

# INTERNATIONAL WORKSHOP SURVEILLANCE AND CONTROL OF CASSAVA DISEASES IN AFRICA

PÔLE DE PROTECTION DES PLANTES (3P)  
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## CASSAVA GENETIC DIVERSITY IN CENTRAL AFRICA : A SURVEY CONDUCTED WITHIN A UE-PRASAC PROJECT FOR SUSTAINABLE CASSAVA PRODUCTION IN THE CEMAC REGION

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Originally domesticated in the southern rim of Amazonia, cassava was introduced into Africa by Portuguese in the 16<sup>th</sup> century at the Congo Estuary and quickly adopted and spread by African populations. Cassava is now a major staple crop for the Central African region. However its productivity is low and farmers face major constraints including recent devastating pandemics of viral diseases.

Faced with this difficult situation, PRASAC and Institutes from the six CEMAC countries developed a regional project funded by EU for sustainable cassava production adapted to local markets (2011-2015). One of the project goals is to improve the knowledge of local genetic resources. For this purpose 753 ac-

cessions were collected among five countries: Cameroon, Central African Republic, Congo, Gabon and Tchad. The sampled accessions were analyzed using SSR markers together with 38 American varieties selected for their geographical diversity.

Despite their considerably lower representation the American accessions displayed a higher number of specific alleles. Nevertheless and despite the bottle-neck following their introduction, the African accessions reached high levels of genetic diversity. Although African farmers generally report a strictly vegetative propagation, it is highly probable that sexual reproduction played a major role in the diversification of cassava in Central Africa.

## CASSAVA INTERNATIONAL TRANSIT SITE ON LA RÉUNION

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Located in the Indian Ocean, Réunion Island is relatively isolated. Sanitary conditions are exceptional for growing and studying cassava because no known cassava virus diseases (especially CMD and CBSD) are present and the incidence of other diseases such as CBB caused by *Xanthomonas axonopodis* pv. *manihotis* remains very low. These favorable factors, together with the presence of the Plant Protection Center's infrastructure and human skills, make La Réunion ideal for developing an inter-

national transit site of healthy plant material and so facilitate international exchange of disease-free cassava material in the near future. CIRAD's Bassin Plat and Ligne Paradis experimental stations have more than 10 ha of experimental fields and 4,600 m<sup>2</sup> of insect-proof tunnels or greenhouses. The Ligne Paradis station hosts the Plant Protection Center (Fig. 2A, G), where research in plant pathology and plant genetics is carried out. The 3P Center contains an *in-vitro* culture laboratory and a staff qualified to carry

out plant sanitation programs. Previous similar work was conducted on local varieties of garlic for which two potyviruses, *Onion yellow dwarf virus* (OYDV) and *Leak yellow streak virus* (LYSV), were eliminated by *in-vitro* meristem-tip culture. Two varieties have been cleaned and recorded in the French official catalog of varieties and a production of certified seed has been implemented. Similarly, a local variety of passion fruit contaminated by a potyvirus (*Cowpea aphid-borne mosaic virus*; CABMV) was successfully sanitized using a technique of *in-vivo* shoot-tip grafting. In recent years, CIRAD has acquired significant experience in the management of plant genetic resources. In 2008, a Biological Resources Centre (BRC) was established within the Plant Protection

Center. The BRC is committed to a quality standard according to the French standard AFNOR NF S 96-900. The BRC holds three collections:

- 1) Vanilla, unique in the world, with about one third of the global diversity
- 2) Short-day tropical garlic of local and regional interest.
- 3) “Under-utilized vegetables” of local and regional interest, including a sub-cassava collection consisting of 13 landraces and seven hybrids.

On Mayotte, a French island in the Mozambican channel, CIRAD also manages a collection of 17 cassava landraces, representative of the local diversity.

## ‘ALLIANCE APPROACH’ FOR PREVENTION AND MANAGEMENT OF DISEASE EPIDEMICS AND PANDEMICS IN AFRICA

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**S**taples crops are under perpetual threat from emerging and re-emerging diseases in sub-Saharan Africa. A few notable examples are cassava brown streak, banana bacterial wilt, banana bunchy top, maize lethal necrosis and wheat rust. Both natural and manmade drivers are expanding disease outbreaks into epidemics and pandemics in Africa. Despite significant advances during the past two decades in disease diagnosis and control, unequal national capacities and fragmented implementation have limited the effectiveness of these interventions in Africa.

Learning from these experiences, regional alliances adopting a common framework for disease prevention and management have been unveiled as an effective approach to tackle transboundary diseases on the continent. The ‘*War on Cassava Viruses in Africa*’ and ‘*the Alliance for the Control of Banana Bunchy Top Disease in Africa*’ are recent initiatives to tackle important diseases of

cassava and banana. Active surveillance for disease outbreaks, early detection, and strategies and resources for emergency response are critical components of these frameworks. Research and development efforts are also being mobilized for better understanding of the disease biology, development of rapid diagnostic tools, finding novel solutions for disease management and even eradication of diseases.

Despite growing optimism, several challenges exist to translate ‘alliances’ into an effective force in sub-Saharan Africa. This presentation shares the experiences of alliance approach to contain banana bunchy top disease and piloting of a model initiative ‘*BBTD containment and recovery: building capacity and piloting field recovery approaches through a learning alliance*’ to eradicate infected plants and recover banana production across nine pilot sites in Benin, Nigeria, Cameroon, Gabon, Congo Brazzaville, DR Congo, Burundi and Malawi.