November 2014

GRATITUDE NEWSLETTER

Gratitude
Reducing Losses from Roots and Tubers

Members of Gratitude at mid-term review meeting Nov 2013

MID-TERM REVIEW REVEALS UNEXPECTED FINDINGS

All partners of Gratitude gathered 4th - 7th November 2013 in Wageningen, The Netherlands for a successful mid-term review meeting

The EU FP7 GRATITUDE project, 'Gains from Losses of Root and Tuber Crops', held its midterm review at Plant Research International, Wageningen, Netherlands from 4 to 7 November 2013. It was attended by 15 members of the project, comprising project research area leaders, country managers and key experts within the project who travelled from Ghana, Nigeria, Thailand, Vietnam, UK, Portugal and the Netherlands. The EU was represented by their Scientific Officer and an external reviewer.

The project is working to reduce waste from postharvest losses of root and tuber crops and turn unavoidable waste into something of value. At the meeting, the leaders of each research area gave presentations on the progress made so far on project activities. After each presentation, the external expert, followed by the EU Scientific Officer, asked questions relating to the work carried out and made a number of helpful and useful recommendations.

Project leader, Keith Tomlins from NRI says: "I am delighted with the progress made in the GRATITUDE project so far. The good team spirit between partners in Africa, Asia and Europe came across well at the review, along with the excellent scientific results and high quality of the research.

We have new findings to communicate, promote and demonstrate, some of which we were not expecting, particularly how waste from cassava and yams is managed in the value chains. The conventional wisdom that waste and losses in developing countries occur at the farm end of the value chain has been challenged; in Ghana in particular, waste and losses were greater at the consumer end and hence economically more costly. This is more similar to developed countries.

Looking ahead, as an international team we have much to do before the project ends and the feedback received from the EU will help us enormously. I am really excited about how this project is creating new knowledge that will help improve food security and incomes of people on low incomes".

Page 4: Improved barn storage for storing yams

GRATITUDE

The Gratitude project (Gains from Losses of Roots and Tubers), which involves partners from three continents; Africa, Asia and Europe, facilitates the interaction between Asia and Africa on solutions that will reduce waste from postharvest losses of root and tuber crops cassava and yam. The project is led by the Natural Resources Institute (NRI) and funded by the European Union

Asian and African scientists strengthen ties in Nigeria and Ghana visit

The Thai and Vietnamese teams of the Gratitude project made a visit to Nigeria and Ghana in August 2013, to share experience and to strengthen south-south interaction, one of the key activities of the project.

In Nigeria, the Thai and Vietnamese collaborators were hosted by Professor Lateef Sanni of the Federal University of Agriculture Abeokuta (FUNAAB). They were taken to visit a large scale cassava processing industry – Thai Farms, an emerging medium scale HQCF producing factory – Psaltry Starch, and a small scale HQCF producing factory – Peak Products. They also visited the mushroom production facilities at the Federal Institute of Industrial Research, Oshodi (FIIRO), another Gratitude partner, who have been developing various mushroom species for over 20 years.

The team met the Vice-Chancellor of FUNAAB, Professor Olusola Oyewole, who pledged his support for the visit and commented that the essence of research was to impact knowledge and urged the project team members to ensure they make the best out of their research efforts.

The team then moved on to Ghana where they were hosted by the Food Research Institute (FRI) in Accra. They visited a number of enterprises producing a range of processed cassava products, including high quality cassava flour and starch.

On the visiting team were Tu Viet Phu, To Kim Anh and Chu Ky Son from the School of Biotechnology and Food Technology, Hanoi University of Science and Technology, Vietnam. From the National Science and Technology Development Agency in Thailand came Jackapon Sunthomvarabhas and Sittichoke Wanlapatit. Ruth Leavett from NRI also joined in Nigeria.

Chu Ky Son of SBFT said of the visit: "This experience is very interesting and new for us. We can learn a lot of things [from our African partners] and we will try to apply this knowledge in Vietnam, to get more value added in cassava."

The visit was a chance to exchange knowledge and experience, strengthen the south-south interaction within Gratitude and to open new potential co-operation among Asian and African partners in the future.

How acceptable is bread made with High Quality Cassava Flour in Vietnam?

Currently in Vietnam, cassava is used to produce starch on a significant scale, which generates a lot of waste. Also produced is a low-grade cassava flour that is manufactured from dried cassava chips and used for non-food applications. An alternative to these products, suggested by the Gratitude Project, is the production of High Quality Cassava Flour (HQCF) that produces less waste than the starch process and could also be used for food applications.

One of the products that can be made using HQCF as an ingredient, is bread. Bread is a popular commodity in Vietnam, a country where the staple food is rice. The reason for its success is historic: in the 19th century when the French colonised Vietnam, they influenced some of the culinary habits, making bread part of the now world famous Vietnamese cuisine. Bread is eaten in Vietnam as a baguette or for sandwiches.

Part of the research conducted for the Gratitude project looks at the consumer acceptance of bread made with HQCF as a partial substitute for wheat flour. At the School of Biotechnology and Food Technology, Hanoi University of Science and Technology (HUST), HQCF bread produced at a local bakery in Hanoi, Vietnam (Minh Dang), was tested by 145 local consumers. Preliminary results showed that the bread containing HQCF was almost as equally as acceptable as the bread made with 100% wheat flour.

The results obtained from this study will be the basis for the School of Biotechnology and Food Technology at HUST to collaborate with manufacturers in cassava processing, with the goal of developing markets for HQCF.

Aurelie Bechoff, food technologist at NRI said "I have enjoyed working on this study and I hope that we can develop new products with locally grown cassava that can be beneficial to the Vietnamese economy."

Kim Anh To, the Vietnam country coordinator and a research package leader on the project, said "HQCF is made with the aim of diversifying cassava products for Vietnam cassava producers and improving income for cassava farmers. We can make bread using HQCF and we are seeking to understand the potential market for HQCF in Vietnam"

SBFT-HUST and NRI colleagues organise a consumer test at HUST, Hanoi

INTERVIEW

Anton Sonnenberg

Leader of Mushroom Research Group, Wageningen, The Netherlands

During the latest all partner planning meeting in Vietnam (in June 2014), Anton Sonnenberg, the leader of the Mushroom Research Group in the Department of Plant Breeding, Wageningen, The Netherlands gave an interview about his role in the Gratitude project and about the mushroom production company the partners visited during this meeting.

"Oyster mushrooms grow very well from cassava peel"

Anton is leader of the work package that researches the utilisation of waste from cassava production to make mushrooms and animal feed etc.

During the meeting the project partners visited the Mushroom production company 'Kinoko' run by a lady named My Duc.

My Duc currently uses materials such as sawdust and bran to grow the mushrooms but she is interested to replace these in part with wastes from cassava, like dry peels and stems.

At the moment she uses the cassava stems to make an inoculum to put the fungus into the substrate material.

Through the Gratitude project we have shown that Oyster mushrooms grow very well from cassava waste such as dry peels. The mushrooms grow much faster on the peels and the peels are much easier to store than sawdust, which deteriorates quickly.

See the whole interview on video here: http://www.fp7-gratitude.eu/communications/videos

Thai team present gluten-free cassava bread at Thai Research EXPO 2014

Products, such as bread made with cassava flour (and hence gluten-free) that were developed from FP7 project Gratitude, were displayed in the Thailand Research Expo 2014 under the food research symposium section in August 2014. The event was hosted at Centara Grand and Bangkok Convention Centre at Central World, Bangkok, Thailand.

This exhibition houses various research disciplinary ranging from medical research, reserve energy development, agricultural practice and product development that targets small and medium food industries.

Audiences from the industrial sector to academia attended the exhibition to share and discuss in multiple seminar panels organised by the National Research Council of Thailand (NRCT). Our cassava bread product received much attention and many viewers expressed high interest and anticipation to our progress.

It came to our attention that the desire for gluten-free products in Thailand is increasing with direction to simplified product ingredients. Our research aims to produce raw material that can replace wheat flour. We succeeded in replacing wheat flour with our developed flour and can maintain physical characteristic and taste similar to products produced from wheat.

Story by Jackapon Sunthornvarabhas, NSTDA Thailand.

Wageningen University, The Netherlands

Wageningen University and Research Centre (UR), Department of Plant Breeding is involved in education, research and consultation in the field of plant breeding in the broadest sense. 'To explore the potential of nature to improve the quality of life', is the mission of Wageningen UR. The domain of Wageningen UR consists of three related core areas: 1) Food and food production, 2) Living environment, 3) Health, lifestyle and livelihood.

RECENT COUNTRY ACTIVITIES	GHANA	NIGERIA	THAILAND	VIETNAM
	Several in-country workshops, inc. 'Handling the yam, how to heal wounds from resulting from transportation' Ahafo Region, July 2014	Dissemination workshop of new products - at the 38th Annual Conference of the Nigerian Institute of Food Science and Technology. Oct 2014.	Exhibition at Thailand Research Symposium Aug 2014, with National Research Council of Thailand (NRCT)	Article in Scientific Journal - International Food Science and Technology, on HQCF processing. Oct 2014.

YAM STORAGE

During storage of yams much physical loss occurs - by Food Research Institute (FRI), Ghana

Yam in Ghana

Yams (*Dioscorea* spp.) are important tuber crops in Ghana, they are wide spread and are one of the highest valued with a significant source of dietary energy. Yams are an important source of carbohydrates.

Postharvest losses during storage

However, the storage of yams is associated with losses, which have been identified to be caused by physical factors such as mechanical damage and temperature, physiological factors such as water loss, respiration and sprouting, and pathological factors such as diseases initiated by nematodes and aggravated by fungi and bacteria. Temperature and humidity influence respiratory losses in agricultural produce, hence losses are higher in tropical countries.

Dormancy and sprouting

After harvest, yam tubers enter into 'dormancy', and this is of major importance in yam storage. If the yam starts sprouting during this time, storage is no longer possible and the yam is of no use; production is hindered. Attempts to preserve raw yam by using sprout inhibitors, controlled atmosphere or low temperature storage have been challenged over the years. This lack of suitable preservation methods explains the seasonal fluctuation in yam prices.

Current storage options

Yams in Ghana are currently stored either in a cylindrical hole dug into the ground and lined with dry grass, under a shady tree where the ground is cleared and lined with dry grass, or in a rectangular wooden hut lined with woven straw. All these are inexpensive but each have their disadvantages, below ground there is little aeration and high infection rates, but above ground there are rodent attacks, and theft.

Improved barn storage for storing yams

Solution

FRI recommend an improved barn storage, that is raised above the ground, is well aerated and has metal plates to prevent rodents.

STEP 1: Construct an improved yam storage barn, with shelves.

STEP 2: Select only freshly harvested yam tubers.

STEP 3: Clean tubers to remove dirt.

STEP 4: Separate any wounded yam tubers and cure for 5 - 7 days.

STEP 5: Treat portions of yam tubers in 600ppm potash solution to delay bud and sprout formation.

STEP 6: Arrange yam tubers on shelves.

STEP 7: Separate different varieties with pieces of wood.

STEP 8: Yam can now be stored for 3 - 5 months.

This research was developed by Dr Charles Tortoe, Mr Solomon Dowuona and Dr Nanam Tay Dziedzoave of CSIR-Food Research Institute.

Gratitude project

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Website: www.fp7-gratitude.eu

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Partners of the Gratitude project

- Accord Associates, UK
- Caltech Ventures, Ghana
- Food Research Institute (FRI), Council for Scientific and Industrial Research, Ghana
- Federal Ministry of Science and Technology, Nigeria
- Federal University of Agriculture Abeokuta, Nigeria
- National Science and Technology Development Agency, BIOTEC, Thailand
- Natural Resources Institute, University of Greenwich (NRI), UK
- Nobex technical company, Nigeria
- Northeastern Starch, Thailand
- Peak Precision Products, Nigeria
- SABMiller, UK
- Social Development and Improvement Agency, Ghana
- St Baasa Ghana Ltd
- Universidade Catolica Portuguesa, Portugal
- School of Biotechnology and Food Technology, Hanoi University of Science and Technology, Vietnam
- Wageningen Agricultural University, Netherlands

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