



# Development and registration of innovative technologies for controlling fruit flies in West Africa: Lessons learned from the SyRIMAO project experience

**F**aced with the ravages of fruit flies on the mango sector, the SyRIMAO project piloted a regional strategy to develop and register innovative control technologies in West Africa, such as Mango Protect and SEN-BIOTRAP. This initiative has strengthened local capacities and obtained initial national registration, although challenges remain for scaling up and sustaining solutions. Sustaining these achievements requires a stronger political and financial commitment from ECOWAS and its member states to sustainably secure fruit production.

## Introduction

### Inadequate technologies in phytosanitary control reduce the performance of the mango sector in West Africa

The mango sector in West Africa is severely affected by the prevalence of fruit flies, particularly the species *Bactrocera dorsalis* and *Ceratitis cosyra*. These infestations cause significant yield losses and compromise access to export markets due to the strict phytosanitary standards imposed by importing countries. Previously, the control was mainly based on technologies developed outside the region and for many, on synthetic chemical pesticides, which have often proven to be unsuitable, costly, and a source of problematic residues. Faced with these challenges, the need to develop effective, sustainable, and locally adapted control solutions has become a strategic priority for the region.

The Regional Innovative System project for control of Fruit Flies in West Africa (SyRIMAO), implemented from 2020 to 2024, aimed to develop, validate, and approve innovative technologies with low environmental impact to combat fruit flies, which cause major losses in the mango sector. It followed the Fruit Fly Control Projects Fruits whose achievements it tried to consolidate and scale up. This note aims to share the lessons learned from this large-scale sub-regional experience. It is based on a review of national and regional activity reports, online interviews with national actors responsible for implementing the project's activities at various levels, and field visits to three countries.

## Summary of the experience

### A strategy support based on regional coordination and capacity building

SyRIMAO's intervention was based on a centrally managed strategy, coordinated at the regional level by the Regional Agency for Agriculture and Food (ARAA/ECOWAS). This strategy focused on strengthening the financial, material, technical, and institutional capacities of national actors.

- **Planning and regional coordination:** Activity research was planned on a regional scale by the Regional Center of Excellence in Fruits and Vegetables (CRE-FL) under the supervision of ARAA and validated by the technical and scientific committees (TC/SC). This approach aimed to ensure methodological consistency and harmonize experimental protocols between the 15 ECOWAS countries. The plan's national activities were then a declension of the regional plan, taking into account local specificities.
- **Targeted funding:** The financial resources, made available by the ARAA, were mainly directed towards the countries that had shown a comparative advantage (Burkina Faso, Côte d'Ivoire, Togo, Senegal, Benin). These countries were responsible for the effectiveness tests of the biological and for the constitution of the homologation files. Other countries received more modest funding for participation in the trials.
- **Strengthening of technical capacities:** Training was provided to technicians, producers, and phytosanitary inspectors on the use of new technologies and monitoring protocols. Harmonized materials, such as fact sheets and videos, were disseminated to facilitate appropriation.

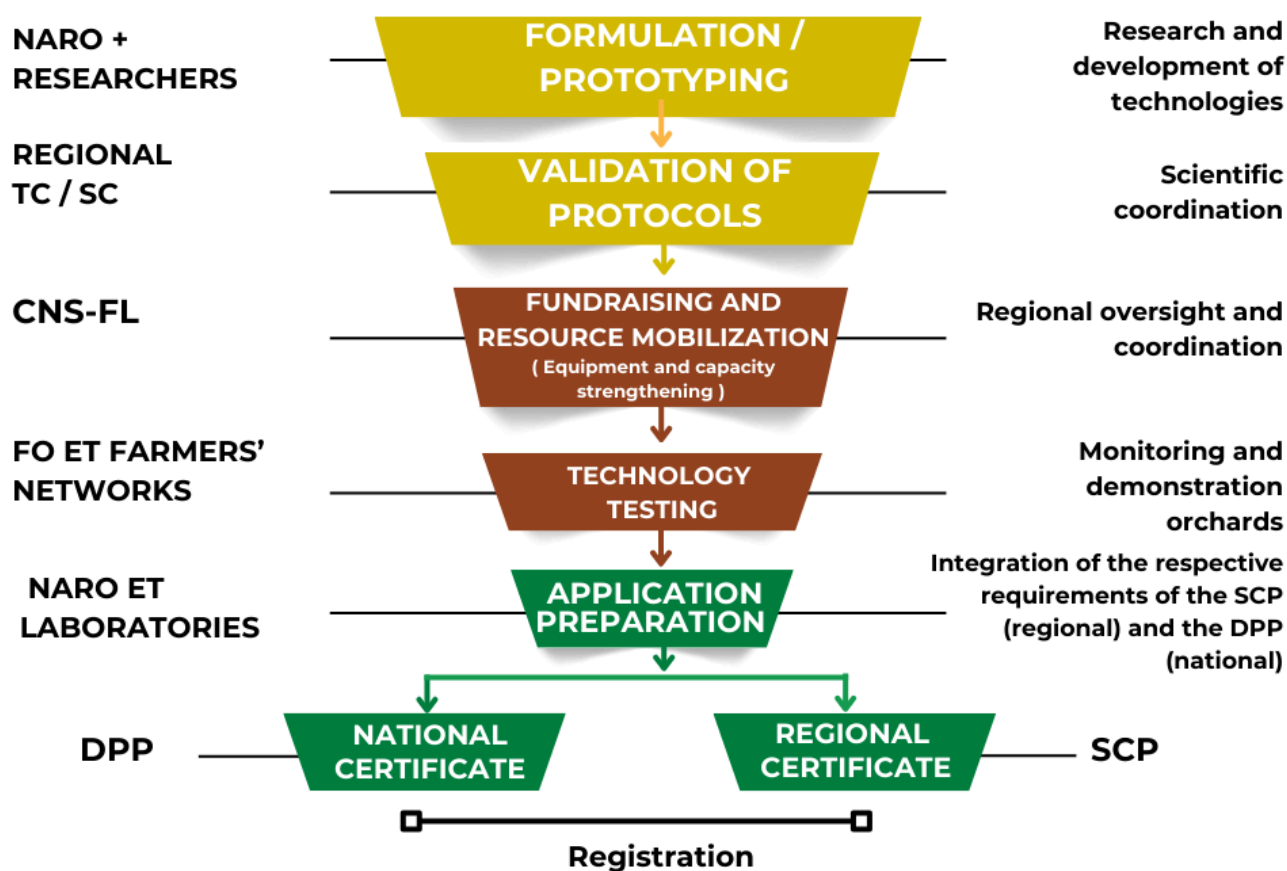
- **Institutional support:** The project SyRIMAO also supported national committees or sub-regions of homologation, in particular by providing technical support for the constitution of files (toxicology studies, ecotoxicology, etc.).
- **Sharing of experiences:** A knowledge sharing mechanism via regional workshops and cross-visits has been established so that the less advanced countries benefit from lessons learned elsewhere, thus strengthening the collective dynamic.

### Codified homologation processes to accommodate institutional realities

The homologation process was codified into several key steps to adapt to institutional realities, national and regional:

- **Formulation and prototyping:** The national agricultural research institutions (SNRA), in collaboration with researchers, developed the technologies, developed the prototypes, and defined the experimental protocols after laboratory and field tests.
- **Validation of protocols:** The regional technical and scientific committees (TC/SC) ensured scientific coordination, validated the protocols, and prioritized the technologies to be tested to guarantee the rigor and comparability of the results.

## Technology registration process




- **Conducting tests in real conditions:** The national networks, including farmers' organizations, conducted field experiments, managed the pilot orchards, and collected the data. They benefited from technical and material support from the project. This phase made it possible to test the products in real conditions and to evaluate their acceptability by the end users.

- **Application and agreement for homologation:** Once the tests were conclusive, the files were submitted for registration. Two routes were possible :

- **National registration:** In countries like Côte d'Ivoire Benin, Togo, the national


- authorities, such as the registration committees, could issue provisional sales authorizations (APV) and then registration certificates.

- **Regional registration:** For the Sahel countries, registration is granted by the Sahelian Pesticides Committee (CSP), which is part of the West African Pesticides Registration Committee (COAHP) at the ECOWAS level. This body assesses the files to harmonize decisions and promote the mutual recognition of technologies at the regional level.

4  DEVELOPMENT AND REGISTRATION OF INNOVATIVE TECHNOLOGIES FOR CONTROLLING FRUIT FLIES IN WEST AFRICA: LESSONS LEARNED FROM THE SYRIMAO PROJECT EXPERIENCE



Monitoring orchard in Toussiana, Burkina Faso

 A diversity of technological solutions has been tested to satisfy a heterogeneous target



Attractive sexualthe SEN-BIOTRAP  
Source: [ARAA News](#), 2025

The project made it possible to test a varied range of technologies, including some that had begun at the advent of the PLMF. Among these, the food attractant Mango Protect and the sexual attractant based on essential oil SEN-BIOTRAP have reached the registration stage. Togo, Côte d'Ivoire, and Benin have approved the two products, while Senegal has given an exceptional authorization for the use of SEN-BIOTRAP in 2024. The files for these products are also under review at the regional level by the CSP for broader recognition. The files for these products are also under review at the regional level by the CSP for broader recognition.



Bait Food Mango Protect  
Source: 202 Project Annual Report4

Biocontrol solutions such as parasitoids (*Fopius arisanus*, *Diachasmimorpha longicaudata*) do not need registration and are released with the establishment of these parasitoids, notably the *F. arisanus* in Benin. However, the results are mixed for other innovations that are not yet fully developed. More specifically, the biocontrol solution through the use of entomopathogenic nematodes remains at the final stage with encouraging field results and a formulation for large-scale use and its registration. Technologies such as protective nets are validated as a cultural practice but do not require registration, and IPM packages (grouping several compatible technologies) are gradually adopted without going through a formal regulatory process.

State of progress and status of registration of products in different countries				
Products	Objectives	Test countries	Current status	Observations
Mango Protect®	Food trapping against fruit flies	Côte d'Ivoire, Burkina, Togo, Sénégal, Bénin	Registered in Togo (2024) and in Benin (2026), in progress in Burkina (CSP 2025)	The slowdown in Burkina is due to additional requirements: toxicology, ecotoxicology, physico-chemistry studies to be carried out to complete the files, and the need for confirmation tests in the field CSP approval
SEN-BIOTRAP®	Bait/attractant based on essential oil	Côte d'Ivoire, Burkina, Togo, Senegal, Benin	Registered in Côte d'Ivoire (2023) in Togo (2024) and in Benin (2026), CSP 2025 in progress	
Parasitoids (Fopius, Diachasmimorpha)	Biological control by parasitism of larvae/eggs	Benin (breeding & releases), other country stations	No need for registration	
Entomopathogenic nematodes	Larval control in the soil	Benin (open field), other countries in the laboratory	Experimental tests finalized, formulation in progress, approval envisaged in 2026	
Protective nets	Physical barrier against infestations	Multi-country pilot orchards	Validated in cultural practice (no regulatory approval)	
Packages IPM (SEN-BIOTRAP+Mango Protect+ sanitation + nets)	Integrated fruit fly management	≥5 pilot orchards/country	Gradual adoption in pilot areas	



PACKAGED MANGO

## Lessons learned

### Success and failure factors

The success of the project rests on several pillars. The strong involvement of national agricultural research systems (NARS) has enabled multi-local tests to be carried out, ensuring better ownership of technologies and increased legitimacy of the process. This commitment was supported by financial support for research and extension. This has accelerated the production of scientific evidence required by the registration committees. In addition, the continuous capacity building of national committees has ensured a good application of protocols. Finally, the synergy between regional and national activities, through the sharing of protocols and the centralisation of data, has fostered the coherence and mutual recognition of results.

Nevertheless, the project encountered significant obstacles. The main factor of failure was the late mobilization of financial and technical resources. This resulted in considerable delays in several countries, sometimes blocking any progress. The initially short duration of the project (four years) also proved insufficient to complete all the experiments, and the long registration procedures were often unknown to the actors. Finally, low coverage of technology needs was reported in some countries, where research activities could not be deployed on certain mango pests, thereby limiting the scope of the project in terms of the development of innovations.

### Sustainability conditions

To ensure the sustainability of the achievements, several conditions must be met. It is imperative to finalize the registration processes already undertaken to avoid the loss of efforts already made. The consolidation of a harmonized regulatory framework at the West African level (COAHP) and the capitalization of knowledge in a regional database to preserve scientific memory and serve as a reference for future registrations are also essential.

Sustainability also depends on the ownership of the system by the regional structure in particular the CRE-FL, the financial commitment of the Member States and the ARAA, and the continuous strengthening of specialized human resources.

### Conditions de mise à l'échelle

Scaling up, on the other hand, is based on the development of a harmonized regional registration guide, applicable to different types of products (biological, chemical, etc.) and sectors. This guide should specify the steps, criteria (bio-efficacy, toxicology, physico-chemical composition, stability in warehouses, etc.), and deadlines to ensure the reliability and transferability of the results of tests conducted in the region.



MANGO ORCHARD IN TOUSSIANA, BURKINA FASO



PREPARATION OF DEMONSTRATION ORCHARD

## Perspectives and recommendations

### Perspectives

- It is now imperative to clarify the questions of intellectual property of products developed certainly by researchers but with public funding and concerted sub-regional research efforts.
- The production on a large scale of approved products must also be organized to ensure their availability in the sub-region. Both in Senegal for SenBiotrap and in Burkina Faso for Mango Protect, the terms of the public-private partnership are being defined for this purpose.

### Recommendations

The achievements of the SyRIMAO project are undeniable, but their sustainability requires strong political and financial actions.

- **To ECOWAS:** It is recommended to accelerate the harmonization of phytosanitary policies to avoid the duplications and delays observed in national registration processes. The rapid establishment of the COAHP as a regional single window is a priority to streamline the process.
- **To national committees:** It is crucial to integrate new control methods into agricultural training programs and involve economic operators upstream via incentives to ensure the production and dissemination of registered technologies. Producers should also be motivated by economic benefits, such as the labeling of "pesticide-free mangoes", to encourage the adoption of effective but costly technological combinations.



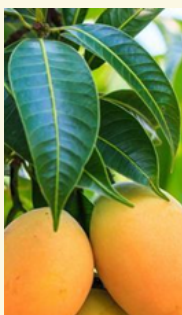
### Financial partners



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