



SPUD SCIENCE

I have followed Dr Charles Merfield's research into mesh crop covers as a way to prevent pests and diseases.

Dr Merfield, usually called Merf, is head of the BHU Future Farming Centre, based at Lincoln University in Canterbury, where he researches organic agriculture and biological farming.

The work that particularly interested me is his trials of mesh covers to control plant pests and diseases: specifically looking at whether mesh could prevent Tomato Potato Psyllid (TPP) in spuds.

Mesh covers have been used to protect plants from pests for years. Growers noticed that frost cloth, when used to extend the season, also proved a highly effective pest barrier and over time, a new fabric has been developed that acts as a physical barrier against even tiny pests but is more porous than frost cloth so the temperature underneath does not get too hot (plus it is totally permeable to rain and irrigation).

NZ Gardener has reported previously on the results of Merf's mesh trials, which he has been running since 2011. In the first year he found a mesh cover not only worked as a control against TPP, it also reduced potato blight. Subsequent trials found a significant increase in yield and reduction in TPP populations from the spuds grown under mesh when compared with a control crop grown in the open air.

Merf has just sent me the results of his latest field trials. The snappily titled *Mesh Crop Covers for Non-Chemical Potato Pest & Disease Control: Final Results from the 2016-2017 Field Trial of Mesh vs Agrichemicals* should be every gardener's beach read this summer. For the first time, a large scale field trial was conducted to compare spuds grown under mesh with spuds grown under the full fungicide and insecticide regime used

by a commercial grower. Merf's research found that mesh was a cheaper (when you spread the purchase price over its 10-year life) and more effective pest control than agrichemicals – completely protecting the spuds from TPP and, because it prevents psyllids from landing on the crop, also eliminating zebra chip disease which is caused by psyllids infecting the spuds with *Liberibacter solanacearum*.

Preliminary results also suggest that mesh controls blight, possibly by blocking UV light, although he is still working to substantiate that. Plus mesh significantly increased the yield, probably because the temperature underneath was a little hotter (1.6°C warmer on average).

There is still a problem, Merf says, with aphids getting underneath and – since the mesh excludes all their natural enemies – proliferating without predation, but results are promising. There is a lot more science in his results but I have read and digested it so am able to summarise it thus: more effective against pests, cheaper, no chemicals and you get a lot more spuds.

Merf says he's had great reports from home gardeners using mesh as a pest control on tomato crops.

"People have been building mesh 'glasshouses', often using fruit cage frames and have been reporting excellent results with the toms they grow inside them, even the best yields they have ever had."

You might think that pollination would be an issue – after all the mesh prevents bees and other pollinators from accessing the crops as well as pests – but Merf says there is enough air movement underneath for tomatoes to set fruit. He believes that, used properly, mesh could be a complete control against TPP, green shield beetles, blight and "pretty much all other tomato pests except aphids".

I am increasingly of the belief that physical barriers like this are the long-term future of pest control.

They have no impact on beneficial bugs, and pests cannot evolve resistance to them! Want to try mesh at your place? BHU sells it online (bhu.org.nz). ❀

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