

Spray application rate, equipment affect pest management in greenhouse ivy plants

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Belgian researchers test spray boom systems on potted ivy plants positioned in greenhouse arches. Credit: Photo courtesy of David Nuyttens

In Belgium, ornamental plants account for almost 0.46 billion euro in sales, or about 34% of total horticultural production output. For growers, finding ways to control pests in production facilities is more difficult as the availability of authorized plant protection products becomes more regulated. Ninety percent of Belgian growers still use high-pressure spray equipment to apply plant protection products, but a recent survey of ornamental plant growers showed that present-day spray application techniques are unsatisfactory. As more growers implement automated

spray boom systems, many questions remain concerning the optimal settings for the equipment. New research now offers some clear recommendations for production greenhouse operators.

Besides the traditional fixed or rolling benches on the floor, Belgian potted plant growers frequently use hanging shelves positioned 2 to 4 meters high in the greenhouse arches. This technique allows growers to make the most of limited greenhouse space.

Because these shelves are located above the traditional benches and close to the greenhouse roof, the only currently available and useful equipment for applying plant protection products are spray guns. In most cases, the spray gun is operated from the ground floor and the spray "cloud" has to be targeted from a distance and sprayed from below to the canopy.

When spray guns, or "lances", are used to apply pesticides to potted plants grown on hanging shelves, much of the pesticide ends up on the ground; the amount of pesticide retained on the crop depends on the formulation of the pesticide, the volume of spray applied, the type of spray equipment, weather, and other factors.

David Nuyttens of the Institute for Agricultural and Fisheries Research (ILVO) and a team of research scientists investigated the effect of spray application technique on the spray deposition in ivy pot plants grown on hanging shelves in greenhouses. The experiment was conducted in a commercial greenhouse during January and February 2008 using the ivy cultivar *Hedera algeriensis* cv. Montgomery (Hibb.). Two different spray application systems were tested: a spray gun equipped with a disc-core nozzle, and vertical spray booms mounted on a trolley. The effect of application rate, nozzle type, size and spray pressure, and the difference between the traditional spray gun and a vertical spray boom system were recorded. The full study was published in HortScience.

The scientists found that the spray system and application rate clearly

influenced the system's effectiveness. "Evaluating the deposition results for the two crop zones reveals that the spray gun performed quite well on the runners", Nuyttens explained. "With this technique, the spray liquid was targeted from below to the easily accessible runners, which might explain the higher spray deposition on this part of the crop." For the sprays performed with the spray boom system, a significant difference was found between the lower and higher application rate. Because the concentration of tracer was the same for both application rates, doubling the application rate justifies the increase in spray depositions.

On the main crop canopy, the spray gun performed a lot worse", Nuyttens added. "Although the spray gun operated from the ground floor still performed best on the easily accessible crop zone with the runners, its performance in the more dense main crop canopy zone was inferior."

Summarizing the significance of the research, the researchers said that the experiment underlines that, besides the application rate, the spray application equipment is an important factor defining the spray deposition achieved when spraying ivy pot plants stored on hanging shelves in greenhouses.

More information: The complete study and abstract are available on the ASHS HortScience electronic journal web site:

hortsci.ashspublications.org/content/44/7/1921

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