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NEWSLETTER

IN THIS ISSUE

EDITORIAL

Dear friends,

March 2026 serves as a stark reminder of the importance of stepped-up scientific vigilance in addressing the plant health threats facing our region.

The detection of EACMV-Ug in Côte d'Ivoire underscores the significant challenge that transboundary diseases represent to food security in Central and West Africa.

In this context, ensuring the phytosanitary quality of plant material, strengthening diagnostic capabilities, and harmonising control practices are key priorities for the long-term protection of our crops and the security of agricultural production.

Meanwhile, WAVE remains committed to scientific excellence, organising high-level seminars, supporting doctoral research, and developing the skills of young scientists.

WAVE's initiatives demonstrate a constant dedication to fostering a robust, collaborative, and sustainable scientific response to the agricultural challenges of our time.

We hope you enjoy reading this issue.

EACMV-UG, A VIRULENT STRAIN OF A VIRAL SPECIES CAUSING CASSAVA MOSAIC DISEASE, IS NOW PRESENT IN CÔTE D'IVOIRE

Cassava growing is critical for food security in West Africa, but the crop is under threat from CMD. CMD is endemic to Africa and present in all cassava-producing countries on the continent. However, it is caused by several different species of virus (nine in Africa), which varies in severity.

EACMV-UG, a strain of a species that originally emerged in East Africa, was discovered in western Côte d'Ivoire by WAVE. The presence of this particularly virulent strain of a species not expected to be found in West Africa is highly alarming.

A dreaded viral disease

Cassava mosaic disease is a dreaded viral disease that affects the leaves of the plant, leading to discolouration, deformation and reduced photosynthesis, ultimately resulting in a significant drop in yields. The strain recently identified in Côte d'Ivoire is particularly aggressive; it is the **Ugandan strain of cassava mosaic virus (EACMV-Ug)**, which is already known for its devastating effects in East Africa.

In the 1990s, the disease led to a dramatic collapse in cassava production in Uganda, with yields falling from several million tonnes to critical levels, resulting in major economic and food security consequences.

A worrying regional spread

Prior to its outbreak in Côte d'Ivoire, the disease had been reported in several West African countries, including Guinea, Sierra Leone and Senegal. The virus generally propagates through cross-border agricultural trade, particularly the transportation of infected cuttings.

The virus spreads mainly through:

- the use of contaminated plant material (cuttings);
- insect vectors, such as whiteflies.

Economic integration and the high mobility of producers in the region facilitate the rapid spread of the disease from one country to another.

Detection in the west of Côte d'Ivoire

Phytosanitary surveys conducted by WAVE have identified and monitored the spread of the virus in several West African countries. In April 2026, the Ivorian authorities confirmed the presence of the virus in the west of the country, a strategically important agricultural region for food production.

In response to this situation, emergency measures were taken:
- prohibition of transporting cuttings from infected areas;
- restrictions on the exchange of cuttings between producers;
- increased awareness-raising among farmers.

As there is currently no curative treatment, prevention remains the only effective strategy to limit the spread of the virus.

A major risk to food safety

Cassava is a staple food for millions of people in Côte d'Ivoire and throughout West Africa. Any significant drop in production would constitute a major risk to food safety and could lead to:
- higher food prices;
- a decrease in farmers' incomes;
- worsening food insecurity.

The situation is made all the more worrying by the fact that the disease can remain latent in certain plants, making detection difficult and allowing it to spread silently.

Which solutions are available for containing the disease?

In the fight against this threat, several priority actions must be implemented:
- the production and distribution of healthy plants from specialised laboratories;
- the development of resistant varieties;
- Training farmers in early detection and good agricultural practices;
- strengthening regional phytosanitary surveillance.

WAVE also advocates cooperation between countries, which is essential to curb the spread of the disease. Indeed, the fight against cassava mosaic disease requires a coordinated approach across West Africa, as the disease knows no borders.

The emergence of cassava mosaic disease in Côte d'Ivoire marks a new stage in its spread across West Africa. It highlights the challenges posed by transboundary diseases in the context of increased agricultural trade.

Without a rapid and coordinated response, this phytosanitary crisis could permanently undermine cassava production and food security across the region.

SEED CERTIFICATION: A CRUCIAL TOOL FOR TACKLING PLANT DISEASES AND SAFEGUARDING FOOD SECURITY IN CENTRAL AND WEST AFRICA.

Seed quality lies at the heart of all sustainable agricultural production. In a context where plant diseases are increasingly threatening food and cash crops, seed certification is an essential tool for securing production. In Central and West Africa, this approach is reinforced by reference institutions such as the WAVE Regional Centre of Excellence, whose expertise and network of laboratories play a strategic role.

Certification: much more than just a stamp — a guarantee of quality

So, what does **'certifying a seed'** actually mean? It is a rigorous process that guarantees producers that what they are planting is healthy and high-performing. It ensures the purity of the variety, its good germination capacity and, above all, that it is free from diseases or pests. How? Through field inspections, laboratory analyses, and strict monitoring of storage conditions. By preventing the spread of infected seeds, certification helps to fight the spread of plant diseases caused by viruses, bacteria and fungi, which can destroy entire crops.

A bulwark against the spread of disease

Using uncertified seeds is a risky gamble. A disease can be transmitted from one season to the next simply through a batch of contaminated seeds, leading to dramatic yield losses and a decline in quality.

Certification therefore acts as an essential health filter. It enables the early detection of pathogens and the removal of high-risk seed batches. In the case of strategic crops such as cassava, maize and rice, this regulatory framework is crucial for safeguarding food security and producers' incomes.

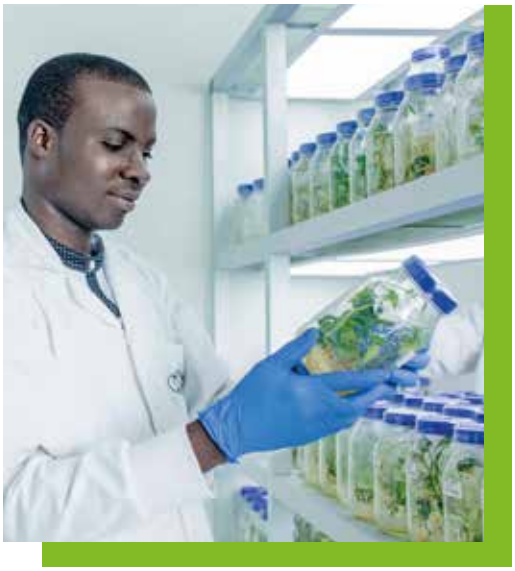
The key role of the WAVE Regional Centre of Excellence

At the heart of this initiative, the WAVE Regional Centre of Excellence has become a leading organisation in the field of plant health in Central and West Africa. Specialising in the study and management of plant diseases, WAVE is actively improving seed quality. Its work is based on three pillars:

- Cutting-edge scientific research using advanced diagnostic tools to quickly identify plant diseases ;
- Capacity building: training technicians, researchers, and stakeholders in the seed sector in good practices for certification and phytosanitary surveillance ;
- Supporting agricultural policies by helping state authorities to develop robust and appropriate seed standards.

A network of cutting-edge laboratories ready to provide practical support for seed certification.

WAVE has a network of **17 cutting-edge laboratories** spread across **10 countries** in Central and West Africa, ready to provide practical support for seed certification and strengthen seed certification in these countries.



Our laboratories offer:

- reliable and rapid seed analysis;
- Large-scale epidemiological surveillance;
- Harmonisation of certification practices across countries.

This regional network promotes the circulation of healthy, certified seeds while limiting the cross-border spread of diseases.

Seed certification : A vital investment

Seed certification is not an option, but a vital investment to ensure the health of our crops and, ultimately, our food security. Supported by institutions such as WAVE, this approach offers a concrete and effective response to health challenges that threaten agriculture.

Investing in certified seeds means investing in the long-term sustainability of farms, stable harvests, and the future of food in Central and West Africa.

HIGH-LEVEL SCIENTIFIC SEMINAR: THE GEMINIVIRUS CHRONICLE AND 10 YEARS OF RICE PAN-GENOMICS RESEARCH

In line with its commitment to promoting scientific excellence and fostering knowledge sharing for food security, WAVE organised a scientific seminar on **24 April 2026**. The seminar brought together two renowned researchers to discuss key issues in plant health and genomics. Held at the **Scientific and Innovation Hub of Bingerville**, this hybrid event enabled the scientific community to explore the diversity, evolution and emergence of vector-borne phytoviruses, as well as pangenomics in rice.

Theme 1: Diversity, Evolution and Emergence of Vector-Borne phytoviruses: The Chronicle of Geminiviruses'

Professor Jean-Michel LETT, plant virologist at CIRAD

During his presentation, Professor Lett emphasised the ecological and molecular mechanisms that facilitate the emergence of phytoviruses, particularly geminiviruses, which are transmitted by insect vectors and are responsible for numerous diseases that affect tropical crops.

Based on his research into several viral complexes, Professor Lett demonstrated that the **emergence** of these diseases is closely associated with **biological invasions** and the **transcontinental spread** of **invasive viral strains,** as well as changes in vector populations.

Analysing the dynamics of viral dispersal has enabled the reconstruction of certain strains' migration routes and the identification of the main global dissemination areas. Professor Lett emphasised that ***« the Mediterranean basin is the main area of dissemination of TYLCV variants and strains circulating worldwide, while the Middle East is probably the centre of TYLCV diversification»,*** highlighting the importance of geographical circulation in the evolution of plant epidemics.

These results demonstrate that the emergence of viral plant diseases is the result of complex interactions between the virus, its vector, and the environments through which it travels. This confirms that biological **invasions play a decisive role in the spread of emerging diseases.**

Professor Lett also presented research into host changes through studying the **maize streak model**, which allows the dynamics of competition between different viral strains within agroecosystems to be analysed. Experimental results showed that some strains exhibited faster **viral accumulation** associated with greater vector transmission efficiency, thus conferring a major epidemiological advantage.

The data presented revealed that a viral strain can reach **86% transmission** efficiency compared to **60% for a competing strain**, illustrating how certain variants gradually gain the upper hand in natural populations.

However, the presentation also demonstrated that less competitive strains can sustain themselves within ecosystems thanks to specific biological mechanisms. This highlights the complexity of the epidemiological balances observed in the field.

Professor Lett emphasised that to **anticipate** the dynamics of emergence and **strengthen phytosanitary** surveillance systems, it is essential to understand the **biological traits of viruses**, their capacity for accumulation, their transmissibility and their adaptation to hosts.

This presentation thus sheds valuable light on the factors underlying the evolution of plant viruses, as well as on the scientific levers necessary to better prevent health risks to food and strategic crops.

Theme 2: Over 10 years of pan-genomics in rice: where have we come from, and where are we going?

Professor François SABOT, Director of Research at IRD

Through a synthesis of the advances made over the last twelve years, Professor Sabot reviewed the rise of pangenomics in rice, made possible by the reduction in sequencing costs and methodological advances in genomic analysis.

His presentation reminded us that pangenomics aims to explore all the genetic variations existing between individuals of the same species, beyond simple point mutations, in order to better understand the genetic determinants of certain agronomic traits.

"The diversity of one individual compared to another is much greater than we think, many genes do not exist in some individuals compared to others."

Through concrete examples, he showed that certain genetic variations specific to certain individuals can play a decisive role in traits such as tolerance to submersion, thus opening up important prospects for rice varietal improvement.

The presentation also insisted on the fact that a single reference genome is no longer sufficient to understand the biological complexity of a species, and that the study of multiple individuals becomes essential to better understand phenotypes of agronomic interest.

"In fact, to fully understand the evolution and diversity of a species, whether it's a virus, whether it's a plant, whether it's a man, you have to have a representation of all this variation. And for that, sequencing is the best way to obtain this information."

Finally, the methodological perspectives discussed have made it possible to glimpse the next steps in plant pangenomics, with approaches integrating more massive data and advanced mathematical tools.

A scientific space dedicated to sharing knowledge and building skills.

Through this seminar, WAVE has further reinforced its commitment to fostering environments conducive to high-level scientific dialogue and the exchange of knowledge and expertise on critical agricultural issues.

The discussions emphasised the importance of strengthening interdisciplinary research on plant diseases and genetic diversity in order to develop sustainable responses to health and food-related challenges in Africa.

By convening researchers, partners, and stakeholders from the agricultural sector to address these pressing issues, WAVE remains dedicated to promoting collaborative scientific research to enhance agricultural resilience and ensure food security.

Interactions with participants

Interactions with participants

viruses

Facteur d'impact : 3.5

MDPI

Epidemiological Surveys of Yam Fields in Côte d'Ivoire Revealed the First Detection of YMMV and Evidence of Episomal Badnavirus

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ABSTRACT

Yam *(Dioscorea spp.)* is a major staple food, contributing significantly to food security andincome generation for millions of people worldwide. In 2019, surveys were conducted across the seven agro-ecological zones (AEZs) of Côte d'Ivoire, the third highest producer of yam globally, to ascertain the current status of viral diseases. In the 324 fields surveyed, a total of 1242 yam leaf samples were collected and tested for the presence of Potyvirus yamtesselati (yam mosaic virus, YMV), *Potyvirus yamplacidum* (yam mild mosaic virus, YMMV), *Cucumovirus CMV* (cucumber mosaic virus, CMV), and the badnaviruses using PCR, RT-PCR, and RCA followed by Sanger or MinION sequencing. The incidence of yam viral disease varied across the AEZs, with the lowest mean incidence observed in yam farms within the AEZ VII (71.95%) and the highest in AEZ V (88.15%). Viral disease symptom severity was moderate across the country, with more severe symptoms identified in AEZs II and VI. The virus screening revealed a potyvirus detection rate of 35.83% in all the AEZs. YMMV infection (25.12%) is the most prevalent in the samples, followed by YMV infection (15.61%). RCA-MinION sequencing revealed the presence of badnaviruses belonging to the T15 episomal groups K8, K9, and K5. Also, the use of this technique enabled the amplification and sequencing of four full-length episomal badnaviruses, namely Dioscorea bacilliform AL virus in group K8 and Dioscorea bacilliform RT virus in group K5. CMV was not detected in all the samples. It is noteworthy that 22.13% of mixed infections were detected in asymptomatic samples. This study revealed the first occurrence of YMMV in all the AEZs of Côte d'Ivoire. Of the yam species, *Dioscorea alata* was more widespread (78.03%) than *Dioscorea cayenensis-rotundata* (21.92%) in the visited fields. Also, D. alata had a highest incidence of YMMV (23.67%) infection than *Dioscorea cayenensis-rotundata*, while D. cayenensis-rotundata registered the highest incidence of YMV (15.84%) infection compared to *D. alata.* Phylogenetic analysis of representative of the various viruses detected in the country revealed that the sequences have high diversity for each virus species. This study revealed that viruses infecting yam are widespread and occur in mixed infection, which poses a real threat to yam production in Côte d'Ivoire.

TWO WAVE PHD STUDENTS REACH A KEY MILESTONE WITH THE DEFENSE OF THEIR THESIS

On 22 and 23 April 2026, the **auditorium of the Bingerville Scientific and Innovation hub** hosted the thesis defences of **Daniel OTRON** and **Mariam COMBALA**, two doctoral students from the **WAVE Regional Centre of Excellence.** This marked an important step in their academic and scientific careers.

Dr. Daniel OTRON presented a thesis titled:

"Characterisation of the cassava virome (Manihot esculenta Crantz, Euphorbiaceae) of Côte d'Ivoire using a metagenomic approach".

For her part, **Dr. Mariam COMBALA** presented her work on the theme:

"Tripartite ACMV-EACMV-host interaction: study of the molecular mechanism of the endemic double infection of two begomoviruses infecting cassava (Manihot esculenta Crantz, (Euphorbiaceae)) in West Africa."

These two successful theses reaffirm WAVE's commitment to training a new generation of scientists capable of producing strategic knowledge to enhance the resilience of agricultural systems in Africa. These successes highlight the importance of scientific research in safeguarding food crops and improving food security across the continent.

CIBiG 2026: APPLICATIONS CLOSED, NOW IT'S TIME FOR SELECTION!

The call for applications for the **third edition of CIBiG** officially closed on **20 April 2026**, marking a important step in this new edition's journey.

The applications received will now undergo rigorous examination to identify the best candidates to take part in this new cohort.

Successful candidates will soon receive information about the learning phases and the **official schedule of training sessions.**