



Pesticide Use and Associated Environmental and Human Health Risks in Cereal Production Systems

Khaoula Toumi^{*1}, Imen Aissa¹, Dalila Haouas¹, Nafissa Soudani²

¹Jendouba University, Higher School of Agriculture of Kef, LR14AGR04: Support for the Sustainability of Agricultural Production Systems in the North-West Region, 7119, Boulifa, Tunisia.

² Higher School of Saharan Agriculture - Adrar, Algeria

Abstract

Cereal production is exposed to biotic stress factors, including weeds, insect pests, and fungal diseases, leading to the intensive use of plant protection products. However, the extensive application of these pesticides raises concerns regarding their potential adverse effects on human health and ecosystem functioning. A field survey was conducted among 100 farmers to assess phytosanitary practices, knowledge levels, and risk perception.

The results revealed that 23 different active substances were used, with herbicides representing the dominant group. Several herbicides exhibited high leaching potential, as indicated by elevated GUS values, suggesting a significant risk of groundwater contamination. All insecticides identified in the study are neurotoxic and may adversely affect non-target organisms. Regarding human health, several active substances present acute and/or chronic toxic effects, and some are associated with potential carcinogenic or reproductive impacts. According to the WHO classification, most pesticides used fall within moderately the hazardous (Class II) and slightly hazardous (Class III) categories, with a limited number belonging to higher toxicity classes.

Furthermore, the study highlights unsafe phytosanitary practices, including limited use of personal protective equipment, poor hygiene behavior during pesticide application, and inadequate management of pesticide containers and residues. These practices increase occupational exposure and contribute to environmental contamination. Overall, the findings emphasize the need to improve pesticide management practices in cereal production systems to mitigate risks to human health and the environment.

Keywords: cereal production, pesticides, environmental risk, human health

