



*Scientists at Uganda's National Agricultural Crop Resources Research Institute (NaCRRI) showcasing the biodegradable plastic material they have developed from cassava starch. Photo Credit: Lominda Afedraru*

# Ugandan scientists target tree nursery operators with biodegradable plastic

By Lominda Afedraru

**S**CIENTISTS in Uganda have invented a biodegradable plastic seedling wrapping paper from agricultural waste targeting tree nursery operators currently using polythene bags.

Use of the biodegradable wrapping paper is expected to reduce environmental pollution and soil degradation associated with plastic litter.

Data from Uganda's National Agricultural Research Organisation (NARO) that agricultural waste produced across the country to be about 1.4 million tonnes arising from vegetable processing and 6.5 million tons from other crops residues annually.

Tree nursery operators are using millions of tons of plastics which they dump in farmlands, leading to soil degradation.

Biochemists at the National Agricultural Crop Resources Research Institute (NaCRRI) came up with the idea of processing biodegradable plastics specifically for wrapping seedlings in seed beds by nursery operators who deal in tree seedlings, coffee and other vegetative propagated plants.

They are collaborating with the University of Bangor in the UK with funding worth 80,000 pounds from the UK government running for 10 months.





***The director Mount Elgon Tree Growers Enterprise, George Sikoyo, said that his team has set up four trial sites in the outskirts of Mbale City where they have tree nurseries.***  
***Photos Credit: Lominda Afedraru***

The researchers previously developed biodegradable plastic from cassava starch for making packaging bags but failed to penetrate the market because of the tight competition from polythene plastic manufacturers.

The head of the Biochemistry unit at NaCRRI Dr Ephraim Nuwamanya said focusing on nursery operators is a good entry point because the aim of the innovation is to help solve the challenge of soil contamination with piles of plastics.

The process starts with collecting agricultural waste such as cassava peels, banana peels, maize straws, and sorghum straws from farmer fields around Wakiso district.

The material is left to dry and crushed into powder form and mixed with water and sodium chloride, and heated thereby obtaining a paste.

The paste is then passed through a machine called thinner to make a paper-like lining. It is then put in an oven to be dried.

This is later put in a silk gel and dried once again in order to come up with a bioplastic product.

The production was performed at Bangor University in UK who have the required machine for processing the product.

The scientists are teaming up with Mount Elgon Tree Growing Enterprise in Eastern Uganda where they have set up trial sites to raise tree seedlings wrapped in biodegradable plastics.

According to the scientists, biodegradable plastics form organic matter which once planted with seedlings in the soil will degrade after six months thereby adding nutrients to the soil.

Once mass production kicks off in the country, it will be an income source for farmers from whom the waste material will be purchased. The challenge of animals consuming plastics in farms will be reduced because there will be no more littering.

The disadvantage is that the product is prone to attack by insects such as termites.

However, the scientists are processing an insect repellent from the *Tithonia Diversifolia* plant which will be incorporated as part of the ingredients of the bioplastics.

Instead of potting the tree seedlings in plastic potting, they have used biodegradable plastics. At the moment they treat the materials with insecticide to avoid penetration of insects.

Some of the trials are on raised tables to avoid insect penetration. The sites are acting as demonstration sites where farmers growing vegetables and tree seedlings come to learn on site and they have appreciated the technology.

Dr Nuwanya and team intend to formalise intellectual property issues with Uganda Bureau of Standards in order to roll out the technology. However, the team is calling upon the private sector to come on board to take up the technology for commercialisation because the product is environmentally friendly.