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Exploring the Use of Drones for Corn Borer Management: A Case Study in Central Italy

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Abstract : Maize is one of the most important agricultural cash crops in the world, involving three different chains: food, feed, and bioenergy production. Nowadays, the European corn borer (ECB), Ostrinia nubilalis, to the best of the author's knowledge, is the most important pest to control for maize growers. The ECB is harmful to maize; young larvae are responsible for minor damage to the leaves, while the most serious damage is tunneling by older larvae that burrow into the stock. Soon after, larvae can affect cobs, and it was found that ECB can foster mycotoxin contamination; this is why it is crucial to control it. There are multiple control methods available: agronomic, biological, and microbiological means, agrochemicals, and genetically modified plants. Meanwhile, the European Union’s policy focuses on the transition to sustainable supply chains and translates into the goal of reducing the use of agrochemicals by 50%. The current work aims to compare the agrochemical treatment of ECB and biological control through beneficial insects released by drones. The methodology used includes field trials of both chemical and biological control, considering a farm in central Italy as a case study. To assess the mechanical and technical efficacy of drones with respect to standard machinery, the available literature was consulted. The findings are positive because drones allow them to get in the field promptly, in difficult conditions and with lower costs if compared to traditional techniques. At the same time, it is important to consider the limits of drones regarding pilot certification, no-fly zones, etc. In the future, it will be necessary to deepen the topic with the real application in the field of both systems, expanding the scenarios in which drones can be used and the type of material distributed.

Keywords : beneficial insects, corn borer management, drones, precision agriculture
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