Trader and consumer criteria for selection of sweetpotato varieties

R.E. Kapinga, D. Rees, S.C. Jeremiah and E.J. Rwiza

3.1 Background

Up until the late 1990s, although information existed on the criteria by which farmers select sweetpotato varieties (see Chapter 2), very little information existed in Tanzania on the preferences of consumers (especially urban consumers) and traders. With the increasing marketing of this crop, an appreciation of the views of urban users becomes more important for breeders. In Tanzania, sweetpotato roots are primarily used for human food, and mainly consumed freshly cooked. However, processing and the use of sweetpotato for animal food are also common. Information on how roots are to be consumed is clearly vital when determining important quality criteria.

In this chapter, we describe the methods by which the Tanzanian breeding programme obtained the information necessary to determine the main selection criteria for new cultivars, and summarize the main results obtained.

Further details of the surveys and their results can be found in Kapinga et al. (1997).

3.2 Methods

3.2.1 Areas surveyed and selection of interviewees

Surveys were conducted between September and October 1996 in three districts of the Lake Zone of Tanzania (Meatu, Mwanza and Ukerewe). A list of the urban areas surveyed and the number of respondents per district is presented in Table 3.1. Only areas where sweetpotato was considered an important commodity were selected. The selection criteria for the areas surveyed were as follows:

- the importance of sweetpotato relative to other food staples

- the contribution of sweetpotato to household food security and household income

- the growing demand of sweetpotato for sustaining household earnings through the sale of roots

- the availability of fresh roots and processed sweetpotato products in the markets

- the level of diversification of sweetpotato utilization.

Within the chosen areas, a total of 35 market agents and 58 urban households were interviewed.

Households were selected on the advice of local leaders and extension workers. Only households known to consume sweetpotato were interviewed. Information about the size and income group of households is given in Table 3.1. Income group was assessed on the basis of the appearance and contents of the house. For example, a household with a 'good-

Table 3.1 Urban households interviewed in Mwanza, Meatu and Ukerewe Districts of Lake Zone of Tanzania, categorized by size of household and income group*

	Number of households interviewed in each income group		
Size of household	Low	Medium	High
Mwanza			
Areas	Igogo, Nyegezi, Mkuyuni		
2–3	1	1	
4–5	1	3	
6–8	4	1	
9–14	2	5	
>14			
TOTAL	**8**	**10**	
Meatu			
Areas	Mwanhuzi town		
2–3	3		
4–5	7	1	
6–8	3	2	
9–14	2	1	
>14	1		
TOTAL	**16**	**4**	
Ukerewe			
Areas	Nakatunguru		
1	1		
2–3	4		1
4–5	2	2	
6–8	3	3	
9–14	3	1	
>14			
TOTAL	**13**	**6**	**1**
	Total number of households interviewed in each income group		
	37	20	1

* Income groups were assessed subjectively by observation of the house and contents.

looking' house and electronic assets was considered to be high income.

Traders were classified as retailers or wholesalers, with some undertaking both functions. The numbers of traders interviewed and the markets at which they worked in each area is given in Table 3.2. The markets were categorized subjectively as small, medium and large (Table 3.2).

3.2.2 Data collection

The interviews were conducted using a set of questions which were adapted from a related study on cassava carried out in urban areas by the Collaborative Study of Cassava in Africa (COSCA) (Nweke *et al*., 1998).

During the surveys, the information collected was considered under two categories: urban households (consumers) and market agents (traders). The main issues covered during interviews were as follows.

Urban households

- Sweetpotato consumption patterns.
- The quantity and frequency of purchase of sweetpotato.
- Acceptance and rejection of specific sweetpotato varieties.
- Utilization practices for sweetpotato roots.
- Post-harvest handling of sweetpotato.
- Sweetpotato cultivation and the varieties commonly grown.
- Sweetpotato marketing.

Market agents

- The nature of markets and categories of traders.
- Marketing of sweetpotato.
- Storage after purchase.
- Varietal preferences.

Checklists used for sweetpotato consumers in urban areas and for market agents are shown below (see Figures 3.1 and 3.2).

Table 3.2   Urban markets visited and sweetpotato traders interviewed in Lake Zone of Tanzania

Market / District	Market size	Number of traders interviewed by category		
		Retailers	**Wholesalers**	**Retailer/wholesalers**
Mwanza				
Mwaloni	Big			1
Kirumba	Big		1	2
Mwaloni/Kirumba*		1	1	
Songoro	Small	4		
Central	Big	4		
Kirumba Sokoni	Medium	2		
TOTAL		**11**	**2**	**3**
Meatu				
Bukundi Permanent	Medium	4		
Market day only	Non-permanent	2	2	3
TOTAL		**6**	**2**	**3**
Ukerewe				
Nakatunguri	Small	4		
Nansio	Medium	4		
TOTAL		**8**		

Market size was a subjective assessment by the interviewers.

* Retailer and wholesaler working in both markets.

Checklist For Semi-Structured Interview (consumers)

Background information

The following information should be noted by the interviewer, but not necessarily asked directly.

1. Location of house

2. Income group

3. Ethnic origin

Interview

4. How often does your family eat sweetpotato, e.g. number of times per week?

5. How many people are there in your household?

6. How much do you spend on buying sweetpotatoes per week? Fresh? Processed?

7a. (i) Which sweetpotato varieties do you prefer to buy, and what are the reasons? If the variety name is not known, go to 7b.

Varieties	Good characteristics

7a.(ii) Are there any sweetpotato varieties that you avoid buying, and what are the reasons?

Varieties	Reasons for avoiding

7b.What characteristics do you like in a sweetpotato? Can you rank these in order of importance.

Preferred characteristics	Ranking

8. (i) Do you grow sweetpotatoes?
   (ii)If yes, which varieties and for what reason?

Name or description of varieties	Reasons for preference

Figure 3.1 A sample of a checklist for data collection on the preference for sweetpotato varieties by urban consumers

9. (i)   Do you store sweetpotato roots after purchase?

   (ii)   If no:
          Are there reasons why you do not store?

   iii)   If yes: where?

   (iv)   For how long?

   (v)   Do you find that some varieties store better than others, and
          which?

   (vi)   What type of damage (quality losses) do you experience, if any?

   (vii) What control measures do you use?

10. By what methods do you cook your sweetpotatoes for eating?

   Do you find that some varieties are better for certain preparation
   methods than others?

Method of preparation	Best varieties (Describe if name unknown)

11. (i)   Do you use processed sweetpotato roots?

   (ii) If yes, which products?

   (iii) Do you buy the processed products, or process them yourself?

   (iv) If you process yourself, which varieties do you prefer to
         process, and why?

12. (i)   Do you sell processed products?

   (ii) If yes, who do you sell them to?

   (iii) How much do you sell?

   (iv) What are the prices?/throughout the year?

13. (i) Do you store processed products?

   (ii) If yes, where?

   (iii) For how long?

   (iv) Do you find that some varieties store better than others, which?

   (v)   What type of damage (quality losses) do you experience, if any?

   (vi) What control measures do you use?

Figure 3.1   *cont.*

Checklist For Semi-Structured Interview (traders)

Background information

The following information should be noted by the interviewer, but not necessarily asked directly.

1. Location of market

2. Size of market

3. What type of trader (i.e. itinerant, wholesaler, or retailer)?

Interview

4. Do you trade in any crops other than sweetpotato? If so, what proportion of your trade is in sweetpotato?

5. How much do you sell per week/ month/ year?

6. Where do you obtain most of your sweetpotatoes? Name the towns and villages in order of importance.

Village or town	District/region	Distance from here

7. What type of customers buy sweetpotatoes?

Preferred characteristics and varieties

8a.(i)   Which varieties do you like to sell and why?

If the variety names are not known, go to 8b.

Note: These characteristics may include both the characteristics preferred by consumers (texture, colour, price), and also any characteristics that make that variety good for trade (storability)

Varieties	Good characteristics

8a.(ii)   Which varieties do you not like to sell, and why?

Varieties	Reasons for avoiding

8b. What characteristics do you like in a sweetpotato? Can you rank these in order of importance.

Preferred characteristics	Ranking

Figure 3.2   A sample of a checklist for data collection on the preferences for sweetpotato varieties by traders

9. What are the prices?/throughout the year?
   Does this differ by variety?

10. (i)   Do you store sweetpotato roots at the place of sale?

   (ii)   If no, are there reasons why you do not store?

   (iii) If yes, where?

   (iv)   For how long?

   (v)   What type of damage (quality losses) do you experience, if any?

   (vi)   What effect does this have on the sale price?

   (vii) Do you find that some varieties store better than others, and which?

   (viii) What control measures do you use?

   (ix)   What do you do with the roots that have deteriorated?

11. (i)   Do you sell processed sweetpotato products?

   (ii)   If yes, which products?

   (iii) How much do you sell?

12. (i)   What type of customer buys processed products?

   (ii)   What qualities are sought for good processed products?

Product	Desired qualities

   (iii) Do you buy the processed products, or process them yourself?

   (iv)   If you process yourself, are there some varieties which you prefer to process, and if so, which ones?

   (v)   What are the prices?/throughout the year?
          Do these vary by variety?

13. (i)   Do you store processed products?

   (ii)   If yes, where?

   (iii) For how long?

   (iv)   What type of damage (quality losses) do you experience, if any?

   (v)   Do you find that some varieties store better than others, which?

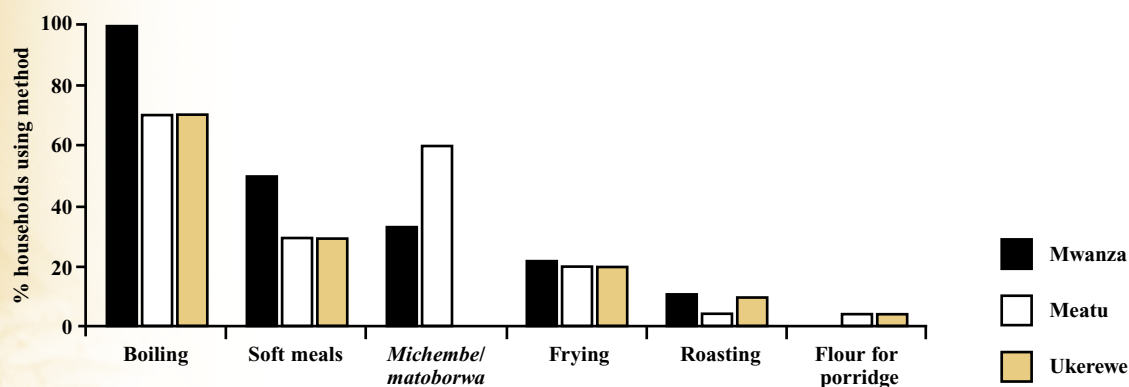   (vi)   What control measures do you use?

Figure 3.2   *cont.*

3.3 Results and discussion

3.3.1 Selection for suitability for local processing methods

Figure 3.3 and Table 3.3 respectively, show different methods of using fresh sweetpotato roots and the varieties identified as suitable for different purposes by consumers in the urban areas of the Lake Zone of Tanzania.

Eighteen households were interviewed in Mwanza and 20 in each of Meatu and Ukerewe. Boiling refers to cooking of whole roots. For soft meals, sweetpotato is mixed with beans and nuts (to make a 'stew'). *Michembe* and *matoborwa* are dried products which are either prepared within the household or purchased ready processed.

Figure 3.3   The methods by which sweetpotato is prepared for eating by urban consumers in Lake Zone of Tanzania, and the percentage of households using each method

Table 3.3   Sweetpotato varieties considered most suitable for each preparation method in Lake Zone of Tanzania

Mwanza (N = 11)	Number of households preferring variety	Meatu (N = 20)	Number of households preferring variety	Ukerewe (N = 20)	Number of households preferring variety
Boiling		**Boiling**		**Boiling**	
Sinia	7	Kaputula	1	All	19
Simama/Suguti (SPN/O)	6	Nyerere	1	Mzondwa	1
Mzondwa	2	Serena	1		
Kasamwa	2	No difference	10		
Polista	1				
Mixing with other dishes		**Mixing with other dishes**		**Mixing with other dishes**	
Mzondwa	1	Serena	1	Mzondwa	1
Kasamwa	2	Kibluu	1		
Sinia	3	Ngoshaatena nimo	2		
Simama/Suguti (SPN/O)	3	Ntulawima	1		
Roasting		**Roasting**		**Roasting**	
Mzondwa	1	Serena	1	Mzondwa	1
Lutambi	1	Nzegamatolo	1		
Simama/Suguti (SPN/O)	1				
Sinia	1				
Frying		**Frying**		**Frying**	
Simama/Suguti (SPN/0)?	2	Matungangoso	1	Mzondwa	1
Sinia	2	Koroboi	1		

Note: Varieties suitable for processing into *michembe* and *mataborwa* are discussed in a later section (see Chapter 9). This is because when buying these products it is not easy to distinguish between varieties and generally only households that carry out processing are aware of which varieties are used.

Selection of improved varieties suitable for indigenous processing methods, particularly slicing and sun-drying to produce reconstitutable foods, should be an essential component of variety development programmes in areas where processing is important, but at present little is known about selection criteria (Kapinga *et al.,* 1995; Agona, 1998). We assume that an important selection criterion for varieties used to make dried products is high root dry matter content, as this results in a product that dries more rapidly.

Additionally selection for low oxidation would lead to a product with an attractive appearance. However, clear definition of selection criteria for indigenous processing requires a strong component of farmer participation. Attention should be given to quality factors likely to be important in the production of flour as a commercial product made from sun-dried chips. (See Chapter 9 for more discussion on processing of sweetpotato.)

3.3.2 Selection criteria of sweetpotato varieties as identified by urban consumers

Results obtained on urban consumer varietal criteria are presented in Tables 3.4 and 3.5. Table 3.4 indicates the preferred varieties and their characteristics, while

Table 3.5 indicates preferred root characteristics and their ranking. The order of these tables indicates the order in which the questions were asked during the interviews. Thus interviewees were given the opportunity to think about what they liked about varieties before having to rank characteristics most important to them. The data indicate that two criteria, 'starch/floury' and 'tasty/sweet', are particularly important to consumers in all three regions. Good cooking quality and good flesh colour are also considered. Good storability was mentioned in Mwanza and Ukerewe, but not Meatu. This may be because Meatu is the only one of the three areas where processing is important. Thus (although not indicated here), this is the only area where interviewees considered good processing quality an important attribute for varietal selection.

Table 3.4   Sweetpotato varieties most preferred for buying by urban consumers and the main criteria considered

District	Variety	Frequency (number of households mentioning variety)	Preferred characteristics (number of households)				
			Starchy/ floury	Tasty/ sweet*	Good cooking qualities†	Good root flesh colour‡	Good storability
Mwanza (N = 18)	Sinia	10	9	8	2	3	5
	Suguti	6	4	4	-	6	-
	Simama	4	4	3	-	2	2
	Chilile	2	1	-	1	1	-
	Mzondwa	2	1	2	-	-	-
	Polista	1	1	1	-		-
	Other varieties mentioned (with frequency) were: Juliasi (1), Nyamwisekeleja (1), Kiliona (1), Rangimbili (1), Tulabagenyi (1), Nyantaya (1), Lutambi (1), Mwiyangi (1), Kasamwa (1), Kinaje (1), Malya (1)						
Meatu (N = 20)	Sinia	5	4	4	-	-	-
	Kibuluu	4	2	3	-	3	-
	Serena	3	1	1	2	-	-
	Ngoshaga-gaga	3	3	1	-	-	-
	Tulwawima	2	2	2	-	1	-
	Suguti	1	1	1	-	-	-
	Other varieties mentioned (with frequency) were: Nzegamatolo (2), Ipembelyangholongo (2), Sengi (1), Ngoshaalaja (1), Ukerewe (Nyekundu) (1), Kenya (1), Sinia la Nyerere (1), Ndoleleji (1), Ngosha atenanemo (1), Polista (1), Koroboi (1), Mwijigumo (1)						
Ukerewe (N = 20)	Mzondwa	14	9	11	-	2	3
	Bilagala	8	3	7	5	-	-
	Chilile	7	5	7	4	3	3
	Sinia	5	2	4	1	1	1
	Lutambi	5	-	4	-	3	-
	Mwiyangi	4	1	-	-	1	-
	Other varieties mentioned (with frequency) were: Balozi (1), Sinia (mpya) (1), Malya (1)						

* Sweet refers to good taste rather than amount of sugar, preferred taste is usually described as neither bland nor very sugary.
† Good cooking qualities means soft when cooked, with a short cooking time.
‡ Good root flesh colour is generally considered to be yellow or white.

Table 3.5   Sweetpotato storage root characteristics preferred by urban consumers and their ranking in Lake Zone of Tanzania

Characteristic	Number of households mentioning characteristic				Mean household ranking *			
	Mwanza (N = 15)	Meatu (N = 20)	Ukerewe (N = 20)	Total (N = 55)	Mwanza (N = 15)	Meatu (N = 20)	Ukerewe (N = 20)	Overall†
Starchy/floury	15	10	12	37	1.4	1.4	1.6	1.5
Good taste	15	8	19	42	1.9	1.8	1.9	1.9
Good cooking qualities/less time to cook and soft when cooked	5	4	6	15	3.0	3.5	1.6	2.7
Non/less fibrous	1	2	4	7	4.0	2.8	2.0	2.9
Good storability	–	1	3	4	–	3.0	3.0	3.0
Good root appearance (shape, size and colour)	3	1	4	8	4.2	4.0	4.1	4.1

– = not mentioned.
* Calculated as the mean of the rankings (1 and upwards) given by individual interviewees.
† Calculated as an unweighted mean of the values for the three districts.

Unacceptable sweetpotato varieties and criteria for rejection as identified by urban consumers are presented in Table 3.6.

Table 3.6   Sweetpotato varieties considered unacceptable for buying by urban consumers and main criteria considered in Lake Zone of Tanzania

District	Variety	Frequency (number of households mentioning variety)	Bad characteristics (number of households)				
			Watery	Not tasty	Fibrous	Hard to cook	Unattractive root appearance
Mwanza (N = 18)	Mwejigumo	3	3	3	–	–	–
	Mzondwa	3	–	–	1	–	2
	Mwiyangi	2	–	–	–	2	–
	Dagaa	1	–	1	–	–	–
	Julius	1	–	–	–	1	–
	Bilagala	1	1	1	–	–	–
	Mayai	1	1	–	–	–	–
Meatu (N = 20)	I'lyangholongo	2	2	1	–	–	–
	Nzega matolo	1	–	1	–	–	–
	Serena	1	1	–	–	–	–
	Dundugala	1	–	1	–	–	–
	N'goshagagaga	1	1	1	–	–	–
	Pili	1	1	–	–	–	–
	Matungagoso	1	–	1	–	–	–
Ukerewe (N = 20)	Mwiyangi	9	–	8	–	4	–
	Mzondwa	5	–	2	–	–	–
	Sinia	2	1	1	–	–	–
	Mlenga	1	–	–	–	–	–
	Julius	1	–	–	–	1	–
	Bilaila	1	–	–	–	1	–
	Chigole	1	–	–	1	–	–
	Beritha	1	–	–	1	–	–

3.3.3 Selection criteria of sweetpotato varieties as identified by sweetpotato traders

The most important information obtained from traders is summarized in Tables 3.7, 3.8 and 3.9. Table 3.7 shows the sweetpotato varieties preferred for selling at different market locations. For Mwanza market, the variety Polista was most frequently mentioned followed by Sinia. Traders noted that the variety Simama/Suguti was preferred by consumers. However, traders indicated that this variety provided a problem in that it does not keep beyond a week, particularly if heavily damaged during transportation.

As for the survey of consumers, traders were asked to rank the characteristics of fresh roots according to their perception of the characteristics considered important by their customers. The ranking gave a similar trend to the characteristics mentioned by consumers. Thus high flour/starch content ranked first, followed by good/appealing root taste and attractive skin colour/root appearance. Varieties rejected and criteria considered by traders are presented in Table 3.9.

Table 3.7   Sweetpotato varieties most preferred for selling by traders in Lake Zone of Tanzania and the main criteria considered

District	Variety	Frequency (number of traders mentioning variety)	Preferred characteristics (number of traders)									
			Starchy/floury	Good taste	Good skin and flesh colour	Good storability	Good processing quality	Good cooking quality	High yield*	Good root shape and size	Easily marketed	Pest resistant*
Mwanza (N = 16)	Polista	16	13	7	11	3	-	-	-	1	-	
	Sinia	13	10	1	4	2	-	-	-	2	-	
	Malya	6	3	4	4	-	-	-	-	-	-	
	Simama/Sugutu	4	4	1	3	-	-	-	-	1	-	
	Chilile	3	2	-	-	-	-	-	-	-	-	
	Mzondwa	2	1	1	-	1	-	-	1	-	-	
	Balozi	1	-	-	1	-	-	-	-	-	-	
Meatu (N = 11)	Sinia†	7										
	Nzega/Nzega matolo	6	5	4	2	-	-		-	-	1	-
	Kabululu/Kisasa†	5										
	Suguti/Simama†	3										
	Ipembelyangholongo	2	1	1	1	-	1	1	1	1	-	-
	Mbiti	2	-	-	-	-	-	-	-	1	-	-
	Siri	2	-	-	-	-	-	-	-	-	-	1
	Kagole	1	1	-	-	-	-	-	-	-	-	-
	Nihambagesengi	1	1	1	-	-	-	-	-	-	-	-
	Serena	1	-	-	-	1	-	1	-	-	-	-
	Ngolo	1	1	1	-	-	-	-	-	-	-	-
	Misonge	1	-	1	-	-	-	-	-	-	1	-
Ukerewe (N = 8)	Mzondwa	7	5	6	-	1	-	1	1	-	-	1
	Chilile	7	4	6	3	-	1	1	1	-	-	2
	Lutambi	1	1	1	-	-	-	-	-	-	-	-
	Bilagala	1	-	1	-	-	-	-	-	-	-	-
	Sinia	1	-	1	-	-	-	-	-	-	-	-

* These attributes were indicated by traders who also grew sweetpotatoes for marketing.
† Data on preferred characteristics missing for these varieties.

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Table 3.8   Traders' perception and ranking of good sweetpotato root characteristics in Lake Zone of Tanzania

Root characteristic	Number of traders mentioning characteristic				Mean ranking given by traders *			
	Mwanza (N = 16)	Meatu (N = 11)	Ukerewe (N = 8)	Total (N = 35)	Mwanza (N = 16)	Meatu (N = 11)	Ukerewe (N = 8)	Overall† (N = 35)
Starchy/floury/ high dry matter content	11	5	5	21	1.1	1.0	1.8	1.3
Good taste	7	4	7	18	2.0	2.2	1.4	1.8
Attractive skin and flesh colour	7	5	3	15	1.7	1.7	2.0	1.8
Large size	5	0	1	6	2.8	-	2.0	2.4
Low/no fibre content	0	0	2	2	-	-	2.6	2.6
Good root shape	2	1	2	5	3.0	3.0	2.5	2.8
Good cooking qualities‡	0	1	1	2	-	3.0	3.0	3.0
Tolerant to bruises and rotting	1	1	1	3	3.0	4.0	4.0	3.7

- = not mentioned.
* Calculated as the mean of the rankings (1 and upwards) given by individual interviewees.
† Calculated as an unweighted mean of the values for the three districts.
‡ Less time to cook and soft when cooked.

3.4 Conclusions and implications

Until recently, although information was collected on the criteria by which farmers select sweetpotato varieties, very little information existed in Tanzania on the preferences of consumers (especially urban consumers) and traders. The methodology used by the Tanzanian national programme to obtain this information in the Lake Zone was presented in this chapter. Thus it was determined that the most common form in which sweetpotatoes are eaten is as boiled whole roots. The characteristics that consumers prefer are firstly, that roots be starchy/floury (high dry matter), secondly, that they have good taste, followed by good cooking quality, low fibre, good storability and good appearance. The criteria used by traders fit closely to those of the consumers, except that appearance is more important, ranking equally with good taste.

The methods described here could be used by national programmes in other countries, although it is important to adapt the questions asked to take account of the most common form in which the sweetpotatoes are eaten.

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Table 3.9   Sweetpotato varieties rejected for selling by traders and main criteria considered in Lake Zone of Tanzania

District	Variety	Frequency (number of traders mentioning variety)	Disliked characteristics (number of traders)										
			Not starchy	Watery	Bad taste	Bad storability	Fibrous	Poor skin and flesh colour	Poor cooking quality	Not easily marketed	Late maturing*	Requires high rainfall*	Low yielding*
Mwanza (N = 16)	Mzondwa	9	2	5	2	3	1	3	2	2	-	-	-
	Bilagala	9	1	3	1	2	-	2	3	-	-	-	-
	Nzito	1	-	-	-	-	1	-	1	-	-	-	-
	Chilile	4	-	3	-	-	-	1	-	1	-	-	-
	Mwejigumo	1	-	-	1	-	1	-	-	-	-	-	-
	Malya	1	-	-	-	1	-	-	-	-	-	-	-
Meatu (N = 11)	Siri	3	-	2	-	-	-	-	-	-	-	-	-
	Mobili	1	1	2	1	-	-	-	-	1	-	-	-
	Ngosha	2	-	-	-	-	-	-	-	-	-	-	-
	Kaptula	1	-	-	-	-	-	-	-	-	1	-	1
	Maselena	2	-	-	-	-	1	-	-	-	-	1	-
	Mapembe	1	-	1	-	-	-	-	-	-	-	-	-
	Ntulawima	1	-	-	-	-	-	-	-	-	-	-	1
	Blanketi	1	-	-	-	-	-	-	-	-	1	1	-
	Serena	1	1	-	-	-	1	-	-	-	-	-	-
Ukerewe (N = 8)	Mwiyangi	2	-	-	-	1	-	-	-	-	-	-	-
	Mzondwa	2	-	-	-	-	-	1	-	-	-	-	-

* These attributes were indicated by traders who also grew sweetpotatoes for marketing.

R. Kapinga, D. Rees, S. Jeremiah and E. Rwiza