

## BASELINE SURVEY

### Stakeholder AWARENESS of and INTEREST in using GRAFTING and GREENHOUSES (Low/High Tunnels) in Tomato Production

KARI-The OSU as supported by USAID HORT-CRSP, March-May 2011  
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Responses to this survey will describe current stakeholder awareness and interest in grafting and low/high tunnels and farmer perceptions of constraints on use of grafted plants and low/high in the Kirinyaga District of Kenya. Responses will help KARI and OSU Hort CRSP team members develop farmer demand driven programs, field demonstrations and educational materials that help stakeholders overcome or eliminate the constraints. This project only anticipates developing activities and materials for planning purposes only.

#### Section A. Respondent Screening

Potential survey respondents were screened by asking two questions ("Do you grow or have you grown tomatoes for market in the past year (12 months)?" and "Are you familiar with tomato production on your farm?") Only those potential respondents answering "yes" to both questions were surveyed by KARI personnel. Farmers were interviewed individually, on-farm by a KARI or extension agent project collaborator. An interview approach was used with each farmer. A total of 109 interviews were conducted and completed.

#### Section B. Demographic Data

The date of the interview and demographic data were recorded.

Farmers cited six locations for their farms: Githiriti (1%), Kangai (73%), Kathiga (4%), Kimbimbi (1%), Kithiriti (2%) and Nyangati (19%).

Farmers cited twenty villages in locating their farms. Five villages were cited by 67% of respondents with most (30% overall) citing Kathiga.

Seventy-six (70%) of the respondents were male and 33 (30%) of the respondents were female.

The average birth year of the respondents was 1964 with a range of 1914-1989. The number and percent of respondents by birth decade was: 1930s (4, 4%), 1940s (8, 8%), 1950s (23, 21%), 1960s (37, 34%), 1970s (20, 18%), 1980s (16, 15%).

All respondents indicated that they attended school. Fifty-three (49%) interviewees claimed to have attended secondary school with 46 (42%), 8 (7%) and 2 (2%) claiming to have attended primary, technical school and university, respectively.

When asked the number of years of formal education they had completed, the average response was 9.3 years, indicating that on average respondents had some secondary education. Twelve (11%), 49 (45%), and 48 (44%) claimed to have taken 1-5, 6-10 and >10 years of formal education, respectively. NOTE: this

is not chronological years spent in school. Instead, the highest grade level achieved was recorded.

### Section C. Land and Management Details (includes all gardens)

On average, respondents claimed to: a) farm and/or rent a total of 4 acres of land, b) had cultivated 3 acres the previous season, c) had placed a total of 1 acre in tomato production the previous season, d) had been farming for a total of 17 years, and e) had produced tomato for 11 years. Sixty-seven (61%) and 73 (67%) of respondents reported that they keep records of tomato production and tomato spraying, respectively.

### Section D. Farm Output and Marketing

Farmers reported that they harvested, on average, a total of 4,739 kg of tomato fruit the previous season. They also reported that they sold, on average, a total of 4,618 kg of tomato fruit the previous season (97% of production).

Fruit were sold at two markets: 83% and 22% of respondents reported selling fruit at the farm gate and local market, respectively. When asked which market is used most often, 68%, 17% and 2% reported "farm gate", "local", and "other", respectively.

When asked to list the **most important** quality factors buyers look for when they purchase their tomatoes, farmers reported the following (percent of farmers listing criterion as important): size (98%), shape (40%), color (54%), firmness (39%), juiciness (5%), ripeness (39%), taste (1%), cleanliness (92%) and disease-free (94%).

### Section E. Inputs Used to Grow Tomato

Farmers were asked to list the inputs used to produce tomato during the last year, and to list the source of each input as self or purchased. The percent of respondents for each input are shown in the table below.

<i>Input</i>	percent of farmers using input	<i>Source</i>			
		self	0%	purchased	
seed	94%	self	0%	purchased	94%
seedlings	56%	self	48%	purchased	8%
inorganic fertilizer	100%	self	0%	purchased	100%
farm manure	61%	self	57%	purchased	14%
compost	1%	self	1%	purchased	0%
pesticides	100%	self	0%	purchased	100%
plant mulch	40%	self	33%	purchased	6%
plastic mulch	0%	self	0%	purchased	0%
stakes	100%	self	4%	purchased	96%
ties	100%	self	0%	purchased	98%
raised beds	99%	self	99%	purchased	

Farmers reported growing three tomato varieties in the previous year: Twenty-two, 23, and 50 percent of farmers reported growing Cal J, Onyx and RioGrande variety, respectively

Farmers were asked why they prefer the variety they do. Sixteen reasons were given. Leading reasons and the percent of respondents citing them are: high yield (42%), fruit firmness (15%), disease res/tol (10%), long shelf life (8%), high demand (7%), early maturing (6%). Remaining 9 reasons referred to fruit characteristics and market factors and constituted 11% of all responses.

Regarding the seasonality of tomato production, 60%, 67% and 77% of respondents reported that they grow tomatoes during the long rain, short rain and dry seasons, respectively.

Irrigation is important in tomato production. Fifty-three percent, 72% and 76% of farmers reported that they irrigate their tomato crops during the long rain, short rain and dry seasons, respectively. One-hundred percent of respondents indicated that they use furrow irrigation, 96% reporting that they use a pump to assist in the process. Pumps are reportedly owned by 83% of respondents, hired by 12% and borrowed by 35%.

Pesticide usage can also be affected by grafting and low/high tunnel usage. One-hundred percent of respondents reported that they use pesticides (chemicals/sprays) to control diseases, insects or weeds. Farmers reported that, on average, 11 pesticide applications were made the previous season.

The decision as to when pesticides are applied is key and complex. Eighty-two percent of respondents reported that sprays are applied on a calendar schedule. Others reported application timing methods, in terms of the percent of respondents employing them, including: when pests are seen in the field (32%), after field sampling and finding a certain number of pests or a certain level of damage (thresholds; 9%), and when told by someone else to apply (extension agent, trader, middleman, etc.; 2%).

Forty-seven percent of respondents reported that they apply pesticides to their crops while 85% also report employing a hired applicator. Six percent of farmers reported that pesticide applications were made by a male family member; 0% report applications being made by a female family member. Regardless of the applicator, all applications appear to be made with the same equipment as 100% of the respondents indicated that a knapsack sprayer was used. Eighty-seven percent of respondents indicated that they own a knapsack sprayer, 5% to hire its use, and 14% to borrow it.

### Section G. Tomato Grafting

Fifty-two percent of respondents reported having *used* grafted plants of any type, 5% of passion fruit and 2% of tomato.

Thirty-nine percent of those who have used grafted plants claimed that doing so helped them due to greater plant vigor while 36% and 6% claimed greater fruit yield and greater plant resistance to disease, respectively, as benefits.

Fourteen percent of those who have used grafted plants claimed that they would do so again in passion fruit production while 9% claimed they would do so in tomato production.

Fifty-one percent of former grafted tomato plants users reported that they would like information on how to use grafted tomato plants more effectively. No respondents in this category denied or were unsure about their interest in additional information on grafted tomato plant use. One-hundred percent of survey respondents, regardless of their experience with grafting, reported that they are interested in learning more

about both making and using grafted tomato plants. Twenty-eight percent of those lacking experience with grafted plants of any kind were aware that tomato plants can be grafted.

Forty-two percent of grafted plant users reported the plants were prepared by another person while 5% reported that they prepared the grafted plants. Of those preparing grafted plants on their own, 1% report doing so for both passion fruit and tomato.

#### Section H. Low Tunnels

Thirty-six percent of respondents were familiar with the term "low tunnel" with 3% reporting they have used a low tunnel.

Twenty-nine percent of respondents reported that they are aware that low tunnels can be helpful in vegetable production. One-hundred percent of respondents reported that they are interested in learning more about both making and using low tunnels.

#### Section I. High Tunnels/Greenhouses

Ninety-five percent of respondents were familiar with the term "high tunnel" with 1% reporting they have used a high tunnel.

Eighty-nine percent of respondents reported that they were aware that high tunnels can be helpful in vegetable production. One-hundred percent of respondents reported that they are interested in learning more about both making and using high tunnels.

#### Section J. Communication and Information Transfer

Farmers were asked to indicate the topics on which they had **received** information in the past year and the number of times they had received information on that topic. A summary of their responses is given in the table below.

<i>Information Topic</i>	Percent farmers having receiving information on this topic	No. times information received in last year
<b>integrated pest management</b>	50%	_avg = 2.2_
<b>irrigation/water management</b>	43%	_avg = 1.9_
<b>pesticide use/pesticide safety</b>	100%	_avg = 2.6_
<b>insect management</b>	81%	_avg = 2.5_
<b>plant disease management</b>	90%	_avg = 2.4_
<b>weed identification</b>	22%	_avg = 2.2_
<b>aspects of fruit quality</b>	31%	_avg = 2.4_
<b>tomato marketing</b>	26%	_avg = 2.4_
<b>food safety</b>	43%	_avg = 3.0_
<b>tomato grafting</b>	0%	
<b>low tunnel use</b>	0%	
<b>high tunnel (greenhouse) use</b>	3%	

When asked to identify the three sources of information on growing and managing tomatoes most important to them, 100% of farmers cited friends and neighbors, 83% cited agro dealers, 72% cited government agency extension, 26% cited private/NGO extension and 5% cited traders.

When asked to identify the three formats for information on growing and managing tomatoes most important to them, 80% of farmers cited pamphlets/leaflets/magazines, 72% cited radio, 28% cited television, and 2% cited postal.

The average number of times in the past year that respondents participated in meetings on tomato production was 2. Respondents also reported meeting with an extension agent about growing/managing tomatoes an average of two times during the previous year. Fifty-two and nine percent of those meetings involved a government agency and private/NGO extension agent, respectively.

One-hundred percent of respondents reported that they would attend field schools or demonstrations on grafting tomato plants, *low tunnels* for tomato *seedling* production and/or *high tunnels* or *greenhouses* for tomato *fruit* production.

One-hundred percent of respondents reported that they would like to have written information on grafting tomato plants, *low tunnels* for tomato *seedling* production and/or *high tunnels* or *greenhouses* for tomato *fruit* production.