



***Ministry of Agricultural Development  
National Directorate of Plant Health  
Laboratory of Pesticides Residues***



***The Monitoring example Panama***

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**RALACA**

Red Analítica de Latinoamérica y el Caribe



**Ministry of Agriculture**



**Ministry of Health**



**Panamanian Food Safety Authority**



# INTRODUCTION

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The Ministry of Agriculture (MIDA):

- register and approves the use of pesticides in the agriculture.
- provides a strong preventative controls program by licensing pesticide applicators, conducting pesticide use inspections, and establishing and enforcing pesticide labelling provisions.

The Ministry of Health:

It has regulations for establishing or adopting maximum residue levels of a specific pesticide chemical that is permitted in or on a food.

AUPSA is responsible to the imported food



# OBJECTIVE

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To establish a monitoring program for pesticide residues in fruits and vegetables, at the national, in order to ensure the consumption of food to the inhabitants of our country food safety and our farmers more competitive in the performance of their processes of production.



# IMPACTS OF MONITORING PROGRAM

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- Compliance of the Maximum Residue Limits (MRLs) of pesticides present in food according to Good Agricultural Practices (GAPs).
- Records and statistical data for the preparation of risk maps.



# MONITORING PROGRAM

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The samples are primarily of the surveillance type, domestic samples of foods produced and held for sale are typically collected close to the point of production in the distribution system, growers, packers, and distributors. Import samples are collected when products are offered for entry into Panama commerce.

1. Primary production farms (MIDA)
2. Expenditures or distribution (Ministry of Health)
3. Hospitals (Social Security Fund) (vegetable suppliers)
4. Large Supermarket Chains (Private) (collectors)
5. Imported food AUPSA

# MONITORING PROGRAM

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Some of the factors considered for planning the types and origin of commodities to sample are chemical characteristics and toxicity of the pesticide used, the incidence of contaminated samples from the agricultural cycle of the previous year.

MIDA maintains a series of satellite centres where local farmers can take their produce to be tested for pesticide residues, using screening method if detects residue, the farmers are referred to the MIDA-SV laboratory in the capital city, which can provide further testing and advice on how to avoid such problems in the future. This certainly helps farmers who grow crops for export, but MIDA-SV also has a keen focus on the internal market and internal consumers.

# Monitoring Program

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Each year, the Pesticide Residue Analysis Laboratory of Panama's Ministry of Agriculture analyses some 3 000 samples of agricultural crops for contaminants. MIDA adopted a technology to conduct rapid screening in the field for “positive samples”. This reduces the number of samples that the analytical laboratory has to test with confirmatory technology.



# Screening Method

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In 2004, the Taiwan Technical Mission of International Cooperation and Development Fund (ICDF) introduced RBPR into the Republic of Panama. Through the collaboration with Ministry of Agriculture, Ministry of Health, Panama Municipal and Panama Agricultural Research Institute, both insecticide and fungicide assay methods were proven to be economic, rapid, sensitive and accurate, and has been proclaimed as an official standard in Panama in 2009.

# Screening Method

Rapid method or screening for the detection of carbamate and organophosphorus pesticides (phosphates and thioates), acetylcholinesterase inhibitors (AChE), present in products of vegetable origin in concentrations of the order of 0,01 mg / kg to 8 mg/kg. Samples that are analyzed by residues of organophosphorus insecticides from the subgroup of thioates should be previously treated with an oxidant (brominated water). This procedure allows a person to analyze up to 20 samples in an 8-hour workday.

## parte A muestra sin insecticida

Muestra + AChE + ATCI  $\rightarrow$  TC + Ac Acet.

TC + DTNB  $\rightarrow$  TNB

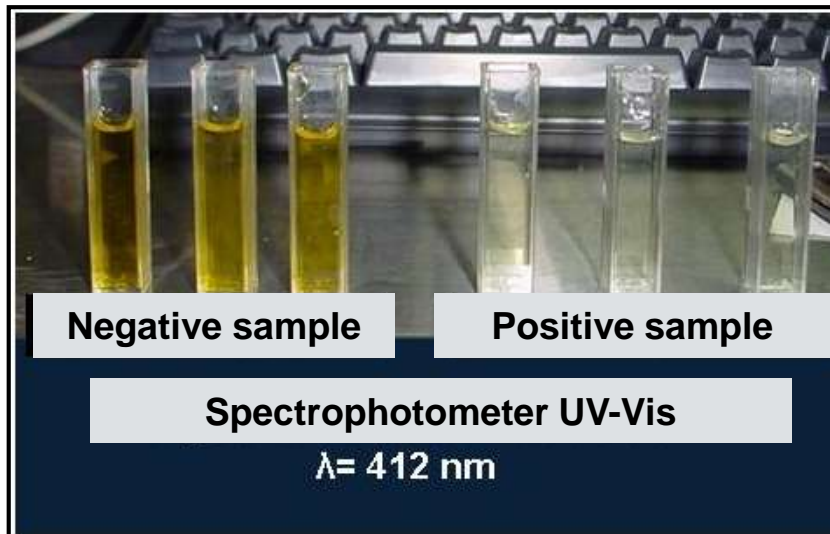
Reacción negativa (color amarillo)

## parte B muestra con insecticida

Muestra con insect  $\nrightarrow$  AChE + ATCI  $\rightarrow$  ATCI

ATCI + DTNB  $\rightarrow$  ATCI + DTNB

Reacción positiva (incolore)





# Screening Method

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- The essay is not applicable in those areas that interfere (false positive) such as coriander, orange juice, potato peel and banana. Positive results must be confirmed with quantitative and confirmatory chemical methods.

# Laboratory of Pesticides Residues



# Satellites Centres



**Chiriquí Province-2007**



**Los Santos Province-2008**



**Panama-Province 2009**

# Analytical Capacity

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- It has the capacity to analyze 156 pesticides of the most used in our national agriculture, prohibited and restricted
- Organophosphorus, carbamates, pyrethroids, neonicotinoids, organochlorines, chloronitriles, triazines, imidazoles phenoxy acetic (herbicides), among others.



# Equipments



**GC-MSMS**



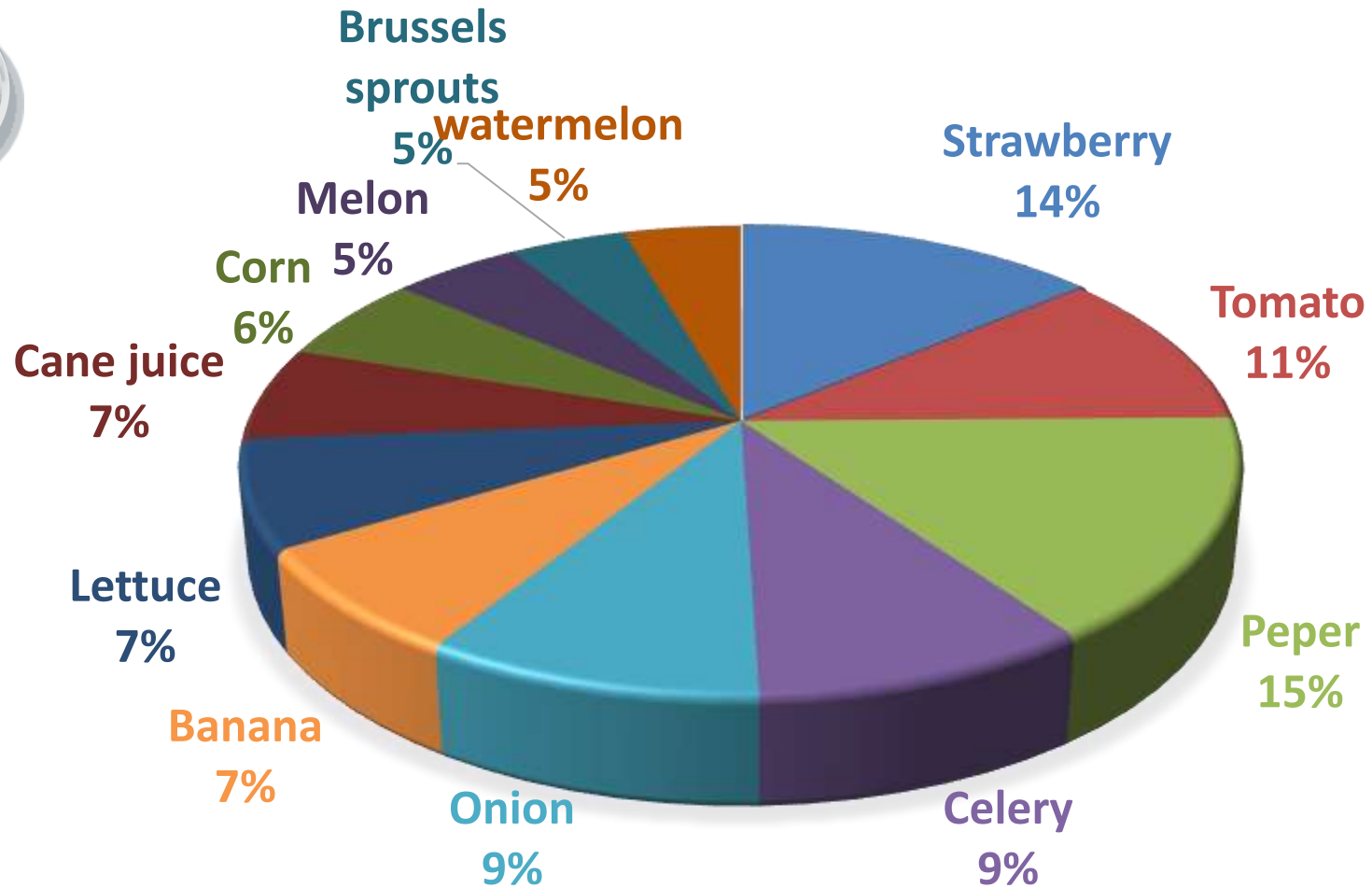
**HPLC-MSMS**



**Potentiostat**

# Monitoring Program

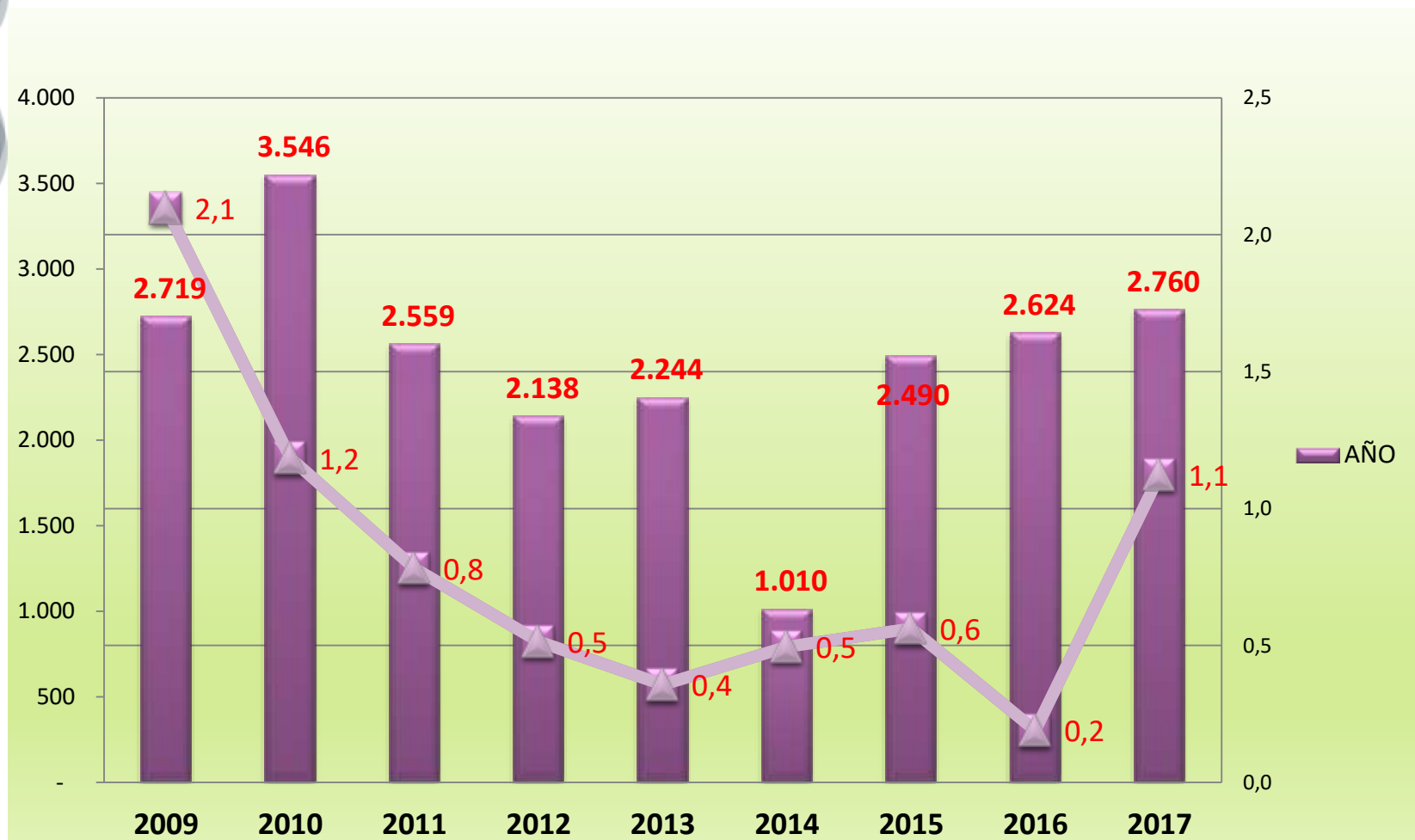
FRUITS AND VEGETABLES MOSTLY MONITORED DURING  
2015-2017





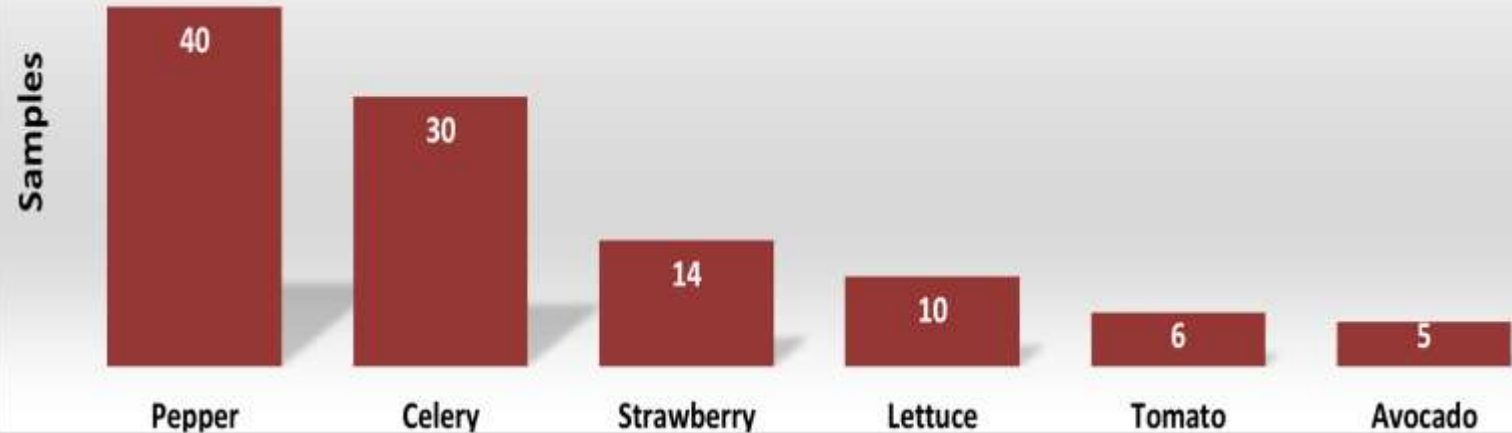
# Results of Monitoring Program

## Screening method

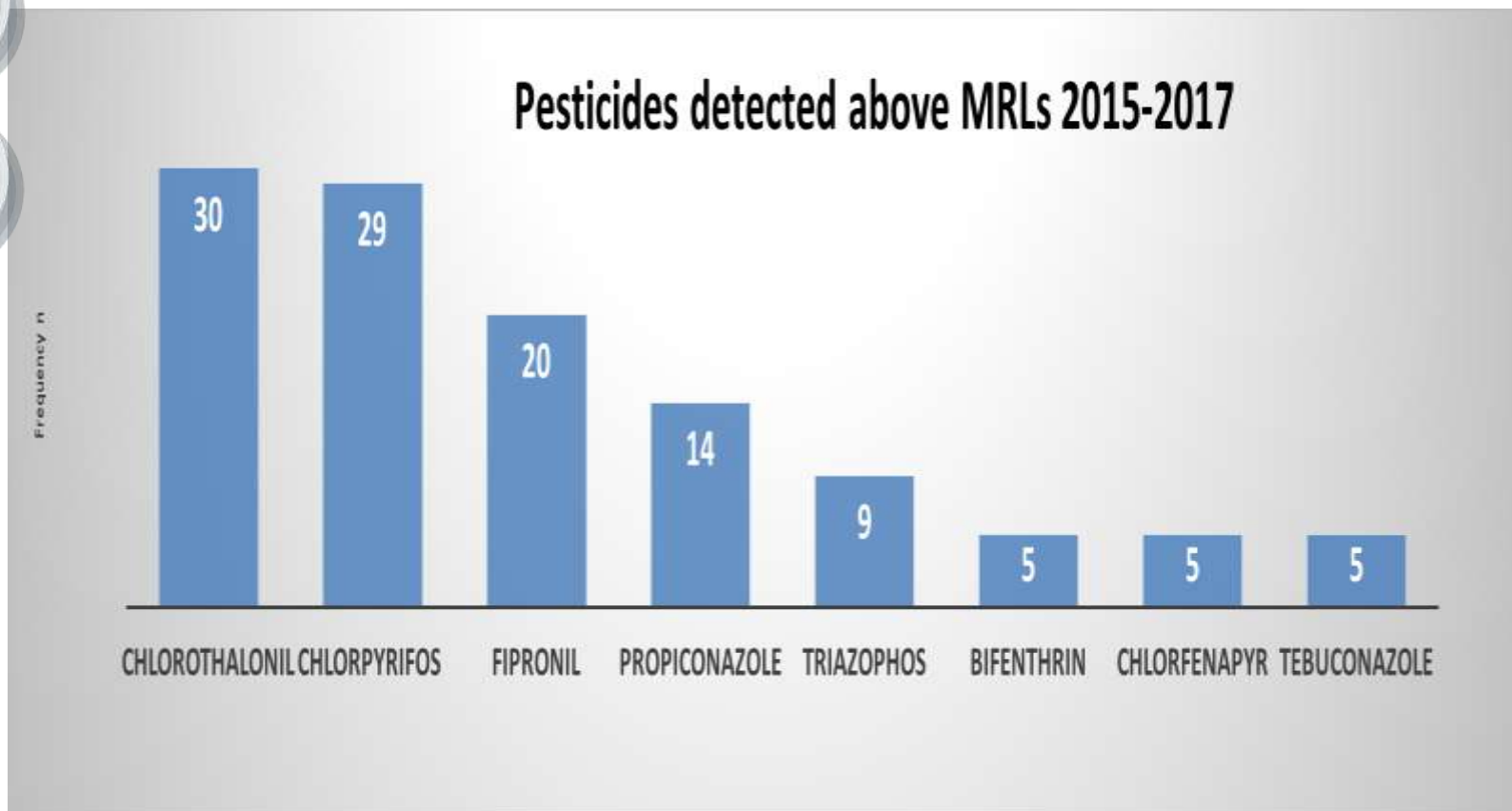


# Results of Monitoring Program

The main commodities exceeding MRLs exceeding 2015-2017



# Results of Monitoring Program





***Thank you***



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