

Glue sprays for anti-shattering treatment of horticultural and pasture seed crops

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Uneven ripening of seedheads in many horticultural and pasture seedcrops is a problem since most crops are harvested in a single operation. At harvest, some late-formed seedheads will be immature and produce seed of poor germinating ability. Other earlier-formed seedheads will be mature, dry, brittle and break up easily and lose seeds ie 'shatter' especially during hot, dry, windy weather or during harvest. These factors are largely responsible for the high risk associated with growing most small seed crops in many parts of the world.

The most effective long-term solution to this problem is the development of non-shattering cultivars of shatter-prone crops. Some progress has been made with certain species, such as Phalaris (McWilliam and Schroeder 1974). However for many shatter-prone crops the problem has only been defined recently and little work has been carried out to improve seed retention in these crops (Yungen 1975; Williams 1977).

Spraying seedheads with glue to reduce seed shattering was compared with nil treatment on single plants in commercial crops on Latham Blanching celery (*Apium graveolens*), Topweight carrots (*Daucus carota*), Creamgold onions (*Allium cepa*) and Australian phalaris (*Phalaris tuberosa*). The glue used was a preparation of poly vinyl acetate (PVA) without toxic plasticisers (thalates) or acrylic compounds. Glue was applied by knapsack spray five days after first seed fall at a rate of 55 kg of total solids in 1 000 litres of water per hectare. Application of the glue to single plants increased seed yield by about one-third in all crops. Celery was the only crop in which there was a significant increase in individual seed weight. Presumably the earlier formed, glue-sprayed seed-heads contained the heaviest seed which did not shatter readily. Aerial application of glue at a rate of 55 kg of total solids in 400 litres of water per hectare to two hectares of an eight hectare carrot crop increased seed yield by 12% and estimated net profit by \$A274/ha. All the extra seed was first grade seed (grades being based on individual seed weights). The glue did not affect moisture content or percentage germination of the seed.

A starch based glue (cost \$A25/ha) has been compared to three PVA glues (the latter cost \$A100/ha). The starch based glue spray when tested on carrot and onion seedcrops has produced similar results to PVA based glues when no precipitation has fallen between the time of glue spraying and harvest. However, as little as 30 mm of rain was sufficient to negate the effects of all PVA and starch based glues tested. Current glues used are resistant to removal by wind but not by water. Future work is aimed at developing glues for commercial application, with a high degree of water insolubility once on the plant. If this can be done glue spraying would become a very promising technique to reduce seed shattering before harvest and to increase seed yield and possibly the mean weight of individual seeds harvested from many shatter-prone crops.

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