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C3P INVENTORY SURVEY FOR CMD-RESISTANT CASSAVA VARIETIES IN WESTERN KENYA

COUNTRY REPORT

BY

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1. Introduction

Catholic Relief Services (CRS) and International Institute of Tropical Agriculture (IITA) are jointly implementing the Crop Crisis Control Project (C3P) on cassava and bananas production in six East and Central African (ECA) countries i.e. Uganda, Tanzania, Rwanda, Kenya, Burundi and DR. Congo. Within the target countries, the implementation is being done in conjunction with country National Agricultural Research Systems (NARS) and other local partner organizations. The focus of the project is to fight cassava mosaic virus disease (CMD) and banana xanthomonas wilt (BXW). IITA and CRS already have working partners in those countries who will help in the project quick start and implementation.

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CMD is one of the greatest threats to cassava production in the above sub region. Recent research shows that the CMD pandemic in the ECA affects about 2,600,000 ha of cassava leading to a loss of 22 million metric tons of produce annually. All the local varieties grown by farmers in this sub region have virtually become susceptible to CMD. As a result, production of cassava has been affected in most areas and food insecurity is on the rise among the rural poor.

IITA in collaboration with National Cassava Programs of partner countries have been exchanging improved cassava germplasm and conducting a number of on-farm cassava participatory evaluations that have resulted in the identification of many CMD-resistant varieties in each of the countries. The multiplication and dissemination of these varieties are limited due to the fact that they require a lot of funds (economic hardships in multiplication and distribution) and poor or inexistent extension service delivery. The project is aiming at increasing multiplication and distribution of the selected improved varieties among rural farmers that are facing the CMD problem.

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To achieve the above, the project intends to deploy effective CMD control strategies among the farming communities through multiplication and distribution of CMD-resistant varieties and promotion of improved management practices. As such, there is need to have an inventory of available and preferred CMD-resistant varieties and establish the amount of planting materials available prior to dissemination.

2. Materials and methods

2.1 Team composition

The survey team comprised of research scientists from KARI and IITA who have been involved in the evaluation of improved cassava clones in Kenya through the breeding programme protocols. The team was accompanied by CRS country coordinator and his partners from Regional Environment and Food Security Organization (REFSO), Catholic diocese of Kisumu and Homabay. Ministry of Agriculture personnel were also involved.

2.2 Cassava varieties selected for C3P and targeted establishment area

After discussions with the agricultural officers, CRS coordinator and the partners, three varieties namely; Migyera, SS4 and MH95/0183 were selected for multiplication and distribution under the C3P. These three varieties were selected based on CMD resistance, availability of planting materials with farmers as the most recent introductions were not widely multiplied by the time the survey was carried out. Another genotype MM96/5280 had been widely multiplied by KARI as well as farmers had to be left out of the project target varieties after it was found to be susceptible to CBSD. In one of the KARI multiplication sites in Siaya (Yala swamp), there was almost 100% incidence of CBSD on the above genotype with a severity of up to 3 based on foliar symptom expression.

2.3 CMD inventory survey area and farmers visited

The inventory survey for CMD-resistant materials was conducted in four Districts of Western province and eight Districts of Nyanza province from 6th -13th August 2006. The districts covered were Busia, Teso, Bungoma, Butere-Mumias, Siaya, Bondo, Kisumu, Nyando, Rachuonyo, Homabay, Kuria and Migori. Some of the districts fall within the intended area for C3P project. Two Districts which were planned for and were not visited are Kakamega and Suba. Kakamega was not visited because the materials at the sites that were to be evaluated had been cut back after a hail storm while Suba was not visited due to limited time allocated to the team to do the work. The team visited the District and Divisional Agricultural offices to get information on the status of the improved cassava varieties in their respective areas of operation. The team was interested to select and recommend a few varieties which could easily be recognized by partners of CRS and farmers based on availability of planting materials which could be easily accessed and were popular amongst the farmers and that, the varieties were free from cassava mosaic disease and cassava brown streak disease.

During the survey period the most serious problems experienced while visiting Ministry of Agriculture extension offices was that almost all agricultural officers at the district level and even at the divisional level were new in their stations. They did not know or recognize differences in the varieties and even the sites where they were grown although some of the officers had only read about them in the office files. This problem cost the team a lot of time discussing and explaining many things regarding the project and improved cassava.

Within a period of six days, more than 41 farms were visited but only a total of 16 had desirable planting materials. The materials quantified from these fields were not sufficient because the project requires more than one thousand bags to start multiplication during the short rains 2006. Most of the farms visited had highly mixed varieties including both local and/or improved varieties as a result many of those fields could not be considered. Other farms had just a few stems which would be uneconomical and inconvenient for the management of C3P project.

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There was therefore need for a further inventory survey which was conducted on 24th – 28th August 2006 in Busia and Teso districts to look for and identify farms which could provide the balance of the planting material needed for the project. The farmers in Busia and Teso Districts were initially worse hit by the virulent CMD in 1994 -1997. As a result they have been proactive to restore cassava cultivation and they have plenty of cassava planting material that is desired for C3P project. This is the reason why a thorough inventory was conducted in the two districts a second time.

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The second survey was conducted on 42 farms out of which 22 were found to have pure stands of desirable planting materials ready for short rains 2006. Altogether a total of 38 farmers have been identified to be able to provide sufficient planting materials of the selected varieties during the 2006 short rain season. There are however many pure stand farms of selected clones for C3P project which can provide planting materials during the long rains March/April 2007 in the two districts (not recorded in the report).

3 Findings

3.1 Quantification of planting materials

A format used in Uganda for the same project was adopted to capture data about the varieties such as area covered by the varieties, plant height to determine the number of stems per stand as well as health status of the materials. The data was taken in two randomly sampled areas measuring 50 M². The other data taken included cropping pattern practiced, age of the crop, quality of the planting materials. In total 1,161 bags of Migyera, SS4 and MH95/0183 varieties were quantified for C3P project. Indicated below is a summary of the findings.

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Table 1: Summary of materials found in various districts per variety

District	No of farmers	Migyera	SS4	MH95/0183	Total bags*
Bondo	2	0.0	188.8	0.0	188.8
Busia	9	53.1	136.1	36.3	225.5
Homabay	2	131.6	0	0.0	131.6
Kisumu	1	21.3	0	0.0	21.3
Kuria	1	4.2	0	0.0	4.2
Migori	1	12.0	0	12.0	24
Nyando	2	3.3	0	0.0	3.3
Rachuonyo	1	7.3	0	0.0	7.3
Siaya	2	16.5	13.2	0.0	29.7
Teso	17	319.8	0	205.9	525.7
Total	38	569.1	338.1	254.2	1161.4

*Note: A bag contains approximately 800 cassava cuttings

3.2 Plant health of the materials inspected

The farms selected had good and healthy plants suitable for multiplication and distribution to farmers in the target Districts of C3P project. The most occurring disease on cassava inspected was cassava bacterial blight that was found with an incidence of 13% but severity was low, with a score of two. There were also some cases of CMD observed but the highest incidence being 4.7% in Migyera, followed by 4.3% in SS4 while MH95/0183 had the least of 3.6%. In all the fields where some CMD symptoms were observed, the severity was only scoring 2. The few CMD infected stems have to be rouged out before planting materials are prepared. There should also be thorough monitoring and scouting for CMD sprouts once the multiplication commences such that they are rouged out at an early age. A summary of the health status of the varieties in the survey is shown in Table 2, below.

Table 2: Summary of the health status of the varieties

Variety	CMD		CBB		CBSD		CMB	
	% incidence	severity	% incidence	severity	% incidence	severity	% incidence	severity
SS4	4.3	2.1	13.1	1.4	0	1	0	1
Migyera	4.7	2.0	2.6	1.2	0	1	0	1
MH95/0183	3.6	1.9	1.4	1.3	0	1	0	1

3.3 Initial sources of planting materials and market outlet

Majority of farmers in Busia and Teso said that they got their materials from KARI-Alupe, Busia FTC and from Uganda – across the border. Many farmers said that they got the materials from their neighbors who had got the materials from KARI-Alupe or Busia FTC. Some farmers said that they were given the planting materials by Ministry of Agriculture or NGOs. The farmers from all the other Districts said that they got their planting materials from KARI-Kakamega, Ministry of Agriculture, NGOs, ICIPE, Yala swamp in Siaya, Bukura FTC, neighbours and/or friends.

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The materials were being bought by fellow farmers, NGOs and the Ministry of Agriculture. The price of cassava planting materials ranged from one district to another. In Teso and Busia districts where the crop was considered staple the prices ranged from KShs. 400 – 800 per bag. In other districts the prices ranged between KShs. 300 – 500 per bag. The price of KShs. 400 which CRS was to offer was acceptable to the farmers who were ready to sell their planting materials. Some other farmers were not willing to sell materials even when they had more than they need for themselves. On further investigation they were afraid that they might loose their planting materials and suffer as at the time of the CMD pandemic.

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3.4 General Observations

While over 24 new improved cassava genotypes have been promoted in western Kenya over the years, majority of the new materials cannot be found in substantial quantities

with the farmers. Only two of the new varieties i.e. MM96/5280 and MH95/0183 were frequently encountered during the survey. Most of the farmers are growing Migyera and SS4 on relatively large scale.

4.0 Recommendations

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CRS Kenya had planned for 100 bags of planting materials per district to start multiplication in this short season. However, some districts could not readily provide sufficient materials to meet their target. We therefore recommend that such districts get balances of their requirements from those districts with excess materials. Teso and Busia districts should be able to provide the balances to the districts which do not have sufficient planting materials right away for the short rains. It is also recommended that preparation of the planting materials should be conducted in the presence of a technician who should ensure that there is no mixing and that the materials are prepared without damaging them. The consignments should be well labeled to indicate all identifications which include names of the seller, District and Division, location and village of origin. The name of the variety should also be indicated. This information will aid in follow-up incase of problems.

From the survey conducted, there is an indication that required materials are available in the region but identification may be a problem to the partners of CRS and personnel from Ministry of Agriculture. There is therefore an urgent need for training on identification of the three cassava varieties selected as well as identify symptoms of diseases and pests especially cassava green mite attack which is often mistaken for CMD.

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Appendix 1: Details of the inspected cassava fields and their locations

No	Farmer	Village	Sub location	Location	Division	District	Alt m	Location		Variety	Estimated No of bags
1	B.A. Omolo	Sijoa	Sigulu	Nangosia	Funyula	Busia				Migyera	7.8
	B.A. Omolo	Sijoa	Sigulu	Nangosia	Funyula	Busia				MH95/0183	21.2
2	Henry O. Makokha	Mujuru	Bugeng'i	Bukhayo West	Matayos	Busia				SS4	21.4
3	Mourice E. Epusi	Kasogoli Kapeli	Kokare	Kokare	Amagoro	Teso				Migyera	13.9
5	John Odhiambo	Uyawa	Nyandiwa	Siaya Township	Karemo	Siaya				SS4	13.2
6	Philister Osumba	Uyiemba	Nyajuok	South Alego	Karemo	Siaya				Migyera	16.4
7	Fanuel Amolo	Nyawita	Nyawita	Bondo Township	Maranda	Bondo				SS4	124.8
8	Samwel Omolo	Waringa	Nyagoko	South Asembo	Rarieda	Bondo				SS4	64.0
9	Atanas Oliech (Jaribu W. G)	Kadera	Kadera	Kajulu	Winam	Kisumu				Migyera	21.2
10	Benard Randiki Akoth	Holo Orucho	Katolo	East Kano	Nyando	Nyando				Migyera	1.4
11	Joseph Odalo	Kagak	Kajimbo	Oboch	U Nyakach	Nyando				Migyera	1.8
12	Vitalis Ogembo	Kajieyi	Kajieyi	E. Karachuonyo	Rachuonyo	Rachuonyo				Migyera	7.2
13	Ngege Farmers Group	Sare	Kotieno	E. Gem	Rangwe	Homa Bay				Migyera	96.0
14	Tom Mboya Nyajowi	Omoche	Kotieno	E. Gem	Rangwe	Homa bay				Migyera	35.0
15	Mary Ombok				Suba East	Migori				Migyera	12.0
	Mary Ombok				Suba East	Migori				MH95/0183	12.0
16	Francis Muhiri	Nguku	Ihore	Gokeharaka	Kehancha	Kuria				Migyera	4.2
17	Ambrose Wafubwa	Bukiri	Bukiri	Ageng'a	Funyula	Busia	1209	N00°13.685'	E034°05.186'	SS4	68.2
18	Sylvester Ouma	Namuduru	Namuduru	Bwiri	Funyula	Busia	1200	N00°10.752'	E034°05.560'	MH95/0183	14.9
19	James Ouma Ogot	Khadoda	Kisoko	Nambale Township	Nambale	Busia	1220	N00°26.952'	E034°16.439'	Migyera	22.4

20	Christine Anyango Juma	Muramia	Kisoko	Nambale Township	Nambale	Busia	1222	N00°26.640'	E034°17.098'	Migyera	22.9
	Christine Anyango Juma	Muramia	Kisoko	Nambale Township	Nambale	Busia	1222	N00°26.640'	E034°17.098'	SS4	8.0
21	Alphonse Ouma	Emadwa	Wambali	Nambale Township	Nambale	Busia	1197	N00°27.978'	E034°15.524'	SS4	38.4
22	Vincent Okisai	Kongrapusi	Apatiti	Kaliwa	Amukura	Teso	1267	N00°32.102'	E034°14.376'	Migyera	7.4
23	John Obama	Amagoro village	Okisumo	Kwang'amor	Amukura	Teso	1277	N00°32.435'	E034°19.666'	Migyera	15.0
24	Cicillia Nanjira	Okisumo	Okisumo	Kwang'amor	Amukura	Teso	1271	N00°33.238'	E034°19.912'	Migyera	6.0
25	William Onyain	Kotur	Kidera	Kotur	Amukura	Teso	1268	N00°33.688'	E034°18.706'	Migyera	68.8
26	Antony Apaa	Kidera	Kidera	Kotur	Amukura	Teso	1266	N00°33.763'	E034°17.386'	Migyera	16.0
27	Selina Ololutele	Akoret	Okatikok	Kaliwa	Amukura	Teso	1248	N00°30.364'	E034°14.286'	Migyera	17.9
28	Kefina Imasete	Garaa	Kodedema	Kamolo	Amagoro	Teso	1220	N00°34.885'	E034°18.822'	MH95/0183	32.4
	Kefina Imasete	Garaa	Kodedema	Kamolo	Amagoro	Teso	1220	N00°34.885'	E034°18.822'	Migyera	8.0
29	Jane Tata Omula	Garaa	Kodedema	Kamolo	Amagoro	Teso	1206	N00°34.971'	E034°18.616'	Migyera	5.2
30	Kefina Osere	Garaa	Kodedema	Kamolo	Amagoro	Teso	1200	N00°35.049'	E034°18.538'	Migyera	17.2
31	Frederick Ichakaa	Garaa	Kodedema	Kamolo	Amagoro	Teso	1210	N00°35.012'	E034°18.682'	Migyera	29.8
32	Joseph Otwani Ojilo	Amoni A area	Kokare	Kokare	Amagoro	Teso	1187	N00°36.746'	E034°19.434'	Migyera	6.0
33	Keneddy Iwurot Wanjala	Amoni A area	Kokare	Kokare	Amagoro	Teso	1190	N00°36.780'	E034°19.378'	Migyera	21.2
34	Chief Pasliano Omaseti	Aleles	Osasame	Kamuriai	Amagoro	Teso	1173	N00°38.869'	E034°17.041'	MH95/0183	71.1
35	Rose Joel Opil	Aleles	Osasame	Kamuriai	Amagoro	Teso	1197	N00°39.022'	E034°17.168'	MH95/0183	42.7
36	Moses Orapidi	Aleles	Osasame	Kamuriai	Amagoro	Teso	1210	N00°38.979'	E034°17.332'	MH95/0183	59.7
37	Peter Okuni Orapidi	Aleles	Osasame	Kamuriai	Amagoro	Teso	1200	N00°39.121'	E034°17.403'	Migyera	81.1
38	Petronila Anyango Osuna	Akadetewayi C	Malaba Township	Akadetewayi	Amagoro	Teso	1186	N00°38.629'	E034°17.462'	Migyera	5.2
						Total					1161

Note that GPS information is missing for the inventory taken in the first round because GPS gadget was not available. It was suggested that a scientist will go back and take these data since sites are known.

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