



Turf tested in the tropics

DAFFQ senior research scientist Matt Roche provides an update on the amended adaptation of warm-season turf for the tropics research project.



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Above: The Mackay Regional Botanic Gardens is one of two trial sites being used as part of DAFFQ's warm-season turf for the tropics project

The aim of the 'Adaptation of warm-season turf grasses for the tropics' project (HAL Project TU09001), was to obtain a greater understanding of how a diverse range of warm-season turf-grasses would handle the tropics. A total of 25 varieties comprising of 14 species were chosen (Table 1) to assess their performance against challenging environmental parameters (e.g.: shade, wear and drought) and resources (e.g.: nutrition).

Two trial sites were established in mid-2011 in Mackay and Darwin with the assistance and support from the Mackay Regional Botanic Gardens and Darwin City Council (Wagaman Park) respectively. A third site was to be established at The Centre of Urban Greenery and Ecology's (CUGE) HortPark in Singapore, however, due to unforeseen circumstances CUGE withdrew from the project as a voluntary contributor and the Singaporean site dropped from the project.

CUGE's withdrawal meant that the budgeted sum of over \$145,000 of matched funds would no longer be available to the project. Discussions between the Department of Agriculture, Fisheries and Forestry Queensland (DAFFQ) and potential voluntary contributors (VCs) to buy into the project commenced early in the New Year.

This included a proposal put forward to the Turf Industry Advisory Committee (IAC) to invest \$30,000 of turf R&D levy money to support the project and stop it from folding as a result of CUGE's withdrawal. The project variation request for levy funds was not endorsed by the IAC through communication received by DAFFQ on 12 March 2012. The IAC felt that the project (TU09001) was not aligned with the Strategic Investment Plan initiatives to date, and the project only benefitted a minority of levy payers.

DAFFQ senior management thought that the

project still had merit and that significant information would still be gained from having the Mackay and Darwin trial sites continue, albeit in a limited capacity. A voluntary contribution of \$30,000 was made from DAFFQ royalty money to support the adaptation of warm-season turf grasses for the project study by DAFFQ on 4 April 2012, which was agreed to by HAL on 14 May 2012.

Following the modified HAL head agreement, the project in its current form (available budget) will allow for a total of three formal assessments to be conducted by DAFFQ research staff of the Darwin and Mackay trial sites to track comparative turf performance only (e.g.: turf quality, colour, mowing requirements, incidence of disease).

Within the original HAL application nutritional studies aimed to reduce nitrous oxide emissions through reduced fertiliser applications and "traffic stress" (implementing wear and compaction) studies using a simulated wear machine (similar to work undertaken during TU08018) were to be undertaken at both the Darwin and Mackay trial sites. However, due to a significantly reduced budget as a result of CUGE's withdrawal and no financial support being made available from the turf R&D levy, these parameters are unable to be researched.

The most recent inspection of the Mackay and Darwin trial sites was conducted on 26 and 27 June 2012 respectively. A summary of the condition of each turf cultivar being trialled to date follows (**M** = Mackay and **D** = Darwin). Where plugs were used to establish the plots, these were planted at approximately 150 x 150mm spacings on 12 July 2011 (Mackay site) and 26 July 2011 (Darwin site).

BROADLEAF CARPET GRASS

Mackay: Planted as sod. The combination sward is nearly equal halves carpet grass and green couch as commonly seen in the tropics (referred to as buffalo grass). The variety is very fast growing and is already in need of a mow after having been cut five days ago. The growth is comparable to the blue couch varieties (Aussibluue and Tropika) being trialled. Nutrition is moderate which is highlighted by the purplish colour in the leaves. Low thatch. Some broadleaf weeds are present as too are ant nests.

Darwin: Established by seed. The carpet grass looks to be a good genotype, somewhat finer than other common broadleaf carpetgrass varieties. Has produced a dense sward under close mowing. Approximately 90 per cent of the plot is carpet grass and 10 per cent green couch. Nutrition level and colour are excellent. Fast vertical growth compared with other varieties, meaning a greater mowing requirement. Low thatch.

OZ TUFF

M: Planted as sod. Good colour. Some dieback in the turf possibly due to disease. Some nutgrass is present. Moderate to high thatch.

D: Established by sod. Possible mite damage is



evident. Good nutrition level and turf colour. Some encroaching contamination from surrounding plots. Moderate thatch.

25A-1 (GREEN COUCH)

M: Planted as plugs. Rapid cover and growth. The variety has produced an even sward and looks as if it had been planted by full sod and is comparable to other laid grasses, whereas the majority of the plug planted varieties are still forming complete swards. Good colour. Some dieback in the turf possibly due to disease. Thatch moderate. Some weeds present.

D: Established by plugs. A high level of contamination present, particularly from the surrounding Aussibluue plot. Turf colour is good. Some mite damage visible. Low thatch.

TROPIKA

M: Planted as sod. The variety is very fast growing (equal to Aussibluue) and is already in need of a mow after having been cut five days previous. Good colour and density. Fertility levels are good. Thatch moderate. High level of green couch contamination is present (although surrounding plots are not green couch). Excess clippings are still present across the turf as a result of high moisture levels (the moisture makes it difficult to catch and remove grass clippings from the fast growing turf).

D: Established by sod. Fast vertical and lateral growth compared with other varieties. Nutrition and turf colour is good. No weeds present. Thatch level low to moderate.

AUSSIBLUUE

M: Planted as sod. The variety is very fast growing (equal to Tropika) and is already in need of a mow after having been cut five days previous. Good colour and density. Fertility levels are good.

Thatch moderate to high. High level of green couch contamination is present (although surrounding plots are not green couch). Excess clippings are still present across the turf as a result of high moisture levels (the moisture makes it difficult to catch and remove grass clippings from the fast growing turf).

D: Established by sod. Fast vertical and lateral growth compared with other varieties. Excellent turf colour and density. Thatch level moderate.

SHADEGRO

M: Planted as plugs and additional seed. Variable growth is observed in the purple and lime green colour foliage. Some necrosis within foliage as a result of disease and or sun damage. Density of turf is good in areas that have covered. Low to moderate thatch. Nutrition levels are low.

D: Established by plugs. High contamination present. However, where the variety is growing, the sward is very healthy. Good turf colour, even some purpling of the leaves (see photo below).



Left: The Darwin trial site at Wagaman Park was established in mid-2011. A total of 25 varieties comprising 14 species were chosen to assess at both sites

The variety ShadeGro showing purpling of the leaves at the Darwin trial site

TABLE 1. WARM-SEASON TURFGRASS CULTIVARS BEING TRIALLED (HAL PROJECT TU09001)

Species	Common name	Variety	Planted as	Darwin	Mackay
<i>Axonopus compressus</i>	Broadleaf Carpet Grass	Broadleaf Carpet Grass	Sod	Y	Y
<i>Cynodon dactylon</i>	Green Couch	OZ Tuff™	Sod	Y	Y
<i>Digitaria didactyla</i>	Qld Blue Grass	Tropika	Sod	Y	Y
<i>Eremochloa ophiuroides</i>	Centipedegrass	Centek	Sod	Y	-
<i>Panicum laxum</i>	-	ShadeGro™	Plugs	Y	Y
<i>Paspalum nicorae</i>	Brunswick grass	Blue Dawn	Plugs	Y	Y
<i>Paspalum notatum</i>	Bahia grass	LowGrow™	Seed	Replaced*	Y
<i>Paspalum vaginatum</i>	Seashore paspalum	Sea Spray	Seed	Y	Y
<i>Stenotaphrum secundatum</i>	Buffalo Grass	Kings Pride	Sod	-	Y
<i>Zoysia hybrid</i>	Zoysia grass	Sir Walter	Sod	Y	-
<i>Zoysia japonica</i>	Zoysia grass	PristineFlora™	Plugs	Y	Y
		Empire™	Sod	Y	Y
		Palisades	Plugs	Y	Y
		ZT-11	Sod	Y	Y
<i>Zoysia macrantha</i>	Zoysia grass	Nara™	Sod	Y	Y
<i>Zoysia matrella</i>	Zoysia grass	Royal	Plugs	Y	Y
		Shadetuff®	Sod	Y	Y

*Replacement was made between LowGro™ with Centek because of LowGro's poor establishment.

BLUE DAWN

M: Planted as plugs. Still sparse in areas that have not covered. Very fast vertical growth even after having been mown five days prior. Blue Dawn is probably the fastest vertical growing variety of all varieties being trialled in Mackay. Nutrition is good. Topdressing is required. Ant nests are also present within the open sward.

D: The density of the sward looks as if it had been established by sod, not plugs. Excellent cover/density. Has the highest vertical growth of all varieties trialled (see photo below). Broadleaf weeds are present. Thatch levels are low.



The Brunswick grass variety Blue Dawn had the highest vertical growth of all varieties at both trial sites at the most recent assessment



LOWGROW

M ONLY: Planted as plugs and additional seed. Slow to spread, but has excellent root development. Moderate to fast vertical growth for mowing. Good (contrasting/different) colour of leaves which are also hairy on both sides of the leaf. Some broadleaf weeds are present. Further seed will need to be sent and added to the plots to achieve full cover. (See photos left)



CENTEK

D ONLY: Established by sod. Excellent turf colour and nutrition. Moderate vertical growth. No weeds. Good turf density. Thatch moderate to high.

Although slow to spread, LowGro (bahiagrass) exhibited excellent root development and good colour of leaves which are hairy on both sides

SEA SPRAY

M: Somewhat sparse in cover, however, the variety was established by seed. A mix of weeds is present within the open sward. Some yellowing of foliage is present. Nutrition level is moderate. Thatch moderate.

D: Established by seed. Excellent colour and density (see photo below). However, moderate to high level of contamination throughout all plots. Moderate thatch.



Right: Seashore paspalum variety Sea Spray exhibited excellent colour and density at the Darwin trial site

KINGS PRIDE

M ONLY: Planted as sod. Very high thatch, the most of all varieties trialled in the Mackay trial. Good dark green colour. Fast vertical growth in need of a mow even though the variety had been mown five days earlier. Growth, however, is not as fast as Aussiblu or Tropika. Disease is also present. Porpoising of the stolons is noticeable. Damage is evident to the leaf tips from the self-propelled mower blades.

SIR WALTER

D ONLY: Established by sod. Excellent turf colour. Some scalping from mower blades and or scarification has occurred and recovery is slow because of its stoloniferous growth. Moderate vertical growth compared to blue couch varieties and Blue Dawn. Nutrition level is good as is colour. No weeds present. Thatch moderate to high.

PRISTINEFLORA

M: Planted as plugs. Topdressing is needed. Nutrition is good. Some weeds are present. Seeding profusely (see photo below). Thatch is low to moderate due to its establishment method.

D: Established by plugs. A high level of contamination, particularly of Aussiblu, is present within the sward. Mite damage is visible. Colour is OK, nutrition is low. Minor undulations are present within the sward. Thatch is moderate to high.



EMPIRE

M: Planted as sod. High thatch level. Has produced a good consistent even sward. Good colour. Damage is evident to the leaf tips from mower blades, but regrowth excellent. Nutrition good.

D: Established by sod. Scalping present from mower blades. Nutrition level and turf colour is good. Low inflorescence presence.

PALISADES

M: Planted as sod. Has produced a good consistent sward. Damage is evident to the leaf tips from the self-propelled mower blades. Some disease is also visible. Low incidence of flowering. Nutrition level is good. Thatch moderate.

D: Established by plugs. Excellent development – the plots looks as if it was established by sod. Good colour and density. Some weeds are present within the canopy. Thatch level low to moderate.

ZT-11 (ZOYSIA)

M: Planted as sod. Very high thatch. Good colour and nutrition present. Moderate inflorescence present within the consistent growing sward.

D: Established by sod. Vertical growth is the fastest of the Zoysia varieties trialled. Good colour and density. Weeds present within the canopy. High inflorescence density. Thatch moderate to high.

NARA

M: Planted as sod. Some dieback from disease, possibly. Damage is evident to the leaf tips from the self-propelled mower blades. High level of green couch contamination present. No visible inflorescence seen within the sward. High thatch levels. Some broadleaf weeds present.

D: Established by sod. Some scalping from mower blades. Nutrition level is moderate to low. Inflorescence density is low. Thatch level is moderate.

ROYAL

M: Planted as plugs. Low nutrition level. Strong stolons porpoising across the establishing sward (see photo below). Topdressing is needed. Some blue couch contamination is present. Moderate inflorescence incidence. Low thatch level because of the establishment method.

D: Established by plugs. Good density and turf colour. Minor undulations present within the sward.

Nutrition is moderate. Weeds are present within the canopy. High inflorescence density. Thatch level is low to moderate.



The zoysia variety Royal at the Mackay site. This variety exhibited strong stolons porpoising across the establishing sward

SHADETUFF

M: Planted as sod. Very high thatch level. Good dark green colour and density. Seeding profusely.

D: Established by sod. Good turf density. Nutrition is low. Weeds are present within the canopy. Scalping observed. Moderate to high inflorescence density. Thatch level is moderate.

Over the course of the study images from the Mackay and Darwin trial sites have been uploaded to the Redlands Turf Research photostream on Flickr www.flickr.com/photos/redlandsturfresearch/. Should you wish to discuss activities of the above trial contact Matt Roche via email Matt.Roche@daff.qld.gov.au.

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