at 1-2 locations. Visually select against undesirable traits: e.g.plant type, excessively late maturity, unacceptable tuber type.
4	Grow >5,000 selected clones in 2-3 row plots at ≥2 locations (one may be a disease screening site). 1) Select visually for highly heritable traits (e.g. color, traits with threshold requirements) 2) Select visually (or with ELISA) for disease/pest resistances with farmer participation 3) Select for yield and quality traits
5	Grow 100-200 selected clones in 3-5 row plots at multiple locations including marginal or high stress environment. Evaluate yield and all agronomic traits including yield stability as well as post-harvest traits, and quality traits; farmer participation in selection for visual traits.
6	Evaluate 50-100 selected clones for yield, agronomic, quality, post-harvest traits in 5 row plots at multiple locations; farmer participation, particularly for flavor and post-harvest; best clones coded
7	Advanced replicated yield trials by maturity group in many locations.
8	1) Advanced replicated yield trials by maturity group in many locations. Disease and quality screening continues. 2) Agronomic trials to develop crop management specifications. 3) S-clone propagation ("seed clones" produced as a source of planting material) and *in vitro* maintenance of disease-free true seed plantlets
9	On-farm trials and large-scale grower trials; Evaluate consumer acceptance as fresh or processed product.
10	Variety registration
11	Release 0-2 new varieties

[1] Seasons are sequential and may occur in the same or different years.