Assessing the risks of biological control to crop and ornamental cultivars

Greg Lefoe[1,2], Cindy E. Hauser[2], Jackie Steel[1], Umar Lubanga[1], Anthony T. Slater[1], Raelene Kwong[1], Libby Rumpff[2]
[1]Agriculture Victoria, AgriBio, Centre for AgriBioscience, Bundoora, Australia,
[2]School of BioSciences, The University of Melbourne, Parkville, Australia
(greg.lefoe@agriculture.vic.gov.au)

Summary The introduction of a new biological control agent to Australia is preceded by rigourous risk assessment. For weed biological control, there is a need to estimate the possible consequences of introduction to native plants, crops and ornamentals. This is a particularly challenging task for weeds such as silverleaf nightshade *Solanum elaeagnifolium* that have many closely-related native and crop species that could be at risk. In these cases, it is necessary to prioritise non-target plant species for testing against new biocontrol agents. However, crops such as potato *S. tuberosum* and tomato *S. lycopersicum* have thousands of cultivars that could also vary in their susceptibility to damage. In these cases, cultivars must also be selected and prioritised for testing. Despite this requirement, we could find no detailed or consistently applied guidelines for selecting which cultivars to test. We propose a decision support tool to prioritise cultivars for biocontrol agent host-specificity testing. We demonstrate the application of the decision tool on a large, complex cultivar group, and argue that our approach will result in cultivar test lists that are transparent, defensible, and feasible to study.

Keywords Biological control, silverleaf nightshade, risk assessment, cultivars