

EFFICIENCY OF SUNFLOWER DISEASE CONTROL BY DIFFERENT MACHINES

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A three-year investigation was conducted to determine the most efficient system of controlling sunflower diseases during growing season by agricultural machines and aircrafts.

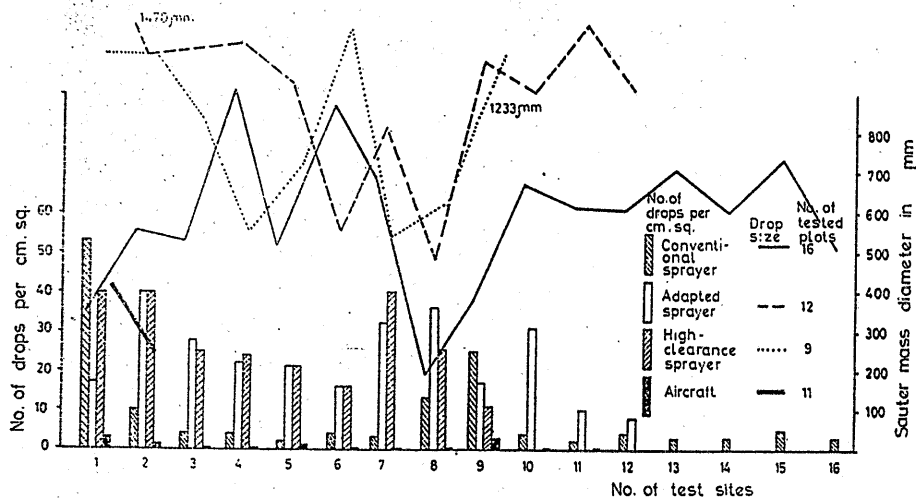
Attention was paid to select sprayers which may be adapted to meet the requirements of sunflower protection and which may be mounted on high-clearance tractors.

The average height of sunflower plants at the time of the first treatment ranged from 49,5 to 73,3 cm, depending on the variant of treatment. At the time of the second treatment, the average plant height ranged from 122,0 to 209,0 cm and the average width of plants from 84,0 to 103,6 cm.

Counting the number of drops per cm.sq. measuring the average size of drops at five places per plant, it was found that the top leaves and the top portion of the stem received enough drops in all variants. However, the median and the basal parts of the stem and the bottom leaves were satisfactorily treated only by an adapted tractor-mounted sprayer in the first treatment and by a sprayer mounted on a high-clearance tractor in the second treatment.

Differences in the quality of protection by different application techniques become clearly evident when presented comparatively. Graph.1 compares the different techniques regarding the number of drops per cm.sq. and their average size in the zone of the basal part of the stem, for one experimental year. A sufficient number of drops was achieved only with the adapted sprayer and the sprayer mounted on a high-clearance tractor.

Graph.1 shows that the sufficient number of drops was realized only by means of the adapted sprayer and the sprayer mounted on a high-clearance tractor. The size of drops corresponded to the mode of operation of the tested equipment, with a larger number of smears in the case of the ground treatments because of the proximity of nozzles and plant parts.



Graph 1 - Number of drops per cm. sq. and their size in the zone of the basal part of the stem

The quality of sunflower treatment by different machines was the results of the traits of sunflower plants themselves at the time of the first and the second treatment.

The first treatment was successful only by means of the adapted tractor-mounted sprayer which ejected a disintegrated jet from above and from both sides of the treated plants. The conventional overhead sprayer produced poor results.

At the time of the second treatment, the plant mass was still larger and the plant width exceeded the row-to-row distance, precluding a successful treatment by aircraft. Only the use of a high-clearance tractor and the sprayer with one overhead nozzle and 3-4 nozzles on both sides of the plants produced satisfactory results.

The performance of the machines was proportional to the operational width and the speed of the machines.