



# Pest Surveillance Programmes and Practices in Belize



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# Belize Medfly Surveillance Programme

## Objectives:

Early detection and eradication

Maintenance of the pest free status

Maintain markets for fresh products

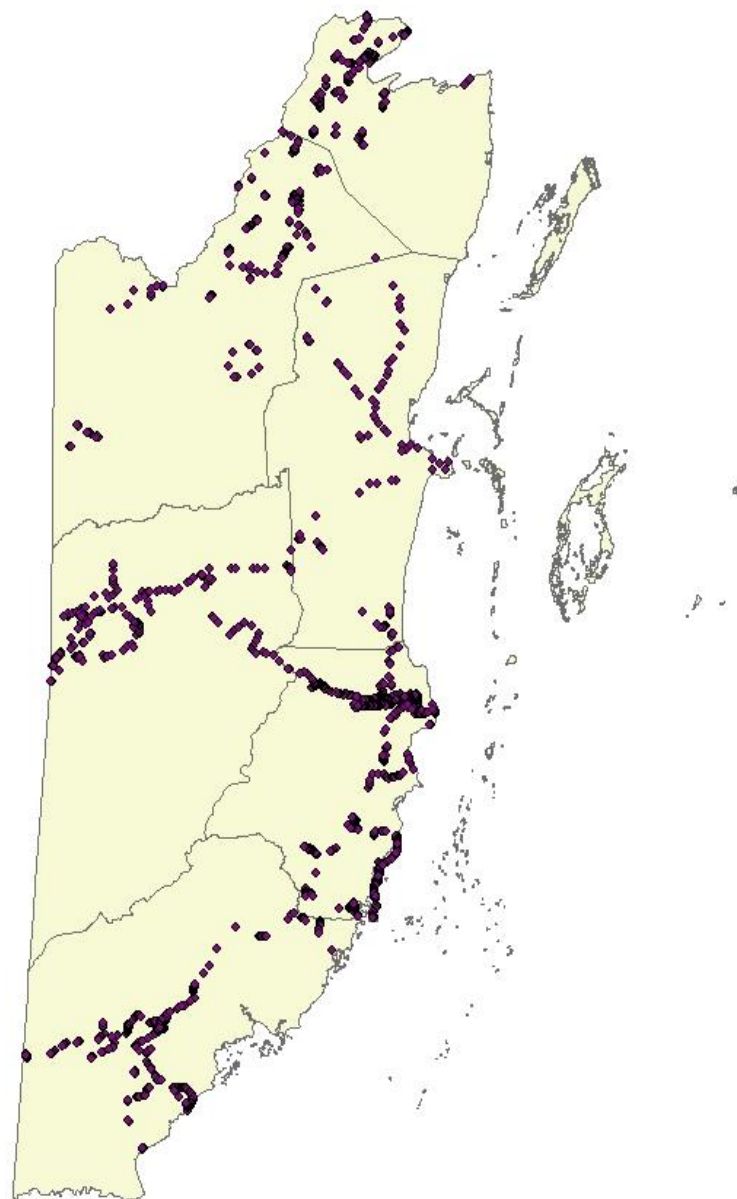


# History of the Medfly Programme

- ▶ 1977- USDA
- ▶ 1987- 1<sup>st</sup> medfly detection
- ▶ 1989- Establish Comprehensive Surveillance Program
- ▶ 2000- BAHA is established
- ▶ 2001- USDA recognizes Belize as a medfly free area
- ▶ 2013- Belize/USDA signs cooperation agreement

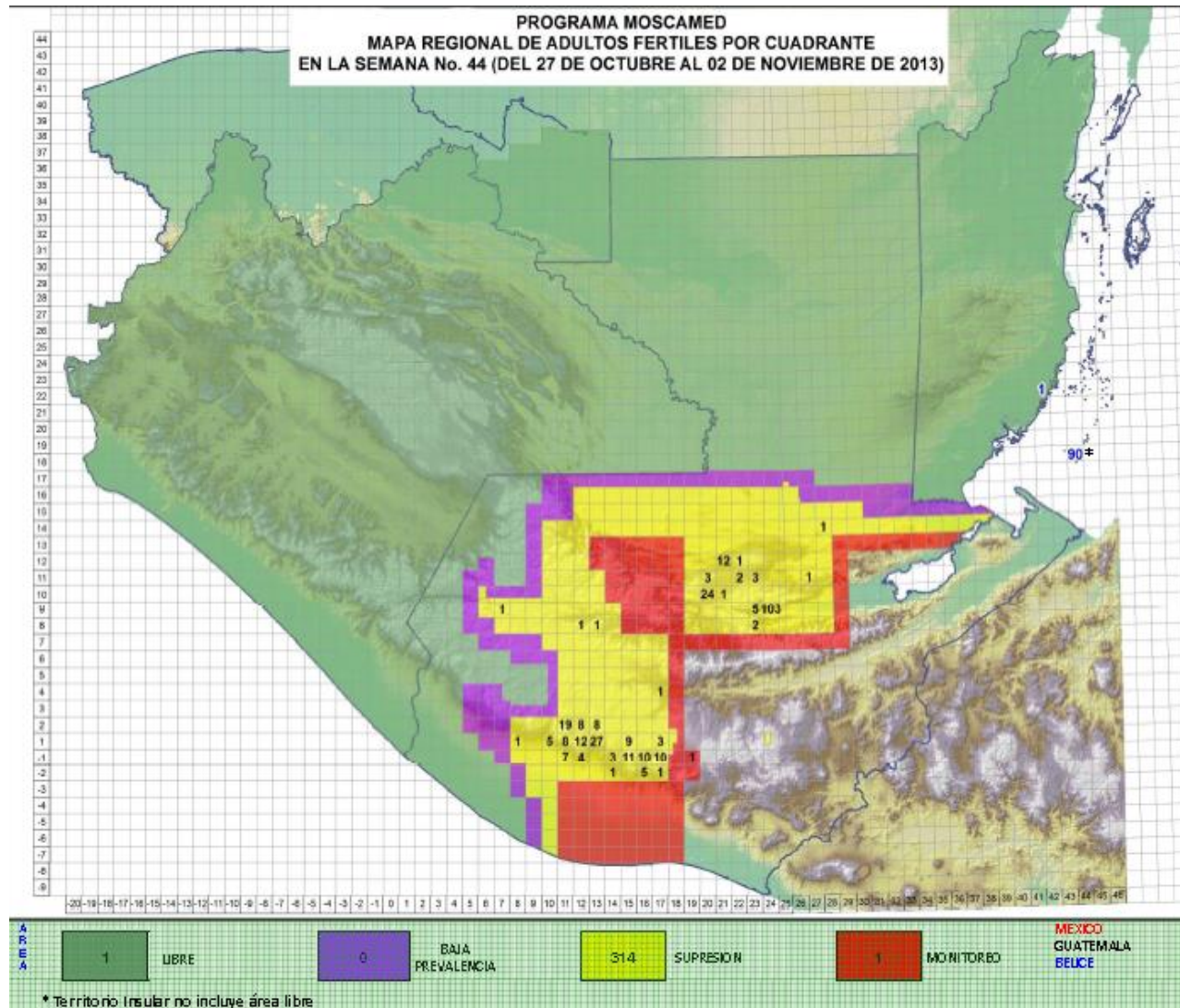
# Medfly Programme

- 1,358 regular traps
- 26 trapping routes
- 5 technicians
- 1 Coordinator
- Supported by diagnostic capacity and a data base.
- Annual Cost US\$250,000 (80% is surveillance)



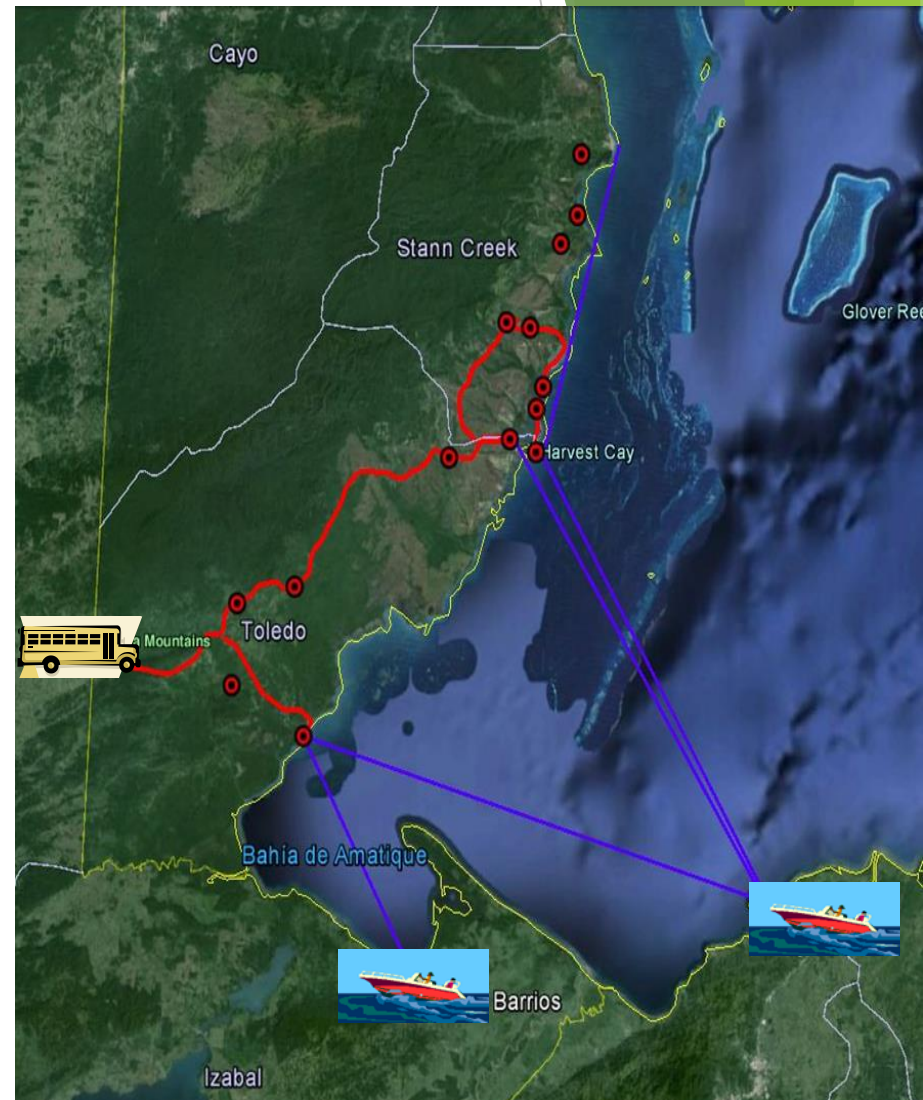


# Regional Perspective



# Challenges

- ▶ Increase threats by new trade routes (i.e. Jalacte)
- ▶ Continued movement of tourists to Sapodilla Cayes
- ▶ Limited resources
- ▶ Increase migration/movement from the south



# Future of the Programme

- ▶ Work with Guatemala and Honduras to mitigate the any existing threat to Belize's medfly free status
- ▶ Use of new technologies to further enhance the programme
- ▶ Develop new products for export e.g. pitahaya
- ▶ Attract new investment in other areas of the country to maximize the pest free status

# Accomplishments

- ▶ The medfly has never become established in Belize.
- ▶ The efforts of the Belize medfly programme has prevented the northern movement of this pest into Mexico and the US
- ▶ The Government of Belize continues to be committed to the programme
- ▶ The regional approach to address this pest has worked and needs to continue.



***Anastrepha ludens***

# Monitoring Mex-fly Populations: Initiative by the Private Sector



## Objective:

Targeted and timely management to reduce damage to fruit and commercialize pulp.



# Mex-fly Low Prevalence

Current Pilot  
Project Area

Proposed  
Expanded  
Project Area





# Citrus Greening and *Diaphorina citri* Surveys



Collaborative surveys with  
industry and regional support  
agencies

# Background

- ▶ February 2009- annual survey for quarantine diseases conducted.
- ▶ Samples of psyllids were sent to Riverside for analysis
- ▶ In April, eleven samples positive
- ▶ Delimiting survey in the areas found suspect trees.
- ▶ Samples confirmed by USDA-Beltsville.

**Initial Objective: early detection**

Present surveys are for management of psyllids and tree removal

# HLB Found: April 2009

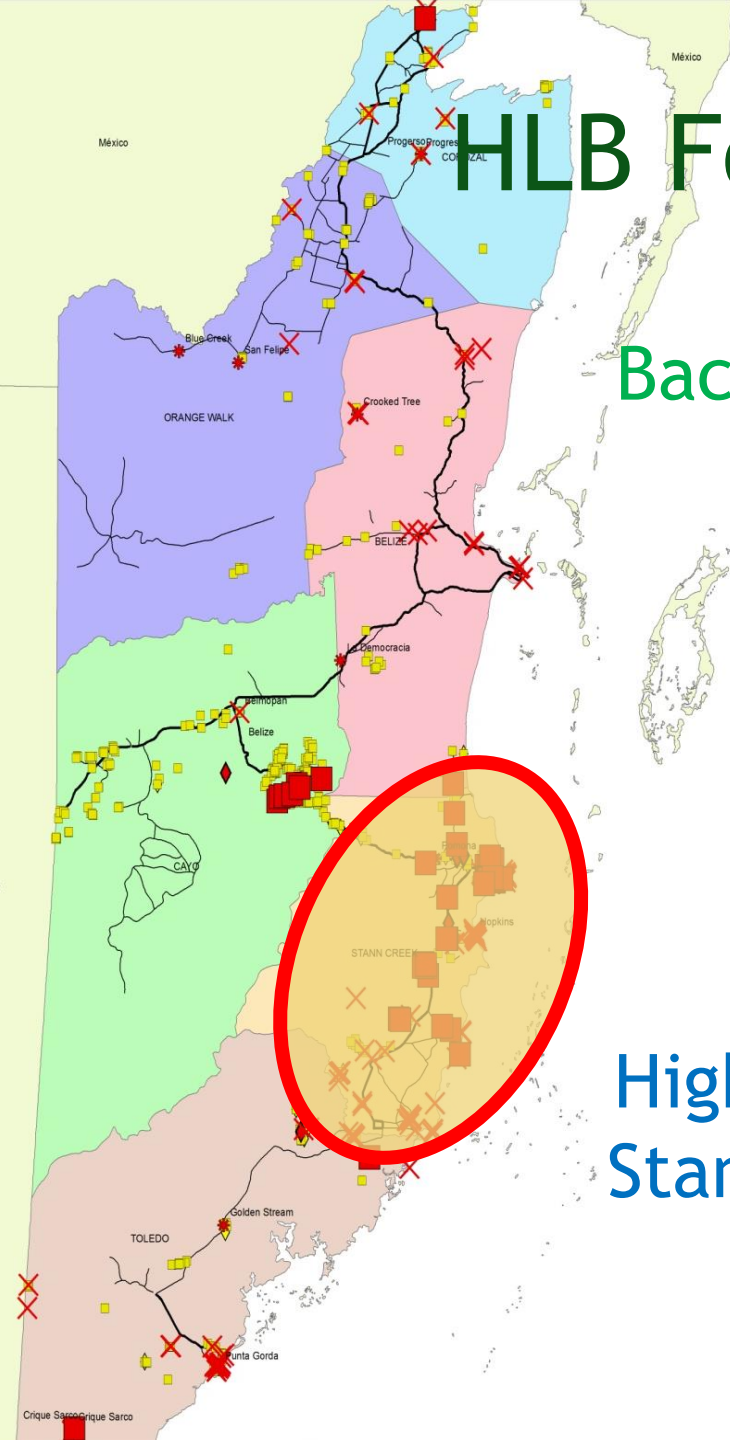
Backyard trees all Districts ✕

In some groves ■

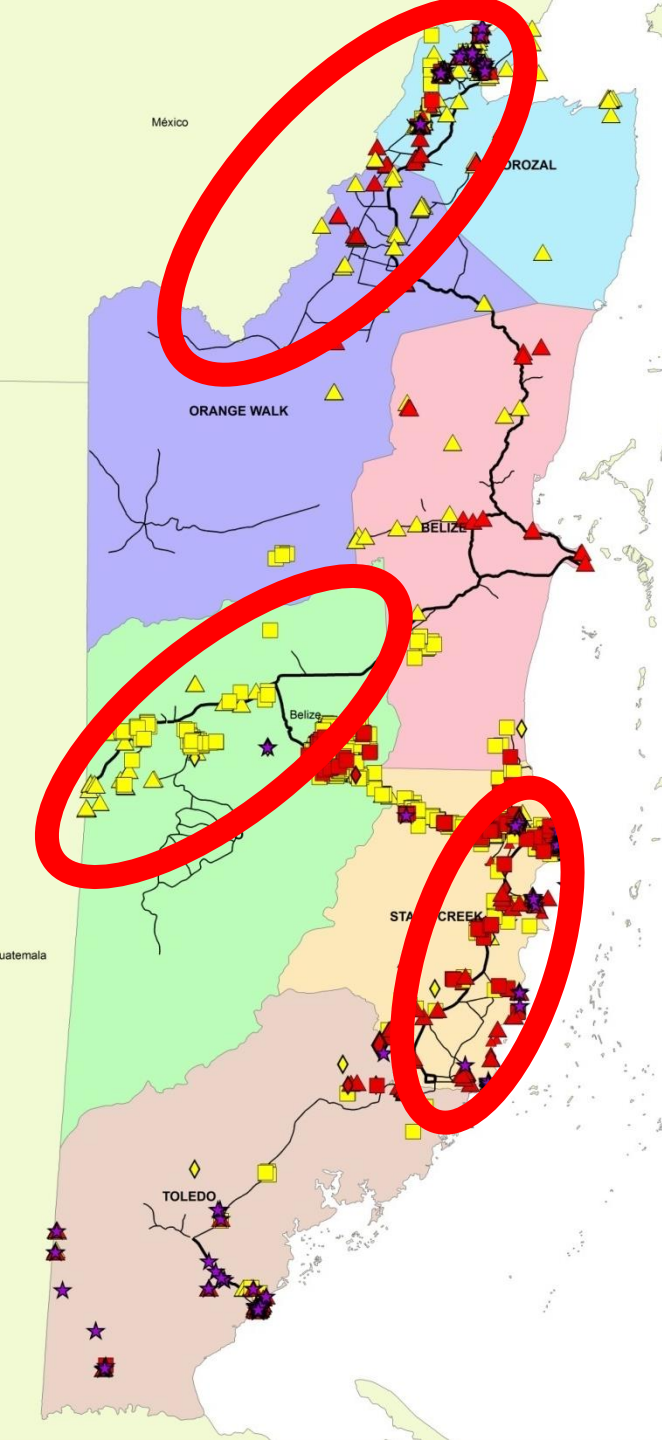
In some nurseries

In psyllids

Highest Occurrence  
Stann Creek District







**SAGARPA**



SECRETARÍA DE AGRICULTURA,  
GANADERÍA, DESARROLLO RURAL,  
PESCA Y ALIMENTACIÓN

# Citrus Leprosis Virus

Citrus leprosis was detected in 2011

It has been restricted to only certain sectors of the industry.

Surveillance conducted jointly by personnel of the citrus industry and the NPPO

The objective is to pin point the affected areas and train farmers on how to manage the vectors and infestation (pruning and spraying)





# Pink Hibiscus Mealybug Programme: a collaborative effort between the NPPO and the RPPO

- Pest surveillance programme with the objective of finding new outbreaks and keeping the pest under low pest prevalence.
- Also to keep it from spreading to Central America
- Cost of the programme
- US \$100,000/year





# Biocontrol Production (*Anagyrus kamali*)



# Surveillance and Public Awareness

Very successful  
programme!

The pest has never  
jumped to agricultural  
crops or forestry  
species.

It is kept a very low  
prevalence.



# Papaya Surveys for General Pests

Surveillance activities conducted for *Paracoccus marginatus* (*P. mealybug*) which is of quarantine importance for the USA

This is continuous and carried out by certification personnel

Other surveillance for management purposes for Papaya Meleira Virus.

Meleira virus currently well distributed within the industry but of low incidence due to continuous monitoring and roughing of infected plants.





# *Tuta absoluta*

Origin: Neotropical (Perú, 1915)

Taxonomy described in 1917  
By Meyrick as *Phthorimea absoluta*

Order: Lepidoptera

Superfamily: Gelechoidea

Familia: Gelechiidae

Tribe: Gnorimoschemnii

Genus: *Tuta*

Specie: *Tuta absoluta* (Meyrick, 1917)



# Delta traps and specific pheromone against *Tuta absoluta*

150 traps across the production area

Objective: early detection and possible eradication

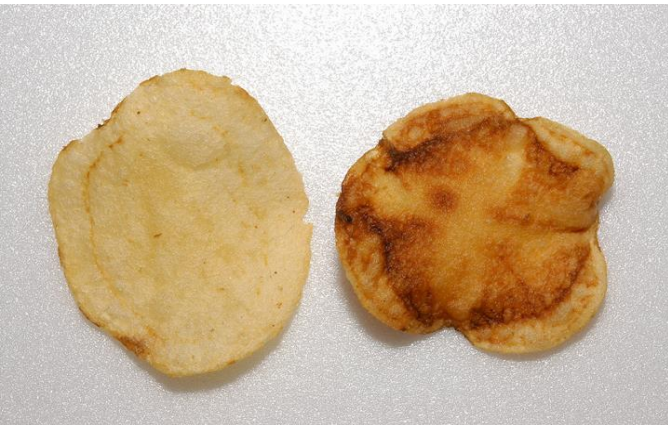
Current status- programme conducted since 2012.

No detections



# Zebra Chip *Paratrioza Cockerelli*

## *Candidatus liberibacter solanacearum*



- ▶ **Causal Organism:** *Candidatus Liberibacter psyllaorous*
- ▶ **Vector:** *Paratrioza (Bactericera) cockerelli*
- ▶ **Hosts:** Potatoes, peppers and tomatoes
- ▶ Visual observation for symptoms and the vector.
- ▶ Status- Ongoing since 2012
- ▶ - No detection to date.



# Kudzu bug



- ▶ Causal Organism: *Megacopta cribraria*
- ▶ Hosts: Legumes
- ▶ Traps placed in soybean and regular bean production areas during the months of June- August and November to February.
- ▶ Traps used – White sticky traps and white pans with water/oil
- ▶ Detections in aircrafts only from USA.





# **Other Surveillance Programmes**

## **General Surveys**

# Rice Mite:

## *(Steneotarsonemus spinki)*



Rice mite is a passive general programme generally individually carried out by industry.

Reports trigger prompt surveys to verify the situation and recommend action to reduce populations.



# *Moniliophthora roreri*

Monilia is a passive general programme generally individually carried out by industry.

Reports trigger prompt surveys to verify the situation and recommend action to reduce populations.





The background features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic visual effect.

# **Future Surveillance Programmes 2016**

# Carambola Fruit Fly

Causal Organism:

*Bactrocera carambolae*

Geographic distribution: Asia,  
Surinam, Guyana, Brazil

Means of introduction:

Contaminated fruit

What to look for: fruits

This survey programme will be incorporated in the current medfly programme so that it does not incur an additional cost except the additional traps and specialized lures (Methyl eugenol)



# Panama Disease



Causal Organism: *Fusarium oxysporium cubense* tropical race 4

Geographic distribution:  
Worldwide

Means of introduction:  
Germplasm, Planococcus citri, Sugarcane

What to look for: Vector, germplasm.

The OIRSA region is considering this to be conducted under a regional platform

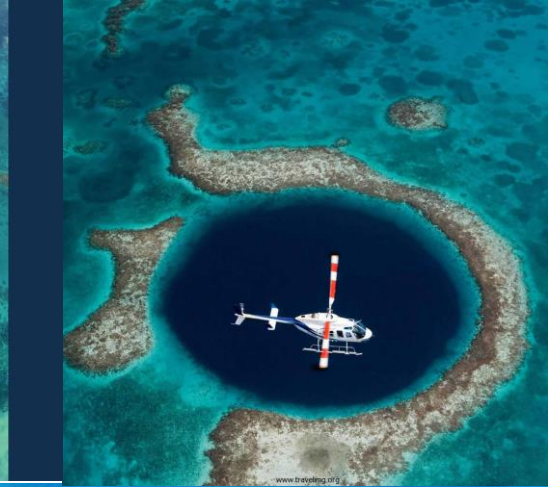


# Related Future Plan

- ▶ A national workshop in the first quarter of 2016 with the objective of establishing a national platform for all surveillance programmes in the country against the fragmented system we currently have.
- ▶ It will be aimed at Extension personnel of the Ministry and private sector agencies as well as the NPPO personnel.

# Constraints

- Limited financial and human resources to conduct more surveillance activities
- Little surveys on crop specific surveys
- Database and GIS capacity needs to improve
- Diagnostic capacity needs to improve



Thanks

