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Assessment of Farmers' Willingness to Pay for Quality Seed Using Dynamic Auctions: The Case of Smallholder Potato Growers in Tanzania

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Selected Poster prepared for presentation at the Agricultural & Applied Economics Association's
2014 AAEA Annual Meeting, Minneapolis, MN, July 27-29, 2014.

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Assessment of Farmers' Willingness to Pay for Quality Seed Using Dynamic Auctions: The Case of Smallholder Potato Growers in Tanzania

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Introduction & Study Objective

- Irish potato is an important income and food security crop in many sub-Saharan Africa countries (SSA).
- However, the neglect of the potato Irish potato industry and failure of privatization to spur investment in seed potato production stifled the industry. Hence farmers have been forced to recycle seed, resulting in quality degradation and, in some cases resulting in up to 66-75% yield, and hence income, declines.
- The recent global food price swings has led to renewed interest in developing potato subsector in most producing SSA countries.
- One intervention by SSA governments has been in trying break the quality seed bottleneck by investing in generation of quality seed.
- Such investment involve construction of state of the art seed production labs to clean degraded seed and evaluate imported seed, on-station and on-farm testing, and promotion smallholder seed production.
- This study uses data collected from Tanzania to examine farmers willingness to pay such seed.
- Since 2009, Tanzania government has heavily invested in developing seed potato industry jointly with international and national research organization through donor support.



On-station evaluation of seed potato varieties, Igeri, Tanzania

Results

- The average WTP for quality seed potato for the six rounds ranged between 34-40 US cents/Kg compared to 29 US cents/Kg in the market.
- The WTP increased as the seasons progressed, closely approximating the cost of producing quality seed (i.e., 40 US cents/Kg), but were lower than the 60 US cents/Kg price charged by the only (private) seed producer in the region
- Results of SURE model yielded chi-squares with p-values of less than 0.001 for all equations indicating that all the equations are significant.
- Different factors affected WTP for quality seed in respective planting seasons. The factors included:
 - > Season 1: education, seed type, radio ownership, number of young children;
 - > Season 2: radio and asset ownership, risk perception;
 - > Season 3: education, seed type, radio and asset ownership;
 - > Season 4: education, radio and asset ownership, risk perception;
 - > Season 5: education, seed type, farm size, asset ownership, experience.



Bids displayed, winning bid chosen based on n-1 bids



An auction variety in a demonstration plot

Methodology

- The study applied the Lancasterian demand theory that posits that demand for a good is based on demand for its attributes, such as quality.
- Demand for quality seed was measured as willingness to pay (WTP) for virus-disease free seed.
- Two quality seed potato varieties (Meru and Tengeru) and one local degraded (i.e., virus-infected) variety (Kikondo) were used during the auction. In each auction, one quality seed was randomly selected and presented against the local variety.
- WTP bids were collected via a dynamic auction that involved 5 rounds, equivalent to 5 Irish potato planting seasons.
- Each auction session had 10 farmers randomly selected from a list of smallholder potato growers in a village. The auction was conducted in 24 randomly selected potato producing villages, hence a total of 240 farmers.
- Due to correlation in WTP bids among seasons, seemingly unrelated regression (SURE) model was fitted to assess the drivers of WTP.



Seed auction in progress



Farmers complete bidding sheets

Discussion, conclusions & implications

- Overall, the average WTP for virus-free seed in each period of the auction was higher than market price of Kikondo, the local variety.
- Results of SURE model indicates that WTP for clean seed is affected by farmer's level of education, experience in growing potato, asset endowment, risk perception, and access to information (proxied by radio ownership).
- This study concludes that there is reasonably high demand for quality seed by smallholder farmers and that farmers would pay higher price for quality seed than what they currently pay for the degraded local seed.
- They study further concludes that farmers demand for seed is affected by a number of farmer specific factors, capital endowment and risk perception.
- The study recommends that:
 - ✓ Farmer education should focus on providing relevant potato agronomic and pest management information to farmers.
 - ✓ Such information can be channeled through popular local FM radio broadcasts given the significance of radio ownership
 - ✓ Efforts to produce virus-free seed should be accompanied by commensurate effort to reduce the risk of adopting quality seed. This can include ensuring that the seed is tolerant to drought and has good market.
 - ✓ The lower WTP than private sector seed price (and cost in early auction seasons) indicate farmers' sensitivity to price, hence the need to keep price of quality seed down through reduction of transaction and transportation costs. Training local small and medium scale farmer seed producers can achieve this.

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