

The starwheel sprayer - a new design for foliage spray penetration of vegetables

T.J. Piggott¹, J. Czech² and R.T. Male¹

¹Department of Agriculture, Vegetable Research Station, Frankston, Vic. 3199.

²CSIRO Division of Mechanical Engineering, Highett, Vic. 3190.

In 1975 the CSIRO, Division of Mechanical Engineering developed a "starwheel" sprayer to ensure adequate penetration of drying emulsion into sultana grape vines.

Subsequently, it was thought that this type of sprayer might achieve more efficient spray coverage of vegetables and a prototype was constructed for evaluation at the Vegetable Research Station.

The design is based on the concept that arms carrying spray nozzles enter the foliar canopy and move between the crop rows in a "walking action" by rotation around the hub of a rimless wheel. A rotary sleeve valve, installed in the hub, ensures that each spoke only delivers spray when directed towards the foliage canopy.

In initial trials at Frankston, using a single starwheel, the sprayer provided good crop cover. Its ability to apply sprays to the underside of leaves, at all stages of maturity, was consistently superior to the standard overhead boom spray.

Using a four wheel unit it was found that at later stages of crop maturity the starwheel was more effective than dropper nozzles at applying sprays to the underside of leaves and it has the additional ability to walk through fully grown lettuce, tomato, potato and cabbage crops with little or no damage to leaves.