

Kirkhouse Times

Issue 18 – Six Months of KT

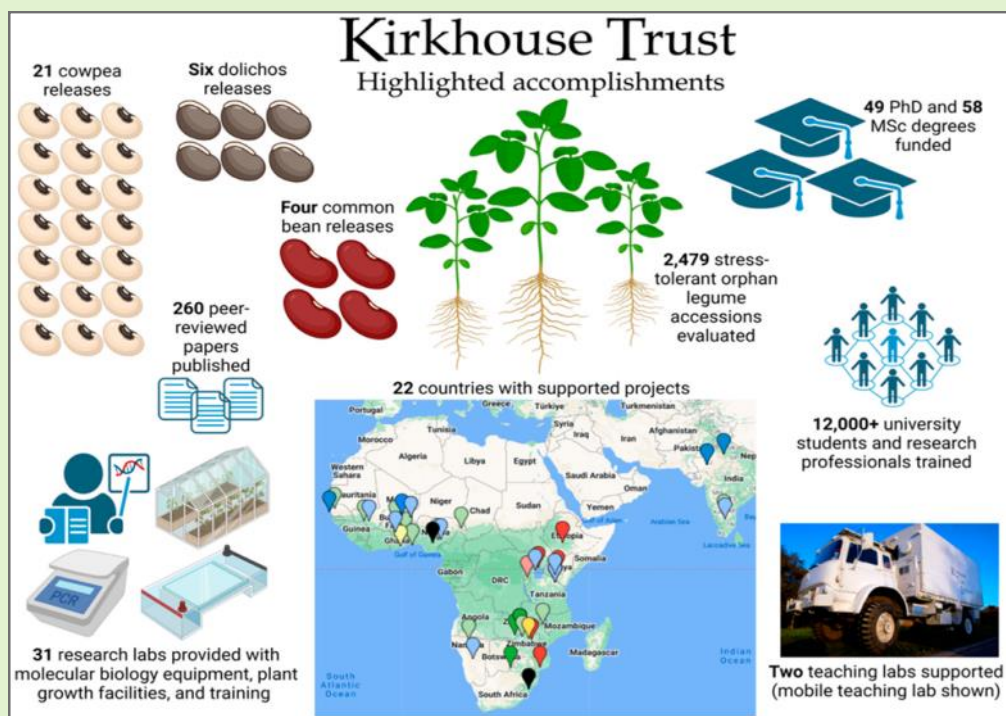
Welcome to the 18th issue of the Kirkhouse Times!

This issue will guide you through our past 6 months and present a collection of photos from our trips to Kenya, Ethiopia, Tanzania, India and Benin. During these trips we met with old and new acquaintances and admired beautiful scenery which I also aimed to highlight in the photos. Additionally, I had an opportunity to get to know a bit better couple of our new PIs and a MSc student who joined KT on our conference trip.

Ms Petra Raitaniemi, Science Project Officer

Kirkhouse Trust – 20 years of supporting breeding projects in Africa and India

Kirkhouse Trust (KT) has funded projects all around Africa and in India for the last 20 years. To celebrate this milestone, Dr Claudia Canales Holzeis, Prof. Paul Gepts, Robert Koebner, Dr Prem Narain Mathur, Dr Sonia Morgan, Dr Maria Muñoz-Amatriaín, Dr Travis A. Parker, Prof. Edwin M. Southern and Prof. Michael P. Timko wrote in collaboration an article about KT's achievements and work to date. If you are interested, you can read the article from [here](#). A pictorial summary of this review paper is shown below.



Current cowpea improvement programmes (dark green pins; Botswana, Cameroon, Zambia); past cowpea improvement programmes (light green pins; Benin, Burkina Faso, India, Ghana, Malawi, Mali, Senegal, Niger, Nigeria and Zimbabwe); current common bean improvement programmes (red pins; Ethiopia, Kenya, Mozambique, Tanzania, Uganda, and Zambia); past common bean improvement programmes (pink pins; Rwanda and Tanzania); current stress tolerant orphan legumes projects (dark blue pins; Burkina Faso, India, Namibia and Senegal); former stress tolerant orphan legumes projects (light blue pins; Ghana, India (Bangalore) Mali, Niger, Nigeria, Uganda); and teaching laboratories (black pins; Ghana (until 2023) and Zimbabwe). At the time of preparation for this manuscript, KT was reviewing potential new projects in Madagascar, Angola (common bean), and Namibia (cowpea).

Professor Appolinaire Djikeng – New Chair of Trustees

In May, Prof. Appolinaire Djikeng was appointed as the new Chair of Trustees at KT. Prof. Djikeng briefly joined us in the combined meeting in Tanzania via Zoom and gave a few words about his history with Prof. Southern and new role as Chair of Trustees.

Prof. Djikeng met Prof. Southern for the first time when he was working for Biosciences eastern and central Africa (BecA) in Nairobi-Kenya. Prof. Southern worked as an external advisor for the projects in Nairobi, giving instructions, for example on low-cost alternatives for existing methods and use of molecular markers. After several years, Prof. Southern asked Prof. Djikeng to return the favour and join the Board of Trustees for KT, which Prof. Djikeng was honoured to do. After joining KT, he was able to see our work from a completely different angle and saw the important work that Prof. Southern has meticulously done in the past 20 years to support programmes and people.

‘You all, sitting in this conference room, have a good foundation and legacy supporting you. It’s all about the people that are committed, not the money.’

Last year, when Prof. Djikeng was in a meeting in Amsterdam, he got a call from Prof. Southern who asked him an unexpected question. Prof. Southern wanted to know if Prof. Djikeng would want to take his place as Chair of Trustees for KT which he answered positively. The positive decision was driven by a new vision and optimism that Prof. Djikeng was able to see in KT.



‘I cannot fill Ed’s shoes, but I want to make sure to continue the legacy and make sure we can support what Ed had visioned and decided to put his own money on, to support people.’

Professor Sir Edwin Southern – Certificate of Recognition given by the World Cowpea Research Conference

In September, KT sponsored a delegation of cowpea researchers and students to attend 7th World Cowpea Research Conference (WCRC) 2024 in Benin. On the third day of the WCRC, Prof. Southern was presented with an honorary award by Dr Ousmane Boukar. This certificate of recognition was given to Prof. Southern for his financial support for cowpea research, development of infrastructure and human capacity in sub-Saharan Africa. Dr Boukar gave a brief speech in which he highlighted the importance of Prof. Southern’s invention and how it enabled many significant findings.

‘Professor Southern is a scientist, inventor, entrepreneur and philanthropist from which the last one has been especially important for this research community, we are feeling it.’

The award was handed to Dr Canales Holzeis who gave a few words of appreciation to the organizers on behalf of Prof. Southern. We were asked to take warm regards to Prof. Southern and let him know that he is remembered and missed by this community. Prof. Southern was very touched by and grateful for this recognition.



The past 6 months of Kirkhouse Trust

In the past six months there have been several major KT events that I want to bring into the spotlight in this newsletter. Instead of lengthy descriptions and summaries, these events will be presented in photos. Without further ado, this is what we saw and learned and who we met:

African Bean Consortium (ABC)

KT made scheduled visits to a few of the recipients of its funding. KT first stopped at in Ethiopia, then Kenya (two sites) before finally arriving in Tanzania to host its planned Annual Meeting (combined consortia – African Bean Consortium (ABC)/African Cowpea Programme (ACP)/ Bambara Breeding Initiative (BBI)).

Centre visit to Sidama Region Agricultural Research Institute (SIRARI) in Hawassa, Ethiopia.



KT visited Sidama Region Agricultural Research Institute (SIRARI) in Hawassa, Ethiopia on 10th June 2024.

Representatives from KT met with senior management and had a tour of the SIRARI institute and field. (left to right) Dr Koebner, Dr Pinheiro, Dr Yayis Rezene (Project PI), Dr Parker and Dr Canales Holzeis.

KT representatives visited the screenhouse at SIRARI where potted bean plants were growing for crosses and selections. Dr Rezene (PI, centre), Mr Mohammed Sitote (KT PhD scholar, second from the left), Mr Musa Tukie (first from the right, former KT MSc scholar and lab technician) with KT consultants, Dr Parker (left) and Dr Koebner (right).





KT travelled to a field station on the outskirts of the city of Hawassa. Dr Rezene (centre) shows KT consultants the common bean crop recently planted. There were various bean lines which included the recently released disease resistant improved varieties Key-Burre and Key-Wolaita.

Seed multiplication of recently released lines Key-Burre and Key-Wolaita at Hawassa field station.



Centre visit to Sidama Region Agricultural Research Institute (SIRARI) in Hawassa, Ethiopia.



Following the site visit to Ethiopia, one part of KT's delegation went to the Kenya Agricultural and Livestock Research Organisation (KALRO) headquarters in Kakamega on 12th June 2024. The purpose of the trip was to re-establish a collaboration, with a former KT scholars, Mr Shamir Misango and Mr Shadrack Odikara who are now employed by the institute and lead the common bean improvement programme.



Former KT scholars, Mr Misango and Mr Odikara, show KT consultants the current common bean breeding lines being trialled in the field at the research station in Kakamega. (Left to right) Mr Misango, Dr Koebner, Dr Parker and Mr Odikara.

KT bean trial in Kakamega. Improved common bean varieties (49) developed in a previously funded KT project were being tested in the field. The aim is to release the best varieties which the charity is providing new funding for.



Centre visit to Embu University in Embu, Kenya



On 13th June 2024, after visiting KALRO, KT officials travelled to Embu University to meet Dr Esther Arunga and her team. (Left to right) Dr Arunga, Ms Serah Njau (PhD student) Dr Parker, Dr Koebner, Ms Grace Wambui Watore, Dr Pinheiro and Ms Nancy Munubi. KT also met with the institute's senior management.



Dr Arunga and her team showed KT consultants the progress of the current funded project at the on-station field in Embu.

Dr Arunga and Dr Koebner discussing the ongoing research activities of the project at the on-station field trial site in Embu.

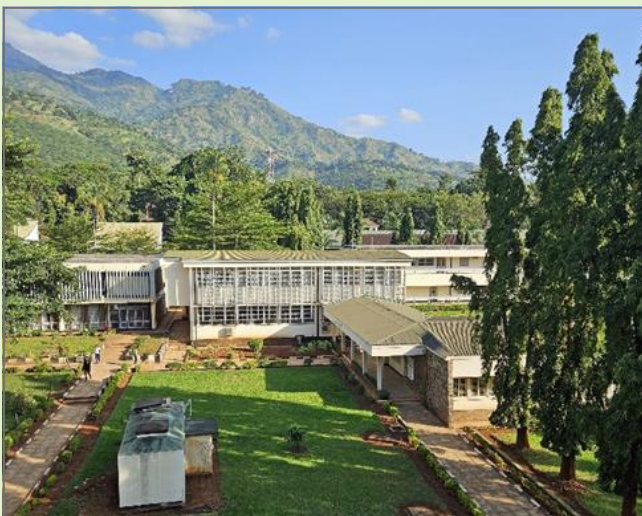


Dr Arunga took KT members on a tour of two farmers' fields planted with common bean plants intercropped with maize. The crop was manually irrigated and was looking very healthy. Dr Parker (left) and Dr Arunga (right) discussing the challenges faced by farmers in Kenya.

Sokoine University of Agriculture (SUA) - Tanzania



The second part of KT's delegation headed to Tanzania, and after a four-hour road trip from Dar es Salaam to Morogoro, we were taken to Sokoine University of Agriculture (SUA) to meet some of the institute directors and researchers. Dr Beatrice Mwaipopo, a lecturer in SUA in Department of Crop Science and Production, gave us a tour around the institute buildings, laboratories and fields. Dr Mwaipopo has previously worked in Prof. Timko's laboratory in University of Virginia while completing her MSc. As for SUA, KT has previously funded common bean research there and established a molecular laboratory which is still functional and in use by students.



Research fields in SUA seemed to continue as far as the eye could see and were surrounded by beautiful mountains. The students in SUA are taking care of these fields while each conducting their studies. We saw a range of different crops such as maize, rice, beans and cowpeas being studied in the fields. I have never seen such neat and well-kept fields in my life which according to Dr Mwaipopo is all thanks to the students.



A group photo outside the laboratory building in SUA. *From left to right: Mr Mark-Sharbel Asman, Prof. Timko, Dr Luseko Amos Chilagane, Dr Mwaipopo, Ms Epifania Peter Mmbando, Dr Canales Holzeis and Ms Raitaniemi.*

Tanzania – Tanzania Agricultural Research Institute (TARI) Ilonga



The next stop on our adventure in Tanzania was TARI in Ilonga. Compared to SUA's massive grounds with endless fields and screenhouses, this station felt more compact. The research team seemed tightly knitted and more like a family. Mr Meshack Makenge, who is a Co-PI in a pilot project KT is starting in TARI, showed us their current screenhouse facilities and ongoing experiments.



Mr Makenge gave us also a short tour of their fields which currently had some cowpea breeding lines growing there. The state of these plants, some of which heavily attacked by aphids, generated discussion amongst researchers and possible solutions were considered to solve some current challenges farmers face with this crop in Tanzania.



Group photo in front of the TARI Ilonga station's office building. *From left to right: Mr Fikiti Akonae Stiliwati, Dr Anold Mushongi, Mr Chaine Hebron Lazaro, Prof. Timko, Mr Nicholas Nchembi Shokela, Ms Victoria Lydon Morungu, Dr Mwaipopo, Ms Witnesspeacequeen Salvatory Kundi, Mr Makenge, Dr Emmanuel Amos Chilagane, Ms Raitaniemi, Dr Canales Holzeis, Mr Asman, Ms Theresia Bruno Jacob, Mr Frank Mulamila Reuben and Mr Phlorentin Philip Lagwen.*

KT Combined Meeting – Tanzania, Arusha



Our combined meeting in Arusha brought together our current and potential new grantees and students from ABC, ACP and BBI consortiums. We were also excited to have external speakers joining us to talk about their work and to discuss collective resources that would be available for KT funded researchers and students and the wider scientific community. *External speakers: Prof. Juan Osorno, Dr Teshale Mamo, Prof. Barbara Reinhold-Hurek, Prof. Juan Carlos Rosas Sotomayor, Dr Pamela Paparu, Dr Timothy Porch, Dr Presidor Kendabie, Dr Sean Mayes, Dr John Medendorp and Dr Barry Pittendrigh.*



On the first day of our combined meeting, we visited The Nelson Mandela African Institution of Science and Technology (NM-AIST) where Dr Mashamba Philipo (PI of a KT-funded pilot project) showed the common bean trials in screenhouse and fields. Some of the trials were surrounded by green nets which stopped antelopes from eating the beans.



A group photo outside the screenhouses in NM-AIST. *From top left to right: Mr Makenge, Dr Muñoz-Amatriaín, Ms Raitaniemi, Dr Koebner, Dr Parker, Prof. Reinhold-Hurek, Prof. Timko, Prof. Osorno, Dr Mwaipopo, Dr Julia Sibiya, Mr Antonio David; from down left to right: Dr Pinheiro, Dr Canales Holzeis, Prof. Hussein Shimelis and Dr Philipo.*



Dr Mamo and some of his colleagues showed us the fields in the Seliani station of the TARI where they trial common bean varieties. We were able to admire the peak of Mount Meru from the fields and commemorate it in the background of our group photo.



Our combined meeting had three full days of presentations prepared by KT-funded PIs and external speakers.

The Stress Tolerant Orphan Legume (STOL) 2024 India visit



The STOL annual meeting was held in Delhi at the Alliance Bioversity & International Center for Tropical Agriculture (CIAT), NASC Complex on the 28th August 2024. Distinguished delegates and PIs from India and Africa (Burkina Faso, Senegal, and Namibia) attended this meeting.



The field visits started at Agricultural University Mandor (AU Mandor), where the group met the university senior management and visited the laboratories and research fields. The image above shows the KT delegation, along with Dr Samuel Jeberson (STOL PI, AUJ India), Dr N K Sharma, and Dr Jai Rana in a meeting with Dr Sitaram Kumhar, the Dean of the College of Agriculture.



All participants visited the STOL field trial at the Agricultural Research Station in Jodhpur (AUJ). This was an opportunity for discussions regarding the diversity of germplasm of various STOL crops. Image on the left is Professor Percy Chimwamurombe (STOL PI, Namibia University of Science & Technology), Dr. Jeberson (STOL PI, AUJ India) and Dr. M. Byregowda in a moth bean field. Image on the right, Dr. Jeberson (STOL PI, AUJ India) discussing moth bean cultivation in India with a smaller

The following day a visit to Agricultural Research Sub-Station, Samdari took place to observe moth bean and mung bean seed production sites. This was a teaching station for MSc students which allows them to learn from local farmers and obtain hands on experience. The image above shows the delegates in a mung bean field. Dr N K Sharma had current mungbean trials at the location which we were able to visit.



Lastly, the delegates had an opportunity to visit Agricultural Research Station, Jalore. This was a wonderful chance for KT and the African STOL PIs to interact with local farmers who stand to benefit benefited from the STOL programme. The field at ARS, Jalore had thirteen hectares of mung bean among other STOL crops like marama bean. The image above shows local farmers in the field of mung bean.

Exploring opportunities for collaboration between India and African countries for the improvement of cowpea (*Vigna unguiculata*)

Mark-Sharbel Asman



Figure 1 Cowpea (*Vigna unguiculata*) in the fields at AUJ, India. Photograph By Dr Jeberson, STOL AUJ.

KT has funded cowpea projects in Africa and India since 2007. Cowpea (*Vigna unguiculata*) is an important legume which plays a significant role in the dietary system of millions of people in Africa and other parts of the world. Cowpea is a relatively drought and heat tolerant crop which flourishes in multiple conditions including sandy soil, rocky terrain or in a sun-baked field. Cowpea is grown in seven Indian states: Maharashtra, Karnataka, Tamil Nadu, Gujarat, Madhya Pradesh, Andhra Pradesh and Rajasthan. Cowpea cultivation in India in 2024 has been reported on 3.8 million hectares with a production of 3.3 million tonnes. During a recent visit to India, we had the opportunity to learn about the recent developments in cowpea improvement projects at the University of Agricultural Sciences, Bangalore.

KT funded a cowpea project in India from 2009 to 2014 at the University of Agricultural Sciences, Bangalore, led by Dr Viswanatha Paramashivaiah and Dr Hirehallur Chandappa Lohithaswa. The aim of the project was the development of high yielding and multiple disease resistant varieties to increase the productivity of cowpea. The objectives included the identification of molecular markers that are linked to disease resistance genes and transferring these genes to agronomically superior genotypes using marker assisted backcross breeding. The achievement of this project was the recent release in Southern Karnataka of a variety resistant to bacterial leaf blight, cowpea mosaic virus, and dry root rot. This variety, KBC-12, is also high-yielding (1300-1400 Kg/ha).



Figure 2 UAS, Bangalore, KBC- 12 cowpea released variety. Photograph By Department of Agricultural

Differences in preferences for cowpea breeding strains in India and Africa were discussed. In African countries, the preference is for large seeded, early maturing varieties, with the preferred seed colour depending on the location. The preference for India is split between the North and South of the country: in the northern part, large, white seeded varieties are preferred, whilst in the southern part they tend to favour brown varieties with a smaller size seed. This is due to culinary practices: whether the local dishes call for the cowpea to be eaten boiled or consumed as flour. India is an important secondary centre of domestication for cowpea. Collaborations between crop improvements programmes in India and in Africa are likely to be mutually beneficial through the sharing of germplasm and breeding tools. Some constraints will be unique, for example, golden mosaic virus is a very important disease in India but not in African countries.

7th World Cowpea Research Conference – Benin



Group photo of the KT representatives in Benin (excluding Dr Fleur Bobbitt and Ms Raitaniemi). All of KT ACP PIs attended the conference and presented their work either in the form of presentation or in a poster. *From back left to right: Dr Kelvin Kamfwa, Prof. Timko, Dr Muñoz-Amatriaín, Ms Velindah Chibomba, Ms Swivia Hamabwe, Dr Canales Holzeis, Mrs Galalea Gillian Gaonosi, Dr Motlalepula Tait, Dr Lydia Horn, Dr Sobda Gonné, Mr Makenge, Dr Merline Yoyo Fankou Gougoua; From front left to right: Mr Kuwabo Kuwabo, Dr Koebner, Mr William Funsani and Dr Mwaipopo.*



On the first day of the conference, representatives of organizations supporting WCRC conference took part in a panel discussion. Goodwill messages were given by Dr Barry Pittendrigh (Michigan State University), Dr Canales Holzeis and Dr Solomon Gizaw (from Technologies for African Agricultural Transformation). On the second day of the conference, Dr Muñoz-Amatriaín, Dr Koebner, Prof. Timko and Dr Canales Holzeis gave a presentation about KT, our previous work and future directions.



After the opening ceremony of the conference, we visited an agricultural fair that showcased different varieties commercially sold, equipment used in breeding and food prepared using cowpea. One of the stations showed different pests causing damage to cowpea such as the legume pod borer (*Maruca vitrata*).



The third conference day finished with conference dinner. As a first timer, it was incredible to experience this warm cowpea community spirit and witness so many cowpea enthusiasts having lively conversations with each other.

The World Cowpea Research Conference was a well planned and executed conference and I, for one, enjoyed it a lot. KT is grateful to the WCRC organizers for the invitation to be part of this conference and we want to thank all participants for an amazing conference.

Mrs Galalea Gillian Gaonosi – conference experience

Petra Raitaniemi

Mrs Gaonosi is a MSc student working in Dr Tait's research group in Botswana University of Agriculture and Nature Resources. I had the pleasure of meeting Mrs Gaonosi in Benin and had a discussion with her about her future plans and goals. It was easy to see the enthusiasm and excitement on her face while we talked about her work in the research group and aspirations to progress further in her career. Inspired by our conversation, I decided to send a few questions to Mrs Gaonosi post WCRC Benin trip regarding the conference and its impact on her goals.



1. What kind of expectations did you have regarding the conference? Was the conference what you were expecting?

I was expecting to meet and connect with my fellow researchers and industry professionals from other countries. I thought this would be beneficial for my future opportunities within the field. I was hoping to gain insights from presentations and pick up any useful information in terms of my ongoing research.

Now after the conference, I can say that it exceeded my expectations.

2. Which presentation(s) did you find the most interesting and why?

I thought the presentations on cowpea genetics and breeding, as well as on the biophysical constraints to cowpea production, were particularly interesting. The content in these presentations align well with my areas of study.

The presentation titled "Farmer-Oriented, Science-Driven Pest Management for Cowpea" was especially intriguing for me, as it directly relates to my current work.

3. Do you think the contacts you made at the conference with other researchers will be useful in the future? How do you see yourself benefiting from them?

Overall, attending the 7th Cowpea Research Conference was a rewarding experience that provided opportunities for my professional growth. The attendees from various institutions were open and accommodating, which I believe will lead to valuable connections in the future.

4. Do you think this conference had an impact on your plans/goals? Did it make you want to do something different than what you are doing now?

The conference and people in the conference inspired me to further my studies in my area of focus, reinforcing my commitment to my current research path.

Introducing new ACP PIs from Tanzania – Dr Beatrice Mwaipopo and Mr Meshack Makenge

Petra Raitaniemi

We are excited to start a new pilot project in Tanzania with Dr Mwaipopo and Mr Makenge. This project will be done in collaboration with the Tanzania Agricultural Research Institute (TARI) and Sokoine University of Agriculture (SUA).

I had the pleasure meeting both Dr Mwaipopo and Mr Makenge in Tanzania on my first trip in Africa. Both were extremely accommodating and easy-going, which made my first visit to this continent a pleasure, despite my slight adjustment issues to the heat. I was able to gain a lot of information and insight into Dr Mwaipopo's and Mr Makenge's careers and aspirations.



PI Dr Mwaipopo and Co-PI Mr Makenge

Questions for Beatrice:

1. What made you interested in crop sciences or plants in the first place? What was it that you wanted to do or achieve with your degree when you started your studies?

My interest in agriculture began in secondary school while studying agricultural biology and mechanisation. This was the initial curiosity about plant biology that drove me to pursue a career in crop sciences. My curiosity also was powered by attraction to plant functions from photosynthesis to nutrient uptake, and their environmental adaptations.

My passion was supplemented by a strong motivation to tackle global challenges, like food insecurity, sustainable agriculture, and climate change, by developing high-yield crops with pest resistance and minimizing the environmental impact. Hence during my second and third degrees I became excited about utilising advanced technologies and scientific methods, including plant pathology, virology, plant breeding and molecular techniques, in solving these agricultural issues.

2. How do you see crop science changing over the next 10 years and what do you think the direction will be?

Over the next 10 years, crop science will be transformed by technological advancements and a focus on sustainability. I see the future of crop science bringing the following aspects:

- Inclusion of high use of integration of AI and IoT in precision agriculture
- Progress in Biotechnology and genetic engineering like CRISPR for resilient crops
- Adoption of regenerative and organic farming practices called agroecology
- Development of climate-resilient crops due obvious climate change
- Digitalization of agriculture.

3. Do you think there's been one key event in your life/career that has got you where you are now? What would that event be?

The key event that shaped my career was during my MSc, funded by the McKnight Foundation. During this time, I conducted research on characterisation of *Alectra vogelii*, a weed affecting cowpea, using molecular markers. At the time, I was under the supervision of Prof. Timko at Uand Prof. Kusolwa at SUA. After completing my research project, I was invited to present my work at a Crop Collaborative Research (McKnight Foundation) conference (2014) in Mozambique. In the conference, I competed for an award honouring our late fellow student from Tanzania, Suma Mwaituro, who had been part of the same project. I worked hard to ensure the award came to Tanzania, where Suma was buried, and I did it.

This experience marked the beginning of my career growth. I was like yes; I can do this! That's where I started my PhD journey, focusing on viruses. I used next-generation sequencing and Diversity Array Technologies as the primary methods for studying viruses and cowpea germplasm respectively.



All the lovely photos overleaf, provided by Dr Mwaipopo, are from the period of her PhD studies in Sokoine University of Agriculture. Dr Mwaipopo collected leaf samples across Tanzania and performed molecular characterisation on the different viruses affecting common bean plants.

4. What would you say is your greatest achievement so far?

I am grateful for the past nine years working with TARI (Tanzania Agricultural Research Institute), I contributed research which succeeded in the release of several cowpea varieties. Additionally, in my four years working at Sokoine University of Agriculture (SUA), I have achieved significant milestones: Firstly, I am proud to see my students graduating each year, but also leading one project as a PI and participating other two projects as a member. I have also published several papers and have 93 citations, which is a notable achievement.

Furthermore, I am thankful to have secured another project on breeding for *Alectra vogelii* of cowpeas under the Kirkhouse Trust which marks the beginning of even greater achievements in crop science, particularly in advanced molecular marker technologies. Another achievement is presenting my findings at international conferences. Collaboration with researchers from various countries has helped me to build valuable connections in the field of crop science. This experience has reinforced my commitment to improving crop resilience and sustainability, making a meaningful impact in the agricultural sector.

Questions to Meshack:

1. What made you interested in crop sciences or plants in the first place?

Tanzania is a growing country and it's been battling with food insecurity for decades. Consequently, I was really interested in learning more about the improvement of food and nutrition security.

2. What would say is the greatest challenge(s) in the improvement of food and nutrition security?

I think there are currently six main challenges that agriculture is facing:

- Insect pests and diseases
- Poor soil quality
- Climate change
- Low adoption and adaptability of improved cowpea varieties
- Low mechanization in agriculture
- Insufficient training in good agronomic practices

3. What was it that you wanted to do or achieve with your degree when you started your studies?

I wanted to generally understand agricultural practices better and that way contribute to improving food security in Tanzania.

4. Has science/breeding methods and directions changed or evolved a lot over the years?

When I started within this field, breeding was mostly done using conventional methods. However, in the present day more and more breeding is done using molecular tools, which is what we'll be doing as well in our new pilot project with KT.

5. Do you think there's been one key event in your life/career that has got you where you are now? What would that event be?

I was part of the team in TARI releasing new cowpea varieties such as Vuli 1 (IT82-889) and Vuli 2 (IT85F-2020) and I would say that was a major event in my career which has led to where I am now.

Photos of seeds from Vuli 1 and Vuli AR1 cowpea plants are presented below.



6. What would you say is your greatest achievement so far?

As I mentioned earlier, from the beginning I have wanted to be part of work improving food security in Tanzania. Through my work in TARI and release of improved varieties, I've been able to contribute to improvement of production and yield of grain legume crops.



Vuli AR 1 cowpea plants growing in the fields and Mr Makenge in TARI screenhouse conducting cowpea evaluation trials.

