

The DEEDI greens test facility at Redlands Research Station. This acted as the centralised testing venue for the duration of the warm-season greens project with a number of additional trial sites in Queensland, NSW, Victoria and South Australia



Management guidelines for new warm-season grasses

Matt Roche (DEEDI), Jon Penberthy (DEEDI) and John Neylan (AGCSA) provide a technical summary of the major findings to emerge from the extensive warm-season greens grass trials conducted at various sites around Australian between 2006 and 2009.

After more than 30 years in which Tifgreen and Tifdwarf were the only greens-quality warm-season turf varieties available, the choice for golf courses and bowls clubs in northern Australia has been expanded to include six new *Cynodon* hybrids [*Cynodon dactylon* (L.) Pers x *Cynodon transvaalensis* Burt-Davy]. Five of these – Champion Dwarf (Texas), MS-Supreme (Mississippi), FloraDwarf (Florida), TifEagle (Georgia) and MiniVerde (Arizona) – are from US breeding programmes, while the sixth, TL2 (marketed as Novotek) was selected in north Queensland.

The finer, denser and lower growing habit of the 'ultradwarf' cultivars allows very low mowing heights (e.g.: 2.5mm) to be imposed, resulting in denser and smoother putting and bowls surfaces. In addition to the *Cynodon* hybrids, four new greens quality seashore paspalum (*Paspalum vaginatum* O. Swartz) cultivars including Sea Isle 2000, Sea Isle Supreme, Velvetene and Sea Dwarf (where tolerance of salty water is required) expands the range of choices for greens in difficult environments.

This project (HAL Project TU05001) was developed to determine firstly the appropriate choice of cultivar for different environments and budgets, and secondly best management practices (BMPs) for the new cultivars which differ from the *Cynodon* hybrid industry standards Tifgreen and Tifdwarf. Management practices, particularly fertilising, mowing height and frequency and thatch control were investigated to determine optimum management inputs and provide high quality playing surfaces with the new grasses.

To enable effective trialling of these new and old cultivars it was essential to have a number of regional sites participating in the study. Drought and financial hardship of many clubs presented an initial setback with numerous clubs wanting to be involved in the study but were unable to commit due to their financial position at the time.

The study was fortunate to have seven regional sites from Queensland, New South Wales, Victoria and South Australia volunteer to be involved in the study which would add to the results being collected at the centralised test facility being constructed at DEEDI's Redlands Research Station. We cannot express enough thanks to the following superintendents and their specialist teams at each of the participating clubs which saw merit in the study and successfully had the request to be a collaborator in the project approved by their committees.

Charlie Giffard (Indooroopilly Golf Club, QLD)
Peter Lonergan (Coolangatta & Tweed Heads Golf Club, QLD)
Pat Pauli (Horton Park Golf Club, QLD);
Daryl Sellar (Glennelg Golf Club, SA);
Dave Thomson (Bermagui Country Club, NSW);
Gary Topp (Twin Waters Golf Club, QLD).

Thanks also goes to Bruce Macphee at Chisholm TAFE who provided his students with a great opportunity to see how warm-season grasses perform on Victoria's Mornington Peninsula.

The major research findings acquired from the eight trial sites included the following which can be broken down into seven broad categories.



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THATCH MANAGEMENT

All of the new second generation ultradwarf couchgrasses tend to produce a large amount of thatch with MiniVerde being the greatest thatch producer, particularly compared to Tifdwarf and Tifgreen. The maintenance of the new *Cynodon* hybrids will require a programme of regular dethatching/grooming as well as regular light dustings of sand. Thatch prevention should begin 3-4 weeks after planting a new ultradwarf couchgrass green, with an emphasis on prevention rather than control.

GREEN SPEED

The ultradwarfs produced faster green speeds than the current industry standards Tifgreen and Tifdwarf. However, all *Cynodon* hybrids were considerably faster than the seashore paspalums (comparable to the speed difference of bentgrass and couchgrass) under trial conditions. Green speed was fastest being cut at 3.5mm and rolled (compared to 3.5mm cut, no roll and 2.7mm cut, no roll).

DISEASE INCIDENCE

All trial sites reported the occurrence of disease in the *Cynodon* hybrids with the main incidence of disease occurring during the dormancy period (autumn and winter). The main issue reported was patch diseases which included both *Gaumannomyces* and *Rhizoctonia* species.

There were differences in severity of disease between cultivars, however, the severity of the disease was not consistent between cultivars and is largely attributed to an environment (location) effect. In terms of managing the occurrence of disease, the incidence of disease becomes less severe where there is a higher fertility rate (about 3kg N/100m²/year) or when a preventative fungicide programme is adopted.

MOWING HEIGHTS

Cynodon hybrid and seashore paspalum cultivars maintained an acceptable to ideal surface being cut between 2.7mm and 5.0mm. Ultradwarf cultivars can tolerate mowing heights as low as 2.5mm for short periods but places the plant under high levels of stress. Greens being maintained at a continually lower cutting height (e.g.: 2.7mm) of both species is achievable, but would need to be cut daily for best results.

The seashore paspalums performed best when cut at a height of between 2.7mm and 3.0mm. If a lower cutting height is adopted, regular and repeated mowings are required to reduce scalping and produce a smooth surface.

FERTILISATION

At this point in time the optimum rate of nitrogen (N) for the *Cynodon* hybrids is 3kg/100m²/year, while the seashore paspalums is 2-3kg/100m²/year.



DEEDI technical staff remove large amounts of thatch from the *Cynodon* hybrid cultivars. All of the new second generation ultradwarf couches tended to produce a large amount of thatch



DEEDI technical staff applying fertiliser treatments to the Redlands plots. A key component of the trial was to investigate best management practices for the new ultradwarf cultivars

DORMANCY

Dormancy occurred for all *Cynodon* and seashore paspalum cultivars from north in Brisbane (QLD) to south in Mornington Peninsula (VIC) and west to Novar Gardens (SA). *Cynodon* and paspalum growth in the cooler climates of Victoria and South Australia was less favourable.

VARIANCE

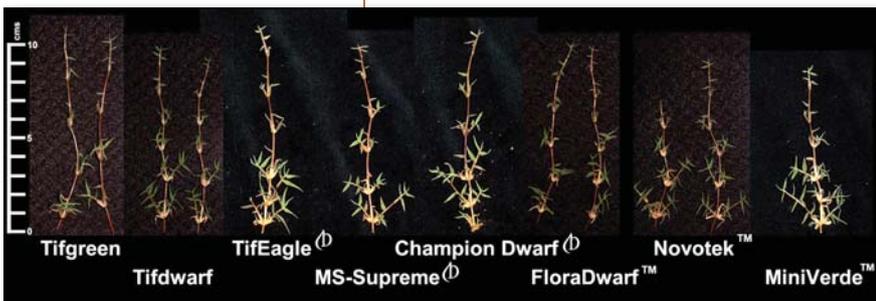
After combining the data collected from all eight sites, the results indicated that there can be variation (e.g.: turfgrass quality, colour, disease resistance, performance) depending on the site and climatic conditions. Such evidence highlights the need to undertake genotype by environment (GxE) studies on new and old cultivars prior to conversion or establishment.

From the above findings, if a club is looking to select either a new *Cynodon* hybrid or seashore paspalum cultivar for use at their club it is recommended they should consider the following:

- Review the research data;
- Look at trial plots;
- Inspect greens in play that have the new grasses.
- Select 2-3 cultivars that are considered to be the better types;
- Establish them in large plots/nursery/practice putter which are big enough to putt on. Ideally the area should be subjected to wear;
- Maintain them exactly as they would be on the golf course/bowls green. This is a critical aspect. Regular mowing, fertilising etc. is essential;

Below: *Cynodon* hybrid cultivars trialled throughout the project

Below right: Seashore paspalum cultivars trialled as part HAL Project TU05001



- Assess them over at least 2-3 years;
- Make a selection and establish it in a playing green so that it is subjected to typical wear.

CONCLUSION

The above data aims to provide just a technical summary of this extensive project. The final Horticulture Australia report is available in its entirety from the HAL website http://www.horticulture.com.au/reports/search_final_reports.asp.

As for the future of the DEEDI warm-season greens trial site, it is likely that additional funding will be sought from HAL to further investigate BMPs for thatch and disease control etc. An application will only be submitted if there is sufficient industry support in the form of voluntary contributions (VCs). For more information on this please contact Matt Roche on (07) 3286 1488 or email Matt.Roche@deedi.qld.gov.au.

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Commercial industry support for this project was extremely gratifying. Numerous financial or in-kind contributions enabled the construction of essential infrastructure such as the building of the Redlands greens test facility and the collection of necessary maintenance equipment for staff to successfully undertake studies. Supporting companies included: David Burrup Golf Course & Sports Turf Design, Southern Pacific Sands, Twin View Turf, Jimboomba Turf, Root Barrier, Rain Bird, Hydro Pumping & Controls, Globe Australia and Moreton Institute of TAFE, John Deere & BHM Machinery, Power Turf, Tru-Turf and Toro Australia.

Editor's Note: Matt Roche will provide a more in depth look at the results from this project during the 26th Australian Turfgrass Conference on the Gold Coast – (Golf Stream - 8.45am-9.30am, Thursday 24 June). 🌱

