Dan Watkins Scholarship in Weed Science

Dan Watkins was one of the founders of the Ivon Watkins Ltd herbicide company, based in New Plymouth, which later became Ivon Watkins Dow and is now Dow AgroSciences. He was a leading figure in the early weed science research arena within New Zealand. Dan Watkins was a founder of the New Zealand Weeds conference, forerunner of the New Zealand Plant Protection Society. He was also a member of the New Zealand National Research Council and was involved with other scientific bodies. This scholarship has been set up and financed by Dr George Mason, one of the founders of Taranaki Nuchem (now Zelam Limited), in memory of Dan Watkins and to recognise his contribution to weed science within New Zealand.

Ross Meffin, a PhD student at the Bio-Protection Research Centre, has been awarded the Dan Watkins Scholarship in Weed Science for 2010/11. His project aims to help develop more effective and efficient regulations controlling the passage of plant germplasm across international borders by better understanding which plants pose a risk as potential weeds. A specific focus is to determine whether traits assessed at the species level are the best predictors of a plant’s potential weediiness. Current models for weed risk assessment operate at the species level. However, there can be substantial intraspecific variability in traits related to weediiness. In New Zealand most subspecific taxa of species already present face few restrictions to importation and new germplasm with weedy traits may unwittingly be allowed entry, while considerable obstacles generally prevent importation of species not currently present. Re-examining this paradigm may allow the number of applications that are unnecessarily denied importation to be reduced, while simultaneously preventing the introduction of weeds that might otherwise be missed. The extensive diversity that exists at both the specific and subspecific taxonomic ranks within the genus Brassica makes an ideal model system to investigate these issues.

Ross will be undertaking field surveys of naturalised Brassica populations in the Canterbury plains, in addition to glasshouse experiments and common garden field trials. The field survey has yielded some interesting preliminary results. Among several taxa recorded, the weedy wild turnip, Brassica rapa var. oleifera, appears to be by far the most frequent naturalised Brassica in the system, often occurring in disturbed areas along roadsides and adjacent to drainage and irrigation ditches. Many of these populations may be ephemeral, but further analysis should reveal the factors responsible for those populations that persist from year to year. It is intended that the glasshouse experiments will build upon this knowledge base. These will involve growing a selection of Brassica taxa stratified by species and subspecies, and quantifying traits linked to weediiness in the genus. Comparing the variation in these among and within species, and with reference to known weedy taxa such as B. rapa var. oleifera, will allow insight into whether a plant’s species is a good guide to its potential to become weedy. The common garden field trials are to take place in plots randomly located along an altitudinal gradient across the Canterbury Plains. By sowing seeds of a selected subset of taxa from the glasshouse trials and measuring variables such as germination rate, survivorship and fecundity, Ross will parameterise population growth rate equations to determine whether populations are likely to persist or die out. These will thus provide a validation of the glasshouse experiments conducted in an ecologically relevant setting.