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Ministers' Brief

CARDI and FAO collaborating on a project aimed at harnessing solar power for food preservation

CARDI and FAO to host webinar on using solar energy for food preservation

The Caribbean Agricultural Research and Development Institute (CARDI) in collaboration with the Food and Agriculture Organization of the United Nations (FAO), will be hosting a webinar on 6 August 2020 focusing on the use of solar energy as a renewable energy resource for food preservation.

The webinar, which targets farmers, agro processors and policy makers, will introduce solar drying as an option for food processing in the Caribbean and provide perspectives on the production and consumption of cassava and sweet potato flours in the Eastern Caribbean.

Barton Clarke, CARDI's Executive Director stated, "If we are to feed a growing population in a sustainable manner we need to adopt more energy smart practices at every stage of agriculture value chains". One of the biggest constraints preventing agriculture stakeholders from investing in energy efficient operations is the lack of information. Through this project, CARDI and FAO are helping to address some of the knowledge gaps that exist between the energy and agri food sectors, Clarke concluded.

Renata Clarke, Sub-regional Coordinator at FAO, highlighted that drying is one of the most important steps for preservation and value addition of food products. She indicated, "Solar drying is an efficient and cost-effective, renewable, and sustainable drying option for the conservation of a broad spectrum of agricultural products – root crops, herbs and spices, fruits and vegetables to name a few". She also indicated that innovations in this area can contribute towards the region's efforts of bolstering food security and reducing the food import bill in the Caribbean.

Dr Randy Koon Koon, from UWI Mona, will present on "Solar drying for food processing" whilst Dr Lynda Wickham, an eminent roots and tubers researcher, will present on the "Use of roots and tubers in composite flour making".

Following the webinar, the project will collaborate with the Government of Grenada to identify and select a recipient group for the installation of a solar drying facility. A virtual training workshop will also be held for 25 participants on the production, harvesting, post-harvest handling, solar drying, packaging, and marketing of sweet potatoes into flour. A range of recipes will also be produced using sweet potato flour as a means of promoting the widespread use of this gluten free product.

Dry and green coconut shells have been transformed into biochar - an effective soil amendment. Plans are on track to scale up its production in Guyana.

Coconut shell a promising resource

The improper disposal of coconut waste (discarded dried husk and green shells) is a growing challenge in Guyana. In both the rural communities and built areas, improperly disposed shells are associated with environmental problems such as clogged waterways and breeding grounds for mosquitoes and vermin. In Georgetown - Guyana's capital, over 20 tonnes of coconut waste is produced daily!

Studies are showing that coconut shells are a promising resource which can be upcycled into compost, biochar, handicrafts, jewellery, utensils and even as planting receptacles.

Under Phase I of the Coconut Industry Development Project for the Caribbean, funded by the European Union (EU) and ACP Secretariat, CARDI collaborated with the University of Guyana to produce biochar from green coconut shells and dry coconut husks. After treatment, the raw materials were subjected to pyrolysis at 800°C, for 6 hours. Preliminarily results indicated that the green shells yielded between 43 – 69% biochar while the dried husks yielded between 62-75%.

Biochar is defined as carbonised biomass obtained from sustainable sources and sequestered in soils to sustainably enhance their agricultural and environmental value. It is an excellent soil amendment which positively impact soils water and nutrient holding capacities and microbial activities. It is also known to improve soil aeration and lower nutrient leaching rates, thus increasing nutrients availability to crops. When added to soils, biochar also has the ability to sequester carbon thereby mitigating against climate change.

Under Phase II of the project, CARDI will be scaling up the production of biochar and commence a study to evaluate its impact on plant growth in sandy soils.

Working with stakeholders to bolster agriculture production in Montserrat

CARDI has been working alongside stakeholders in Montserrat to improve the productivity of the island's agriculture sector.

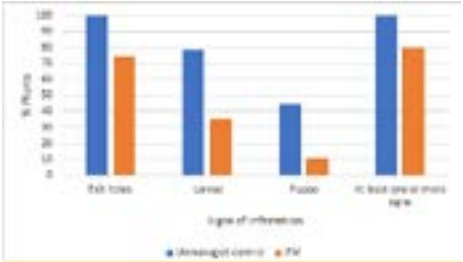
Over the last year, cuttings for cassava, sweet potato, forages and a variety of clean, quality seeds and other agricultural inputs were supplied to Montserrat from CARDI Antigua and Barbuda.

The CARDI Antigua Unit also provided technical assistance to the Ministry of Agriculture, Lands, Housing & the Environment's (MoALHE) Backyard Garden Initiative. The programme targets 3 areas- hoop house rehabilitation, container gardening and open field production. Through technical assistance, CARDI worked with the MoALHE to increase production and supply of quality seedlings and planting materials to local farmers. This program complements the Government's initiative of boosting local production on the island.

CARDI has also identified and is working with 12 satellite farmers across the island. These farmers are involved in the production of a variety of crops including herbs, vegetables and root crops. The satellite farmers' programme are exposing farmers to best practices and technologies to boost production. These farmers are in turn sharing their experiences and new knowledge with secondary farmers in their communities. According to CARDI Representative, Paul Lucas, this model has been very successful at bolstering local production in communities as the secondary ring farmers are readily up taking the information being disseminated by the satellite farmers.

Earlier this year, as an immediate response to the COVID–19 pandemic and the urgent need to promote food security, in Montserrat, CARDI supplied more than 15 pounds of seeds for a variety of crops including lettuce, tomatoes, peppers, pumpkin and corn to the MoALHE. These were handed over to the Ministry of Agriculture for seedling production which were distributed to farmers on the island.

Mr. Robert Murraine, CARDI Technician and Mr. Cliffel Ryan Ministry of Agriculture, Montserrat supervising nursery operations



Graph showing the percentage of damaged plants from IPM and control plots in St Vincent and the Grenadines

CARDI developed IPM strategy effectively controls sweet potato weevil

Sweet potato is one of the most widely cultivated root crops in St Vincent and the Grenadines. In 2018, 4.7 million lbs (2.1 m kg) of sweet potato was produced. However, farmers in Queens Drive and Dorsetshire, two main production areas, have been experiencing severe crop losses caused by the West Indian sweet potato weevil. The larvae, which does the most damage, tunnels through the base of the stem (crown) and through the storage roots. In the storage roots, tunnelling produces chemicals called terpenes, which give the flesh an unpleasant taste.

To assist farmers, CARDI in collaboration with the Ministry of Agriculture, established a demonstration plot in the affected area, to show by comparison the effectiveness of an Integrated Pest Management (IPM) strategy towards reducing damage caused by the weevil. A combination of cultural, mechanical and chemical tactics were found to be very effective in controlling the beetle. Some practices included field sanitation, the removal of alternative hosts – wild relatives of the *Ipomoea* genus and the use of insecticides to treat both planting material and soil.

The study plot was maintained alongside a control plot of minimal management inputs. Based on examination of 90 sample plants per study plot, there were marked differences observed between the results from the two treatment regimens. Weevil activity in each plot was estimated by number of larvae, pupae and exit holes (adults) on the stems (non-destructive sample) of each sample plant at time of harvest. The number of each stage of the weevil was significantly ($P<0.001$) lower in the IPM plot than in the unmanaged plot. The percentage of infested sample plants, was lower for IPM plot compared to control plot; 80% versus 100%. Consequently, there were no losses in marketable yield from the IPM plot due to weevil attack compared to 56.2 % weevil-damaged losses in the control plot. This demonstration will be repeated to substantiate the benefit to cost.

The IPM tactics employed in this study had effectively reduce the weevil population and damage to stems and tubers. This strategy will help sweet potato farmers manage this pest and improve an increase their productivity.

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