



Weaver ants can boost cashew yield, study shows

Cashew (*Anacardium occidentale*) was introduced from Brazil in the 16th century and has become an economically important [cash crop](#) for a number of African countries. In the Benin Republic, for instance, raw cashew nuts have replaced cotton as the number one agricultural export produce and account for over 13% of export earnings. Production is, however, severely constrained by infestation by several insect pests, sap-sucking insects, leaf miners, branch borers, coreid bugs, mirid bugs, and thrips, which adversely affect the quality of harvestable nuts and causes yield losses of up to 80%.

In a recent [report](#) published in the Journal of Agricultural and Forest Entomology, a team of researchers that includes Dr [Jean-François Vayssières](#), IITA entomologist, present remarkable findings. Cashew nut yields can be boosted by as much as 78% with weaver ants only, and 151% with ants and GF-120 bait sprays, when treatments incorporating the African weaver ant (*Oecophylla longinoda*) are employed against Béninois insect cashew pests.

The researchers carried out their two-year study on a cashew orchard in the Parakou area of Bénin. First they divided the cashew trees into three blocks. Each block was then divided into four treatments, each with 72 trees. The treatments were as follows: a plot of trees colonized by weaver ants (ants); a plot of trees colonized by weaver ants fed with sugar solution (ant feeding); and an integrated pest management system (IPM) consisting of a plot of trees colonized by weaver ants and with spot application of GF-120. GF-120 is a biopesticide mixed with protein bait compatible with organic production but detrimental to cashew pests. Finally, the control treatment against which the performance of the other treatments was measured consisted of a plot of trees not subjected to any form of pest control.

Trees protected by weaver ants were compared with those without any form of

protection. They found that nut yield and weight increased by 78% and 73% for the ants treatment, by 122% and 118% for the ant feeding treatment, and by 151% and 141% for the IPM treatment compared with the control.

“The presence of weaver ants patrolling the trees provides protection against pests,” said Dr Vayssières. “They can have a direct impact by capturing insect pests such as cashew bugs and also provide, ‘visual and olfactory cues’ that act as a repellent.”

The efficacy of weaver ants as natural biocontrol agents against a wide range of pests as shown by this study is in harmony with findings from previous studies carried out by Dr Vayssières in 2008. These demonstrated that *Oecophylla longinoda* was efficient in repelling and reducing damage caused by these dangerous fruit flies—*Bactrocera dorsalis*, *Ceratitis capitata*, and *Ceratitis cosyra*—in mango and citrus plantations.

An unexpected finding from the present study, however, revealed that treatments using weaver ants and sugar-fed weaver ants led to an increase in thrips activity which resulted in a higher than expected reduction in nut quality. Conversely, when weaver ants were used in conjunction

with GF-120, nut quality was enhanced and thrips damage reduced.

Therefore an IPM program incorporating weaver ants and GF-120 or a similar pesticide is recommended. Because organic pesticides are expensive, more studies are required to determine the cost effectiveness of this kind of program to ensure that the gains from an increased yield are not eroded by the costs of the treatments.

Dr Vayssières also confirmed that there are other control methods focused on thrips to be tested in this way. He added “The red ants, *O. longinoda*, are particularly suitable for African developing countries where fruit trees are rarely monitored for pests and where IPM is hampered by high tree size and inadequate/insufficient farmer knowledge. Weaver ant technology is cost free, labor saving, self-regenerating, and requires few interventions of African growers. This conservative biological control method is thus especially suitable for smallholder growers in sub-Saharan Africa. The long history of the technology in Asia with *Oecophylla smaragdina* illustrates how this biological control of predators has great promise as a component of an efficient and sustainable IPM for smallholders (cashew, mango, citrus) in all sub-Saharan Africa.”



Capture of a coreid bug by *O. longinoda* on cashew leaves. Source: JF Vayssières, IITA

NCF partners with IITA on forest restoration, species protection

The Nigerian Conservation Foundation (NCF) has signed an agreement with IITA on conservation and protection of biodiversity.

The memorandum of understanding (MoU) was signed by the Director General of NCF [Mr Adeniyi Karunwi](#) and IITA Deputy Director General, Partnerships and Capacity Development, [Dr Kenton Dashiell](#). The two organizations will be undertaking the following in the next five years:

- Exchange of scientific information and development of specific cooperative programs and projects, especially in the areas of bird monitoring; forest restoration/reforestation
- Seed collection of the International Union for Conservation of Nature (IUCN) Red-List trees.

- Propagation and ex-situ conservation of 'at risk' plant species, especially trees
- Vegetation surveys and assessments
- Development of joint funding proposals
- Participatory management of IITA Forest Reserve for conservation of threatened species among others.

The terms of the partnership between the two organizations also cover regular exchange of ideas and capacity building for staff in the areas of integrated forest management and protection of endangered species (both plants and animals).

For several years, the [IITA Forest](#) Project and NCF have been collaborating on Schools Conservation Clubs in the Ibadan-Ilesa-Osoybo area, and on bird monitoring as required by the designation of the IITA Ibadan campus by [BirdLife International](#) as



Dr Dashiell welcomes Mr Karunwi of NCF in a productive partnership with IITA

an Important Bird Area (IBA). The IITA Forest Reserve in Ibadan is home to the endemic Ibadan Malimbe ([Malimbus ibadanensis](#)), a critically endangered bird species found only in the Ibadan area, which has recently been seen in the forest for the first time in three years.

Belgium Ministry of Development Cooperation official visits IITA-Tanzania

IITA hosted an official of the [Ministry of Foreign Affairs, Foreign Trade and Development Cooperation](#) from the Kingdom of Belgium at its East Africa Hub in Dar es Salaam on 23 June. Mr Reinout Van Vaerenbergh was in Tanzania to oversee the implementation of projects funded by the Belgian Government.

He was warmly received by the team at the Hub led by its Director, [Dr Victor Manyong](#), who made a short presentation on the ongoing research activities at the Hub. These include efforts to close the wide yield gap in farmers' fields through breeding improved high-yielding varieties, tackling major pests and diseases, and sustainably managing the land.

Dr Manyong said the Institute also went further to safeguard the produce by addressing postharvest losses through

processing and promoting improved storage practices as well as tackling a hidden enemy that renders food unfit for human and livestock consumption and trade, aflatoxin. Aflatoxin is a chemical secreted by naturally occurring fungi which attacks crops.

"We call it a hidden enemy because you cannot see it or taste it. But it causes many health problems in Africa and a loss of export income estimated at US\$450 billion every year as infested commodities cannot be traded in international markets," Dr Manyong said.

For his part, Mr Van Vaerenbergh said he was happy to hear about all the ongoing research activities at the Hub and noted that they resonated well with the new Belgian Government's policy both geographically and thematically.

"We have a new policy and a new Minister for Development Cooperation. We are also entering a new phase of funding and we have made a selection of new partner countries to work with. We have dropped some old ones and added new ones. Thematically, the new policy is stressing sustainable and inclusive economic growth and agriculture is seen as an important vector in the process. It is therefore one of the four priority sectors," he said.

He also explained the various funding channels through which the Belgian Government operates. These include the multilateral channel to [CGIAR](#) which is through its [Research Programs](#); the [Belgian Technical Cooperation \(BTC\)](#) which identifies problems and develops programs without interference from the embassies or the Ministry; and a third channel is to Belgian nongovernmental organizations (NGOs). In Tanzania, one of the areas the BTC had prioritized was the Kigoma region and BTC will start implementing a new program from 2016.

Dr Manyong said IITA was grateful to the Belgian Government for all its support to the Institute. "IITA," he added, "is also looking forward to continuing dialog with BTC to identify areas where it can provide technical support in efforts to reduce yield gaps in Kigoma in a sustainable manner."

Mr Van Vaerenbergh also toured the various laboratories in the Science Building, visited the greenhouses, was shown some processing technologies being assembled, and got more briefing on the ongoing research activities.



Mr Van Vaerenbergh visits molecular lab to learn more about cassava diseases research. IITA staff include, from left, Dr Amare Tegbaru, gender specialist; Dr Edward Kanju, cassava breeder; and Mr Rudolph Shirima, research associate/PhD student.

Cassava team holds post-MTR meeting to fast-track project activities

As a sequel to the AfDB Mid-Term Review (MTR) of the [SARD-SC](#) project and Stakeholders Consultation workshop held last May, the Cassava Team of the project conducted a post MTR workshop in Dar es Salaam, Tanzania on 1-3 June. The purpose of the workshop was to realign and initiate strategies to fast-track implementation of project activities across countries. Participants came from all cassava project implementing countries – DR Congo, Sierra Leone, Tanzania, and Zambia. Dr Juma Kayeke (Mikocheni Agricultural Institute, Tanzania) and Mr Sylvanus Fannah (SARD-SC Sierra Leone) chaired the meeting.

Dr [Victor Manyong](#), IITA Director for the Eastern African Hub, welcomed all participants and expressed his delight at the opportunity of hosting the meeting. He charged participants to deliberate on ways to ensure that the benefits of the project percolate to the beneficiaries, while admonishing the team to embrace the [African Development Bank's](#) recommendations to fast track project deliverables. He commended the project for its achievements so far, saying the SARD-SC baseline study revealed a 45% adoption of improved cassava varieties by surveyed households. However, the study showed that intensity of adoption, that is, area grown with improved varieties was only 24%. The implication is that farmers need to increase the areas for growing improved cassava varieties.

Dr [Marie Yomeni](#), Cassava Specialist, said she was happy that cassava value chain implementation was commended during the MTR and attributed the success to the dedication of the implementers from all cassava project implementing countries. She emphasized that the objective of the meeting was to realign the remaining project activities to the work plan and meet the project delivery goals 6 months before the project ends in 2017. It was also an avenue to strategize on how to solve some



Dr Marie Yomeni, SARD-SC Cassava Specialist, talks at the post-MTR meeting

of the challenges identified by partners and implementers during the MTR.

“We are looking forward to come up with a good procurement plan, ensure that implementers and partners understand and follow the new directives, and see new

windows where the second half of the project would kick off from,” she said.

Representatives from participating countries gave goodwill messages from their respective governments and encouraging testimonials about the SARD-SC project.

Partners' testimonials

What do partners say about SARD-SC?

Mr Ivor Mukuka, representing ZARI-Zambia: Other than maize (which is a major staple crop) cassava has become a very important crop in Zambia as a result of the project activities. Therefore, the crop, subsidized by the government is now part of a program known as Farmer Input Support. The government also subsidizes the distribution of clean and high-yielding planting materials to increase production and improve quality. Hence, the SARD-SC project is very important because it is a good strategy to improve farmers' livelihood.

Mr Francis Sankoh, Director – General, Ministry of Agriculture, Sierra Leone: To date, IITA has established 21 cassava processing centers in Sierra Leone, four of them supported by the SARD-SC project. IITA's work is fully captured in the nation's

policy of combating hunger, malnutrition, and food insecurity. IITA's efforts include boosting the production of cassava which has contributed to Sierra Leone producing more than its domestic needs; now it is exporting cassava and its products to neighboring countries. I appeal to IITA/SARD-SC project to continue research on cassava because it is a means of livelihood for many people.

Dr Juma Kayeke, Director of Research and Development, MARI: The SARD-SC project has contributed a lot to cassava production practices, improved varieties, and increased cultivated areas. Therefore we expect a bumper harvest that can help enhance food security. I want to express my appreciation to the project for all the training on cassava production and processing, and the establishment of cassava processing centers for the development of its value chain.

IITA postdoc wins oral presentation award at international biology meet

Rajesh Manoharan, a Postdoctoral Fellow in the Yam Tissue Culture and Genetic Transformation project under the supervision of Leena Tripathi at IITA –Nairobi, received the best oral presentation award from the [Society for In Vitro Biology \(IVB\)](#) for his presentation “Regeneration of D.

rotundata through somatic embryogenesis” during the 2015 In Vitro Biology Meeting held at Tucson, Arizona, USA, 30 May-3 June. The Society for In Vitro Biology, founded in 1946, organizes conferences and workshops every year to foster the exchange of knowledge on biological research and development.

