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Homologation and working quality of spray drones

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Abstract. Spray drones or unmanned aerial spraying systems (UASS), have been homologated in Switzerland for seven years. It was the first European country to officially introduce these vehicles for plant protection purposes. To date, over 100 machines have passed the test. The transverse spray liquid distribution, measured by means of an enlarged patternator, showed coefficient of variation less than 15% at a working width of less than 4 m. Measurements of lateral wind speed generated at distances of 10–20 m showed low values of less than 2 m/s, which increased with heavier vehicles exceeding a weight of 150 kg. Flight accuracy, as measured by RTK-GNSS loggers, showed high accuracy, easily respecting the tolerance of ± 50 cm for a planned flight route. The modified patternator and ultrasonic wind sensors proved valuable in characterising the working quality. The positive feedback over the past seven years confirms the pragmatic approach that was chosen. This has enabled the potential of UASS to be realised primarily in the cultivation of steep vineyards. A new trend is emerging of spreading slug pellets using these vehicles; however, initial results show that, like traditional methods, the UASS does not achieve regular distribution of the pellets on the ground.

Keywords: UASS, transversal distribution, test method, drone, plant protection