



Integrated Pest Management Conference for Sub-Saharan Africa, 8-12 September 2002, Kampala, Uganda, edited by J.S. Tenywa, M.P. Nampala, S. Kyamanywa, and M. Osiru. IPM: CSRP.

Pita, J.S., V.N. Fondong, A. Sangaré, G.W. Otim-Nape, S. Ogwai, and C.M. Fauquet, 2001. Recombination, pseudorecombination and synergism of geminiviruses are determinant keys to the epidemic of severe cassava mosaic disease in Uganda. *Journal of General Virology* 82, 655-665.

Sseruwagi, P., M.E.C. Rey, J.K. Brown, and J.P. Legg, 2004a. Cassava mosaic geminiviruses in post-epidemic areas of Uganda. *Annals of Applied Biology* (In Press).

Sseruwagi, P., W.S. Sserubombwe, J.P. Legg, J. Ndunguru and J.M. Thresh, 2004b. Methods of surveying the incidence and severity of cassava mosaic disease and whitefly vector populations on cassava in Africa: a review. *Virus Research* 100, 129-142.

CASSAVA STARCH PILOT FACTORY, THE FIRST OF ITS KIND IN MALAWI

By

Alex Nthonyiwa¹, Albert Mhone¹, Hendrix Kazembe,² Christopher Moyo,¹ Vito Sandifolo,¹ Sella Jumbo,¹ Dyton Siyeni,¹ Nzola-Meso Mahungu¹, Vianey Rweyendela³ and James Abaka-Whyte¹

¹IITA/SARRNET, P.O. Box 30258, Lilongwe 3, Malawi, ²Chitedze Research Station, P.O. Box 158 Lilongwe, Malawi. ³IITA/SARRNET, ARI-Mikocheni, Tanzania

Introduction

Malawi has the first pilot cassava starch factory established. During the period 2000 and 2002 IITA and CIAT implemented a collaborative agreement in which IITA subcontracted CIAT to backstop SARRNET on its market-led activities. Promising results were obtained in this activity; a number of industries in Malawi were

contacted and their specific interest on flour or starch were identified, as potential markets for cassava flour or starch. From these identified potential markets, a joint project (IITA and CIAT) was designed to train farmers on cassava

starch processing in two pilot sites of Malawi and Tanzania and link them to industries using starch.

Market identification and analysis

Starch has very wide application. The range includes pharmaceutical drugs as a binder, paper in sizing, textiles as a binder; animal feeds as a binder and nutrients. When

modified, starch can be used in paper industry as a binding agent, filler, coating agent and coloring agent, in the textile industry in sizing, filling and finishing, and printing/color applications, for making cardboards and plywood adhesives and also for making corrugated board glues. Starch may also be used to produce other products like glucose, ethanol, lactic acid, citric acid

and gluconic acid. Derived products from glucose substrates include dusting powders - reduces moisture diaper s as super absorbent polyesters, detergent where it is used as redeposition inhibitor of dirt, oil drilling of mud - increases viscosity and reduces fluid loss. Starch may also be used in the making of

biodegradable plastics and polyester plastics. The starch used in Malawi is mostly cornstarch imported from countries like Zimbabwe, South Africa and Bangkok and yet a lot of industries use starch in many different forms. Considering the fact that the project is on pilot stage and therefore low starch production is expected. Thus a few companies with lower starch requirement



Masinda cassava pilot Starch Factory in Nkhotakota



were contacted for their agreement to use locally produced cassava starch as raw material in their industries. Table 1 below indicates the companies, which indicated willingness to test cassava starch, their current starch consumption and current prices.

During the market identification exercise some industries in Malawi were reluctant to use locally made cassava starch unless the starch was in line with the Malawi Bureau of Standards (MBS) requirements. Recently MBS has released cassava and maize specifications.

The formulation of the standards for cassava starch will clear the misconception that some industries have that cassava starch is inferior and can not work in their products. Some middlemen had previously been supplying fine cassava flour to some industries in Malawi as cassava starch and this in some cases worked and sometimes not. By so doing it scared potential users giving the impression that cassava starch does not work in their industries.

Description of the site and the starch factory

The factory is at Tandwe section in the lakeshore district of Nkhotakota. The average yields of mature cassava in this area are about 18 tons per hectare above the national average is 15. In this area cassava is also the staple food. However farmers always have surplus and do not have markets for the surplus. Most of the cassava varieties grown in this area are local. The Ministry of Agriculture in the recent past years has released improved varieties which withstand better to pests and diseases and yield twice as much as local varieties under rain fed conditions.



The cassava starch is allowed to sediment before discarding the fruit water

Some of these varieties have deliberately been introduced into this area for adoption by the small-scale farmers to cope up with

increasing demand for cassava roots as starch production scales up.



A grater which is used for starch extraction

Under this activity, structures have been constructed under a contributory scheme. The factory is composed of receiving bay, starch sieving and settling room, two store rooms and milling room. Grater is on the



The Masinda factory has become an attraction in Malawi. Third from left is Dr Paula Bramel Director of Research at IITA based in Tanzania

receiving bay while hammer mill and settling tanks are in milling room and settling room respectively.

The project provided installation materials and equipment while the farmers provided labor, bricks, sand and the land. A great contribution was also provided by the government extension staff from agriculture Ministry and NGOs working on cassava in



terms of organizing farmers during the construction process.

An industrial mixer has been purchased to homogenize the cassava roots for efficient extraction of starch. Cassava roots are being grated using an IITA model grater but now made locally in the region with a starch extraction rate of 17% from a local varieties. It is expected to install a homogenizer between the grater and the mixer in order to increase the extraction rate to about 24 - 25%. Being in a rural place without power grid, a generator has also been purchased to provide power. A hammer mill has been provided to mill the dried starch. Water is being provided from a nearby river using a motorized pump.

On market identification the farmers were taught on how to come up with gross margins. The cassava starch processing technician who provides guidance to the farmers at the pilot center, the commodity chain specialist at IITA/SARRNET who is responsible for linking producers to markets and one farmer representative went to the various industries in Blantyre to identify the right market for the starch being made. Packaging Industries was interested and has

bought a sample of 225kg and is now willing to go and collect from the starch factory in Nkhotakota. The pilot center produces about 3-5 metric tons per month (Tanzania and Malawi).

The cassava starch pilot processing centers will work as small industries in rural areas. They will at maximum production be using a lot of water in the order of 12,000 - 15,000 liters per day utilizing about a ton of fresh cassava producing over half a ton of residues, which may later be used in animal feed. The Department of Environmental Affairs has been contacted and has given a line of action to avoid environmental pollution.

The processing plant draws its water from a nearby perennial river. The small-scale rural starch factory in Malawi is rousing a lot of interest, a number of individuals and projects have shown interest to make their own cassava starch factories, thus demonstrating that the pilot processing plant is playing its role to scale up this sector. The challenges are for such starch produced locally to be competitive to imported starch and to be of good quality

Table 1: Companies willing to use cassava starch, their current starch use, requirements and import costs.

Company	Starch use and current requirements	Landed cost	Remarks on use of cassava starch
Packaging Industries Malawi (Ltd)	Making glue for corrugated cartons, cement bags, take away fast food packages (500t/annum)	US\$470	Tested and works well on small scale. Bought for batch testing
Nzeru Radio Company	For use in dry cell batteries (40t/annum)	US\$500	Samples taken for analysis
Leopard Matches	For use in match heads	-	Awaiting results