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DEVELOPING AN INTEGRATED PEST MANAGEMENT (IPM) AND BIORATIONAL PROGRAM FOR CONTROL AND CONTAINMENT OF THE INVASIVE PEST OF TOMATO (TUTA ABSOLUTA) IN NIGERIA

TCP TERMINAL REPORT

July 2019

SDGs:



Countries:

Nigeria

Project Codes:

TCP/NIR/3601

FAO Contribution:

USD 421 000

Duration:

1 March 2017 – 30 April 2019

Contact Info:

FAO Representation in Nigeria

FAO-NG@fao.org

Implementing Partners

Federal Ministry of Agriculture and Rural Development

Beneficiaries

200 farmers (men and women), primarily in rural areas of Kano, Katsina, Kaduna, Plateau and Jigawa states

Country Programming Framework

The project is in line with the Strategic Objective/Organizational Outcome 201 (100%) and Country Programming Framework Outcome: Output C1.1 – “Strengthened capacity of the institutions to provide technical support services (extension, irrigation, seeds), to relevant actors in the agriculture priority value chains”

BACKGROUND

Small-scale farmers are the main producers of tomatoes for domestic consumption in Nigeria, as well as for the regional markets. Post-harvest losses, estimated to be as high as 51 percent, continue to take a heavy toll on the country’s economy. With a sizeable proportion of Nigeria’s population living below the internationally accepted poverty line, major emphasis needs to be placed on minimizing losses so that produce can become available and affordable to vulnerable rural communities, in particular women and children, thereby raising the nutrition standards of rural people.

Most tomato production is carried out by small-scale farmers. However, both the small-scale producers and the potential commercial growers are now affected and threatened by the outbreak and spread of *Tuta absoluta*. This pest leads to a fungal infestation, which in turn causes rotting of the fruit either before or after harvest.

The project’s focus was on developing and incorporating an acceptable Integrated Pest Management (IPM) protocol to curtail the menace of *T. absoluta* and to mitigate its adverse effects on the processing industry, as well as the socio-economic implications of farmers abandoning the tomato farming business for other crops in Nigeria, in particular in the five states selected for the execution of this pilot project (Kano, Katsina, Kaduna, Plateau and Jigawa).

The specific objectives of the project were (i) to reduce the use of conventional chemical pesticides, (ii) to introduce alternative biorational technologies, (iii) to improve environmental health and human nutrition by surveillance, (iv) to revitalize tomato cultivation, (v) to strengthen the national capacity for *T. absoluta* surveillance and the operation of a network for the containment of its spread, and (vi) capacity-building and training of quarantine officers and extension agents at different levels within the country.

IMPACT

The expected impact of the project was to enhance the food and nutrition security of the population in target areas, building safeguards for the livelihoods of tomato farmers.

ACHIEVEMENT OF RESULTS

T. absoluta was successfully controlled on the target tomato farmlands.

The capacities of stakeholders from the five target states were strengthened. Trainees were drawn from the Federal Ministry of Agriculture and Rural Development (FMARD), state-level Ministries of Agriculture, Agriculture Development Projects (ADPs), research institutions, the National Agricultural Seed Council (NASC) and the National Agricultural Quarantine Services (NASQ).

The capacities of 200 farmers, 40 extension workers, plant quarantine officers and other stakeholders were built on tomato nursery and field management, as well as on the use of phytosanitary measures and *T. absoluta* biorational solution control/containment kits for successful tomato production in the five project states.

An IPM strategic plan for the management of *T. absoluta* on tomato farms was successfully developed, as well as a biorational solution using an indigenous predator for a long-term solution to the spread of *T. absoluta*. The project’s monitoring and evaluation targets were also met.



IMPLEMENTATION OF WORK PLAN

All activities were carried out within the planned budget, though there were some delays in the procurement process due to the technical nature of some of the items. Risk-prone areas were avoided during the project. In addition, the project team collaborated in all locations with local staff, who were able to provide guidance on areas to be avoided. In terms of the potential risks identified at the outset of the project, the low capacity of the extension system for adoption of IPM was considered the risk most likely to materialize. To mitigate this risk, however, the project ensured that specialized technical assistance was provided at the outset of implementation, while the planned trainings were conducted in a timely manner.

FOLLOW-UP FOR GOVERNMENT ATTENTION

The beneficiaries of the project are expected to cascade the knowledge acquired to others in their communities, while the involvement of local government should be encouraged. Partners are advised to ensure that traps are mounted and monitored regularly, in order to curtail the invasion of the *T. absoluta* pest. In addition, further indigenous natural enemies of *T. absoluta* should be identified and further trials conducted in order to revalidate and test some of the project's strategies.

SUSTAINABILITY

1. Capacity development

The relevant officers in different sectors were supported from the inception of the project, which will ensure an avenue for quick buy-in of the project, as well as project sustainability.

The project was structured in such a way that the key actors were drawn from the organizations/ministries that were able to adopt and expand upon the existing framework used for the execution of the project.

In addition, partnerships and alliances were formed with government bodies, such as the NASQ, ADPs, and research institutions such as the National Horticultural Research Institute (NIHORT), which are expected to further strengthen and build upon the existing platform created through this project for sustainable management of *T. absoluta* in Nigeria.

2. Gender equality

The needs of both male and female participants were considered, and support provided to them, throughout the course of the project. All benefits were made available to both male and female participants.

3. Environmental sustainability

All project activities were carried out within the agro-ecological farming system.

4. Technological sustainability

The project greatly contributed to the development of local knowledge through the series of trainings held, which built the capacities of the different stakeholders on the knowledge and best management practices required for successful control of *T. absoluta*.

The approach and knowledge transferred are simple and flexible. Indigenous knowledge among farmers was also encouraged.

5. Economic sustainability

The availability of further funds would allow the project to be extended to other areas not presently considered due to limited resources. Stakeholders will continue to need support from the Government and other agencies.



DOCUMENTS AND OUTREACH PRODUCTS

- ❑ Sustainable and Safe Tomato Production in Nigeria: Integrated Pest Management of *Tuta absoluta*. FAO Nigeria, NIHORT and FMARD.
- ❑ Developing IPM and bio-rational solution for *Tuta absoluta* containment/control in Nigeria. FAO Nigeria, NIHORT and FMARD

ACHIEVEMENT OF RESULTS - LOGICAL FRAMEWORK

Expected Impact	Food and nutrition security of the population enhanced, building safeguards for the livelihoods of tomato farmers.		
Outcome	The spread of and damage caused by <i>Tuta absoluta</i> to tomato in Nigeria is controlled/contained.		
	Indicator	200 farms with an IPM control strategy. 200 farms on which the <i>T. absoluta</i> attack on tomatoes has been controlled. Increased availability of tomatoes not infested by <i>T. absoluta</i> in the markets.	
	Baseline	No capacity for <i>T. absoluta</i> management/control	
	End Target	Successful control of <i>T. absoluta</i> on tomato farmlands. Capacities of stakeholders from five states strengthened. Trainees drawn from FMARD, ADPs, research institutions, NASC and NASQ.	
	Comments and follow-up action to be taken	Achieved. Beneficiaries to cascade knowledge acquired to others in their communities. Involvement of local government should be encouraged.	
Output 1	IPM developed and incorporated into national strategy for the control of <i>T. absoluta</i> – (biorational solution will be combined with chemical pesticides that are extracts of natural microbial origin, such as Abamectin, Spinosad and traps).		
	Indicators	Target	Achieved
	Provision of pest surveillance and control/containment kits (pheromone lure, Recharge, Antario, Supersede and Yellow Optiroll Super) and tomato seeds to 200 farmers. Strengthened national capacity of extension workers and research institutes to monitor/detect <i>T. absoluta</i> and develop an IPM protocol with biorational solution for management of <i>T. absoluta</i> in Nigeria. Field trials carried out for the management of <i>T. absoluta</i> using non-chemical alternatives. Control/containment trials conducted with farmers on farms. Capacities of 200 farmers built on <i>T. absoluta</i> detection, monitoring and management of the leaf miners in the five affected states. Capacities built of 40 crop protection officers from NASQ and research institutes on early detection, monitoring, phytosanitary measures and the use of <i>T. absoluta</i> biorational solution control/containment kits. Incorporated IPM Strategy for <i>T. absoluta</i> in National IPM strategy document.	200 tomato farmers, 40 crop protection officers from NASQ and research institutes well informed and equipped with knowledge and hands-on experience on early detection, monitoring and phytosanitary measures and the use of <i>T. absoluta</i> biorational solution and control/containment kits.	Yes
	Baseline	Zero	
Comments	Beneficiaries were linked with <i>T. absoluta</i> resources developed by FAO and NIHORT and were provided with surveillance tools (pheromone traps and lures). Project partners should ensure that traps are mounted and monitored regularly to curtail the invasion of the <i>T. absoluta</i> pest.		
Activity 1.1	Stakeholder consultation and inception workshop.		
	Achieved	Yes	
	Comments	Implemented successfully.	
Activity 1.2	Provision of pest surveillance and control/containment kits and seeds to farmers.		
	Achieved	Yes	

Activity 1.3	Capacity-building to strengthen national capacity for T. absoluta IPM surveillance and control.		
	Achieved	Yes	
Activity 1.3	Comments	200 farmers trained on tomato nursery and field management and use of Tuta solution control/containment kits. 40 extension workers from the project states trained on field management with biorational options. Capacities of 40 crop protection officers from NASQ built on early detection and monitoring of T. absoluta in Nigeria. The extension officers trained are expected to cascade this training to other farmers in their respective communities.	
	Organize field trials in research station and on farms.		
Activity 1.4	Achieved	Yes	
	Comments	Establishment of 200 (0.25 ha) farmer-managed trial plots in the five project states. Field trial plot established in NIHORT out-station in Bagauda, Kano State for the management of T. absoluta using IPM.	
Activity 1.5	Incorporate IPM strategy for T. absoluta in national IPM strategy document.		
	Achieved	Yes	
Activity 1.5	Comments	Equipment for production of biorational solution (neem extractor) procured and installed at NIHORT, Ibadan. Production of two biopesticides (NIHORT-Lyptol and NIHORT-Raktin). IPM strategic plan for the control of T. absoluta on tomato was developed and published, for distribution to policy officers, farmers and other stakeholders.	
	A biorational solution using an indigenous predator for a long-term solution to the spread of T. absoluta is developed.		
Output 2	Indicators	Target	Achieved
	Identification of indigenous natural enemies carried out in the five project beneficiary states. Natural enemy (Nesidiocoris tenuis) reared under screen house and released to 200 farms. Performance data on reared predator collected, analysed and reported.	T. absoluta population is kept below economic threshold.	Yes
Baseline	Zero.		
Comments			
Activity 2.1	Identification of local parasitoid and predators.		
	Achieved	Yes	
Activity 2.1	Comments	Indigenous natural enemies (parasitoid and predators) of T. absoluta were collected from Tuta-infested fields and identified. Further indigenous natural enemies of T. absoluta should be identified.	
	Release of reared indigenous natural enemies.		
Activity 2.2	Achieved	Yes	
	Comments	The predator Nesidiocoris tenuis was reared under screen house at NIHORT and released for the control of T. absoluta on tomato crops.	
Activity 2.3	Data collection, analysis and reporting on performance of released predator.		
	Achieved	Yes	
	Comments	The increased population of Nesidiocoris tenuis in the field resulted in effective T. absoluta control.	

Output 3	Monitoring and evaluation.		
	Indicators	Target (expected value at project completion)	Achieved
	Farmer's diagnostic tool/questionnaire developed. 1 ha of farmer-managed on-farm trial plots established at cluster map sites. Pamphlets developed on IPM/biorational strategy for the control/containment of T. absoluta in Nigeria, for incorporation into the national T. absoluta control strategy and distribution to farmers.	Production of pamphlet on IPM/biorational strategy developed for control/containment of T. absoluta in Nigeria. Capacities of farmers, extension workers and other stakeholders developed on the production and use of bio-rational solution for T. absoluta control.	Yes
Baseline	Low capacities on T. absoluta information and management in affected states.		
Comments	The different targets set were achieved.		
Activity 3.1	Monitoring and evaluation of project activities.		
	Achieved	Yes	
	Comments	Monitored performance of inputs distributed to farmers during the wet season. Monitored performance of inputs distributed to farmers during the dry season. Further trials should be conducted in order to revalidate and test some strategies.	

Marketing, Outreach and Reporting Unit,
Business Development and Resource Mobilization Division (PSR)

For more information please contact: Reporting@fao.org

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