Estate, Glasshouse & Field Services Unit

P. Gill, G. Pitkin & E. Caldwell

Graham Pitkin attended the International Controlled Environment Conference, 'The Power to Control', which was held at the University of Queensland's Bioscience Precinct in Brisbane, Australia during March 2004. Topics ranged from small to large scale Controlled Environments (growth cabinets, growth rooms and glasshouses) used by CSIRO and the Australasian universities. There were also presentations from NASA on bio-regeneration life-support systems used in space exploration. About 100 delegates attended from the Pacific Rim States, North America and Europe.

Glasshouse Section Construction of the latest phase of the general-purpose glasshouse complex began in 2003. This will provide a mixture of cubicle sizes from 13 m^2 to 75 m^2 housed within a double-winged 'Venlo' glasshouse. Facilities and service specification are similar to the earlier phase but with an upgrade of supplementary lighting to a minimum PAR of 150 $\mu mol.m^{-2}.s^{-1}$ at the top of the crop canopy.

Two new 12 m^2 growth rooms were commissioned in February. They each have 6 m^2 of benching which can be adjusted to maintain a constant irradiance at the shoot apices of 600 $\mu mol.m^{-2}.s^{-1}$. The HPI/tungsten light source provides a good spectral balance for growing barley plants, which are used in anther culture, isolated microspore and transformations.

About twenty children participated in the annual 'Bring your child to work' day held in the spring. They were shown how the weather is recorded at the meteorological site and had the opportunity to mix their own compost and sow flower seeds.

Aerial view of new general-purpose glasshouse complex.

Glasshouse staff assisted with the potato demonstration at the Dundee Flower & Food Festival held in September. The exhibit included the collecting of wild species from south and central America which are retained as part of the Commonwealth Potato Collection. These species are used in the breeding programme as sources of pest and disease resistance and added health and nutritional benefits.

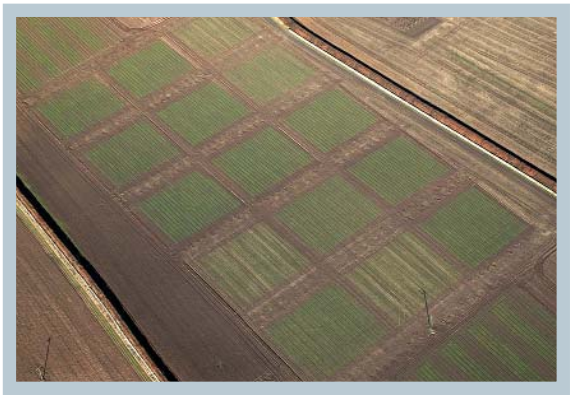
Two contracts undertaken entirely by the glasshouse staff are germination tests of oilseed rape selections and the production of game-cover plants for The Game Conservancy Trust for display at Scone, Kelso and the Black Isle agricultural shows.

Field Section Work started in early 2004 to convert a muddy 0.15 ha field site into an educational resource aimed at the local community and schools. 'The Living Field Community Garden' will show the links between science, agriculture and the environment by the use of demonstration plots, interactive exhibits and information boards. The site will include a small pond, with adjacent bog area, and a wild flower meadow with hedges and trees to provide shelter for a variety of birds and insects. This initiative complements the institute's other environmental and sustainable agriculture activities.

As a LEAF Innovation Centre, a series of display boards on food webs, beneficial organisms and pests and diseases have been erected at strategic points within the institute as part of the Invergowrie Path Network initiative.

Various projects under the Countryside Premium Scheme were continued and extended, including tree wind-breaks, species-rich grassland, beetle banks and mixed native hedgerows. The presentation of experiments was improved by the grassing of field roadways, reducing the need for herbicide sprays and enhancing the biodiversity within the grass sward.

A soil disturbance trial was begun as an extension to the cereal breeding programme and compared five different methods of soil preparation prior to sowing. These included zero tillage (no soil disturbance), minimum tillage (light cultivation and discing), traditional ploughing with pressing, deep ploughing with



Aerial photograph of tillage experiments

pressing and traditional ploughing followed by soil compaction. Field staff worked together with manufacturers of commercially-available equipment following discussions held at the 'Tillage 2003' event held in North Yorkshire.

Several items of new equipment were purchased including a long-wheel based, crew cab Land Rover together with trailer for transporting tractors and equipment to off-station experimental sites. The acquisition of a narrow vineyard tractor will make an important contribution to operations within the soft fruit tunnel area and a new air-assisted sprayer will improve pesticide application and minimise chemical drift.

In preparation for the proposed Science Park, over 10,000 blackcurrant plants were transplanted from South Bullion to Laboratory field between late November and February, when plants were dormant. These large, mature bushes were each excavated with a large root ball to minimise establishment losses at the new site. The operation was exacerbated by adverse weather and poor ground conditions but no plants were lost during the process.

New strawberry and raspberry advanced selections were planted in the Spanish tunnels during the spring for assessment of their potential under commercial protected cropping regimes.

Two contracts are undertaken exclusively by field staff, including the biomass accumulation of grasses and the performance of a range of fleeces and their effects on potato yields.