



Grass roots

wear and tear

The Queensland Department of Employment, Education, Development and Innovation (DEEDI) is working together with Redland City Council on testing and evaluating a series of warm-season turfgrasses under simulated and actual wear conditions on community sporting fields. Pictured is the planting of phase two of the trials (foreground) and the surrounding turf (background) at the Redlands Touch Association in late November 2009

Winter is arguably one of the toughest times of the year for turf managers when sportfield usage is high and the recoverability of the turfgrass is low. It goes without saying that in order to provide the best opportunity to get through to spring, turf managers need to ensure they have the best quality turfgrass.

Choosing the appropriate species or cultivar is half the battle. However, neither the right grass nor a finely tuned management programme will overcome unrealistic expectations, poor growing environments or limitations due to improper construction techniques (Bevard et al., 2005)

Persons involved in the design and construction of sports fields need to place greater emphasis on what variety of turfgrass should be planted. This decision should be influenced by research findings and not driven by cost, which can often be the case.

To assist those people involved in the development, funding (e.g. government agencies offering grant money) and management of

DEEDI senior research scientist Matt Roche outlines how a new research project being carried out in conjunction with Redland City Council in Queensland will help provide community sporting clubs and local councils with additional information in choosing suitable turfgrass varieties for facilities which experience high usage.

the playing surface, including the end users (e.g. community groups or sporting clubs), the Queensland Department of Employment, Education, Development and Innovation (DEEDI) is working together with the Redland City Council in Queensland on testing and evaluating a series of warm-season turfgrasses under simulated and actual wear conditions on community sporting fields.

The aim of this work is to rank the turfgrass cultivars in relation to wear tolerance and recoverability. A higher ranking will provide



community sporting clubs with additional information in choosing a suitable turfgrass for their facility, particularly if they experience high and/or frequent usage of their fields.

Phase one of the two-phase study involved construction and setup of trial sites at Redlands Research Station (RRS) and the Redlands Touch Association (RTA) between 7 and 12 January 2009. Eleven months later phase two of the trial began with construction of two additional fields at the RTA taking the number of fields under actual wear and assessment to four.

The turfgrasses being trialled at the RTA and/or RRS sites are made up of:

- Seven green couch (*Cynodon dactylon*) – TifSport, OZTUFF, Wintergreen, Hatfield, Conquest, Legend and Grand Prix);
- Kikuyu (*Pennisetum clandestinum* (Whittet))

- Two blue couch (*Digitaria didactyla*) – Tropika and Aussiblu

WEAR TOLERANCE AND RECOVERY

In earlier simulated wear studies (Roche et al., 2009) conducted between 2006 and 2008 at RRS on eight *Cynodon* cultivars, the turfgrasses incurred higher levels of wear, damage and compaction to best simulate elite sportsfield conditions. Given that the current trial conditions are different, inputs such as fertiliser are reduced and a sandy loam/clay soil type is being used instead of a USGA type sand.

The wear being imposed by the DEEDI wear machine (based on the design of the GA-SCW Simulator (Carrow et al., 2001) developed in Georgia, USA) had to be finely tuned over time to replicate the damage being imposed by players at the RTA ground.

Variation in wear tolerance and recovery of (from left) blue couch, green couch and kikuyu at Redlands Research Station (20 October 2009)



Variation in green couch cultivars being tested at the Redlands Touch Association grounds (12 November 2009)

Significant variation in wear tolerance and recovery has been observed to date at the RRS and RTA trial sites during phase one of the study. The RRS site is showing that usage of this magnitude, under routine council turfgrass management practices, does not favour kikuyu and blue couch (see photos previous page). A similar situation is emerging for some green couch cultivars being trialled at the

RTA and both sites are showing variation in wear tolerance and especially wear recoverability in the green couches (see photos above).

Decompaction treatments are also being applied at both the RRS and RTA trial sites. Treatments are being applied at six-week intervals, twice a year, yearly and a control plot at the RRS site is also being assessed to determine what level of difference the effect decompaction has on the playing surface.

Throughout phase one of the trial at both the RTA and RRS sites, two-spotted mite (*Tetranychus urticae* Koch) damage has been observed. Mites possess the ability to inhibit the lateral development of the turf plant by feeding on plant tissue following the puncturing of the surface cells with their fangs or stylets.

The damage caused following an infestation of mites can often be seen following a close inspection of the turf (see photo opposite) and is best described as 'the witches broom effect'. The arachnids, which are between 0.2 and 0.5mm in size, are commonly very hard to find and accurately identify. The result, if not detected, poses a threat to new leaf and stolon tissue that become severely distorted effecting lateral growth and turf vigour which is not desirable when turf recovery of a sportsfield is essential.

Further research into the lifecycle (including feeding habits) and safe, effective control of the mites is warranted. From observations made in the field, it seems that particular cultivars are resistant to the effects of two-spotted mites and cultivars with high total cell wall content (TCW), lignin and neutral detergent fiber (which are associated with wear tolerance, Roche et al., 2009) are not excluded from being attacked.

Phase two of the trial commenced wear applications in February 2010 to coincide with the Redlands Touch Association's playing schedule. It is anticipated that results from phase one of the study will be published in time for distribution at the forthcoming Australian Turfgrass Conference and Trade Exhibition on the Gold Coast (21-25 June 2010).

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Further information on the Horticulture Australia project Traffic Tolerance of Warm-Season Turfgrasses under Community Sports Field Conditions (TUO8018) can be found at www.deedi.qld.gov.au.

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Damage of plant growth following two-spotted mites (*Tetranychus urticae* Koch) damage in early January 2010. Mites possess the ability to inhibit the lateral development of the turf plant by feeding on plant tissue following the puncturing of the surface cells with their fangs or stylets



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QUEENSLAND DEEDI CALLS FOR CHEMICAL PHYTOTOXICITY TESTING EXPRESSIONS OF INTEREST

Over the last nine years Horticulture Australia Ltd (HAL), together with voluntary contributions (VCs) from the turf industry, has funded three consecutive research projects (HAL Projects TU00011, TU04006 and TU06008) in the Chemical Phytotoxicity Testing Facility for Warm-Season Turfgrasses at the Queensland Department of Employment, Economic Development and Innovation's Redlands Research Station in Cleveland.

The phytotoxicity testing facility has provided chemical companies and the Australian turf industry with an invaluable testing site to evaluate the phytotoxic effects of selective turf pesticides on 28 warm-season turfgrass cultivars from 16 different turf species.

From commencement in 2001, a total of 76 products consisting of 187 different treatments have been tested at Redlands. During the first three years, 39 products were comprehensively examined, resulting in the registration of 12 new products for the turf industry.

Following the success of this research and consequently the availability of new pesticides, and to develop additional options for a range of host grass/weed combinations, DEEDI is seeking to continue this work on a newly developed evaluation site at Redlands Research Station.

Chemical phytotoxicity testing of varied turfgrass species and cultivars can be undertaken cost effectively at the Redlands testing facility. Additionally, the registration of generic or selective pesticides can be fast-tracked for the mutual benefit of turf producers and the chemical companies. This work is extremely valuable as very few chemicals are registered for use on turf within Australia. The availability of a wider range of effective chemicals for the control of weeds, pests and diseases will reduce chemical misuse within the turf industry.

The current HAL Project TU06008, led by DEEDI senior research scientist Matt Roche, will be completed in May 2010. As such DEEDI is seeking expressions of interest from the turf industry in the form of voluntary contributions (VCs) to continue providing the industry with this resource from late 2010 and beyond.

The new 0.5 hectare phytotoxicity testing facility will be constructed to meet industry needs with DEEDI providing dedicated labour to maintain and if requested, apply and assess experiments. To obtain further information regarding the phytotoxicity testing facility, or to discuss the opportunity of becoming a voluntary contributor to the project, contact Bartley Bauer of DEEDI on (07) 3286 1488 or email Bartley.Bauer@deedi.qld.gov.au.