

**P-020: Sensor technology for gap detection – technical measurements of infrared sensors**

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Especially in orchards, the use of modern sensor technology has increased to improve the precision of use of plant protection products (PPP). Within the project OLSVA, funded by the Federal Ministry of Food and Agriculture, different sprayers were equipped with infrared sensors for gap detection to adapt the application of PPP on heterogeneous leaf wall areas in orchards. Therefore, it is possible to consider different age of the trees, growth of the tree crown during vegetation, pruning and natural gaps. In the past, field trials showed high saving potentials of PPP and a minimization of potential drift into the environment by using sensor technology. During the project term, sensor technology changed from infrared sensor IRS01 to IRS02 due to a better detection performance by higher driving speeds. However, it is unknown, which parameters influence the detection performance and at the end can confirm the suitability of the sensors in this scope of application.

Therefore, different infrared sensors were compared. The measurements took place under laboratory conditions to find out which influence driving speed, colour of the object, the distance to the object and sleeves against sunlight on the detection quality had.

Results showed that faults in detection occurred by increasing distances between sensor and the object and increasing driving speeds by using IRS01. In comparison, results of IRS02 were constant during all measured driving speeds and distances. Finally, sleeves against sunlight did not influence the object detection during different drivings. The summarized assessment of the results showed that IRS02 is suitable for a gap detection in orchards.