

 **O.40 - Use reduction of agrochemicals by canopy density spraying of fungicides**

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Matching spray volume to crop canopy sizes and shapes can reduce chemical application, thus reducing operational costs and environmental pollution. Developments in crop-adapted spraying in arable crop spraying are highlighted. The potential of crop-adapted spraying in bed-grown arable crops is assessed. Potential volume rate savings and therefore agrochemical use are evaluated based on crop canopy structure evaluations during the growing season of bed-grown flower bulbs. It was shown that for the whole season spraying, spray volume could be reduced on average by 25% and at early crop development stage even by more than 90%. The evaluation of spray techniques to apply variable dose rates show that application techniques based on variable rate Pulse Width Modulation spray nozzles (Weed-IT) and individual switchable nozzles in a multiple nozzle holder (Lechler VarioSelect) show the potential of real-time changeable spray volumes of 50-500 l/ha. Based on these possibilities the units of treatment in the field in spraying crop protection products can be decreased from a full boom width treatment to section wise and even nozzle wise variable applications. Individual plant detection in size and place and canopy structure can be achieved with sensors used for weed-control (Weed-IT) based on fluorescence and on fertilizer application (SensiSpray; Greenseeker) based on spectral reflectance. Based on these principles, prototypes have been developed to apply agrochemicals respectively plant-specific or canopy density related. A first field test protecting potatoes against late blight (*Phytophthora infestans*) with a plant-specific sprayer was performed. In early late blight spraying of potatoes spray volume savings of a prototype plant-specific sprayer are shown to be more than 75% compared to conventional applications using a field boom sprayer, while maintaining a similar protection level.