UNIVERSIDAD SAN SEBASTIAN
VOCACIÓN POR LA EXCELENCIA

Foods 2024 Conference
The 5th International Electronic Conference on Foods
The Future of Technology, Sustainability, and Nutrition in the Food Domain
28–30 October 2024 | Online

Agencia Nacional de Investigación y Desarrollo
Ministerio de Ciencia, Tecnología, Conocimiento e Innovación
Gobierno de Chile
FONDECYT
Fondo Nacional de Desarrollo Científico y Tecnológico

Highly Hazardous Pesticides in Fruits and Vegetables: Analysis of food surveillance in Chile between 2015 and 2023.

Sebastian Elgueta[1]*, Daniela Nogué[1]
[1]University San Sebastian, Faculty of Health Care Sciences, Providencia, Chile
* sebastian.elgueta@uss.cl

INTRODUCTION

❖ Using pesticides in Chile has increased crop production and agricultural exports. However, this benefit has challenges, particularly regarding public and environmental health, due to the indiscriminate use of Highly Hazardous Pesticides (HHPs).
❖ According to the World Health Organization (WHO), the Food and Agriculture Organization of the United Nations (FAO), and other internationally reputed organizations, including international agreements or conventions (Rotterdam (RC), Stockholm (SC), or Montreal (MP)), some toxic pesticides can be considered Highly Hazardous Pesticides (HHPs) due to their impacts on the environment and human health.

OBJECTIVE

❖ Our study aimed to evaluate the national surveillance for Highly Hazardous Pesticide residues in fruits and vegetables in Chile between 2015 and 2023.

METHODOLOGY

❖ Official data was requested to the National Council of Transparency, which provides official data from different public institutions in Chile.
❖ The Agricultural and Livestock Service (SAG), which belongs to the Ministry of Agriculture of Chile, conducted food surveillance in the country.
❖ The period of evaluation was from 2015 to 2023.
❖ The total number of samples evaluated was 9145, of which 2634 and 6511 were vegetables and fruits, respectively.
❖ Our research, in collaboration with the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO), led to the classification of HHPs into eight groups:
  ❖ Pesticide formulations (PF) or active ingredients (AI) classes IA or IB.
  ❖ Carcinogenic pesticides that meet criteria IA and IB of the Globally Harmonized System on Classification and Labeling of Chemicals (GHS).
  ❖ PF and AI that meet the criteria of mutagenesis IA and IB of the GHS.
  ❖ PF and AI that meet the requirements of mutagenicity IA and IB of the GHS.
  ❖ PF and AI that meet the requirements of reproductive toxicity IA and IB of the GHS.
  ❖ The Stockholm Convention lists PF and AI in its annexes A and B, and the Rotterdam Convention lists them in its annexes III.
  ❖ PF and AI are listed under the Montreal Protocol.
  ❖ PF and AI have adversely affected human health and the environment.

RESULTS AND DISCUSSION

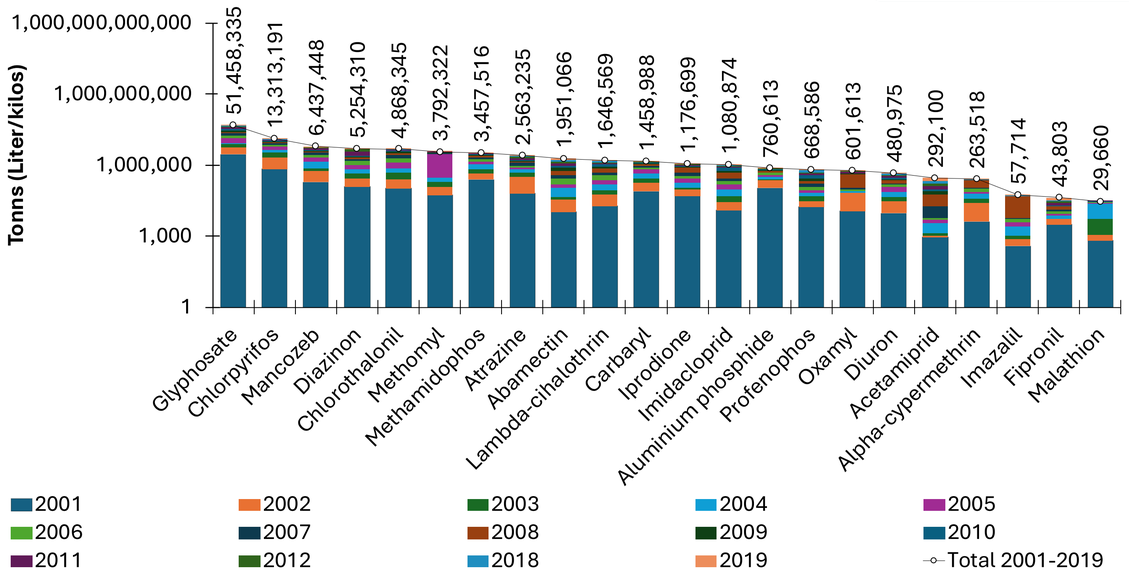

Figure 1. HHPs (a.i) sales in Chile, period 2018-2019 (official data reported by SAG).

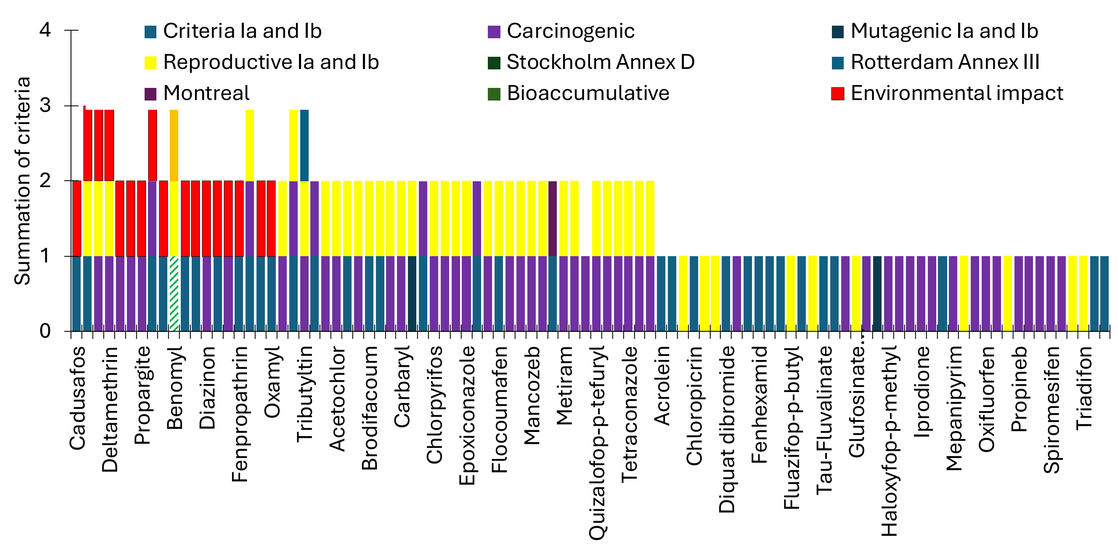

Figure 2. Highly Hazardous Pesticides October 2024 in Chile.

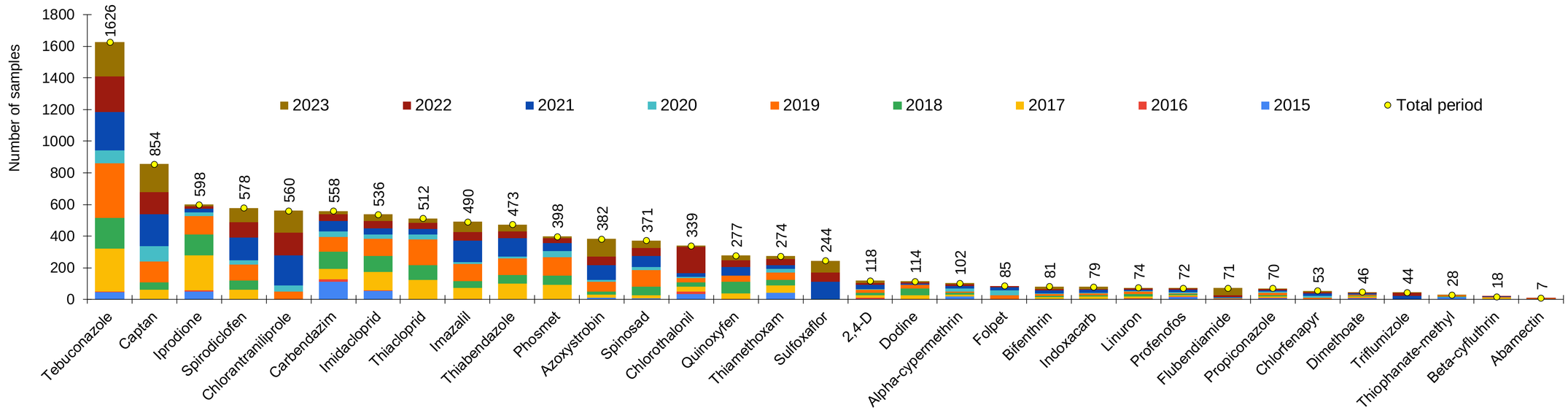

Figure 3. Highly Hazardous Pesticides were detected in the food national surveillance of Chile in the period 2015 to 2023.

❖ The results show that of the 1449 currently authorized pesticides (October 2024), 193 formulations are categorized as HHPs.
❖ In our evaluation of all samples from 2015 to 2023, fenhexamid, lambda-cyhalothrin, captan, and iprodione were detected in 12,3%, 5,2%, 4.7%, and 3.2% of fruits and vegetables, respectively.

CONCLUSION

❖ Almost 100 pesticides (active ingredients) from the Chilean Market can be considered Highly Hazardous.
❖ The results demonstrate the need to modify the pesticide regulation and surveillance programs in Chile, focusing on protecting human health and the environment.
❖ It is essential to align with international standards to protect human health and the environment.

ACKNOWLEDGMENTS

This work was financed by ANID FONDECYT 1230872 Chile.