

Project ID-504

Competitive Research Grant

Sub-Project Completion Report

on

Risk assessment and development of management approach(es) against tomato leaf miner, *Tuta absoluta* Meyrick

Project Duration

May 2017 to September 2018

Entomology Section
Horticulture Research Centre
Bangladesh Agricultural Research Institute
Joydebpur, Gazipur-1701

Submitted to



Project Implementation Unit-BARC, NATP 2
Bangladesh Agricultural Research Council
Farmgate, Dhaka-1215



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Acronyms

Abbreviation	Elaboration
IPM	Integrated Pest Management
Bt	<i>Bacillus thuringiensis</i>
<i>T. absoluta</i>	<i>Tuta absoluta</i>
<i>B. bassiana</i>	<i>Beauveria bassiana</i>
<i>M. anisopliae</i>	<i>Metarrhizium anisopliae</i>
DAE	Department of Agriculture Extension
RH	Relative Humidity
MBCR	Marginal Benefit Cost Ratio
WSC	Water Soluble Concentrate

Table of Contents

Sl. No.	Subject	Page No.
	Cover Page	i
	Citation	ii
	Acronyms	iii
	Table of Contents	iv
	Executive Summary	v
A.	Sub-Project Description	1
	1. Title of the CRG sub-project	1
	2. Implementation organization	1
	3. Name and full address of PI with phone, cell and E-mail address	1
	4. Sub-project budget	1
	5. Duration of the sub-project	1
	6. Justification of undertaking the sub-project	1
	7. Sub-project goal	2
	8. Sub-project objective	2
	9. Implementing location	2
	10. Methodology in brief	2
	11. Results and discussion	5
	12. Research high light/findings	15
B.	Implementing Position	16
	1. Procurement	16
	2. Establishment / renovation facilities	16
	3. Training / Study Tour / Workshops	16
C.	Financial and physical progress	16
D.	Achievement of Sub-project	17
E.	Materials Development / Publication made under the sub -project	17
F.	Technology / Knowledge generation / Policy support	18
G.	Information regarding desk monitoring / Field monitoring	19
H.	Lesson Learned / Challenges	19
I.	Challenges	

Executive Summary

The South American tomato leafminer, *Tutaabsoluta* Meyrick (Lepidoptera: Gelechiidae), a native of South America, is a serious pest of tomato causing up to 80-100% yield losses if no appropriate control measures are taken. Following its accidental introduction to Spain in 2006, *T. absoluta* was recorded throughout Europe and the Mediterranean by 2010. This invasive pest has since spread to the Middle East and North Africa, East and West Africa, and reached India in 2014, Central Asia in 2015, Bangladesh and Nepal in 2016. This project aims to find out the peak and severity of this invasive pest and its management simultaneously.

Commercial growers have mainly relied on chemical control as a primary management tactic for *T. absoluta*. Because of the heavy use of chemical insecticides, this insect has developed resistance to organophosphates, pyrethroids and others. Pheromone traps are widely used for monitoring and mass trapping. Growers need to implement mass trapping with insecticides or on an area-wide basis to be effective. Several parasitoids and predators of *T. absoluta* have been identified in other *Tuta* affected countries. Biopesticides such as *Bacillus thuringiensis* (*Bt*), *Beauveria bassiana*, and neem products are used in an IPM approach.

Under this project, survey on incidence and pest status of tomato leafminer, *Tutaabsoluta* in different region of Bangladesh like Gazipur, Panchagarh, Comilla, Moulvibazar and Jessore and Development of Biorational Management Approach(es) against Tomato leafminer, *Tutaabsoluta* were conducted. From the survey results it was found that tomato leaf miner, *Tutaabsoluta* damaged up to 27.36% leaves and 25.25% tomato fruits. Among five locations, the highest infestation was observed at Panchagarh and the lowest at Comilla. The peak period of *Tuta* attack was observed in March- April in winter and May-June in summer season and this introduced pest is appearing as a serious challenge to the farmers of Bangladesh especially at Panchagarh regions. The population of this pest was much more higher during summer season than that of winter season. The *Tuta* catch was positively correlated with monthly average temperature, %Relative Humidity (%RH) and rainfall (mm).

Field experiment on “Development of Bio-rational Management Approach(es) Against Tomato leafminer, *Tutaabsoluta*” was conducted during two consecutive seasons (winter and summer season) at Gazipur and Panchagarh, respectively. So, considering the result of two consecutive seasons, T₉ treatment package (Application of *Metarrhiziumanisopliae* biopesticide in soil @ 5g/L of water + Foliar spray of Azadirachtin (Bio-Neem plus 1EC @ 1ml/L of water) + Mass trapping through installation of Delta sex pheromone trap) may be recommended for controlling tomato leafminer, *Tutaabsoluta* which performed best in reducing *Tuta* infestation, increase of marketable yield highest marginal benefit cost ratio.