

Test Methods for Spraying Machines in Order to Reduce Pollution

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Abstract

The aim of the paper is to present equipment for testing the technical status of spraying machines used by Department of Mechanization from USAMV Cluj-Napoca, test methods and results for cross distribution at IDK 120-04 nozzle, made by Lechler.

The follow stands are used for testing and diagnose the technical status of spraying machines (in concordance with European, International and Romanian standards):

Cross distribution test stand, for:

- Determination of the uniformity of cross distribution of field sprayer;
- Determination of the flow rate of the individual nozzles of a field sprayer boom;

Test stand for single nozzles for:

- Measuring the liquid distribution of single nozzles to evaluate and compare the quality of distribution;
- Measuring the spray angle;

Pump test stand for:

- Determination of the characteristic lines of pumps for plant protection equipment;
- Testing of control devices for plant protection equipment.

For testing the cross distribution at IDK 120-04 nozzle we used the first stand. We tested the nozzles at 3 different pressures (2 bars, 4 bars, 6 bars) and at 3 different heights from collecting level - soil level - (40 cm, 50 cm 60 cm).

As a result of our experiments, at pressure of 2 bars, the cross distribution is between $\pm 15\%$ and the most favorable cross distribution is for 60 cm height. At pressure of 4 bar, the most favorable cross distribution is for 50 cm height and at pressure of 6 bar, the most favorable cross distribution is for 50 cm. For all variants, at the central part of the sprayer boom, the cross distribution exceed with 4% the limits of $\pm 15\%$ because of local and linear pressures lost.

In conclusion, using these equipment for testing and evaluating the technical status of the spraying machines, will allow us to adjust them properly and to replace the components which do not function correctly, in order to reduce pollution.

The reducing of the environment pollution (earth, water) through rational use of the chemical substances used at plant protection treatment is one of ways that help us have a sustainable agriculture.

Key words: testing methods, spraying machines, technical status, pollution

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