Ministers’ Brief

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Validating safer methods to control the South American Palm weevil in Trinidad and Tobago

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Validating safer methods to control the South American Palm weevil in Trinidad and Tobago

Through the European Union (EU)/CARIFORUM financed - Coconut Industry Development and Enhancement Support for the Caribbean project, The Caribbean Agricultural Research and Development Institute (CARDI) collaborated with the Research Division, Ministry of Agriculture, Lands and Fisheries (MALF) to validate and demonstrate improvements to the Ryncholure pheromone trapping technology for South American Palm Weevil (SAPW) Rynchophorus palmatorum. The SAPW is the main vector of the Red Ring disease, with 35% mortality reported in coconut fields during the first 3-10 years in Trinidad and Tobago. Trees infected with Red Ring usually start in the tips of older leaves which turn yellow to bronze then to reddish-brown and eventually fall. The trunk of the tree produces a fermented smell and the tree wilts and dies within three months of infection. When a cross-section of the trunk is cut, a symptomatic red ring band appears. While Ryncholure pheromone technology is not new to Trinidad, farmers have had low adoption rates for managing the SAPW, with many discontinuing its use over the years.

CARDI and MALF worked together to validate three improved technologies which have been recently researched in Latin America and found to increase the trapping of SAPW. These include: an improved trap design; the use of a synergist—ethyl acetate called Rynchomagnet combined with the Ryncholure pheromone and the positioning of traps in the field.

The improved design is a funnel-shaped trap that reduces the escape of the weevils and removes the need for using insecticide. The funnel traps are constructed from two used 1-gallon water bottles, one of which is inverted into another or alternatively using a 5-gallon bucket with a funnel inverted through the cover of the bucket. Traditional pheromone traps currently used by farmers require insecticides to prevent the escape of the weevils.

During the pre-test phase from September 2021 through November 2021, 20 coconut farmers received technical assistance from CARDI to set up and maintain the use of funnel traps on-farm and also advised on field sanitation practices. To successfully manage Red Ring disease, it is recommended that farmers practice a combination of trapping the SAPW and field sanitation.

Following the pre-test, a commercial multiple farm trial over four major coconut growing areas in southwest, east, central and south Trinidad, was executed from December 2021 to March 2022. Fifty-four funnel traps were set on 14 farms and monitored over a 16 week period. The traps were set in a randomized design, with each farm having at least three treatments covering a total area of 135 acres. CARDI Trinidad and Tobago Unit's staff and the Entomology Unit at MALF, specifically designed the experiment, constructed funnel traps and collected the field data. In addition, the Entomology Unit processed weevils weekly and CARDI's Biometrician conducted the data analysis.

After 16 weeks, 12,065 adult weevils were trapped. One adult weevil has the potential to infect one coconut tree with the nematode Bursaphelenchus cocophilus which causes the Red Ring disease. From the data analysis, the treatment comprising of Ryncholure pheromone combined with the ethyl acetate synergist (Rynchomagnet) and sugar cane was more efficient, trapping the most number of weevils, 111 (458) weevils more than the traditional farmer treatments of Ryncholure pheromone combined with sugar cane and molasses. The ethyl acetate treatment combined with the pheromone and sugarcane was also found to increase the trapping of more female weevils by 8% (195) more female weevils than the farmers’ practice. Trapping of more female weevils would reduce the population of adult weevils in coconut plantations at a faster rate. The traps positioned on the ground were found to trap 21% (864) more weevils than the traditional traps placed 1.5 meters above the ground.

This synergistic effect of Rynchomagnet (ethyl acetate) in the funnel trap has also been found to decrease the SAPW population at a faster rate of 6.58 weevils per week, when compared to the farmer practice of sugar cane, molasses, Ryncholore pheromone and insecticide, which was only able to reduce the weevil population by 0.8 weevils per week.

The results obtained under the project are that farmers can now utilize the Rynchomagnet (ethyl acetate) synergist combined with the Ryncholure pheromone technology thereby replacing the use of insecticides and molasses in the pheromone traps, resulting in lower treatment costs and providing an environmentally safer management practice. This tool can also be used to increase the trapping of weevils and also reduce the population levels at a faster rate compared to the traditional farmers’ practice.

The next phase of this collaboration, between CARDI and MALF, would commence in June through November 2022 and would involve mass trapping of adult SAPW on 80 coconut farms in Trinidad and Tobago, to demonstrate the improved results from the funnel trap design combined with the synergist effect of Rynchomagnet (ethyl acetate) and other field sanitation and integrated pest management practices for reducing SAPW infestation of coconut trees.

This EU Coconut project is being co-implemented by CARDI and the International Trade Centre’s Alliances for Action.
CARDI welcomes new Scientists

We warmly welcome Dr. Shelley Bridgewater to the CARDI family. Dr. Bridgewater will serve as the CARDI Representative in the Bahamas.

She holds a Doctor of Veterinary Medicine from the University of the West Indies, School of Veterinary Medicine as well as a Master of Science in Tropical Animal Science and Production and a Bachelor of Science in General Agriculture.

Prior to joining CARDI, Dr. Bridgewater spent 4 years in the Turks and Caicos. While there, she served as the Director in the Department of Agriculture and before that as the Chief Veterinary Officer. Among her many accomplishments were the development of protocols for farmers’ registration, development of the country’s first biosecurity policy and the development of several communications initiatives.

Dr. Bridgewater’s experience and expertise in the field of agriculture, veterinary medicine, animal breeding, nutrition and production and management will be an asset to the development and expansion of CARDI’s small ruminants programme.

Starting her career in Agriculture in 2010, Dr Melissa Williams journeyed through different posts developing her expertise and competence in the field. Dr. Williams has held several positions at the Division of Agriculture, Tobago House of Assembly (THA). Up until December 2021, she served as Advisor to the Secretary for Agriculture. Her experience and proficiency in conducting research and developing and implementing livestock projects and programs augurs well for the institute.

Dr. Williams pursued and completed her Doctor of Philosophy in Livestock Science, from the Faculty of Science and Agriculture UWI St Augustine, in 2020. Dr. Williams has done extensive research, publications and conference presentations in Livestock, Wildlife Management and Agriculture.

Agriculture remains a priority area of focus in Tobago and Dr. Williams will help ensure the institute satisfies the vision and needs of the Division and other stakeholders on the island.

The management and staff warmly welcomes Dr. Williams to the CARDI family.

Improving coconut seedlings supply in Dominica

In September 2017, Maria, a category 5 hurricane, devastated Dominica’s agriculture sector. The country’s coconut industry was particularly hard hit with more than 95% of the bearing coconut trees destroyed. A long term impact of this destruction continues to be the acute shortage of locally available seed nuts for propagation to satisfy the demand for quality planting material. Private nurseries have since began offering small quantities of coconut seedlings for sale to farmers who are desirous of getting into production or expanding their operations.

Under the European Union/CARIFORUM supported Coconut Industry Development and Enhancement Support for the Caribbean project, Victoria Blooms a private ornamental nursery in Warner has been able to expand their production of coconut seedlings. Through the project’s assistance, the nursery infrastructure was expanded by 1800 square feet and covered with a 70% saran netting. Four propagation bins, each with a dimension of 60ft x 6ft have also been constructed. Through the infrastructural improvements and the technical advice provided to the owner Diana Laville, Victoria Blooms now produces 2,000 coconut seed nuts annually.

Seed nuts for the nursery are sourced from mother palms of the Malayan Dwarf and Atlantic Tall varieties identified by the national positive selection exercise conducted in 2021, under the project. In Warner, fifteen suitable mother palm trees have been identified on the farm of Mark Henry. The mother palms have been characterized using the International Plant Genetic Resources Institute (IPGRI) descriptors for coconut and seed nuts.

Diana Laville is pleased with the support that has been provided and describes the intervention as “timely and a dream come true.” A student at St. Nicholas University- School of Veterinary Medicine, Mrs. Laville envisages that the increased business will contribute to her meeting her financial obligations towards her education.
Antigua and Barbuda

CARDI collaborated with the Ministry of Agriculture, Fisheries and Barbuda Affairs to train farmers and field officers on soil and water conservation techniques.

Guyana

The Sustainable Agriculture in the Caribbean (SAC) Project team paid a courtesy visit to CARDI to discuss the project, synergies with ongoing activities and possible areas of collaboration.

Belize

CARDI is the recipient of 1 of 3 Automatic Weather Systems (AWS) handed over by the European Union (EU) and the Caribbean Community Climate Change Center (CCCCC). The weather station is installed at the Central Farm Agricultural Station.

Cayman Islands

CARDI hosted students and parents from Cayman Homeschoolers for a field day. During their visit students learnt all about sweet potato and even helped to plant some slips.