

Research Application Summary

Producer and consumer preferences for maize and sorghum quality characteristics in Uganda

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Abstract

Maize and sorghum are important staple food crops in Uganda and are emerging cash crops. Despite release of several improved varieties of maize and sorghum, adoption rates among farmers remain low. This is due to breeding programmes ignoring non-yield production and consumption characteristics which are important to farmers. The current study aimed at identifying and evaluating non-yield productive and consumptive attributes and their influence on the price farmers were willing to pay for seed of varieties that embodied these attributes. The hedonic pricing technique was used to analyze data generated from a survey. Results showed that maize farmers preferred varieties that were short, possessed high pest and disease resistance and were high yielding; while sorghum farmers preferred varieties whose yield was high and took three and half months to mature. Short plant height, yield and pest and disease resistance influenced the price farmers were willing to pay for seed and this affected varietal selection.

Key words: Hedonic pricing, maize, preferences, sorghum, Uganda

Résumé

Le maïs et le sorgho sont des importantes cultures vivrières de base en Ouganda et apparaissent comme des cultures commerciales. En dépit de la sortie de plusieurs variétés améliorées de maïs et de sorgho, les taux d'adoption par les agriculteurs restent faibles. Cela est dû à des programmes de reproduction ignorant la production de non-rendement et les caractéristiques de consommation qui sont importantes aux agriculteurs. La présente étude vise à identifier et à évaluer les attributs de non-rendement productifs et consommatifs et leur influence sur les prix que les agriculteurs sont prêts à payer pour les semences de variétés qui incarnent ces attributs. La technique hédoniste des prix a été utilisée pour analyser les données générées à partir d'une enquête. Les résultats ont montré que les variétés de maïs préférées par les agriculteurs,

qui ont été courtes, possédaient une grande résistance aux parasites et aux maladies et ont été de haut rendement, tandis que les variétés de sorgho préférées par les agriculteurs dont le rendement était élevé, ont duré trois mois et demi pour arriver à maturité. La courte hauteur de la plante, le rendement et la résistance aux parasites et aux maladies ont influencé le prix que les agriculteurs étaient prêts à payer pour les semences et cela a affecté la sélection typique.

Mots clés: Prix hédoniques, le maïs, les préférences, de sorgho, de l'Ouganda

Background

Adoption of improved varieties of maize and sorghum are still low and are estimated at 9% for maize and 35% for sorghum (Lanyintuo, 2008). This may be due to the ignoring of non-yield productive and consumptive quality attributes in the breeding of new crop varieties (Dalton, 2003). Therefore the knowledge of producer preferences for quality characteristics is important to further improve the breeding programmes and markets for these crops. This study aimed at evaluation of both producer and consumer quality characteristics of maize and sorghum in order to inform their breeding programmes so that they can more accurately assess the trade-offs between yield and quality characteristics and anticipate future market changes.

Literature Summary

Hedonic pricing enables the modeling of the price of a product as a combination of the individual values of the characteristics that make up that good (Smith, 2007). Therefore, the overall price of the good consists of the sum of the values of the individual characteristics. This enables the breakdown of the price of a good into the individual values of the characteristics that make up that good.

In order for breeders to accurately assess trade-offs between yield and non-yield productive and consumptive quality attributes, knowledge of farmers' preferences for these attributes is key (Agbola *et al.*, 2002). No such evaluation has been carried out with regard to maize and sorghum in Uganda. The hedonic pricing approach has been used in numerous studies to analyze marginal implicit values of agricultural commodities such as rice (Dalton, 2003; Horna *et al.*, 2007), maize (Hintze *et al.*, 2002) and chick pea (Agbola *et al.*, 2002; Mishili, 2005).

Study Description

A household survey was carried out in four districts of Uganda, namely; Masindi, Iganga, Soroti and Pallisa. A total of 325

households were surveyed in Masindi and Iganga, key maize growing areas in Uganda, while a total of 326 households were surveyed in Soroti and Pallisa, areas that widely grow sorghum. In the study, respondents were asked to fill out a structured questionnaire, the data collection tool used in the survey. The effect of quality attributes such as; plant height, grain colour, grain size, threshing ability, drought tolerance, pest and disease resistance, plant cycle length and bread expansion on the price farmers were willing to pay for one kilogram of seed of their preferred maize or sorghum variety was investigated.

The hedonic price analysis approach was used to analyse trade-offs of the various attributes as used earlier in the other studies (e.g. Hintze *et al.*, 2002).

Results

Maize farmers in Masindi and Iganga preferred Longe 6H and Longe 5 for production because these varieties were considered drought tolerant, had a short growing cycle and were pest and disease resistant. This is illustrated in Figure 1. Farmers were willing to pay between Ush 200-5,000/kg for these maize varieties (1US\$ = 2,200 Ug. shs.). The non-yield productive attribute that farmers considered important in maize varieties were short plant height (Dalton 2003) and pest and disease resistance (Hintze *et al.*, 2002), as shown in Table 1.

Table 1. Hedonic prices of important maize and sorghum attributes.

Attribute	Maize		Sorghum	
	Hedonic price (Ush)	p-value	Hedonic price (Ush)	p-value
Plant cycle				
Short	-0.534	0.054*	0.212	0.041**
Medium	-0.627	0.024**	0.249	0.009***
Plant height				
Short	0.177	0.019**	0.168	0.288
Medium	0.08	0.308	0.244	0.161
High pest & disease resistance	0.157	0.096*	-0.109	0.206

*** 1% level of significance. ** 5% level of significance. * 10% level of significance.

With regard to sorghum, farmers preferred *Sekedo* and *Serena* for production because these varieties were considered to be drought tolerant and also had short growing cycles. This is illustrated in Figure 2. Farmers were willing to pay between Ush 200 - 2,500/kg for these sorghum varieties. The only non-yield attribute that farmers considered important in sorghum varieties was short to medium plant cycle of three and a half

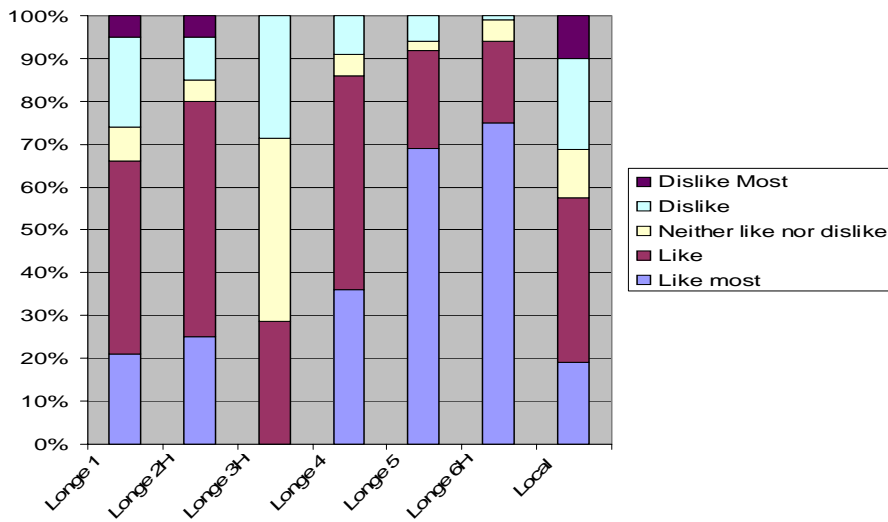


Figure 1. Farmers' ranking of maize varieties.

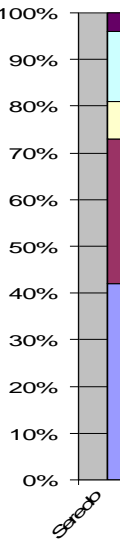


Figure 2. Farmers' ranking of sorghum varieties.

months or less (see also Dalton, 2003; Horna *et al.*, 2007), as shown in Table 1.

Recommendation

Based on the above results, it is recommended that participatory breeding be carried out by breeders and that new crop varieties are developed in such a way that the quality attributes valued by farmers be incorporated in the new varieties.

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References

- Agbola, F., Kelley, G., Bent, M. and Parthasarathy, R. 2002. Eliciting and valuing market preferences with traditional food: The case of chickpea in India. *International Food and Agribusiness Review* 5:7-21.
- Dalton, T. 2003. A hedonic model of rice traits: Economic values from farmers in West Africa. Paper presented at the 25th International Conference of Agricultural Economists, August 16-22, 2003. www.maine.edu
- Hintze, H., Renkow, M. and Sain, G. 2002. Variety characteristics, transaction costs and maize adoption in Honduras. Selected paper 2002, American Agricultural Economics Association Meeting, Long beach, California.
- Horna, D., Smale, M. and Von Openn, M. 2007. Farmers' willingness to pay for seed-related information: Rice varieties in Nigeria and Benin. *Journal of Environment and Development Economics* 12:799-825.
- Langyintuo, A. 2008. Current status of the seed sector in Uganda and Kenya. Maize Working Group Meeting, 20th - 21st November 2008, Kampala, CIMMYT.
- Mishili, J. 2005. Cowpea markets and consumer preferences in Ghana. Msc Thesis, Purdue University, www.purdue.ac
- Smith, J. 2007. Hedonic pricing of bulls. Msc Thesis, Oklahoma State University. www.okstate.edu.