Article

Evaluating Students' Literacy on Safe Pesticide Use and Sustainable Resource Management: A Case Study in Alentejo, Portugal

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Abstract: The intensive use of pesticides contaminates soil and water, raising the risk of diseases like cancer and hormonal/neurological disorders. The continuous exposure to pesticides through water and food is concerning. Therefore, raising awareness about biological pest control is essential to reduce the harmful impact of pesticides on food and the environment. This study evaluates students' literacy on pesticide use and its implications, focusing on three topics, pesticide use, disease prevention, and sustainability and health promotion. Thus, a questionnaire was drawn up and distributed to students of both genders, aged between 12 and 16 years old, from Alentejo (Portugal). The students were asked to indicate their agreement grade with statements related to key themes, such as pesticide use and consumer attitudes, healthy practices and disease prevention, and sustainability and health promotion. The cohort includes 1051 students, and the results suggest that environmental education and student awareness are crucial for promoting sustainable water resources and minimizing exposure to environmental and food pesticides. This study presents an Artificial Neural Network model, with its accuracy surpassing 90%, to assess students' literacy on pesticide use and its implications. It also proposes a new approach to evaluate their potential for improvement, which is essential for developing educational strategies on health and the environmental impacts.

Keywords: environmental literacy; pesticide contamination; sustainable water resources; artificial neural networks