

Third Winner

Innovation

Project Title

Preparing Technical Data of Electrostatic Pesticide Sprayer and Preparing Production Process

Initiator: East-Azerbaijan Engineering Research Center

Contributors: Jahad Research Institution, Ehsan-Tahghigh Cooperative Company, Machinery Development Center of Agricultural Machines and Equipment-Test Group, Agriculture Faculty of Urmia University, Pest Campaign and Plants Protection Institution Sahand Jahad Tahghighat Company

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Abstract

Today, the drift, run-off and fallout of pesticides and consequently soil pollution are main environmental damage by chemical compounds. Charging droplet electrostatically is a useful and efficient method to pest control and soil pollution prevention. It has provided significant benefits such as reduction in toxic active ingredients entering the ecosystem, enhancement of droplet deposition reliability and even coverage upon complex targets. This technology significantly improves spray deposition on the top and bottom surfaces of leaves, reduces drift and run-off, provides a means of reducing the amount of pesticide/diluents and, thereby, increases the efficacy of pesticide application. This sprayer produces the fine charged droplets using the high voltage. Using this sprayer provides droplet charging and pesticide consumption is decreased consequently (about 1/3 to 1/4). Also, in this the spraying efficiency increases from 20% to 80% compared to conventional sprayers. The chemical compounds consumption is decreased to about 50% and droplet drift on non-target surface is decreased preventing as environment pollution. EAERC used induction electrical charging of pesticides, and designed Electrostatic Sprayer Head. The designed head include a rotary disk and a charging electrode connected to H.V power supply. The disk produce liquid droplets and electrode induce electric charge on them. Charged sprays are attracted to any targeted, conductive and earthed objects such as plants, trees, animals and certain types of building materials. Applying pesticides and other agricultural chemicals (such as fertilizers and growth regulators) with an electrostatic low-volume spraying system provides the grower with several benefits, including increased spray efficiency, increased spray efficacy, lower economic costs, greater safety and less damage to the environment. This system has approved by Agricultural Machines and Equipment Test Group and Pest Campaign and Plants Protection Institution.