



National Agricultural Research Laboratories- NARL

E-bulletin September 2025

A quarterly *E-bulletin highlighting News from NARL and stakeholders: Collaborators, NARO Institutes, Agriculture sector, Donors and the Public and Policy Stakeholders* Contacts: P.O.Box 7065, Kampala Tel +256414661977, Email: director.narl@naro.go.ug website www.narl.go.ug tweeter @NarlKawanda, Facebook NarlKawanda

Message from Director NARL



Dr. Robooni Tumuhimbise,

Director of Research National Agricultural Research Laboratories (NARL)-Kawanda

It is my great honour and pleasure to share with our esteemed readers news from research and development at NARL during the start of this financial year 2025/2026. NARL has shaped agricultural research in Uganda and still momentously contributes to the development of the agricultural sector and socio-economic development of Uganda.

Throughout its journey of over 90 years since its establishment in 1937, NARL has evolved in mandate and structure to develop novel agricultural technologies and innovations, and solve agricultural challenges in this country. Our current mandate is to carry out agricultural research of a strategic nature and national importance and offer development services under four key research areas of Food Biosciences and Agribusiness, Bio-systems and Agricultural Engineering, Soils, Environment and Agro meteorology, Biodiversity and Biotechnology.

Technology Generation, Technology Promotion, Research Partnerships and Strengthening Agricultural Research Capacity have made news at NARL and NARO. In this issue we bring you insights of moments when the delegates from FAO and World Bank visited NARO, of citrus farmers in Teso to celebrate their bold steps in increasing production and marketing of citrus with continuous support from KOPIA and NARL. You will also read about how bio-control of invasive species using *Listronotus setosipennis* weevils to curb the congress weed is giving hope to farming communities and researchers in Uganda and Pakistan.

I wish you nice reading. Thank you.

The Giant is Awake!

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NARL receives Weevils to Contain Congress Invasive Weed



Left: Dr. Kasifa Katono and Dr. Mohammad holding a congress weed pot in the screen house prior to releasing the weevils at NARL Kawanda.

Dr. Muhammad Asif from CABI Pakistan delivered more than 500 *Listronotus setosipennis* weevils to NARL Kawanda. The weevils feed on the flowers, leaves of the *Parthenium hysterophorus* also known Congress weed. This weed is affecting farmlands, livestock health and human health in many parts of Africa including Uganda. Besides the biological control using *Zygogramma bicolorata* weevils that is being used, the new weevils will go a long way in reducing invasion of the Congress weed. Dr. Kasifa Katono from Biodiversity and biotechnology program of NARO NARL received the weevils and have been released in the screen house for further multiplication. The invasive weed looks like *Artemisia* but has a broader stem. Invasive weeds are becoming common on land as well. The Congress weed *Parthenium hysterophorus* known to affect farm lands as well as wild life conservation areas respectively. This Weed occupies arable land and leads up to 97% contamination of produce with seeds that will germinate routinely. One plant can produce up to 25,000 seeds, it completes a life cycle in 28 days, stops other plants from growing. The weed causes severe allergies, severe skin rash, bronchitis and Asthma in humans.

On the other hand, if milk and meat of infected livestock that consume this weed get affected by getting mouth ulcers and can lead to abortion of pregnant animals. *Listronotus setosipennis* are stem boring weevils used for the biological control of *Parthenium hysterophorus* weed. Adult weevils feed on leaves and flowers, but cause negligible damage. Females chew small holes flowers and leaf bases where they oviposit eggs. When newly hatched larvae emerge from the eggs, they burrow and tunnel into the plant's stem, where they continue their development while causing significant damage to the weed.

Larvae feeding inside the stem leads to reduced plant height, leaf production, and flower production thereby lowering plant biomass. This kills the plants, especially during the rosette stage of the weed, feeding of five larvae can kill the plant. Another insect controlling the

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weed is *Zygogramma bicolorata*. A leaf feeding beetle used for the biological control of *Parthenium* weed. Feeding by both adults (leaves) and larvae (buds) causes severe defoliation of up to 100% leaf loss, flower damage and reduced seed production. Thus, resulting in stunting, lower weed density, reduced plant biomass, and a reduced soil seed bank, thereby effectively controlling the weed. The weevils are envisaged to reduce the population of the invasive weed.

NARL and KOPIA Give Hope to Teso Citrus Farmers through Trainings and Market Linkages



LEFT: A ripe citrus fruit tree ready for harvest. MIDDLE: HE Ambassador of the Republic of Korea to Uganda Park Sung Soo addressing farmers and stakeholders in the citrus sector at Arapai Soroti. RIGHT Farmers who received awards for best performance during the first ever citrus festival in Soroti pause for a photograph with Dr. Ilho Choo Director of KOPIA, Dr. John Adriko Director of Resarch NaFORRI and Dr. Robooni Tumuhimbise DoR NARL Kawanda

The Ambassador of Korea to Uganda His Excellency Park Sung Soo commended the NARL and the Korean Program on International Agriculture (KOPIA) for having helped citrus farmers in selected districts of Teso to produce high quality citrus fruits that will increase household income. Speaking at the first ever Teso Citrus Festival which awarded the best 140 farmers under the Citrus Model Village project, 57 in Soroti and Kalaki, 40 in Ngara and 43 in Kumi . The ceremony was held at the Citrus training centre in Arapai -Soroti district which was earlier launched in August 2025.

Ambassador Park Sung Soo observed that the festival is celebrating the farmers' efforts. He was grateful to the local government leadership and partners for working with citrus farmers. "Korea has been working closely with Uganda to share advanced agricultural technology and provide modern farming equipment through the collaboration in working with Citrus Model Village approach stands out as one of the most successful inspiring stories". He noted that "The Korean Parliament is now promoting a new global initiative called K- Agriculture whose vision combines Korean development in areas to meet



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international cooperation helping countries like Uganda modernize agriculture while promoting food security and environment stability.

K- Agriculture seeks to build better, smart, sustainable and inclusive agriculture for a better world. It aligns with Uganda's plan to advance agribusiness and add value to farm products." He said The Ambassador is hopeful that Korea and Uganda especially in Teso will continue to nurture this partnership from field to market from harvest to prosperity especially with the Teso citrus farmers. He was optimistic that across Uganda citrus food will become an important source of income nutrition, and pride to empower many farmers making a contribution to the national economy. Noting that challenges of diseases, low quality seedlings and limited access to modern practices will be overcome through strong collaboration between farmers, local government leaders, researchers and developing partners. He noted that the work of KOPIA and NARO is so vital in training farmers and giving hope to Uganda citrus industry, He is confident that Uganda can become the leading citrus producer in East Africa.

The Director of Research at NARO -National Agricultural Research Laboratories (NARL) Kawanda Dr. Tumuhimbise Robooni encouraged the farmers to protect the knowledge and skills they have obtained during their working in Model villages. He noted that this knowledge should reach other farmers so that there is a multiplier effect across the region. Dr. Robooni noted that the work being undertaken in the model villages aligns with the National Development Plan 4. "NDP 4 looks at agricultural production, job creation that farmers have created by growing citrus. All of us are in the money economy, which is good. By growing Citrus, we are improving household incomes and nutrition. Farmers can now afford school fees to take children to school. Citrus growing in the region has improved nutrition which all align with the NDP 4 especially agro-industrialization. NARO is contributing to Agro- Industrialization". The festival marked a visual and palatability taste session of 15 selected farmers citrus fruits of Hamlin variety. Out of 1000 samples, 150 were selected in the first round of selection and 15 made it to the final selection. Laboratory tests were done prior to the visual and palatability testing by independent evaluators. This process culminated to the award of the best farmers crowned "Citrus King". Parameters of good citrus fruits include the peel coloration (green tending to yellow at maturity), orange pulp, brix level of 8 and above, bigger size fruits and high juice content.

Dr. Onesmus Semalulu the NARL Principal Investigator of the Research Project explained that the project started with addressing issues of citrus diseases which have been solved by using fungicides, pesticides and insecticides that have controlled many diseases. The project



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also emphasized soil fertility enhancement and water conservation in the orchards. "To date there has been tremendous increase in production of quality citrus fruits and today the project is recognized as the best KOPIA supported project that has improved livelihoods and incomes of farmers." Technology intervention by NARO since the project started. Include technologies under Pest and Disease management including spraying of herbicides, pesticides, fungicides, pruning using pruning saws and scissors, application of nylon strings, orchard sanitation (picking up and burying of fallen and rotten fruits), technologies under Soil Water and Fertility Management such as mulching, application of cover crops and intercropping, fertilizer application, digging of basins and trenches. Under fruit quality and value addition, post-harvest handling methods were taught to farmers and availed tools and equipment for use by farmers respectively. These handling methods such as use of crates to harvest fruits, use of tarpaulins to store fruits instead of putting on the ground and use of sorting tables for grading the fruits. The contention of marketing is a challenging issue that the project is handling. The marketing team has linked farmers to the traders from (Busia, Rwanda, South Sudan, Nakasero market in Kampala). A few fruits are sold to the Teso Juice factory but most of the bulk is being taken outside Uganda.

"The Farmers did not have cooperatives and if they had there were inactive so the marketing team has linked them to institutions that help develop cooperatives and they have set up some active ones. "KOPIA has supported the farmers with Pruning saws, protective wear (gumboots, gloves, eye goggles, helmet), for protection during spraying, wheelbarrows, pruning scissors, pesticides and fertilizers, tapolins, tanks for water storage, crates for carrying harvested fruits from orchards to home.

Dr. Cho Ilho Director KOPIA was emphatic about the quality of citrus and encouraged farmers to continue doing the good work. "The evaluation done today shows the picture in the market. Some get more scores than others because that is the score of the buyers. I know the citrus from Uganda will become number one". The Soroti City Production coordinator Mr. Okiria Richard was grateful for the support that the project has given to farmers. "Soroti is known as the Citrus City. The best citrus fruits are found in Teso". He observed that many farmers are elderly so there is need to entice young farmers in citrus cultivation as well. He emphasized more involvement of government extension officers.

Mr. Emeju Charles one of the best citrus farmers observes that he has learnt a lot from the project and his farm has become a learning area for more farmers outside the model village. His farm hosts the experimental field for the research on the water management and fertilizer application, pests and disease management and related agronomic practices of fruit trees.

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The collaboration between NARO and KOPIA has supported rice farmers in Lira and Doho in Butalejja districts as well. The festival among other things intended to introduce the unique green citrus now called the Green Ball grown in Teso and work towards popularizing it in the markets across Uganda.

Pictorial Summary of the Citrus Festival in Arapai-Soroti City



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1. *Dr. Onesmus Semalulu stands with Mr. Emeju at a citrus demonstration site in Arapai Soroti*
2. *Dr. Robooni Tumuhimbise (left) Dr. John Adriko (right) at the Citrus Festival*
3. *Judges tasting different citrus fruits of selected farmers*
4. *Josyline Okumu (left) and Barbara Atim(right) at the festival*
5. *Citrus project Staff (NARO) at the festival*
6. *Citrus Project (KOPIA) at the festival*

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MAAIF Upholds Work by the Plant Resource Genetic Center



Dr. John Wasswa Mulumba shakes hands with Hon. Minister Fredrick Bwino Kyakulaga at the Ministry of Agriculture Animal Industry and Fisheries office. Dr. Catherine Kiwuuka from the Plant Genetic Resources Center of NARO is on the second right and on the right is Mr. Birantana Johnie.

Minister of State for Agriculture Rt. Hon. Bwino Fredrick Kyakulaga has applauded the work by the Plant Genetics Resources Center of NARO. The Minister appreciating Dr. John Wasswa Mulumba's commitment to the conservation of PGRFA and ensuring that the country acquires a policy framework for the conservation and sustainable use of Genetic Resources for Food and Agriculture. Speaking to a team comprising Scientists, Policy analysts representing NARO, MAAIF, and Civil Society Organizations including Participatory Ecological Land Use Management (PELUM), Advocacy Coalition for Sustainable Agriculture (ACSA), Caritas-Uganda and the Eastern and Southern Africa Small-scale Farmers; Forum (ESAFF) ,Mr. Birantana Johnie (Policy analyst MAAIF) and Dr. Catherine Kiwuuka (PGRC). He committed to ensuring that Uganda enacts an enabling a legal framework to support the conservation and sustainable use of our Genetic Resources for Food and Agriculture (GRFA).

Cognizant of the complementarity between the draft GRFA policy and the draft Bio-economy policy, the teams were advised to harmonise the provisions of the two policies by integrating the Bio-economy issues and strategies into the draft GRFA policy document. In an effort to fast-track the objectives, from MAAIF organised a meeting to brief the Minister of about process highlighting historical background and current state of affairs. The Minister committed to support the process towards the desired goal. He appreciated Dr. Mulumba and the team for not giving up on the process encouraging them that they need to use the period July 2025 to May 2026 to ensure that the process is accomplished. He pledged his support and advised the team to present the GRFA- - harmonised draft policy and roadmap to him by 15 September 2025. Hence a technical task force of 8 people was set up to work towards the timelines set and accomplish the work in time.

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World Bank and FAO to Support More Agricultural Research in Uganda



Left: NARL team showing the hand maize cranked machine to the FAO DG QU Dongyu (third right). RIGHT: World Bank Divisional Director Mr. Qimiao Fan (Third left in green shirt) poses for a picture with World Bank team and NARO staff

The World Bank team was led by Mr. Qimiao Fan, Divisional Director for Kenya, Rwanda, Somalia, and Uganda, alongside Uganda Country Manager, Ms. Ayo Francesca visited NARO and was impressed with the work done so far. The World Bank Mission was hosted by the National Agricultural Research Organisation (NARO) at the National Livestock Resources Research Institute (NaLIRRI) in Nakyesasa, Wakiso district.

Mr. Qimiao, toured NARO's research facilities, praised the organization's contribution to agricultural transformation. "During my last meeting with His Excellency President Museveni, he asked me to return and visit NARO. Now I know why. It is because of the wonderful work you are doing, as shown by what I have witnessed today. "Mr. Qimiao remarked. He highlighted agriculture's potential to create decent jobs and drive incomes, noting that while Uganda's maize yields average 2.3 metric tons per hectare, some countries achieve 6-7 metric tons. "If we get to that level, farmers will double or triple their incomes. That's why the World Bank has, for many years, prioritized supporting agriculture," he said.

He said the Government of Uganda was on the right course in prioritizing agriculture in its strategy to achieve tenfold growth by 2040. The strategy that emphasizes Agro-industrialization, Tourism Development, Mineral Development (including oil and gas), and Science, Technology, and Innovation seeks to increase the nation's economy from approximately US\$50 billion to US\$500 billion by 2040. Mr. Qimiao pointed to areas for continued collaboration, including climate-resilient agriculture, high-yielding seeds, irrigation, and improved access to inputs like fertilizers. He also emphasized the importance of infrastructure such as rural access roads and electricity for strengthening market linkages.



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"I have been impressed by the dairy zero waste model you have shown me. That's the kind of thing we want to build – the ability to tap into the long value chains of each product," he added. Adding that agriculture can be a better source of jobs that are inclusive and at the same time increasing yields for farmers. urged inclusion and use of irrigation and inpiuts such as fertilizers.

The Minister of Agriculture Animal Industry and Fisheries Mr. Frank Tumwebaze cautioned against fragmented projects, citing the example of vanilla growing in Uganda, which was promoted without adequate planning for market linkages. "It is dangerous to plan for increased production alone without having a lens on markets. Agriculture can only be appropriately planned for with focus on complete value chains. Through this, our projects will become more impactful and farmers will find greater sense in doing agriculture" Hon. Tumwebaze said. The Minister further stressed the need to align agricultural projects with seasonal cycles to prevent mismatches in the provision and use of inputs. He also commended the research potential at NARO, reiterating the strong support President Yoweri Museveni has for agricultural research.

NARO Director General, Dr. Yona Baguma, outlined the organization's strides in developing high-yielding, drought-tolerant, and disease-resistant varieties of key crops such as coffee, banana, maize, beans, rice, cassava, groundnuts, sweet potato, millet, sorghum, wheat, and potato. These innovations, he noted, have boosted food security, enhanced resilience to climate change, supplied raw materials for Agro-processing and contributed to enhancing national security. Dr. Baguma also acknowledged the World Bank's longstanding support through projects such as the Agricultural Research and Training Project (ARTP I & II), Agricultural Technology and Agribusiness Advisory Services (ATAAS), and the Eastern Africa Agricultural Productivity Program (EAAPP), which have helped rehabilitate public research institutes, train scientists to postgraduate levels, upgrade laboratories and equipment, and establish regional centres of excellence in cassava, dairy, rice, and wheat. While the foundations of Uganda's research system are strong, Dr. Baguma noted that more needs to be done to align innovations with market demands, foster private sector partnerships, and scale adoption.

He asked the World Bank to work with NARO in scaling technologies that improve productivity and competitiveness, build climate resilience, generate jobs and exports, and position Uganda as a leader in agro-industrial transformation in Africa. Representing the Permanent Secretary of MAAIF, Dr. Henry Nalalet Opolot observed that the bilateral visit for development cooperation by the world bank is timely just after the launch of ndp4 which has an objective of achieving a higher household incomes, improving national economy and employment for sustainable economic development. Unser the 10 fold gross development



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strategy which targets 10 billion to 500 billion shillings by 2040.“ The program is set to achieve over the 5 years of ndp4 we envisage sector growth up to 8percent, increased export value of priority commodities, up to 4.8 million dollars from 2.5 million dollars reduced imports of value added products from 1000 million US Dollars and create at least 60,000 jobs annually. He noted that “Sustainable agricultural production will depend on significant improvement in on farm production to ensure steady supply of raw materials”. Adoption of new technologies and management practices if are required the country to achieve sustainable agricultural production”, adding that NARO has done a lot and what is required is to push out the technologies to farmers. “There is need to improve post-harvest handling and marketing, access to infrastructure, strengthening extension and enhancing regulatory frameworks ,improving input and output quality, strengthening skills and output based agricultural trainings and engagement with private sector.”

Earlier in July 2025, the FAO Director General QU Dongyu visited NARO and commended them for the driving transformation of the Agri-food system of Uganda. He noted that “Investing in Science and innovation has never been greater because they can change transform challenges of food security and climate stress to opportunities. Read more by clicking on this link <https://news.naro.go.ug/2025/07/23/naro-welcomes-director-general-of-food-and-agricultural-organization-of-the-united-nations/>

Words of Wisdom

1. Knowledge is like a garden; if it is not cultivated, it cannot be harvested.
2. If you heal a monkey's toothache, it is your maize farm that will suffer
3. Wisdom does not come overnight.
4. The fool speaks, the wise man listens.
5. He who learns, teaches.

