

Optimized gap detection for precise application of PPP in orchards

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The use of plant protection products (PPP) in orchards is indispensable to maintain crop health and to secure yield. To reduce potential inputs into the environment, the reduction of the amount of PPP and the minimization of drift are important social and political objectives. Therefore, the use of sensor technology for gap detection and precise application offers a technical solution to comply with these aspects.

In a prior project (LADUS), a master plan for an optimized tree gap detection based on an optimal harmonization of sensors and nozzles was developed. For this purpose, a sprayer with a radial fan (NH 63) was equipped up to twenty optical infrared sensors on both sides of the sprayer. The technical request for the gap detection was to achieve a high compliance between the scanning field of a sensor and the spatial extend of the spraying area of a single nozzle.

Field experiments in Jork ("Altes Land") have shown, that in different fruit orchards a precise application can reduce

the output quantity of PPP, especially in young orchards with a saving potential of 70 %. At the same time, the evaluation of the coverage in the gap showed significant lower values compared to a conventional application without gap detection.

In general, the acquired knowledge out of the different trials enables the construction of a cross-flow fan sprayer and the retrofitting of sprayers in use. One focus of the new project OLSVA will be the evaluation of the biological efficiency of the gap detection system with the different sprayer types. However, for precise recommendations there are several years of investigations necessary.

The aim of the project is to develop a product with a market maturity for new sprayers just as for retrofitting sprayers in use. Therefore, the equipment has to be extremely reliable and robust as well as affordable. In the same way, the product has to fulfill the requirements for a high biological efficiency.