



Abstract

Cost Comparison of Drone and Foot Based Early Bark Beetle Detection [†]

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Abstract: Early bark beetle detection is still a challenge, as the symptoms of early infestation stages are hard to identify. Conventional foot-based detection is time consuming, and the associated costs mostly depend on stand characteristics. Detection by gas sensor equipped drones has the potential to be more economical, as it does not rely on the limitations of walking speed on the ground. A novel drone-based system for early bark beetle detection by means of resin odor cues was compared to conventional foot-based detection. The results showed that the cost efficiency of the drone system was highly dependent on flight speed and hourly costs of the pilot, while the cost efficiency of the foot-based assessment highly depended on terrain slope and forest floor characteristics. In general, the drone-based detection of early infestation stages becomes more economical in comparison to the conventional foot-based detection method as forest areas, terrain slopes and understory density increase.

Keywords: UAV; conifer forest; walking speed; electronic nose



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