Warm-season wear trials wind up

DEEDI senior research scientist Matt Roche looks back over the Horticulture Australia Limited-funded project TU08018 which over the past four years has extensively explored the wear tolerance and recovery of various warm-season turfgrasses used primarily on community sportsgrounds.

HAL
Know-how for Horticulture™

The recent Department of Employment, Economic Development and Innovation (DEEDI) community sportsfield studies have come to an end after nearly four years of R&D activities. In 2008, a two-year research project (TU08018), funded by Horticulture Australia Limited (HAL), was set up to investigate the effect of wear and compaction of different turfgrasses, primarily for sports field use.

Trial sites were established at DEEDI's Redlands Research Station (RRS) and the Redlands Touch Association (RTA) to apply and assess wear in a single simulated site utilising DEEDI's wear traffic simulator at RRS and two sites undergoing actual wear (through the playing of touch football games) located at RTA.

In 2010, an extension was granted by HAL to continue the warm-season wear studies being conducted in Queensland, but also undertake further R&D work associated with the grasses (as outlined in Table 1) suitable for sportsfield, recreational, golf and/or recreational use. These projects included:

- Establishing a case study site at the University of Queensland's (UQ) St Lucia Campus to trial, on a larger scale, unreplicated 1500m² plots of Grand Prix, OZ Tuff, TifSport™ and Wintergreen couchgrass;
- Conduct ash and lignin fibre testing to correlate results against wear tolerance data; and
- Undertake efficacy/phytotoxicity testing of the plant growth regulator Trinexapac-ethyl. The growth regulator was also applied using different rates over a 12 month period to collect mowing frequency data.

As part of the RRS and RTA wear trials, subjective quality and percentage bare ground, along with traction, hardness (Clegg hammer) and moisture data has been collected from all three trial sites (RRS, RTA and UQ).

TABLE 1. TURFGRASS CULTIVARS TRIALLED (HAL PROJECT TU08018)

Scientific name (common name)	Cultivar	
Cynodon dactylon (green couch)	TifSport™	Grand Prix
	OZ TUFF™	CT-2
	Wintergreen	AGRD
	Hatfield	Winter Gem
	Conquest™	Premier
	Legend®	Blue Dynasty
C. dactylon x C. transvaalensis (*Cynodon* hybrid)	Tifgreen	MiniVerde™
	Tifdwarf	Novotek™
	MS-Supreme	Santa ana
	TifEagle	Patriot
Digitaria didactyla (blue couch)	Tropika	QLD Blue
	Aussiblue	MRD-1
Paspalum vaginatum (seashore paspalum)	Sea Isle 2000	Velveteen™
	Sea Isle Supreme™	
Pennisetum clandestinum (kikuyu)	Whittet	

Note: Not all turfgrass cultivars are being tested in each study.

The Redlands Research Station wear trial site as of 22 March 2012. HAL Project TU08018 has been running since 2008 to investigate the effect of wear and compaction of different warm-season turfgrasses used mainly for sportsfield use

RSS TRIAL SITE – WEAR

Wear data obtained from the RRS simulated wear study (Table 2, pg 70) has shown enormous variation in wear tolerance (percentage bare ground) between the three species trialled (green couch, blue couch and kikuyu).

Following the recommendations of McAuliffe and Roche (2009), a field with 15 per cent or greater wear should be considered unfit for play. Under these guidelines, if a sportsfield planted with blue couch (e.g.: cultivars Aussiblue, Tropika) undergoes high usage (as simulated at the RRS trial site in a sub-tropical environment), the results show that a field of this nature would be out of play 56-100 per cent of the time.

If kikuyu (e.g.: Whittet) was planted across a sportsfield undergoing the same amount of wear, the field could be closed between 55-100 per cent of the season. However, the kikuyu plots at RRS had to be re-established twice (January 2010 and November 2011) and by the end of the trial in late April 2012 would be in need of further turf replacement, because of minimal to zero recovery.

If a variety of green couch were planted (e.g.: Conquest, Grand Prix, Legend, OZ TUFF, TifSport™) across the field it would be less likely that a field closure would take place. On average, only 21-44 per cent of the time would a field closure result if wear was greater than 15 per cent. However, there is also significant variation present within the green couch varieties, with wear damage being between 5-83 per cent.

RSS TRIAL SITE – PGR

Trinexapac-ethyl treatments were applied six times in 2011 (5 April, 3 May, 14 September, 11 October, 9 November and 15 December) and three times in 2012 (10 January, 1 and 28 February) to the sportsfield and/or recreational grasses trial at RRS.

The DEEDI wear traffic simulator in action at the Redlands site

As part of the extension of HAL Project TU08018, a height of cut trial site was established at Redlands to investigate the practicality of using growth regulators versus mowing requirements

Decompaction work being undertaken of the D1, D2 and D6 wear trial plots at Redlands Research Station

Twelve months' data was collected of turf colour (using a Turf Colour Meter) and mowing frequency. Variation in the number of mows required using different Trinexapac-ethyl rates on different grass species and cultivars was observed. These results, which will be published in the TU08018 HAL final report, will show to turf managers that, given the correct environment, they will have the ability to save time and resources by using growth regulators as per the recommended label to reduce the need for mowing.

Trinexapac-ethyl treatments were applied to the greens quality grasses located at the RRS greens testing facility (see photo page 72) on nine occasions in 2011 (5 and 19 April, 3 May, 17 and 28 September, 11 and 25 October, 9 November and 15 December) and three occasions in 2012 (10 January, 1 and 14 February.)

Phytotoxicity data (after Australian Weeds Committee 1979), Turf Colour Meter and subjective turf quality (0 = worst, 6 = acceptable, 9 = best) data is to be withheld until 30 June 2017 under a commercial-in-confidence clause with Voluntary Contributor Syngenta Crop Protection P/L. However, performance information of these treatments will be made available in the final report.

The RRS greens testing facility containing four replications of the Cynodon hybrid cultivars Tifgreen, Tifdwarf, MS-Supreme, TifEagle, MiniVerde™ and Novotek™, and the seashore paspalum cultivars Sea Isle 2000, Sea Isle Supreme™ and Velvetene™, will be wound up in June 2012 following minimal interest associated with R&D activities with the improved greens quality grasses.

This is disappointing following interest sparked by the warm-season greens grass management trial (HAL Project TU05001), but somewhat understandable due to the slow conversion rate by golf and/or bowls clubs. The latter is largely due to the increase in resources and change in management practices (e.g.: dethatching) needed to maintain the latest 'ultradwarf' varieties.

RTA AND UQ SITES

Phase 1 (ratings of Fields 3 and 4) of the RTA site ended in May 2011. The two years of data collected,

CONTINUED ON PAGE 72

TABLE 2. AMOUNT OF WEAR (RRS SITE)

	2009/2010		2010/2011		2011/2012	
Cultivar	Bare ground higher than 15%	Maximum bare ground observed	Bare ground higher than 15%	Maximum bare ground observed	Bare ground higher than 15%	Maximum bare ground observed
Aussiblue	75%	87%	77%	97%	41%	88%
Conquest	61%	58%	65%	83%	38%	70%
Grand Prix	8%	17%	54%	53%	38%	57%
Legend	31%	43%	62%	59%	38%	41%
OZ TUFF	0%	5%	0%	14%	0%	6%
TifSport	3%	16%	65%	69%	35%	81%
Tropika	69%	85%	100%	99%	42%	89%
Whittet	94%	87%	100%	89%	55%	98%

Note: Figures represent the amount of wear (bare ground) observed following analysis of collected data from within the RRS simulated wear study between 2009 and 2012. During 09/10 the collection period was from 16/5/09 to 14/5/09, at the time of publication only 36/80 days have been statistically analysed; During 10/11 the collection period was from 19/5/10 to 18/5/11, at the time of publication 26/58 days have been statistically analysed; During 11/12 the collection period was from 25/5/11 to 20/3/12 (current), at the time of publication 26/36 days have been statistically analysed.

The Redlands warm-season greens grass testing facility trialled various treatments (rates) of growth regulator across a range of 'industry standard' and improved *Cynodon* hybrid and seashore paspalum cultivars for golf and/or lawn bowls use

CONTINUED FROM PAGE 70

including wear and turf quality ratings, traction, Clegg and moisture will be made available in full in the HAL final report.

The wear experienced at the RTA site compared to the RRS site is slightly less severe, largely because of the DEEDI wear traffic simulator used at RRS. The analysed wear data (Table 3, page 72) shows that the green couches experienced between 13-79 per cent damage. The extreme damage (up to 79 per cent) was observed on the 5 January 2011 assessment date, during the time of the 2011 Brisbane floods. The latter observations highlight the need for appropriately timed field closures during inclement weather.

TifSport data was captured as part of Phase 1, however, it is not statistically part of the trial. TifSport was not included in the statistical design at the request of Redlands City Council as it was on the remainder of the field, surrounding the trial.

Wear, subjective turf quality, traction, Clegg and moisture data was also collected from within Phase 2 (Fields 5 and 6) of the RTA trial. The trial evaluating the performance of six green couch varieties ended in March 2012 allowing for two complete years of data to be collected.

Results indicate that the wear damage observed (Table 4) is similar to that seen in Phase 1 (Table 3). The major difference is that Legend couch was excluded from the trial at the request of Redlands City Council and RTA staff because of its performance in the 2009-2011 (Phase 1) study.

Inspections of the UQ case study site (Field 4 at the university's St Lucia Campus) were conducted by the project leader on 10 November 2011, 2 March and April 2012. Information collected from the UQ site, including photographs, along with a summarised progress report from UQ's senior supervisor grounds Shane Biddle will be made available in the HAL final report.

FINAL REPORT

Data and information collected throughout the duration of the TU08018 study will be made available to the wider turf industry in the HAL final report due in June 2012. You will be able to download a copy of the report from the AGCSA (www.agcsa.com.au) and Sports Turf Association (www.sportsturf.asn.au) websites following its release by HAL. Information will also be rolled out in future editions of Australian Turfgrass Management Journal.

Past updates on HAL Project TU08018 can be found in Australian Turfgrass Management Journal Volumes 12.2 (March-April 2010 – **'Grass roots wear and tear'**), 12.4 (July-August 2010 – **'Turf wearability and recovery of community sportsgrounds'**) and 13.2 (March-April 2011 – **'DEEDI wear tolerance trials extended'**).

TABLE 3. AMOUNT OF WEAR (RTA SITE – PHASE 1)

Cultivar	Bare ground higher than 15%	Maximum bare ground observed
Conquest	21%	44%
Grand Prix	9%	38%
Hatfield	4%	18%
Legend	42%	79%
OZ TUFF	3%	17%
Wintergreen	0%	13%

Note: Figures represent the amount of wear (bare ground) observed following analysis of collected data from within Phase 1 (Fields 3 and 4) of the RTA wear study between 2009 and 2011. Data was collected between 12/5/09 and 23/5/11, to date only 38/72 days have been statistically analysed.

TABLE 4. AMOUNT OF WEAR (RTA SITE – PHASE 2)

Cultivar	Bare ground higher than 15%	Maximum bare ground observed
Conquest	24%	40%
Grand Prix	5%	20%
Hatfield	5%	25%
OZ TUFF	0%	14%
TifSport	5%	28%
Wintergreen	0%	12%

Note: Figures represent the amount of wear (bare ground) observed following analysis of collected data from within Phase 2 (Fields 5 and 6) of the RTA wear study between 2010 and 2012. Data was collected between 17/3/10 and 11/1/12 (available data), thus far 46/46 days have been statistically analysed.

ACKNOWLEDGEMENTS

DEEDI gratefully acknowledge support from the following organisations, clubs and business groups in funding, contributing in-kind or assisting with the trials. They include: Horticulture Australia Limited, Redlands Touch Association, Q Turf Machinery, Sports Turf Institute (Aust.), Sports Turf Association QLD Inc. (STA QLD), Sports Turf Association NSW Inc. (STA NSW), Turfgrass Association Australia Inc. (Victoria) (TGAA VIC), Australian Golf Course Superintendents Association (AGCSA), Golf Course Superintendents Association Queensland (GCSAQ), Golf Queensland, Syngenta Crop Protection P/L, Oz Tuff Turf, Australian Lawn Concepts, Dad and Dave's Turf, Evergreen Turf, Twin View Turf, Turf Force, Turf Solutions, Turf World, Caboolture Turf, Jimboomba Turf and Progressive Seeds.

A special mention needs be made about Redland City Council and University of Queensland who should be congratulated for their proactive approach to keeping the community's sportsfields safe and open and investing in research that will allow members of the community to continue playing sport and living a healthy lifestyle.

DEEDI staff would also like to thank the Turf Industry Advisory Committee (IAC) and HAL for their support in extending the project over four years.

Doing so has provided community sporting groups who rely on the performance, including safety, of natural turf surfaces with solid information on which to base future turf installation decisions.

Should you wish to discuss activities of the above trials or speak to Matt Roche regarding innovative research and development opportunities for your business or organisation, please contact him via email Matt.Roche@deedi.qld.gov.au.

Field 4 at the University of Queensland's St Lucia Campus which has been established with unreplicated 1500m² plots of Grand Prix, OZ Tuff, TifSport™ and Wintergreen couchgrass

REFERENCES

***Australian Weeds Committee (1979)**. 'Guidelines for Field Evaluation of Herbicides'. Australian Government Publishing Service, Canberra.*

***McAuliffe, K. and Roche, M. B. (2009)**. TU06019: Best Use Modelling for Sustainable Australia Sports Field Surfaces. Final Project Report for Horticulture Australia Ltd (HAL).*