

Measuring of spray drift by an electrostatic method

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Abstract

This paper presents a new method for the measurement of the spray drift of the atomized stream of a sprayed liquid. Existing test methods - measuring the weight of the liquid during spraying or catching the drops of above-all water, do not allow to quickly and accurately measure the exchanges in spray drift caused by environmental conditions. The traditional methods do not provide possibilities to measure the quantity of spray drift during a normal operation of the sprayer in an orchard or in the open field. The purpose of the study was to examine the possibility of using the effect of electric charged liquid particles to measure the quantity of spray drift. The method of measuring the quantity of spray drift by measuring electrical charges carried by the microdroplets, will eliminate the disadvantages of traditional methods, and also open new possibilities for the measurement and statistical analysis of the measurement results. This method is based on the measurement of the electric charge carried by water drops e l e c t r i c a l l y charged . The electrostatics sensor to measure the droplet size, is associated with a system scanning the sprayed surface. The electric charge carried by the droplet, depends on its size and charging voltage. Thus, by measuring the amount of charge at a constant voltage supply it is possible to determine the movement of the atomized liquid stream and the size of the droplets.

The amplified and conditioned signals from the electrostatic sensor are send to the computer system to analyse the size and spatial distribution of the droplets.

The high sensitivity of the instrument allows the detection of very small spray drift liquid particles which are most susceptible to spray drift, and are often undetectable by conventional methods. Performing real-time measurement provides instantaneous observations of the effect of sprayer s e t t i n g s , t h e spray distribution and spray drift.

Keywords: lateral spray drift,electrostatic, measurement systems