



## ASSOCIATE PROFESSOR PETER MARTIN



Progeny testing advanced lines of brown top bentgrass. Mated with the same male parents, line 243 has given vigorous offspring (left) while the offspring of line 331 (right) are variable and weak

### Peter Martin outlines turf research initiatives at the University of Sydney's Plant Breeding Institute at Camden.

In 2001 the University of Sydney's turf research group relocated from cramped quarters on the main campus in the inner city to the university's Plant Breeding Institute at Camden, about 80km southwest of the Sydney CBD.

In a rural location with extensive laboratory, greenhouse and field facilities, the institute offers an ideal setting for research into breeding and cultural management of turf.

There are numerous turf farms in the Camden district as well as a wide range of turf based sporting facilities with whom the institute maintains regular contact and undertakes co-operative research.

The environmentally sensitive Nepean River flows through the institute's land, which helps to keep us focussed on one of our major breeding aims of developing turfgrasses with reduced requirements for water, pesticides and fertilisers.

The graduate turf management programme, which offers a graduate Diploma and a Master's degree in turf management by a combination of external studies and block attendance, also relocated to Camden.

In the second year of their course students carry out a research investigation and write a thesis. Research done in this way greatly extends the range of turf topics in the institute's research programme and also provides a geographic spread which we could not otherwise afford.

Graduates of the turf program have recently formed, with the approval of the vice-chancellor, a Sydney University Turf Management Alumni Association, with Robert Cooper as foundation president.

#### STAFF RESEARCH

The staff research programme is conducted on a full-time basis by the professional staff and

full-time doctoral (PhD) research scholars, assisted by technical and field staffs.

Within the institute's Amenity Horticulture Group, turf research comprises the newest but most rapidly expanding research area.

Closely related to the turf area is the institute's program on landscape grasses and grass-like plants.

Turf breeding activity from 2001 to 2003 concentrated on the bentgrasses (*Agrostis spp.*), with advanced selections being made in brown top and creeping bentgrasses for the parental lines of new 'synthetic' cultivars which should be ready for release to the seed-increase growers in two or three years.

Work continued on the identification of superior lines in ecotypic populations of the lowland Australian native bents and in some introduced and local types of red fescue (*Festuca rubra*).

Other turf investigations included continuation of the work on the causes of varietal differences in the phosphorus requirement and the efficiency of phosphorus acquisition in bentgrass and couchgrass (*Cynodon dactylon*), expansion in the number of salt-tolerant lines of several species in the germplasm collection and a significant expansion of the kikuyu (*Pennisetum clandestinum*) collection as a prelude to major investigations in that species in 2004-2006. Fieldwork on local turf farms on sustainability issues such as phosphorus and salinity management has also been launched.

The institute's work on landscape grasses and grass-like plants has generated interest among many visiting golf course superintendents seeking to develop more natural looking areas to set off their closely clipped turf.

Current work is centred on the tall ornamental species of *Poa* and *Lomandra*, the primary aim being to develop economical and efficient methods of vegetative mass-reproduction of superior forms arising from our breeding programmes. Industry interest in this area is strong and an expansion of the number of species being worked with is imminent.

#### STUDENT RESEARCH

There is insufficient space to enumerate in detail the 18 investigations undertaken by students in the course in the period 2001-2003, but the following grouping by topics will give a fair idea of the scope of this work.

##### Cultural practices

Timing of renovation; The effect of verti-draining on root growth; Management of ultra-dwarf couches; Propane flame method of weed control.

##### Growth regulators

Primo and alternative growth regulators as management tools for kikuyu in golf and horse racing.

##### Nutritional and pesticide programmes

Assessing sustainability of pesticide programs by monitoring soil biology; Sustainability of nutritional programs monitored by soil biology; Nitrogen and phosphorus responses of bentgrass; Iron and manganese deficiency in C<sup>4</sup> grasses.

##### Thatch management

Varietal factors; Nutritional factors; Topdressing practices.

##### Salinity management

Survey methods; Effects of saline inundation.

##### Breeding and Cytology

Ploidy levels in bentgrass accessions; Alternative species studies.

#### CONCLUSION

Turf research at the University of Sydney is characterised by a concentration of effort on a few major projects at the staff level and by a great diversity of topics in the student research program.

In the past relatively little of the turf research done at the university has been published. A high priority for the next few years will be the dissemination of the findings of this considerable body of work through both formal scientific publication and contributions to conferences and industry magazines. ♣

