



COUNTING WILD FLOWER HEADS USING UAV

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ABSTRACT

Management of both natural and semi-natural terrestrial habitats suffers from lack of high quality data (Wiszniewski et al., 2012) and wild plant-flowering is particularly sensitive to air born pesticide exposure (Carpenter and Boutin, 2010; Strandberg et al., 2012; Bhatti et al., 1995). So, a method based on flower head counting in the neighborhood of farming fields, could be promising as a mean for monitoring for pesticide effects. Thus, in this investigation a UAV is tested to make picture recording for subsequent digital imaging to count the number of flower heads. Hsu et al. (2011) use different image-analyses methods and they could correctly identify more than 90% of the examined flower heads. However, the success of counting will depend heavily on the type of flowers and this investigation tests a series of different wild species under realistic conditions. In an unsprayed field, a 20 m by 100 m area was (2014) sown with a mixture of perennial herbs commonly found in field margins and river banks. The following year (2015), when the plants are well-established, the experimental area is exposed to drifting glyphosate from a tractor-mounted sprayer operating along the area on a day when a moderate wind blows perpendicularly to one of the long edges of the area. The number of flower heads is manually counted every 14 days for each of the 100 single 50 X 50 cm squares that are numbered for identification on the UAV collected pictures. A UAV is used to take pictures of the whole 20 X 100 m area every time a manual flower counting is undertaken. The collected pictures and the manually counting are used to calibrate and validate the application of UAV to count the number of flower heads.

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