



Setumba Mukasa
Associate Professor / Crop Scientist

Tel: +256 (0) 782 670 041
Email: Setumba.mukasa@mak.ac.ug

ORCID ID: <https://orcid.org/0000-0001-9613-4334>
www.senaibioscience.org

<https://news.mak.ac.ug/2022/04/boosting-food-security-mak-caes-icopsea-project-supports-production-of-quality-sweet-potato-planting-material/>

Address

Department of Agricultural Production,
School of Agricultural Sciences,
College of Agricultural and Environmental Sciences,
Makerere University, P.O. Box 7062, Kampala UGANDA.

About/Introductory statement

Dr. Setumba Mukasa is an Associate Professor of Genetics and Plant Virology at the School of Agricultural Sciences, Makerere University, Uganda). He obtained a PhD (Plant Virology; SLU, Uppsala Sweden); MSc (QLD, Australia), and BSc (Makerere University). He has taught undergraduate and postgraduate courses, and supervised several MSc and PhD student. He has won several competitive research grants; and with research interest in seed systems with over 60 publications in peer-reviewed journals. He is a promoter of SENAI Bioscience Laboratories, and the Managing Director of SENAI Farm Supplies Ltd.

Qualifications

- PhD Virology (Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden; 2004)
- MSc. Plant Breeding St. (University of Queensland, Australia; 1996)
- BSc. Agric (Crop Science). (Makerere University, Kampala, Uganda; 1992)
- Certificate in Applied Plant Breeding (Wageningen Agriculture University /International Agriculture Centre, The Netherlands; March-July 1998)

Biography

Dr. Setumba Mukasa is an Associate Professor of Crop Science (Genetics and Virology) at the School of Agricultural Sciences, Makerere University, Uganda, and with business acumen. He obtained a PhD in Plant Pathology (Virology) from the Swedish University of Agricultural Sciences, Uppsala, Sweden; MSc (Genetics/Plant Breeding) from the University of Queensland, Australia; and

BSc Agriculture (Crop Science) from Makerere University. Over the last 20 years, he has taught both undergraduate and postgraduate courses including Genetics, Biometry, Plant Biotechnology, Plant Tissue Culture, and Plant Virology. He has supervised to completion 33 MSc students and 17 PhD students. He has won several competitive research grants and actively carried out research and led a number of biotechnology research projects in Uganda, in the East African region and projects involving international partners and collaborators. His research interest is in the areas of plant biotechnology, and seed systems for vegetatively propagated crops including bananas, cassava, and sweetpotato. He has published over 60 papers in various several international and peer-reviewed journals. Prof Mukasa is a reviewer to a number of scientific journals and also a science editor for the Makerere University Journal of Agricultural and Environmental Sciences (MUJAES). He is serving as a member of the National Biosafety Committee of the National Council for Science and Technology (2017-2020; 2021-2024). Besides services to the University and local communities, he is a promoter of business ideas including to Senai Bioscience Laboratories, and Senai Farm Supplies Limited (www.senaibioscience.org).

Other Activities

We developed a system for virus elimination in sweetpotato plants. This enabled production of planting materials that are virus free and of regained productivity potential. This allowed avoided abandonment of elite sweetpotato varieties due to declined productivity. Farmers can now use such disease free planting material with high yields. These varieties, especially the orange fleshed ones, are now widely grown by commercial sweetpotato farmers.

Teaching

- Advanced Molecular Biology and Genetics
- Applied Statistics and Biometry
- Introduction to Genetics
- Plant Biotechnology
- Plant Cell and Tissue Culture
- Scientific Writing and Communication Skills

Research

- Applying Tissue Culture to Improve Access to Cassava and Sweetpotato Clean Planting Materials for Farmers in Eastern and Central Africa. Funded by ASARECA. ASARECA/AB/2009/05-2/D. US\$ 25,000. One Year: 2010. Principal Investigator.
- Developing a community-based cassava seed system for increased productivity and market linkages in Uganda. RUFORUM - 2014 CARP 04. US\$ 372,420. 2014–2018. Principal Investigator.
- Enhancing Banana Production through Biotechnology Applications: Scaling up the Production

- of Disease-free Tissue Cultured Banana Plantlets in Uganda. Millennium Science Initiative (MSI) Project. 2008-2010. US\$ 250,000. Principal Investigator
- Integrating ICT in Commercial Production of Quality Sweetpotato Planting Material in East Africa (ICOPSEA). icipe BioInnovate Africa Programme BA/C1-03/2017. US\$ 127,600. 2018-2020. Co-PI
- MAK MENU Sweetpotato Project. Meals for Nutrition in Uganda (MENU); Enhance capacity to support production of certified OFSP seed in Uganda. IFPRI/HarvestPlus Project Agreement #2017H8818.MAK. – USD 35,200. June 2017 – May 2022. Co-PI.
- MAK-ILRI Passionfruit Tissue Culture Project (July 2012 – December 2014). “Developing tissue culture for the production of quality passion fruit planting material”. ILRI Nairobi Kenya. US\$ 38,850. Two and half years. Co-PI.
- Towards sustainable cassava and sweetpotato production in eastern Africa. Project between BIOEARN institutes in Ethiopia, Kenya, Tanzania and Uganda. Funded by Sida/SAREC-BIOEARN. 2006–2010. SEKs 2,393,000 (US\$ 320,000). Co-PI.

Research groups and Centres

<https://bioinnovate-africa.org>

<https://www.harvestplus.org/countries/uganda/>

Community based work

- Member of the Task Force. Control of Cassava Brown Streak Disease in Uganda. National Crops Resources Research Institute (NaCRRI)/Ministry of Agriculture Animal Industry and Fisheries (MAAIF), September-December 2007.
- Chairman, Fathers' Union, Uganda Martyrs Church Busega (2010 -2024; 2024 - 2018).
- Member, Namirembe Diocese Synod, Church of Uganda (2018 – 2022).
- Member of the National Biosafety Committee (NBC), Uganda National Council for Science and technology (UNCST), for period of four years (Oct 2016 – Sept 2020).
- Member Project Advisory Committee (PAC) to The Sweetpotato Action for Security and Health in Africa (SASHA) Project (August 04, 2009 - July 31, 2019).
- Technical Committee Member to Makerere University Journal of Agricultural and Environmental Sciences (2018 – 2020).
- Policy Brief: The importance of inspection and certification in sustainable production of cassava in East Africa: A case for Uganda and Rwanda. October 2018.

Publications

- Waniale, A., Swennen, R., Mukasa, S.B., Tugume, A.K., Kubiriba, J., Tushemereirwe, W.K., Uwimana B., Gram. G., Amah, D., and Tumuhimbise, R. (2021). Use of timelapse photography to determine flower opening time in banana (*Musa spp.*) for efficient pollination. Scientific Reports

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- Waniale, A., Swennen, R., Mukasa, S.B., Tugume, A.K., Kubiriba, J., Tushemereirwe, W.K., Batte, M., Brown, A., and Tumuhimbise, R. (2021). Seed set patterns in East African Highland cooking bananas (*Musa* spp.) are dependent on weather before, during, and after pollination. *Horticulturae*, 7, 165. <https://doi.org/10.3390/horticulturae7070165>
- Waniale, A., Swennen, R., Mukasa, S.B., Tugume, A.K., Kubiriba, J., Tushemereirwe, W.K., Amah, D., and Tumuhimbise, R. (2021). Application of pollen germination media on stigmas during pollination increases seed set in East African Highland Cooking Bananas (*Musa* spp.). *Agronomy*, 11, 1085. <https://doi.org/10.3390/agronomy11061085>
- Waniale, A., Mukasa, S. B., Tugume, A. K., Tumuhimbise, R., Kubiriba, J., and Swennen, R. (2020). Glucose performs better than fructose, sucrose, and diluted nectar for germination of banana pollen. *Acta Horticulturae*, 1282, 269 – 276. <https://doi.org/10.17660/ActaHortic.2020.1282.40>
- Ssenko, J. Wasswa, P. Mukasa, S.B. Okiror A. and Kyamanywa S. 2020. Portable PCR field-based detection of sweetpotato viruses. *African Crop Science Journal*, 28(3): 329 – 339. DOI: <https://dx.doi.org/10.4314/acsj.v28i3.1>
- Kasule, F., Wasswa, P. Mukasa, S.B. Okiror A. and Mwang'ombe A.W. 2020. Effective isolation distance for prevention of cassava virus infections in Uganda. *African Crop Science Journal*, 28(1): 1 – 13. DOI: <https://dx.doi.org/10.4314/acsj.v28i1.1S>
- Ssamula A., Okiror, A., Avrahami-Moya L., Tam, Y., Gaba, V., Gibson, R.W., Gal-On, A., Mukasa, S.B. and Wasswa P. 2020. Factors influencing reversion from virus infection in sweetpotato. *Annals of Applied Biology*, 176: 109–121. DOI: 10.1111/aab.12551
- Baguma, J.K, Kawuki, R., Mukasa, S.B., Buttibwa, M., Nalela, P., Eyokia, M., Oshaba, B., Lentini., Z. and Baguma, Y. 2019. Exploring the induction of doubled haploids in cassava through gynogenesis. *African Journal of Agricultural Research*, 14(23), pp. 975-985. DOI: 10.5897/AJAR2018.13779
- Namanda, S., Mwanga, R.O.M., Mukasa, S., Talengera, D., Musoke, C., Kyalo, G., Low, J., Ssemakula, G., Magezi, S. and Ball, A.-M. 2019. Sweetpotato virus pathogen-tested planting material of susceptible varieties results in root yield increase in Uganda. *Crop Protection* 124: 104851. 5 pages DOI: 10.1016/j.cropro.2019.104851
- Waniale, A., Mukasa, S.B., Tugume, A.K., Tumuhimbise, R., Kubiriba J. and Swennen, R. 2019. Simple sugars perform better than sucrose for in vitro and in vivo germination of banana pollen.

Acta Hort. 2019

- Scovia Adikini¹, Settumba B. Mukasa¹, Robert O.M. Mwanga², and Richard W. Gibson³. 2019. Virus Movement from Infected Sweetpotato Vines to Roots and Reversion on Root Sprouts. *HortScience*, 54(1):117–124. 2019. DOI: 10.21273/HORTSCI13392-18
- Ssamula, A., Okiror, A., Avrahami-Moyal, L., Tam, Yt, Gal-On, A., Gaba, V., Mukasa, S.B. and Wasswa, P. 2019. In silico prediction and segregation analysis of putative virus defense genes based on SSR markers in sweet potato F1 progenies of cultivars 'New Kawogo' and 'Resisto'. *African Journal of Biotechnology*, 18(16): 334-346. DOI: 10.5897/AJB2018.16724.
- Mbeyagala, E.K., Maina, S., Macharia, M.W., Mukasa, S.B., Holton, T. 2019. Illumina sequencing reveals the first near-complete genome sequence of Ugandan Passiflora virus. *Microbiology Resource Announcements* 8:e00358-19. Doi 10.1128/MRA.00358-19.
- Baguma, J.K., Mukasa S.B., Kawuki, R., Tugume, A.K. Buttibwa, M., Nalela, P., Eyokia M., Oshaba, B., Ceballos, H., Lentini, Z. and Baguma, Y., 2019. Fruit set and plant regeneration in cassava following interspecific pollination with castor bean. *African Crop Science Journal*, 27(1): 99 – 118. DOI: 10.4314/acsj.v27i1.8
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Videos

https://www.youtube.com/watch?v=w-JZRN_dw5M