

Pesticide Spraying with UAVs in Agriculture

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Pesticides used in agriculture are commonly considered as a burden, and recently further restrictions to the spraying volume have been made to protect the environment. An Unmanned Aerial Vehicle (UAV) is a solution to minimize the amount of pesticides when applying poison to weed and fungi-infected crops.

Utilizing UAVs as a supplement to traditional trailed sprayers carries many advantages, e.g. they can work at the most optimal hours of the day regarding wind conditions and humidity, and expensive man-hours are not a cost. Because of total mobility, UAVs can spray on rough grounds and avoid tramlines, thus having the smallest possible impact on the crops. But most important is that only weed- and fungi-infected areas are sprayed with pesticides, keeping the crucial pesticide volume to a minimum.

As a proof of concept we want to present a spraying and refill mechanism that could be used with an UAV. A system for automatic battery shifting will also be presented in order for the solution to be fully autonomous. Only mechanical aspects of aerodynamics and vibrations will be taken into account because of limited time, so some of the electrical problems might not be completely solved.

The agriculture is a traditional field but during the last decade there has been quite some development in the adaption of new technology, e.g. mapping methods for classifying weed species are already a reality and software for cooperation between UAVs are fully available and under further development.

Thus in the future, seeing the farmer managing the protection of his crops is not completely science fiction.