



Deliverable summary D6.5

Effectiveness of UAVs for precision application of biopesticides against tree PnPs

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CI Classified, as referred to Commission Decision 2001/844/EC	
CO Confidential, only for members of the consortium (including the Commission Services)	

1. Summary

Precision application of biopesticides for the control of emerging/invasive pests by targeting only the individual trees or individual branches that are infected, should improve the effectiveness of pest management and reduce environmental impact. In WP4 we tested the use of specific cues that may be used to detect the presence of nests of pine processionary moth, *Thaumetopoea pytiocampa* Schiff, such as by using cameras mounted on UAVs. These cues could be used to detect nests at tree level using an AI algorithm. This method may further be applied, in a more advanced stage, to develop the ‘see and spray’ concept, i.e. combining embarked sensors, decision support computer and automated sprayer, where infected trees and branches are sprayed immediately after being identified. This method would be very useful in the early detection and eradication of colonies in new colonised areas, particularly in urbanised areas. However, in the first stage, we need to demonstrate the efficiency of precision application of biopesticides. Here we tested the single tree and single branch precision spray using ground equipment to test this concept. We use *Bacillus thuringiensis* toxin (Bt) as biopesticide in trials conducted in Italy, Portugal, and France. The results were highly satisfactory, observing a reduction in the number of trees with tents between 94% and 96%. The result may be applied to develop automated precision application with UAV above target tree for *Thaumetopoea* species.