

New Zealand Controlled environment Laboratory
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Over the past year, the main activity of the laboratory has been the development of the physical containment capability to enable transgenic plants to be grown in the controlled environment rooms. This required considerable discussions with the Ministry of Agriculture to develop the plans. Over the past two months, the building has been changed to allow the requirements for potting of plants, sterilisation and disposal of plant material to be met. In addition, laboratory space has been created where transgenic plants can be analysed for growth and other aspects of study can be provided. The facility is scheduled for official opening in early November.

Another technology achievement has been the development of a system to control root-zone temperatures of large potted trees. This system uses chilled water or glycol to provide a cooling supply and has a proportional controller to regulate heat input. To date, tests have shown the temperature of potted trees can be adequately maintained at the range from 6 to 30°C. This extends the capability of the earlier developed hydroponic-based system to control root temperature in small plants. This has shown that low root temperatures impact on shoot biomass accumulation and also restrict flowering. As an adjunct to this system, a root - shoot gas exchange system has also been acquired, enabling hydroponically grown plants to have root respiration and shoot photosynthesis measured simultaneously. The system also allows independent control of root temperature from a circulating water bath while the shoot temperature is controlled by the CE room temperature.

Use of controlled environment space has been relatively low over the past year, reflecting reduced demand through retirement of users and shifting science patterns. However, observations at other Australasian CE facilities have demonstrated that use for genetically-engineered plants has increased CE demand markedly and this has been the impetus to develop our own capabilities and increase demand.

A continuing though small use of the Laboratory space has been activities by athletes to acclimate themselves to hot and humid conditions before going to places such as India and the Philippines to perform in various sporting events.

Three workshops were hosted by the team over the past year, focusing on various Laboratory activities, including use of controlled environments for genomics, studying dynamic climatic aspects and control of the root environment with soil-less technologies. A new quarterly newsletter "Outside In" was established this year and provides users with an update on lab activities, new technologies and information on staff changes.

The web site for the Laboratory is www.hortresearch.co.nz/products/ncl