



# Environmental Analysis Department



## Canary Islands Institute of Technology (ITC)



Technology and Innovation for a Sustainable Development





## Environmental Analysis

We are committed to sustainable agriculture and food safety for Canary Islands consumers



# Sustainable Agriculture and Food Safety in **Canary Islands**



The response to a specific demand of the Canary Islands' fruits & vegetables production sector, as well as to public administrations in this field, led to the **start of the analytical activity in pesticide residues in fruits and vegetables**

Commitment to  
**sustainable agriculture**

Contribution to **food safety**

Consolidation of local production  
**integrity and authenticity**





**Official Laboratory of the Canary Islands**  
Government for pesticide residues analysis



**Transnational co-operation in**  
Macaronesia and Cape Verde



**Established** in 2004

# Environmental Analysis Department



**Activity:**

- Pesticides: waste and environmental behavior
- Isotopic footprint: traceability of geographical origin



**€ 0,6 M (2021)**  
(87% external financing)



**Mission:** To provide support to the Canary Islands Public Administrations with competences in the field of Sustainable Agriculture and Food Safety through the provision of analytical and R&D services



**Leads and participates** in services and projects on pesticides, waste and environmental behavior



**Certified Laboratory** by the Spanish National Accreditation Entity: **ENAC** (Accreditation N° 937 / LE1845)

2002



### Analysis of pesticide residues in fruits and vegetables

The response to the specific demand of the Canary fruits & vegetables sector, as well as of competent administrations, propitiates the launching of an analytical service for determination of pesticide residues in fruits and vegetables

2003



### National Food Plan

Start of projects to study pesticide dissipation curves in crops in the Canary Islands. DIPLAVID: wine grapes; TOMAPLAG: tomatoes.

2006



### Official Laboratory of the Canary Islands Government

Identification as an Official Laboratory of the Canary Islands Government for the analysis of pesticide residues in plant products and farmland (Regional Ministries of Agriculture and Health)

2011



### ENAC accreditation of the Phytosanitary Residues Laboratory

ENAC accreditation of the Phytosanitary Residues Laboratory, which belongs to the Environmental Analysis Department

# Milestones

# Milestones

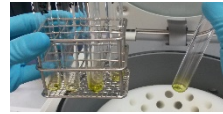
2021



**Study of isotope ratios to analyse the traceability of local/endogenous products**

New line of activity: Study of isotope ratios to evaluate the traceability of local products

2017



**15 years serving to the primary sector and food safety in Canary Islands**

Multiple projects related to the study of the environmental behavior of pesticides used in canary intensive agriculture (DIPLAVID, TOMAPLAG, RURALPEST, PERVEMAC I and II), have been shaping the activity of the Department from its beginning to the present

2014

**First international cooperation Project in sustainable agriculture**



RURALPEST is the first international cooperation project aimed at promoting environmental sustainability and food security in the smallholder farming regions of the Canary Islands (Spain) and Souss Massa Drâa (Morocco)

2015



**First International Cooperation Project on Food Security**

The PERVEMAC project, financed under the MAC 2007-2013 program, was the first Research and Development Cooperation project on the incidence of the presence of residues of Phytosanitary Products in Vegetable Products that are consumed in the geographical area of Macaronesia

# Activity Lines

**Analysis of Pesticide residues:**  
Execution of surveillance plans



**Pesticides:**  
Destination and  
environmental  
behavior



**Traceability of  
geographical origin:**  
Isotopic footprint



# Activity Lines

## Analysis of Pesticide residues: Execution of surveillance plans

Surveillance Plans:  
**Canary Islands  
Government**

- ➔ National Program for Official Hygiene Control of Primary Agricultural Production and the Use of Phytosanitary Products
  - Regulation 1107/2009
  - Directive 128/2009 / RD 1311/2012

**Plant Health Service / General Directorate of Agriculture**

- ➔ Quality of agri-food products in the Canary Islands: pesticide residues control plan  
**ICCA: Canary Institute of Agrifood Quality**

- ➔ PNCOCA: National Plan for Official Control of the Food Chain  
→ Regulation 882/2004  
European Coordinated Program / AESAN. → Regulation 585/2020  
**General Directorate of Public Health**

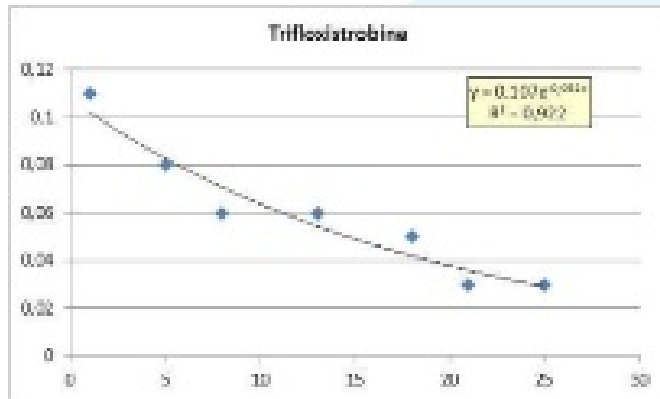
Pesticide residues programs:  
**Local Public Administrations**

- ➔ Farmer's Markets: Arucas and Vecindario → Fruits and Vegetables  
Campaigns: olive and oil & wine grape and wine  
**Cabildo of Gran Canaria**
- ➔ Pesticide residue campaign in oils and olives  
**Cabildos of Fuerteventura and Lanzarote**

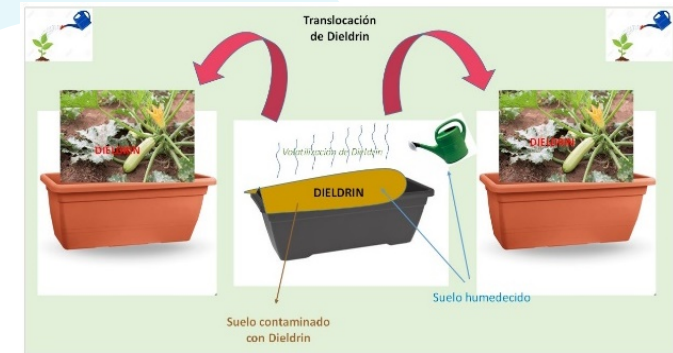


# Activity Lines

Field tests:  
**Dissipation curves**



Laboratory studies:  
**physico-chemical and partitive properties**

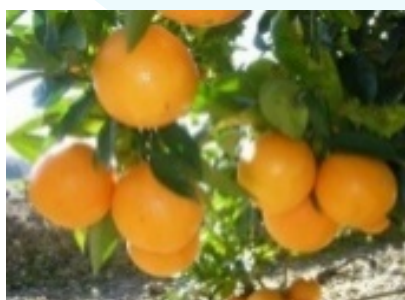


**Pesticides:**  
Destination and  
environmental  
behavior



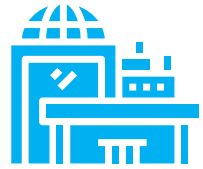
# Activity Lines

Characterization of the **isotopic footprint** of light elements as a tool to evaluate the **traceability of the origin**, quality and authenticity of agri-food products from the Canary Islands



**Traceability of  
geographical origin:  
Isotopic footprint**





## Technological Infrastructure

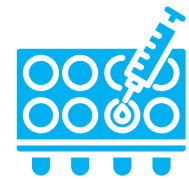
### Canary Islands Phytosanitary Residues Laboratory

- Chromatography Room
- Isotope Laboratory
- Patterns Room
- Extractions and tests laboratory
- Sample preparation room

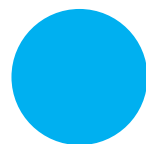


- Laboratory for sample preparation and testing
  - Gas-mass chromatograph
  - Liquid-mass chromatograph
- Isotope Ratio Mass Spectrometry (IRMS)

## Equipment



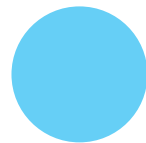
# Our SERVICES



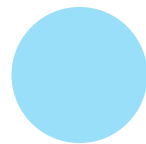
**Pesticide analysis services for public administrations**



**Field tests with phytosanitary products: Dissipation curves**



**R&D studies on the environmental behavior of pesticides for agricultural use. Physico-chemical and partitive properties**



**Characterization of the isotopic footprint as a tool to characterize the traceability at origin of products**



# Currently...

**General Directorate of  
Agriculture**  
(Canary Islands Government)

**Cabildo of Gran Canaria**



TRAZCAN

**Multi-residue  
GCMSMS**

(140 pesticides)

**Multi-residue  
LCMSMS**

(110 pesticides)

**Fungicides of the  
Ditiocarbamates  
group**

**RECOLECTA**

RECOLECTA  
GRUPO OPERATIVO PREDICCIÓN DEL MOMENTO ÓPTIMO  
DE RECOLECCIÓN MEDIANTE GESTIÓN INTEGRAL TÉRMICA  
DE CULTIVOS (RECOLECTA) - MAPAMA - PDR 2019



**Orders**

**Ongoing  
Projects**

**Pesticides**

**R&D&i  
Projects**

## Actions carried out in Cape Verde since 2014 in the framework of **food security** and **sustainable agriculture**

- **Development of the first monitoring plan** for pesticide, mycotoxin and heavy metal residues in vegetable products and cereals consumed in Cape Verde
- **Cape Verde's first nutritional survey: ENCAVE**



## International Cooperation

PERVEMAC  
2014-2015

PERVEMAC-II  
2017-2021

VERCOCHAR

# Trajectory

**3 Scientific publications** in collaboration with research groups in journals included in the SCI

**Official Laboratory** of the Canary Islands Government in analysis of pesticides

Analysis essays accredited by the National Accreditation Entity, **ENAC**

**1 Project** of the Ministry of Agriculture: Operational Groups

**Conference and Technical Seminars** on pesticide residues organized and coordinated in the Canary Islands and Cape Verde

**International workshop** on pesticide residue control in Europe and Cape Verde (2018)

**+1000** soil samples analyzed

**International cooperation projects:** 3 projects of the Interreg-MAC program; 1 project of the Poctefex program

**Workshops** of European reference laboratories in pesticides: EURLs

**2 Projects** of the National Food Plan

**+30,000** fruit and vegetable samples analyzed for pesticide residues

Pesticide residue analysis service

**Collaboration with the Spanish National Reference Laboratories (NRL)** in the analysis of pesticide residues: 2007 - 2020

**31 Communications** presented at international congresses

**Orders** of the Canary Islands Government for the execution of the pesticide residue surveillance plans: 2004 - 2021

**R&D studies on the environmental behavior of pesticides in response to the needs of the fruit and vegetable producing sector:** +25 Dissipation curve tests in the field; 5 Trials with products and post-harvest treatments on plantain

**Laboratory studies:** physicochemical and partitive properties

Annual meetings of the national working group of Official Pesticide Residues Laboratories: 2003 - 2020

**PESTICIDES** Pesticides residues analysis

**Expansion of the list** of active pesticide substances that we analyze

**Expansion of the laboratory's scope** of accreditation

**SUSTAINABLE AGRICULTURE** environmental behaviour of pesticides

**Dissipation curves:** field tests

**Organic fertilization:** pesticides degradation in agricultural soil

Immobilization of historical pesticide residues in soils:  
**biochar**

**TRAZCAN** new activity line

**Characterization of the traceability** of the origin of agri-food products of the Canary Islands:  
**isotopic footprint**

A close-up photograph of a person's hand holding a small amount of dark soil and several small, light-colored seeds. The hand is positioned over a larger area of dark, rich soil, suggesting an agricultural or environmental context. The lighting is dramatic, highlighting the texture of the soil and the individual seeds.

**Challenges**





Head of Department  
**Dr. Ricardo Díaz**  
[laboratoriode  
residuos@itccanarias.org](mailto:laboratoriode<br/>residuos@itccanarias.org)

# Environmental Analysis Department



[www.itccanarias.org](http://www.itccanarias.org)



<https://www.facebook.com/ITC.Gobcan>

<https://twitter.com/itccanarias>

<https://www.youtube.com/cognosfera>



<http://www.flickr.com/photos/institutotecnologicodecanarias/>

<https://es.scribd.com/user/27734441/Cognosfera>

[http://pruebas.itccanarias.org//itc\\_virtualtour/](http://pruebas.itccanarias.org//itc_virtualtour/)