



MASTER THESIS PROJECT

**Towards Landscape ERA:
Reinterpretation of ecotoxicological results for assessing
combined pesticides effects at population level.**

AWOT GEORGE UKBAMICHAEL

**Instituto de Salud Carlos III, Centro Nacional de Sanidad Ambiental,
Risk Assessment Unit
Madrid, Spain**

PLENTZIA (UPV/EHU), JULY 2023

ABSTRACT

Ecosystems face increasing threats from human activities, particularly in agriculture, where pesticide use contributes to environmental pollution. While pesticides have improved food production, their intensive application poses significant risks to the environment and health. Current risk assessment methods often fail to predict the unintended impacts of pesticides on non-target organisms. This study proposes a novel approach by extracting relevant data from EFSA reports and conducting a meta-analysis to derive a dose response curve. A simplified model is created using this curve to assess population-level effects of combined pesticide exposure. The study focuses on Mediterranean agricultural landscapes, particularly vineyards and associated crops, using Folpet and Pirimicarb as selected pesticides. The results of the meta-analysis successfully derive dose response curves, with modifications to overcome data challenges. The findings highlight differences in sensitivities of focal species to the pesticides. Common blackbirds show higher susceptibility to Pirimicarb, while wood mice are more vulnerable to Folpet. Combined pesticide application intensifies toxicity effects on mammals and birds. However, caution is advised due to limitations associated with the model's simplicity, data availability, and focus on human health endpoints. Uncertainty also arises from safety factor selection and the model's limited scope. Addressing these limitations will contribute to a better understanding of the topic and guide future research. The results emphasize the importance of including safety factors to account for variabilities in pesticide risk assessment.

Key words: Pesticides; combined effects; landscape risk assessment; ecological model; population-level impacts