Training and capacity building

In order to improve the management of cassava viruses and bacteria in Africa, a comprehensive educational and training plan that will support the continental surveillance and diagnostic activities of the pan-african surveillance cassava network (PASCAN) and the diagnostic cassava network in Africa (CDNA) is needed.

This plan will leverage the facilities and expertise available from various institutions in Africa and beyond. The institutions can serve as hubs for short-term or long-term formal training sessions that will accommodate both French and/or English speaking audiences. In the heart of the Indian Ocean, the Plant Protection Platform center (3P center) at La Réunion can host students (BSc, MSc, PhD students), technicians and scientists for such training programs; in western Africa, Le Laboratoire Mixte International (LMI) Patho-Bios (Burkina Faso), University Nangui Abrogua and University Felix Houphouet-Boigny (Ivory Coast) can propose such training sessions; and in eastern and central Africa, the Biosciences eastern and central Africa-International Livestock Research (BecA-ILRI) Hub located in Kenya provides a biosciences research platform useful for capacity building opportunities.

Modules of training in plant protection are proposed to be developed within the framework of the MSc “Biodiversity and tropical terrestrial ecosystems” program currently offered by University of La Réunion. The modules would include: diversity of pests and plant pathogens; plant-pest interactions; epidemiology of tropical plant diseases; plant health management; agroecology; valorization of plant resources; and diagnostic of plant diseases (from the field to the lab : sampling, existing technologies: ELISA, PCR etc.)

The introduction of such modules to augment existing programs would enable students to specialize in tropical agronomy with skills in ecology and epidemiology of plant pathogens (viruses, bacteria, fungi) and insects; plant sanitation (thermotherapy, chemotherapy, meristem culture, mass propagation, acclimatization); plant breeding; quantitative genetics; and multi-species interactions and their applications to agro-ecology and integrated pest management (bio control, genetic control - resistant/tolerant varieties, chemical control, prophylactic measures - seed sanitation, healthy seeds).

The plan is to allow participants in these courses (students, technicians, researchers, and lecturers) to either follow the complete Master’s program or select specific modules depending on their needs. These modules can be used as basis for training trainers who will then be responsible for onward transfer of knowledge. A similar format of trainings is proposed for introduction to the University Nangui Abrogua and University Felix Houphouet-Boigny in Ivory Coast (training will be done theoretically and practically in the field).

To facilitate wider coverage and possible networked learning and training, the development of e-learning modules has also been proposed based on an existing model at the University of La Réunion. Already, the university has developed an e-learning module entitled “Invasive insects and agro-ecological management: the case of vegetable flies in La Réunion”. A similar approach can be used to develop virtual modules focusing specifically on cassava pests and diseases.

Another proposal is the convening of training workshops on emerging technologies for molecular diagnostics of cassava pests and diseases (deep sequencing, advanced technologies...) and other lab
based workshops. The BecA-ILRI Hub has adaptable models of convening workshops with a built-in participant action plan approach that ensures onward transfer of skills acquired at the training. The models include hosting collaborative trainings at the BecA-ILRI Hub with expert trainers drawn from various institutions all over the world; and convening participants at a regional research institution or university for workshops conducted by Beca-ILRI Hub experts and/or international experts. Regular short-term training workshops on diagnostic and surveillance of cassava pests and diseases will be particularly instrumental in ensuring personnel of national agricultural systems (NARs) and national plant protection organizations (NPPOs) are armed with key competencies. Such short-term technical trainings will focus on viral, bacterial diseases and pest diagnostic and surveillance on the field and laboratories (symptoms identification, when to sample, sampling and sample preparation, identification and detection methods – biological, serological and molecular methods).

Creation of awareness in less technical areas such as the importance of using and producing clean planting material and the risks of moving germplasm without regulatory support is also necessary as part of the overall plan on education and training. This awareness creation is targeted at various stakeholders including policy makers, administrators, regulators, extension service officers, NGOs as well as farmer associations and farmers. Towards this, the development of manuals/visual materials/mobile device applications that will support basic surveillance and identification of cassava diseases and pests is proposed. In the medium-term, awareness of the design of new diagnostic tools and creation of plant clinics will be essential in target countries to succeed in the fight against cassava diseases and pests.

In the long-term, the goal is to design and set-up a complete program on cassava including bacteriology, entomology, virology, breeding, diagnostic, integrated pest management (IPM), seed quality control, regulation and commercialization of quality seeds. Such a program will contribute greatly to equipping the next generation of plant pathologists in Africa to participate more effectively in the fight against cassava pests and diseases.