

Automatic Pesticide Application in Greenhouses

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Three automatic pesticide application systems are presented: an automatic thermal vaporimeter; a cold fogger (low volume mist applicator or mechanical aerosol generator); and an automatic air-assisted sprayer for controlled droplet application (CDA). The automatic thermal vaporimeter is thermally regulated to prevent spontaneous ignition of the evaporated pesticide, and is equipped with an automatic quantity-control system. One vaporimeter is capable of treating an area of 0.4 ha when an air circulation system is operated. The efficacy of some commercially available cold foggers for pest control was evaluated in various crops (rose, gerbera, gypsophila, tomato) and under different application conditions in plastic houses in Israel. Uniform spray distribution and good penetration into the foliage, with a high ratio of the deposits on upper: lower leaf surfaces and lower: upper parts of the plants, were obtained when assisted by indoor air movement (*e.g.* by horizontal air blowers). There was a high correlation between the deposition patterns produced by cold foggers and their biological efficacy against pests and disease agents. The third system – the automatic CDA air-assisted sprayer – was designed with the purpose to benefit from the advantages of the knapsack mist blower, at the same time avoiding operator mistakes. It consists of an air-assisted sprayer, self-propelled along a monorail, which revolves on its axis during its forward movement, applying drops in the 100 μm volume median diameter size range and leaving an even deposit within a 14–18-m-wide swath. The advantages of automatic pesticide application systems are: no exposure of the operator to toxic materials; increased efficiency and effectiveness; optimal timing; and reduced error by the operator. Reduced pesticide dosages make them of increasing importance in modern agriculture.

KEY WORDS: Pesticide application; automatic sprayer; cold fogger; vaporimeter; greenhouse; operator safety.

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