

AUSTRALIAN

Turfgrass



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MANAGEMENT

Tails from the turf

A dog's life on course

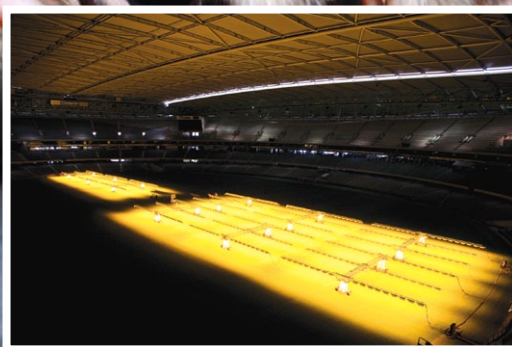
Coastal Trails
From Bandon Dunes
to Pebble Beach

Research

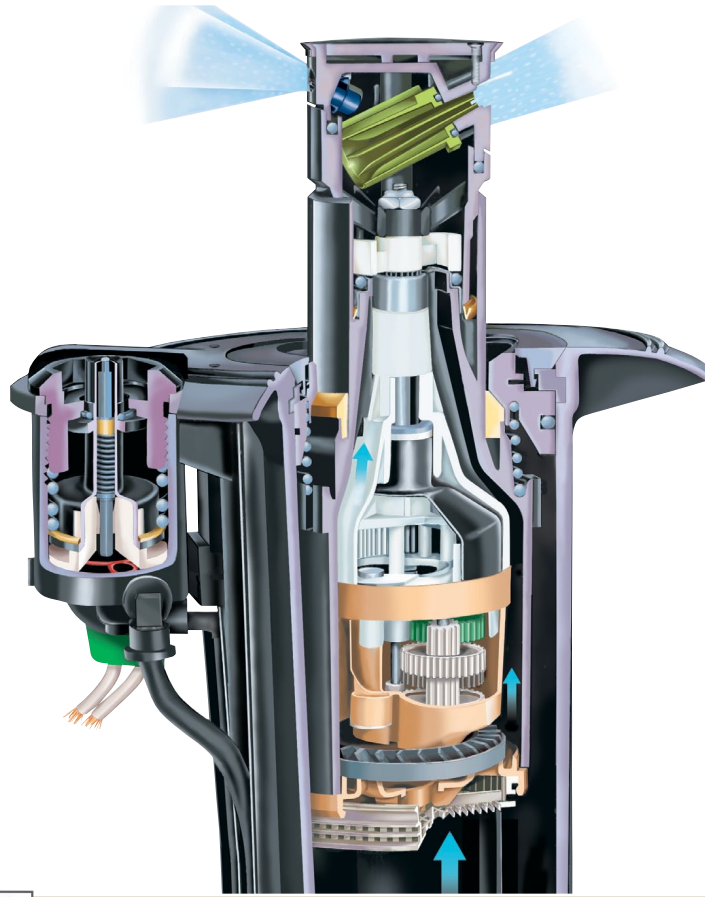
Australian sod production
Seashore paspalum

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have their say

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COVER:

A dog's life:

Jack, a staffie-cum-ridgeback calls Monash Country Club his second home. Owned by course superintendent Marshall Howarth, Jack cuts a familiar figure around the Sydney club and is one of many canine 'assistants' in the turf management game.

Inset: Telstra Dome will employ artificial lighting rigs to aid surface recovery during the 2008 AFL season and beyond. The rigs, which cost \$2.2 million, will be carbon offset.

Photos:

Brett Robinson



ENVIRONMENTAL MANAGEMENT - NEW SECTION

Dome flicks the switch on carbon emissions

50

In the first instalment of a regular section on environmental management, ATM looks at the Telstra Dome's efforts to become carbon-neutral.



Tails from the turf

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They say dog is man's best friend and for a number of Australian superintendents that tenet certainly holds true. ATM meets a pack of canine assistants and recounts some of the stories which have made them four-legged legends at their respective clubs.

Coastal trails: From Bandon Dunes to Pebble Beach

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The American west coast boasts some of the world's most renowned golf courses, including the likes of Pebble Beach, Cypress Point and the stunning Bandon Dunes complex in Oregon. Prior to attending the 2008 GCSAA Golf Show, AGCSATech's Andrew Peart visited some of these great courses to gain an insight into their agronomic operations.

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Dr Jim Hull takes a look into this technical and often confusing area of a turf manager's job.

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2007 Australian Open

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Seashore paspalum: Breeding a turfgrass for the future

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Initially billed as a 'niche grass' for use on salt-affected sites, seashore paspalum is gaining



AGCSA advice for
superintendents and clubs
to improve golf course
maintenance practices

popularity around the world on many new golf course developments even where salt and irrigation water quality are not an issue.

WATER MANAGEMENT 52 Final hurdle in sight for Pennant Hills plant

Despite experiencing its wettest year since 1994, Pennant Hills Golf Club is nearing completion of its groundbreaking sewer mining plant.

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four-legged legends

If there's one thing you can be guaranteed of in the turf industry, it's the love of a laugh. In a profession where superintendents and turf managers are increasingly cultivating stands of reports rather than stands of fine turf, there comes a time when you need a little light-hearted release from the everyday grind. Well, I've taken that on board for this edition and with the lead feature have decided to step a little outside the square.

Many of us at some point in our lives would have owned a dog or had involvement with one. I was fortunate enough to grow up with a gorgeous Samoyed called Sasha who was one of the family. He was a faithful companion during my very early years, and I can still clearly remember the day we found him 'asleep' in his kennel. I was just six years old at the time and I think my folks were that heartbroken they couldn't bring themselves to get another.

As the saying goes, dog is man's best friend and that is certainly the case for a number of golf course superintendents. After all, you would be hard pressed to find a better place for a dog to let loose than a golf course – wide open spaces, an abundance of wildlife to chase and plenty of golfers willing to forego part of their pie or give a scratch under the chin. In many instances these four-legged canine assistants have won the hearts and minds of staff and members alike and have written themselves into club folklore.

The idea for this edition's lead feature came when I joined the AGCSA back in 2003. I travelled to Sydney shortly after Castle Hill Country Club superintendent Martyn Black was appointed as an AGCSA board member. It was on that visit I had the pleasure of meeting the indomitable Vincent, a muscle-bound Jack Russell terrier with attitude to boot. I clearly recall jumping into the utility alongside Blacky only for Vincent to give me the filthiest look, as if to say, 'Oi, that's my spot, bugger off!'

Throughout my many subsequent travels I have come across other supers and their dogs and gradually compiled notes and photos in order to put together such a feature. Here, finally, it reaches print. It is a bit of a departure from the normal turf management article, but for that I make no apologies. Hopefully you'll get a laugh out of it and take your mind off things for a few minutes.

On to more serious matters, in recent editions we have incorporated a water management section and provided a forum for turf technicians to raise their profile. In this edition we continue to expand the magazine's content with the inclusion of a dedicated environmental management section. The Australian turf industry as a whole is making serious inroads into improving its environmental management responsibilities and in this and future editions ATM will highlight those industry practitioners and facilities leading the way in this area.

To kick the new section off we take a look at the amazing new artificial lighting rig system the Telstra Dome has purchased at a cost of \$2.2 million. Not only will the rigs help to prevent wear and aid surface recovery at one of Australia's busiest sporting arenas, the Dome has also become one of the first stadiums in the world using such a system to fully offset their carbon emissions.

Elsewhere in this edition, Andrew Peart recounts his recent trip to the US where he had the privilege of visiting the likes of Bandon Dunes, Cypress Point and Pebble Beach, while in our water management section we look at the final stages of the Pennant Hills Golf Club water reclamation plant which will hopefully be commissioned this month.

Enjoy the read.

Brett Robinson

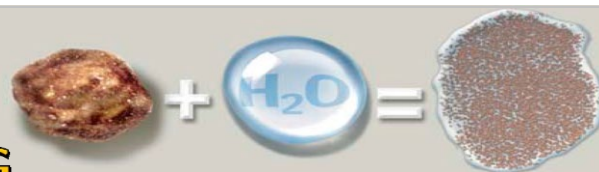


Editor



Introducing

Nutri DG.



Sometimes, Not Seeing Is Believing

As we move quickly into a new year, it is a good time to review the year ahead and reflect on the year just gone. The office of the AGCSA has undergone some significant changes since November 2006 and 2007 was full of new ideas and initiatives.

Looking back on 2007, the AGCSA has worked hard at responding to member needs and to position itself in such a manner that golf course superintendents can have their say on a range of emerging issues that are challenging the golf industry.

Over the past 12 months the AGCSA has continued to play a key role within the recently formed Australian Golf Industry Council (AGIC), while the Environmental Initiative gained further momentum. The year also saw the establishment of an HR and best practice service, which is headed by former AGCSA Excellence in Golf Course Management award winner Daryl Sellar, while the Water Management Initiative was also launched. On top of this the association's Australian Turfgrass Management magazine continued to go from strength to strength and there was the highly successful annual conference which went to Cairns for the first time.

In addition, the AGCSA has been represented at the Golf Course Superintendents and Managers Association of India conference, attended the Asia-Pacific Golf Summit and attended a seminar conducted by the Thai Golf Course Superintendents Association. As a result of such activities, there has been increased interest from the South East Asia region in what we do and how we may be able to assist these burgeoning organisations.

Much of the interest is in the area of education and the need for such developing regions to improve the education of local superintendents and greenkeepers.

While there are many activities that the AGCSA can become involved in, it still remains a relatively small organisation albeit one that has grown significantly in size since its inception in 1981. As demands for our time increase we need to reassess our priorities and consequently we will be undertaking a strategic review in the first half of 2008.

Because of the potential opportunities, we need to assess where we commit our resources and what additional resources may be required to undertake new activities. The strategic review will set the platform for the AGCSA for the next three to five years, with the underlying priority always being our members and their needs.

As an adjunct, AGCSA staff Scott Petersen and Andrew Peart recently attended the GCSAA conference in Orlando, gaining knowledge and sharing ideas with other international superintendent associations. The theme for the week was environmental management and it was quickly realised that Australia is not only leading the Asian region but the world in this area. These international associations are watching Australia closely and if we succeed with the likes of the Environmental Initiative it could become a blueprint for golf courses worldwide.

Relating to this, the February 2008 edition of 'Marketing' magazine highlighted a survey which found that 64 per cent of the population would not invest in a company that damaged



the environment. Such a figure shows that if the Australian golf industry does not place a significant commitment to environmental management within the next couple of years, we will have a serious problem attracting future generations to 'invest' their time in the game of golf based on environmental principles alone.

The survey also indicated that 53 per cent of the population would pay up to five per cent more for a product that did good things for the environment, as long as the quality was the same. The industry therefore has a challenge in maintaining high quality turf conditions in an environmentally-friendly manner with the potential of having a five per cent increase in budgets to support such changes.

So as we set about our strategic planning, the AGCSA will concentrate on providing whatever is required to assist the industry achieve its corporate and environmental responsibilities.

The only assistance the AGCSA needs to achieve these goals is from you and your commitment to make it happen. 🌱



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As the saying goes a dog is man's best friend and for a host of Australian golf course superintendents and greenkeepers, their jobs just wouldn't be the same were it not for their canine companions. Whether working class or purely around for their uncanny ability to take the stress out of any situation, ATM pays tribute to some of the turf industry's four-legged legends.



Tails from the turf

Martyn Black can still recall the gut-wrenching feeling when he received the phone call. Working as a Course Quality Official at the 2006 Australian Open at Royal Sydney, the Castle Hill Country Club superintendent answered a call from one of the club's most highly-respected members who was in a state of hysteria – "I've run over Vinny, I've run over Vinny! He's taken off and we can't find him!"

Downing his rake, Black broke every speed limit en route back to the northern suburbs of Sydney. By the time he had arrived at his house, which backed on to the course, Vinny, Black's treasured Jack Russell terrier, had managed to limp back home before collapsing on the back steps.

Lazing on a cart path alongside the practice putting green, Vinny had, rather foolishly, found respite from the heat under the wheel of a golf cart. As the cart was electric, when the member jumped in and took off, Vinny, who had fallen asleep, had little chance of getting out of the way.

Taking him to the vet fearing the worse – the golf cart weighed in at around 250kg compared to Vinny's small but perfectly formed seven – Black was elated to discover that despite suffering severe crush injuries, there

were no broken bones or ruptured organs. Six months later Vinny was back to full health and running amuck on the lush kikuyu fairways that have been his home for seven memorable years.

One of the main reasons he was able to recuperate so quickly from such a trauma, or so the vet believed, was because of his health and lifestyle. Tearing around a golf course six days a week chasing rabbits and birds is enough to get any pooch primed and for this particular Jack Russell it may well have saved him.

It's stories like that which have elevated Vinny, one of the most ripped specimens of his breed you'll ever come across, into cult figure status at Castle Hill. Together with his companion Marley, Black's gorgeous three-year-old black Labrador, the two rule the roost and have become treasured "members" of the club.

"The place just wouldn't be the same without them," says Black, who has been superintendent at Castle Hill for 19 years. "They would leave a big gap if they weren't here. I know they won't be around forever, but they'll probably see me out in the greenkeeping side of things. Unless they get killed by a bloody evil golf cart, I don't think I'll ever have another

dog after these two. They are champions.

"I told Mick, the poor chap who ran over Vinny, I never thought I'd hate carts more than I already did until the day he ran over my best dog. My hatred of golf carts reached a whole new level.

"Thankfully Vinny was so fit the little bugger bounced right back, but I can assure you there were some very worrying times in the Black household when it happened."

EARNING AN HONEST KEEP

Vinny and Marley are what you would call true working class dogs, even if their owner now resides in a veritable palace befitting the status of a Hills district superintendent.

Ever since they were each seven weeks old Black has had them on the course. Their rabbiting prowess has become legendary, both working together to flush out and catch at least a couple a week, while Marley has single-handedly taken ownership of the 'Castle Hill Wood Duck and Corella Reduction Programme'.

Vinny has been ensconced at Castle Hill since 2000, arriving shortly before Black's former dog, an Irish wolfhound stray named Shags (more about him later) died of old age. Vinny was a present from Black's wife and

Vinny (left) and Marley (right), treasured possessions of superintendent Martyn Black, have become regular fixtures at Sydney's Castle Hill Country Club



daughter and he fondly recalls first meeting his little charge.

"The females in my life saw fit to buy him without consulting me, but I'm glad they did because he is a dead set weapon," explains a very proud Black. "I expressed to (my wife) Deb one day that I wanted a small dog adept at catching rabbits as we were having a few problems on the course. I thought nothing more of it until one afternoon I got home from work and there was a small parcel on the kitchen bench.

"I opened it and here's this tiny Jack Russell pup, no bigger than a can of VB. He was that small we took a photo of him in the cup on the 14th green! We called him Vincent after John Travolta's character in the movie Pulp Fiction.

"He has grown to be the fittest living thing in the Hills district. I would never have thought after our previous dog, Shags, who is buried on the course, that another dog a tenth of his size could come along and capture the heart of an entire club in such a short space of time. But Vincent has done just that."

Four years later, Marley (named after Jamaica's favourite son Bob) came on the

scene. Black says that initially Vinny was so jealous of Marley that he would try and prevent her from coming onto the course. As Marley quickly outgrew her pint-sized counterpart, Vinny reluctantly gave up trying and they have been thick as thieves ever since.

Marley has more than earned her keep at Castle Hill and according to Black she has reduced the incidence of bird damage on the golf course by up to 90 per cent.

"At one stage we had 300 wood ducks and 400 corellas destroying the whole course and I trained Marley inside a few months to start barrelling into the flocks," explains Black.

"The birds soon realised that it wasn't a safe place to be and they went elsewhere. Even though we superintendents love ducks and corellas, when they are destroying our crop, which is a 3mm bentgrass green, they need to be told who's boss and Marley does the job with aplomb."

While feral animal control skills rank high on both their CVs, Black says having the two around has more tangible benefits. While not easy to measure, Black says their presence on the course and around the shed has engendered a spirit within the club and improved the morale of both maintenance and clubhouse staff.

Having them on course since an early age, Black has had few issues with the dogs causing problems, whether it's chasing golf balls, running amuck in bunkers or digging up turf. When they were pups Black would take them on the course after hours, schooling them in the fine art of golf course etiquette. Being a Jack Russell, a breed known for its intelligence, Vinny got the gist inside four goes, whereas it took Marley about 20.

"I suppose there are several clubs around where dogs wouldn't be allowed, for a number of reasons, but here Vinny and Marley are part of the furniture," says Black. "They're old

enough now to know their boundaries. Most of the time they will tag along with me or go do their own thing, but if they lose me or I go away for a long period Vinny will actually go somewhere high on the course and start to whine.

"Even when you're having a shitty time and it has been raining for two weeks and the course is rooted, these blokes don't care. They help to take your mind off things. They're good companions and they give you a sense of security, especially if you're out at night hand watering or answering an alarm. And comfort too, although they're not as warm as the missus."

SIMPLY THE BEST

While Vinny and Marley have captured the imagination of Castle Hill's membership, they have a little way to go before reaching the legendary standing of their 'grandfather', a full-blooded male Irish wolfhound by the name of Shags.

An emaciated stray that wandered into the maintenance shed one day in the late 1980s, Shags would go on to grace the fairways of Castle Hill for 11 years. Such was his stature that when he pegged it from old age, the club's board saw fit to erect a memorial behind the sixth tee.

"As it says on the plaque, Shags was 'simply the best'," recalls a wistful Black. "He was an absolute mess when he first came into the shed. Our mechanic threw him a soggy tomato sandwich and he swallowed it in one gulp. He never left after that.

"He was so popular – more than I will ever be – that the members used to buy a pie or a sausage roll for him at the Sprig Bar. It got to the stage where it nearly killed him. He became lethargic and we took him to the vet who discovered his cholesterol level was way off the scale. We ended up erecting a sign saying 'Don't feed Shags'."

Despite being hopeless at nabbing rabbits – although Black recalls one instance when a rabbit "committed suicide" by actually jumping straight into Shags' mouth after being startled by headlights – Shags' sheer size and presence warranted attention. Living as he



Marley tackles some irrigation work

CONTINUED ON PAGE 9 ►

Vinny and Marley have created more than their fair share of headlines over the years at Castle Hill Country Club



Pit bulls and pooh-bahs

As you can imagine, with two dogs as shadows most days of the week, Castle Hill Country Club superintendent Martyn Black has been on hand to witness some of their “finest moments”.

If it's said that a cat has nine lives, then Vincent Black, Castle Hill's lovable Jack Russell, must be part feline given the amount of close calls he has had. Whether it's getting run over by golf carts or getting taken out by wayward golf balls (on the day ATM visited the club one lady golfer skewed her tee shot within millimetres of Vinny's nose – he didn't even blink) Vinny has used up a few lives during his seven years on course.

One of his closest calls came when he attracted the unwanted attention of a couple of pit bull terriers. Black recounts the story:

“I was talking to the young club pro in the car park and these two pit bulls came strutting in from a nearby construction site. I could see they were trouble and as soon as they saw Vinny all hell broke loose.

“Being the aggressive little bugger he is – small man syndrome I think they call it – Vinny wanted to take them on. I panicked, as I knew

they would kill him for sure, so I screamed to the pro to go to the shed and get a star picket. I grabbed Vinny and put him on my shoulder as these two pit bulls started jumping up and attacking us from both sides.

“Meanwhile the pro has shat himself and is standing there frozen, so I've kicked the older pit bull right under the chops. He did a backflip and came crashing down and didn't move. I thought I'd killed him but he got back up and took off.

“That wasn't the end though. Vinny's somehow got out my grip, and to his credit or stupidity, one of the two, he still wants to have a go at them. He's chased the big one and bit him on the arse! That was it as far as the pit bulls were concerned and they both came back for a second shot, so I grabbed Vinny, bolted to the shed, locked him in the lunch room, grabbed the star picket – the young pro still hasn't moved by this stage – and I've chased these two bastards the whole length of the car park, yelling obscenities. It was a tumultuous few minutes.”

Companion Marley, on the other hand, who Black refers to as a “big, dopey, good-

looking chick”, has a far more laid back demeanour than her elder sibling. One of her more notable moments came one day when Black was showing the president, captain and chief executive of the club the dam works on the 17th.

“The dam had just been pumped out for work to start and Marley was in there having a great time wallowing in the thick black mud,” recalls Black. “I'm showing these chaps, all dressed in suits, what we were doing to the dam and we turned to head back to the golf cart. Marley has twiggged from 100 yards away that we were leaving and she's jumped out. Normally when I head towards a vehicle, that's her cue to come and jump on board.

“To this day I have never seen three grown men, the grand pooh-bahs of any golf club, shit themselves as much as these blokes did when they saw this mud-covered, smelly black Lab come barrelling towards us. They knew what she was going to do – jump on board with us – and they were screaming at me, ‘Get the hell out of here!’ I think the golf cart had a rush of adrenalin as we were able to get away just in time.”

◀ CONTINUED FROM PAGE 7

did for many years on course, if Black had to answer an alarm in the middle of the night, he would take two things with him – a mattock handle and Shags.

Famous for many things, Shags' crowning glory came when the club hosted the first Canon Challenge in 1993. It was the final round and Black was collecting flags trailing the final group which contained young Kiwi pro Michael Campbell who was leading Peter Senior. Shags was in tow minding his own business, or so Black thought.

On the par five fifth, Senior rips two perfect shots to within 10 feet, while Campbell has gone bush with his first two but is still on the green for three. Senior proceeds to hole out for an eagle, while Campbell lags his birdie attempt to five feet. While all this is happening Shags decides to cool off in the dam next to the fifth green as it was a hot day. Black takes up the story.

"Shags was splashing around so knowing how tetchy pros can be about noise I was keeping a close eye on him the whole time.



Shags the Irish wolfhound garnered such a reputation at Castle Hill he was buried with full honours on the course

Fortunately he was quiet when Senior putted out and Campbell had his first, but just as Campbell is drawing back the stick for his par putt, Shags decides it's time to get out. I'm watching Campbell, the putter, Shags, Campbell, the putter, Shags. Splash, splash, splash! The putt lips out. Campbell scores six and there's a three shot swing!

"Campbell storms off to the next tee and his caddy comes over and yells to me, 'Get that f*****g dog off the course', adding that Shags had just cost his player a shot. I replied by saying that he wasn't mine even though Shags is standing there dripping wet looking at me with his tail wagging. I said something smart like 'Well, if a duck does the same thing do you want me to get rid of it as well?' The caddy said a few more expletives and took off.

"Campbell won eventually and I went up to him in the clubhouse afterwards, introduced myself and apologised for what happened down on the fifth. He was in a good mood having won the tournament so wasn't too bothered.

"As most people know I'm not huge on the pros, so I said to him that if he had of lost and tried to blame it on the dog, it wouldn't have mattered because tomorrow he would be gone and Shags would still be here. As far as I was concerned Shags was more important to the club than he was. It was my finest moment. Needless to say he didn't stick around." ▶



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At just six months old, Andrew Dwyer's Jack Russell pup Rioli is quickly gaining a reputation among the members at Port Fairy Golf Club

◀ A GREAT LIFE

As many who have owned a dog, or any kind of pet for that matter, will attest, their passing can often be a time of great sadness. When Shags eventually died, Black says Castle Hill was in mourning for months.

Fellow Sydney superintendent Malcolm Harris knows just how they would have felt as for the past year he has been adjusting to life without his beloved staffie cross Jacko.

In just three short years, Jacko become something of an institution at Northbridge Golf Club, winning not only the heart of Harris but the membership as well. His passing – he was put down in December 2006 after a stroke paralysed his back legs – warranted a special mention in the club's newsletter.

Harris never planned on getting a dog, but can thank his son Sam who did what all kids do best when they want something bad – put on the waterworks.

"I was reading the newspaper one Saturday and it had a Pet of the Week column," recalls Harris, who has been superintendent at Northbridge for 22 of his 25 years there. "Jacko was the rescue dog that week. I'm not a big dog lover but for some reason I love staffies and he was just staring out of the paper. I said jokingly to my five-year-old that we'd go and get him.

"Anyway, on the way back from soccer Sam has asked when we were going to get him. I explained that I had only been joking, but he started to ball his eyes out! So that's how we got Jacko."

Jacko had been handed into the local pound, ironically by friends of Harris's sister who weren't able to care for him any more. Apparently they had given him up as he suffered from an anxiety disorder which meant that every time they left the house he would go searching for them and get hopelessly lost.

Managing to iron out those neurological kinks, Jacko's loyal nature meant he quickly endeared himself on everyone at the club and soon became a regular down at the Northbridge shed. Harris brought him to the course the very first day and he never left his side until one day in early December 2006 when he dragged himself into Harris's office and collapsed on his mat.

"He was fine when we arrived at the course but next thing he comes into the office with this terrible look on his face," recalls Harris. "He dragged himself over to his bed in the corner and I could tell something wasn't right. I took

him straight down to the vet but he never got any better. We had him put down a week later.

"I couldn't believe how much his death affected me. My wife said it was the saddest she has ever seen me. We only had him for three years but he become such a fixture that when he was gone it wasn't quite right.

"I haven't been able to bring myself to get another dog since. Someone was offering a dog recently but it just didn't feel right. I can't explain why. I guess I just wasn't ready. I will definitely get another dog, but the time isn't right just yet."

Harris says the hardest adjustment has been the little things – not coming out of a greens committee meeting to find Jacko lying prostrate across the entrance to the clubhouse waiting for Harris return, or the incessant barking between the hours of 6am and 7am when the crew were firing up the machinery ready for the day's work.

"Being on the golf course was a great life for him," says Harris. "He was more aesthetic value than practical value and it was almost like stress relief having him around. He was such a good companion. He never got upset if the course wasn't perfect. He was very gracious like that and loved you all the same."



Mal Harris's staffie cross Jacko

LINKS LIFE

While Harris waits for the right time to move on, Victorian greenkeeper Andrew Dwyer is enjoying watching his six-month-old Jack Russell pup, Rioli, take his first steps on a golf course. Since last November, the unofficial ▶

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Phil Hill and Border collie George now call Barnbougles Dunes their home

fourth member of the Port Fairy Golf Club maintenance team has been cutting his teeth on the spectacular links land on which the club resides, chasing rabbits and the occasional golf ball.

Growing up in an AFL-mad family, Dwyer had dogs as a kid and such was the family's passion for the Richmond Football Club their dogs were named after yellow and black greats – Bartlett (after Kevin Bartlett) and Roach (after Michael Roche). Keeping with tradition, Dwyer named his pup Rioli, after Richmond's 1982 Norm Smith medallist Maurice Rioli. "I was going to call him KB – after Kevin Bartlett – but if I did that he would never come back," quips Dwyer.

Rioli's presence at Port Fairy has quickly gained the attention of members as well as the editor of the club's newsletter who featured the new recruit in the most recent edition.

Dwyer procured Rioli after a chance meeting with a local Port Fairy resident who regularly walks his dogs on the course. He informed Dwyer that his son had a litter of Jack Russell pups and that he should go down and pick one up. Taking his advice, Dwyer brought Rioli with him to work not long after and he hasn't stopped running since.

"He absolutely loves it here and he is quickly gaining a reputation among the members," says Dwyer. "He'll follow me everywhere, chase everything and even catch

a ride when I'm mowing. We've got some big hares and rabbits on the course and he spends hours chasing them. He'd never get near them, but just the other week he caught his very first one.

"I was divotting tees and he comes up to me dragging this rabbit. I put him in the trailer and I've tried to grab it off him but he wouldn't let go. He ate about half of it and then buried the rest in the sand I was using for divotting! He thinks he's the big hunter now."

CANINE SEA CHANGE

If Port Fairy rates as a perfect playground for a young pup, then George, an eight-year-old Border collie has perhaps reached canine nirvana. Seven months ago his master Phil Hill was appointed superintendent at one of the country's most talked-about golf courses, Barnbougles Dunes.

Sprawling across the marram-covered dunes just outside of Bridport on the northern coast of Tasmania, there wouldn't be anywhere better for a dog to run wild than the world's 35th ranked golf course.

Hill has had dogs his entire 25-year career as a greenkeeper which started at Mowbray Golf Club in Launceston. Despite losing the first one, a golden retriever called Rebbo, due to a marriage split, Hill had a Border collie pup called Sophie who moved across to Launceston Golf Club when he took over

as superintendent there in 1997. A full-time course dog, Sophie oversaw turf maintenance operations until her passing when she was the grand old age of 13.

"She was very territorial with the maintenance shed and people wouldn't come near it if they weren't supposed to," says Hill. "She loved to swim in the lakes and chase birds. She had a fantastic personality and all the members loved her and looked out for her."

Well, not quite all the members. A few of the directors didn't quite share the same view and Sophie unwittingly came close to costing Hill his job back in 2000.

At the time some of the directors were having issues with people walking their dogs around the course and their solution was to bring in a law banning all dogs on the course. That included Sophie so you can imagine Hill's reaction.

"I let it be known to the club in no uncertain terms what I thought of that and said bluntly to the general manager, 'If there's no Sophie, there's no Phil'," recounts Hill. "The matter was never mentioned again."

"It was a brave call and it could have easily worked against me. But I was adamant; she had been there since a pup and if she wasn't able to be with me then I was out of there. We were a team."

Unfortunately the team was forced apart for good in the middle of 2006. Suffering a perforated bowel, Sophie got through an operation but two days later her age and the invasiveness of the procedure finally took their toll. Hill says it was a very traumatic time and heading to work the next day without her just didn't feel right.

It wasn't long, just three weeks in fact, until George came on the scene. Hill had been up to Melbourne looking at some Border collie pups and was back in Launceston collecting his two cats from the local cattery. The cattery owner also had George and had always been at Hill to adopt him, knowing his love for the breed.

Hill had been reluctant in the past about having two dogs on course, but with Sophie gone it was a no-brainer. Taking possession of George, Hill took him down to the course the very next day.

"He was an absolute nut for the first few weeks," laughs Hill. "He wasn't the most obedient of dogs and he was a bit of a handful with all the new smells, wildlife and bush to explore. But once he knew where he was and what his boundaries were, plus a few stern words, he settled down. He won't go out of my sight now."

George quickly endeared himself on the Launceston membership, in particular the maintenance staff and one of the course directors.

"He's a bit of a character is old George," says Hill. "He has a real fetish for getting into the guys' bags and eating their lunches. If the blokes are silly enough to leave their lunch tins lying around, they'll come back to find nothing. If left unsupervised, George will open their bags – he's an ace at it – and demolish everything, leaving no trace."

"One of the course directors came down to volunteer for a few days while we were doing some course works. He left his knapsack with his lunch in it on the ground and sure enough he's turned up at lunch to find it all gone. Not only has George scoffed his lunch, he's then done what all dogs do best, cocked his leg and marked his territory on the director's knapsack. We got plenty of mileage out of that."

Just a year after starting his 'apprenticeship' at Launceston, George found himself on the move, and although he probably doesn't appreciate it, he is now one of the luckiest dogs in the turf management game. In August 2007 Hill secured one of the plum jobs in the industry – superintendent of Barnbougles Dunes – and together with his master George made the move north east of Launceston.

A little rattled at first considering the dramatic change in environment from his former golf course home, George soon got the lie of the land and now the wide expanse of Barnbougles' fescue fairways are his to roam, although Hill won't let him too far out his sights on account of the snakes which reside in the marram dunes.

"It has been a bit of a sea change for George, but he loves it," laughs Hill. "It's a massive site and we'll take him for walks along the beach late in the day. He couldn't be happier."

"Barnbougles is an absolute gem of a course, both for George and for me as a superintendent. To tell you the truth, I don't know which one of us is the luckier one." 🐾

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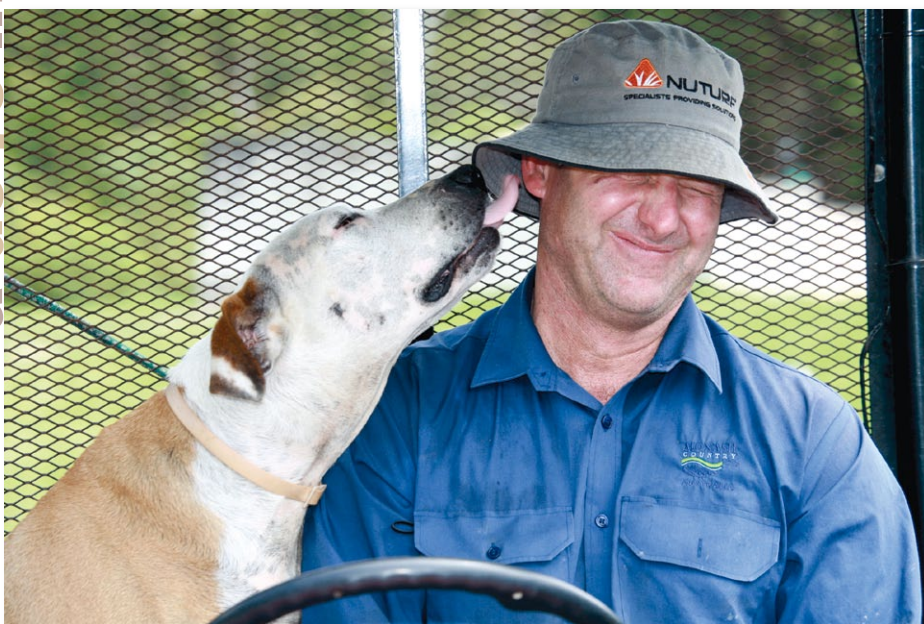
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Jack gives his master, Monash Country Club superintendent Marshall Howarth, the usual greeting

Marshall Howarth and Jack – Monash Country Club

If you're planning a visit to Monash Country Club in the northern suburbs of Sydney, then chances are this solid unit, the star of this edition's cover, will be there to greet you.

Jack, a staffie-cum-ridgeback, has called Monash home ever since he was a pup and is the faithful sidekick of superintendent Marshall Howarth.

Taken by his distinctive brown and white markings, Howarth's wife picked up Jack at a local pet shop some 10 years ago. Living on course just a stone's throw from the maintenance shed, Jack has grown up with the course as his backyard. As Howarth says, "He's known no better!"

During his formative years Jack was taken under the wing of Howarth's other dog, an Alsatian cross called Ellie. More of a house dog than a course dog, Ellie died about 14

months ago and as soon as she was gone Jack latched on to Howarth in a big way.

"He would always come out on the course with me, but once Ellie was gone he started to follow me everywhere – he's my shadow," says Howarth. "As soon as I step out of the office or head towards the utility he'll bolt and jump straight into the driver's seat, not the passenger's seat. It's rather annoying as he's a big unit to try and shift.

"He'll sit right up close to you and give you a big lick right up the side of your face. He's caught me out a few times on the course when he's been playing with a dead animal. He'll see me move towards the vehicle, come bounding over, jump up and give me a great big lick unbeknownst to me that he's just had a face full of dead rabbit – not pleasant I can assure you!"

"If he hasn't been on the vehicle for a while, he'll start grunting which is his sign that he's happy. If he likes something he grunts, a bit like a bullie does. His ears will flap out like wings too when you're flying along. It's quite a sight."

Jack has become a regular fixture around the fairways of Monash, although because of his size the members still always ask Howarth's permission before they pat him.

"It's quite funny. He looks a bit intimidating but he has such a great nature and would be more likely to lick them to death," laughs Howarth. "He's more staffie in character and is very placid, but if anyone was to do something untoward to me or any of the other guys in the shed, he'll let you know.

"If someone who hasn't been here before comes into the shed, he'll let us know straight away. But, remarkably, if that same person comes back six months later, he won't do a thing. He just knows that person's been here before so they must be okay."

As Jack enters his twilight years – the average life span for his breed is around 12-13 – Howarth says he has started to notice that the old man's energy levels aren't quite what they used to be and isn't looking forward to the day when Jack's presence will no longer grace the maintenance facility.

"He's had a good life although he's getting on a bit now," says Howarth. "Sometimes he'll be swimming in the dams and you can see he struggles to get back on shore. "It won't be the same when he goes, but I certainly won't trip over as much because he's always at your feet. I'll probably get a lot more work done."

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David Warwick and Helmo

DAVID WARWICK AND MO – AVONDALE GOLF CLUB

Of all the dogs in the turf management caper, David Warwick's corgi-fox terrier cross wins the gong for having the most original name. Known as Mo, his full name is Helmo after the leaf spot disease *helminthosporium*.

Warwick, superintendent at Sydney's Avondale Golf Club, gave his little charge the name on account of the sole brownish spot on his back which bears an uncanny resemblance to helmo.

Seven years going on one, Helmo is a part-time course dog who joins Warwick after hours and on weekends. A prolific ball chaser, Warwick hasn't been game to bring him in on members comp days as he can clearly predict what would happen.

"If you say the word golf course at home he just goes ballistic," says Warwick. "Running in freshly manicured bunkers is a favourite past-time and doing circle work on greens and scuffing them up is another guilty pleasure of his. He loves chasing birds, but if he got one he wouldn't know what to do with it.

"The only nuisance with Mo is that he won't get in a golf cart – you have to grab him and chuck him on – and when you take off he will bark like crazy. As soon as the accelerator revs he just goes off.

"His turf diagnostic skills are pretty good though. He seems to know exactly when the greens are stressed because as soon as I get home he can sense that's dad's cranky and he shoots through."

HARRY'S RIGHT ROYAL ESCAPE

Harry, one of two terriers owned by Royal Sydney Golf Club superintendent John Odell, created headlines for all the wrong reasons when he went missing for a day in August 2005. Odell recounts the 'great escape':

"My wife Chris took Harry and Willie out for a walk on Thursday evening and after both disappeared into the scrub on the 4th hole only Willie came out. We spent all night searching the course as well as neighbouring Woollahra GC and the surrounding district thinking he may have been run over, got caught down a fox hole, been taken by a fox or had simply gone AWOL. We tramped through the scrub until 11pm with torches and Willie on the leash to no avail.

"The next morning after I gave out orders to all the boys, many suggested we all try to find Harry but we had a heap of work to get

prepared for the weekend. Staff member Glenn and I took the backhoe out to see if we could dig up some of the fox holes. The mass of fig tree roots and dense leptospermum around the fox holes made this impossible. Misty-eyed, the bunker crew brought in the entrails of what they thought was Harry but it turned out to be a possum that had been taken by a fox the night before.

"When all seemed lost irrigation technician Mark Young came to see me and said that he had rung home to tell his children Amy and Todd (Todd has muscular dystrophy and is wheelchair bound) that Harry had disappeared. Mark said they were in tears and implored him to tell me not to stop searching. So Glenn and I went back out to the 4th hole at about midday with shovels to see what we could find.

"After about 20 minutes and six metres of digging along the first fox hole we saw, we

thought we had come to a dead end. I said to Glenn that was probably all we could do and that Harry could be anywhere or may have been run over after all. So I pulled the shovel out of the ground and with a flick and a shake out popped Harry covered in sooty black sand and blinking like Blinky Bill! Willie jumped in and licked the sand out of Harry's eyes and both proceeded to have a rumble which suggested that Harry was okay.

"It might sound corny and some might say Harry is only a dog, but I couldn't help but feel that were it not for the collective well wishes and positive thinking from my crew, the members who knew, Chris (who had been crying all night) and Todd and Amy, the outcome may not have been so good. I don't think it bothered Willie too much whether Harry came back because he got a double helping for dinner that night!" 🐾

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The stunning Bandon Dunes complex on the coast of Oregon consists of three courses – Bandon Dunes, Pacific Dunes and Bandon Trails – and will be joined by a fourth course which is due to open in 2010. Pictured is the 14th hole on Bandon Trails

Coastal Trails – from



The west coast of the United States boasts some of the most talked-about golf courses in the world. Prior to attending the 2008 GCSAA conference, AGCSA's Andrew Peart was able to visit two of the region's great golfing destinations – the Monterey Peninsula, which is home to the likes of Pebble Beach, and the new Bandon Dunes complex in Oregon – to gain an insight into their turf management operations.



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BANDON DUNES

Bandon Dunes consists of three courses – Bandon Dunes, Pacific Dunes and Bandon Trails – and in 2006 US-based Golf magazine rated all three in the top 10 public access courses in the United States, with Pacific Dunes ranked No.1.

The property is 2500 acres and was purchased in the early 1990s by Michael Keiser who enlisted three different but highly qualified golf course architects to design the courses.

Bandon Dunes, the first of the three to be constructed which opened in 1999, was designed by David McLay Kidd. Pacific Dunes was designed by Tom Doak and opened in 2001, while the third course – Bandon Trails – was designed by Ben Crenshaw and Bill Coore and opened in 2005. At present work has just started on a fourth course to open in 2010 called 'Old McDonald' and again will be designed by Tom Doak.

Bandon Dunes is located in the small coastal town of Bandon, Oregon. Bandon was previously well-known for its fishing and logging industries, however, due to environmental pressures became solely reliant on the summer tourist season until the opening of the golf resort which has been a life-line.

Bandon's temperature generally ranges from highs of 45-75°F (7-24°C) from winter to summer with frosts occurring seldom over the winter months, although this last winter has been particularly bad. The annual rainfall is around 65 inches (1650mm).

Bandon Dunes is links golf in its truest form, or very close to it. Both Bandon Dunes and Pacific Dunes have holes adjacent to the Pacific Ocean and the vegetation is dominated by fine fescue, European beach grass (Marram grass) and gorse.

Bandon Trails on the other hand, apart from the two opening holes and closing hole, is nestled in a woodland environment with fir and pine trees dominating the landscape. However, the natural undulations in the landforms still remain and have been unaltered in the design of the course.

Playing surfaces on all three courses are dominated by fine fescues (slender creeping red and chewings). The greens on Bandon Dunes were also sown with a small percentage of colonial bentgrass, however, the rate has been reduced on Pacific Dunes and Bandon Trails to the extent where the Old MacDonald course will be sown with 100 per cent fine fescues.

Bandon Dunes to Pebble Beach

Poa annua remains a perennial weed problem on the fescue playing surfaces, particularly the greens during the winter months. It can be transitioned (baked) out in the summer, however, the cool moist weather over the winter provides a perfect environment for its reappearance.

Proxy selective herbicide is used to eliminate its seedhead during the transition stage to minimise the disruption to the putting surface as well as limit the seedbank. No other herbicide programme has produced significant results despite extensive trials being conducted on the practice facility by Oregon State University.

Regular topdressing (dusting) is a key component in the management of the fine fescue putting surfaces. Greens are dusted every two to three weeks through spring to autumn and even monthly dustings in winter. On average a full hopper of sand is used (0.76m^3) per green.

Dusting is done with two hoppers at 3.30am in the morning, rubbed in at 5.30am, watered and greens mown before golfers have teed off. A similar operation is conducted when the greens are solid tyned with half inch cores, oversown and topdressed.

According to Jeff Sutherland, course superintendent of Pacific Dunes, "fescue loves sand". There is no thatch on the fescue greens

at Pacific Dunes and likewise on the other two courses and this can be attributed to the regular topdressing programme as well as a lean fertility programme.

The annual nitrogen regime is 0.5lb-1.0lb/1000sq.ft ($0.25\text{-}0.5\text{kg}/100\text{m}^2$) and the primary source of nitrogen is ammonium sulphate. Other nutrients consist of magnesium (Epsom salts) and some calcium, generally gypsum during the winter to leach salts (ocean interaction) through the profile.

Greens are mown at 6mm in height with walk-behind mowers on an as needs basis – this can be limited depending on the number of frosts.

The fairways receive a similar amount of annual fertility which is delivered primarily through an organic based fertiliser derived from aerobically composted chicken manure and ammonium sulfate.

There are incidences of low fertility disease outbreaks on the fairways such as red thread (*Laerisaria* spp.), however, as these tend not to affect the playability of the surface they are generally left to grow out.

The tees are the most heavily fertilised area of the course with double the fertility of the fairways. This is due to the increased wear on these areas and the need for a quicker recovery time.



All playing surfaces on the three Bandon Dunes courses are dominated by fine fescues (slender creeping red and chewings)



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Pebble Beach's famous 7th hole

The biggest maintenance issue at Pacific Dunes is the management of gorse. Annually, gorse is cut and removed from the fairways adjacent to the ocean as it tends to grow unimpeded up the banks from the sand below. Also, individual areas on the golf course are identified and selectively removed.

Removing is conducted by cutting them out and burning in-situ. Some effectiveness is also achieved through the use of the herbicide Crossbow which is best applied to new growth that may have re-shot from older material.

Chemical inputs are very minor at Pacific Dunes with the only fungicide ever to be sprayed on the greens being Prostar for some fairy ring/thatch collapse. As mentioned, red thread may sometimes be evident on both fairways and greens but this is generally left to 'run its course' and seen as an indication that the nutritional programme is lean.

Bandon Dunes relies on bore water for irrigation. With so much yearly rainfall it would be conceivable that run-off would be the main source, however, due to the deep coastal sands there is very little surface run-off. The bore water is stored in plastic-lined dams and is generally of very good quality with a slightly alkaline pH, which offsets the acid sandy soils due to the fir trees and iron levels.

The complex's resort (which can sleep up to 400 guests) also has its own treatment plant in which all the waste water is treated and then used to irrigate Bandon Dunes.

Water usage is only minimal due to the predominance of fescue surfaces and the attempts to 'bake out' the *Poa annua* in the greens. One of the assistant professionals



made the comment that the bunkers appeared to receive more water in the summer than the greens!

Last year Pacific Dunes hosted 46,000 rounds of golf, but it is not just the number of golfers that place pressure on the fescue surfaces, as caddies are available for all players. Caddies are readily used over the summer with numbers as high as 400, however, in the winter the numbers tend to drop to around 50.

MONTEREY PENINSULA

From the fescue-dominated playing surfaces at Bandon Dunes, the Monterey Peninsula could arguably be said to be the *Poa annua* centre of northern California.

While many believe *Poa annua* is one of the more challenging weeds on a golf course, it appears to be a very logical choice for the climate and playing requirements of the area. The climate is very mild to say the least with less than half a dozen days in summer getting into the 80's (27-32°C).

The Peninsula consists of six golf courses within the gated community of Pebble Beach – Pebble Beach, Cypress Point, Spyglass Hill, Poppy Hills, The Links at Spanish Bay and Monterey Peninsula Country Club (two 18-hole courses). All courses are open to the public with the exception of Cypress Point and the Monterey Peninsula Country Club.

The Pebble Beach Company owns three of the courses – Pebble Beach, Spyglass Hill and The Links at Spanish Bay – as well as another course close by known as Del Monte.

Turf surfaces at Cypress Point are dominated by *Poa annua*, however, fairways are oversewn with perennial ryegrass on an annual basis



PEBBLE BEACH GOLF LINKS

Pebble Beach is arguably the best known golf course in the world and hosts a US PGA Tour event each year, the AT&T Pebble Beach Pro-Am.

Grass species throughout the course are dominated by *Poa annua*, with ryegrass also persisting on the tees, fairways and roughs. The greens at Pebble Beach are very small and the majority are still constructed with native sandy soil. Pebble Beach endures about 70,000 rounds of golf per year which does not include additional wear from caddies or other organised tournaments.

Greens are regularly dusted, about every two weeks, with hand spreaders and bagged kiln-dried sand. As a result of the large number of rounds, the greens are regularly fertilised with high rates of nitrogen and higher rates of potassium, around 6-10lbN and 20lbK/1000sq. ft/year (3-5kgN and 10kgK/100m² /year).

Fungicide applications also occur on a regular basis to ensure disease problems are few and far between. Pebble Beach has also just begun using an Irish seaweed extract on a regular basis to aid with root system sustainability.

Aeration of greens is via a Planet Air which has vertical blades that leave a small incision in the turf but cause some cracking beneath the surface to increase air movement. Some greens also have the SubAir system within the profile that allows the profile to be cooled by injecting air or can pull out excessive moisture.

Greens are mown daily with Jacobsen electric mowers at an average height of 3.2mm but raised in the winter and lowered for tournaments to around 2.5mm. Fairways are mown every day at 12.5mm and the rough is cut twice a week.



The rough also contains large areas of kikuyu and it is anticipated that there are more than 10 acres in total around the course. Kikuyu was first introduced to help stabilise the shoreline and has done an excellent job, but as a result has migrated onto the golf course.

Attempts have been undertaken to rid the course of kikuyu and a programme has been devised. However, with the need to keep the course in pristine condition year round, a broad spectrum application hasn't been made.

The cost for a round at Pebble Beach is US\$500 and to guarantee a tee time in the summer golfers must stay in The Lodge a minimum of two nights at \$800 per night. It is understandable with the public paying this amount there is a large expectation on course quality and the inputs are a reflection of that.

SPYGLASS HILL AND THE LINKS AT SPANISH BAY

Spyglass was designed by Robert Trent Jones Snr with the first five holes set among the rolling sand dunes and the last 15 among the Monterey pines. The Links at Spanish Bay was designed by Tom Watson, Sandy Tatum and Trent Jones Jr. and is set in one of the more environmentally sensitive areas of the Del Monte forest.

CYPRESS POINT

Unlike the previous three courses, Cypress Point is a member's only course and as such receives far less traffic. The day before I visited Cypress Point it was reported that there were only 12 rounds of golf played the entire day.

Being a members course the fertility inputs are not as intensive as Pebble Beach as the numbers of rounds are far less, and being a private club members can access the course all year round rather than maybe just once in a lifetime. Unlike Pebble, dusting of greens is irregular as incorporation into the lower cut sward is more difficult.

Designed by Alister MacKenzie and constructed in 1928, it is a classic golf course highlighted by the ocean holes 15, 16 and 17, along with some other great sand dune holes further inland. Most turf surfaces are again dominated by *Poa annua*, however, fairways are oversown with perennial ryegrass on an annual basis. Fine fescue has been laid around all greenside bunkers to aid with reduced water requirements in the summer.

Bentgrass is being considered as an option instead of *Poa annua* on the greens at Cypress Point due to constant pressure from a parasitic nematode known as *Anguina pacificae*. The Monterey cypress trees (*Cupressus macrocarpa*) throughout the course are a definite highlight, particularly on the 18th hole. ►

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The Shore course is one of two 18-hole layouts that makes up Monterey Peninsula Country Club

MONTEREY PENINSULA CC

MPCC consists of two contrasting 18-hole golf courses, the Dunes course and the Shore course. Both were recently remodeled with Rees Jones carrying out work on the Dunes course which was originally constructed in 1926 and designed by Seth Raynor. Michael Strantz remodelled the Shore course which was initially constructed in 1962 and designed by Bob Baldock.

The major difference between these two courses compared with the other five in the region is that MPCC is actively pursuing growing bentgrass as its preferred greens playing surface.

The successful transition back to bentgrass has been attributed to a high iron sulphate regime as well as other sulphate-based fertilisers, namely potassium, magnesium and manganese.

A nitrogen-based fertiliser is generally applied on alternate weeks with an annual nitrogen regime of 6-7lb/1000sq.ft compared with iron that is in the vicinity of 32-40lb iron sulfate heptahydrate.

They have also actively sprayed out the *Poa annua* in the fairways on the Dunes course with ethofumesate and oversown with ryegrass. The major reason for this is not only aesthetic but to create firmer fairways during the winter.

The fairways on the Shore course are a mix of colonial bentgrass and fine fescue. At the moment the bentgrass appears to be dominating, however in areas, especially around collars, the fescue is providing a very good surface.

NEMATODES

As mentioned, one of the major threats to the pristine *Poa annua* putting surfaces on the Peninsula is the presence of the parasitic nematode known as *Anguina pacificae*.

At the moment this is causing large amounts of damage to all courses but in particular Cypress Point. The Northern California Golf Association has conducted trials at Cypress Point to achieve adequate control but as yet nothing has provided acceptable results.

The Pebble Beach Company is about to start a trial on greens height turf at Spanish Bay on the right hand side of the 13th fairway. It consists of one bentgrass plot of numerous varieties as well as four *Poa annua* plots created by extracting cores from the four Pebble Beach Company golf courses. Products to be trialed will be:

- AgroNeem;
- Cleary's 3336 (a fungicide);
- CPR (an organic product);
- Algi-green (Irish kelp);
- Fertility programme;
- Neemex/Trilogy; and
- Primo

While the greens are under attack, so too is the Monterey pine (*Pinus radiata*) which is the dominant species on nearly all courses. This species is under serious threat from an introduced fungal disease known as pine pitch canker caused by *fusarium circinatum*.

As a result many trees are dying leaving some golf holes without a strategic play, so in many cases the Monterey pine is being replaced with cypress trees that are not susceptible to the disease.

All courses on the Peninsula are watered with treated effluent supplied from a 325 acre foot (400 megalitre) dam in the Del Monte Forest. However, they complain about its poor quality, although the salinity is probably less than 1dS/m. The Pebble Beach Company has just completed constructing a desalination plant that will supply water to all six courses within the Peninsula.

ACKNOWLEDGEMENTS

I would like to thank those that gave up their time to show me around their respective venues. Jeff Sutherland, superintendent at Pacific Dunes, Mike McCollough at the Northern California Golf Association who organised visits to all the golf clubs I visited on the Monterey Peninsula, as well as the assistant superintendents - Billy Hausch (Pebble Beach), Akoni Ganir (Cypress Point) and Earl Kennel (MPCC). I would also like to acknowledge Horticulture Australia Limited for its assistance in this trip and subsequent attendance at the 2008 GCSAA conference. 🌿



One of the major threats to the *Poa annua* surfaces on the Monterey Peninsula is the presence of a species of parasitic nematodes *Anguina pacificae*

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One of the more confusing areas of turf management is the interpretation of soil test results.

With names like Colwell, Bray, Mehlich and Skene next to them, and fertiliser recommendations that the experts argue over, the average turf manager can be forgiven for sometimes being confused. Jim Hull provides some background information on the aims of soil testing and what the tests are designed to tell turfies.



Soil testing, interpretation and recommendations

Before the mid 1800s, agricultural researchers experimented with methods of extracting plant nutrients from the soil and measuring the amounts. These methods were often aggressive procedures such as boiling in strong acid.

Unfortunately the results of the soil tests often did not correlate very well with the response of the plant to fertiliser application. For example the test might indicate that the soil had plenty of a nutrient but the plants grew much faster when fertiliser was added. The reverse could also happen; that the test showed little nutrient but the application of more fertiliser made no difference.

In 1845 Charles Daubeny proposed that in soils there were 'active' and 'dormant' nutrients, with the active nutrients taking part in soil reactions and being available to plants, and the dormant nutrients being inactive in the soil. The concepts were taken up by others and soil nutrients were defined as 'available' and 'unavailable' or 'sparingly available'.

Available nutrients are those forms of the soil nutrient that are able to be accessed by the plant in some reasonable period of time.

Nutrients that are dissolved in the soil solution are immediately available to the plant as are those that are readily exchanged from cation exchange sites.

Other nutrient forms are not so readily available, but can be accessed by the plant over time. Minerals that are only slightly soluble, ions bonded to mineral surfaces and nutrients bound in degradable organic matter are a part of this slowly available fraction. Most things dissolve or degrade eventually but some stubborn mineral or organic nutrient forms play no realistic part in the nutrient supply of plants.

DEVELOPMENT OF PLANT NUTRIENT EXTRACTS

Once soil scientist recognised the concept of 'available' plant nutrients, they had to develop methods that replicate the plant's ability to access this amount of nutrient. The previous practice of using strong extractants released all of the nutrient and did not give a very good estimate of how much was plant available.

Daubeny proposed an extractant of carbonic acid because plant roots expel

carbon dioxide into the soil during respiration and this forms weak carbonic acid in the soil. Daubeny therefore proposed that shaking soil in this weak acid would give a good estimation of how much nutrient the plant could access. Due to analytical problems this test method was never widely used.

The first widely used extractant was the one per cent citric acid extract for phosphorus proposed by Bernard Dyer. He analysed the sap of plants and thought that it was approximated by one per cent citric acid.

Other test methods followed and many are specific to certain nutrient elements. Others, such as ammonium acetate and the Mehlich III extract, are designed to be used in multi-element tests.

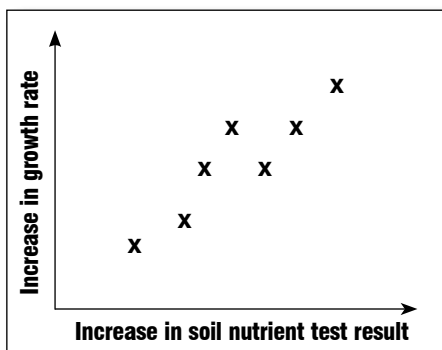
It is very important to note that not all methods will extract the same amount of a nutrient. For instance, in most soils the Colwell method will extract about twice as much phosphorus as the Bray 2 method, and several times as much as the Olsen method. The Olsen and Colwell tests actually use the same liquid as an extractant but the shaking time and ratio of soil to liquid varies.

Regular soil testing is an invaluable aspect of a turf manager's operations but knowing how to interpret the results and understanding the methods behind them can be confusing at times

When we look at various recommendations (e.g.: in Carrow et al, 2001) we can estimate that the Mehlich III test extracts about 0.75 times as much calcium, about the same amount of magnesium, and about 20 per cent more potassium than the ammonium acetate method, which is one of the more commonly used soil tests.

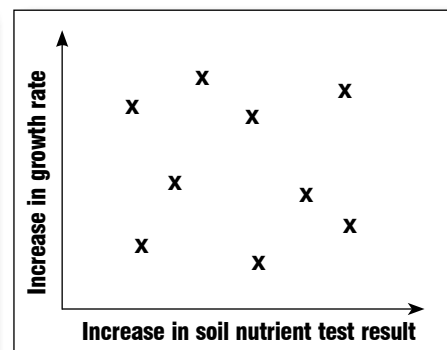
CORRELATION, CALIBRATION AND RECOMMENDATION

When a new test is developed for a soil nutrient, or an existing test is applied to a new situation, it needs to be 'correlated' to plant response, normally measured as plant growth. This means that an increase in the amount of nutrient extracted from the soil by the test is accompanied by an increase in plant growth rate.



The above diagram represents a good correlation between soil test result and growth response. This soil test would be a good choice of method in soils similar to those used in the tests that produced this data. The same test method may be completely inappropriate for a different soil type. The diagram next to it shows a poor correlation between soil test result and growth response. This test method would not be appropriate for use for the tested soil type and crop.

The process of correlating a soil test to an increase in plant growth must be carried out for each soil test in each type of soil.



CALIBRATION

Once it is established that a soil nutrient test is well correlated to plant growth, the test needs to be 'calibrated' to the relevant plant species. This process of calibration defines how much nutrient is sufficient for the desired growth rate, what level of nutrient is deficient and what level might induce toxicity.

Needless to say this calibration is only really accurate on the soil and plant species that the calibration was carried out on. Extrapolating the results to other soils and other plant species is educated guesswork and observation.

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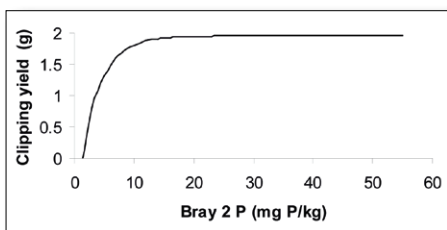
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The above chart shows a calibration curve for the Bray 2 soil phosphorus test in bentgrass maintained as a putting green in a sandy soil. The clipping yield, in g/m²/month, increases as the amount of applied phosphorus increases.

The calibration indicates that any application of phosphorus to soil that is at a level above around 12-15 mg P/kg would produce no growth response. This assumes that the other nutrients are present in sufficient amounts for the required growth rate.

If the nitrogen input is increased to produce rampant growth then the phosphorus requirement is likely to increase. In this experiment the nitrogen input was set at 0.3kg N/100m²/month, which is a generous amount of nitrogen for maintenance purposes.

It is critically important that each soil test method is calibrated for plant type and soil type. Every so often a new method of soil testing seems to pop up in the turf management area and recommendations are made with no apparent calibration. Turf managers should question these recommendations.

INTERPRETATION AND RECOMMENDATION

Once a sufficiency level or range is established, a test can be carried out on a soil sample. The test results can be interpreted against the desired level, and an estimation of deficiency and a fertiliser recommendation can then be made.

The quantity of fertiliser that needs to be added to rectify a deficiency varies according to the nutrient and soil type. Some nutrient elements are almost completely soluble in soil solutions and a recommendation can be made based on a rough calculation of the amount of soil to be treated and the deficiency in

milligrams of the nutrient per kilogram of soil.

Other nutrient elements are not so easily dealt with, as they can take part in reactions in the soil that render them almost unavailable, or they can be toxic if applied in high concentration to the turf or soil surface.

In agriculture, a fertiliser recommendation is often made with the intent of applying enough nutrient to supply the crop through its entire growth cycle until harvest. This is understandable as it is not really desirable to drive all over a crop in an attempt to top up the soil nutrient levels.

In turf management it is normally possible (and desirable) to avoid large inputs of fertiliser and thus we tend to 'spoon feed' or use controlled-release nutrients. Many fertiliser programmes are based on 'maintenance rates' of nutrient application, adjusted for the deficiencies and excesses revealed by soil testing.

PROBLEMS WITH INTERPRETATION OF SOIL TEST RESULTS

The process of the interpretation of soil test results and the recommendation of fertilisers can lead to controversy, mainly because there are two main schools of thought on how to interpret a soil test.

The first is the Base Cation Saturation Ratio (BCSR) method and the second is the Sufficiency Level of Available Nutrient (SLAN) method. The argument over these two methods involves the 'base cations' – calcium (Ca), magnesium (Mg), potassium (K), sodium (Na), and sometimes the acid cation (H).

The BCSR method originated in the research of Firman Bear in New Jersey and William Albrecht in Missouri. The theory behind the BCSR method is that there is an 'ideal' ratio of exchangeable cations in the soil, and recommendations of fertiliser should be made to adjust the soil to this ratio. The theory states that of the total cation exchange capacity of a soil, about 65 per cent of the exchange sites should be occupied by calcium, 10 per cent by magnesium, and 5 per cent by potassium, with the rest being sodium and hydrogen.

The cation exchange capacity (CEC) is the capacity of a soil to hold and exchange the positively charge 'cations'. This ability comes about because clays and organic matter have negative charges and opposite charges attract each other. (Organic matter and some clays also have positively charged sites but that is not relevant here).

The SLAN method simply states that a plant needs a certain amount of each nutrient, and you fertilise to correct a deficiency in that nutrient, regardless of other nutrients.

A review of the literature has been recently carried out by the school of Land and Food Sciences at the University of Queensland (Kopittke and Menzies, 2007). They find that, "The data do not support the claims of the BCSR, and continued promotion of the BCSR will result in the inefficient use of resources in agriculture and horticulture". They also find that "90-95 per cent of the soils tested by the turf industry in Australia are currently tested according to the BCSR concept".

Kopittke and Menzies also report on a

The process of interpreting soil test results and the recommendation of fertilisers can lead to controversy, mainly because there are two main schools of thought on how to interpret such tests



field experiment conducted in Nebraska over eight years that found that the cost of fertilising according to the BCSR method was double that of the SLAN method.

The turf industry is awash with products that are 'bio-active', 'organically chelated', 'complexed' or the like. They normally cost much more than the base fertilisers and therefore the cost difference of the Nebraska trial could be exaggerated in the turf management industry.

Carrow et al. (2001) also point out deficiencies in the BCSR method of interpreting soil test results. It should also be noted that different testing methods extract different ratios of the elements. The CEC is often calculated simply by adding up the amounts of Ca, Mg, K and Na extracted, and cation ratios are calculated against this.

A soil producing the 'ideal' ratio with one testing method will almost certainly not do so when another method is used, and therefore an unnecessary recommendation will be made.

To summarise, it should be noted that the weight of evidence is not on the side of the BCSR method of soil test interpretation.

WHY ARE THERE SO MANY PHOSPHORUS SOIL TESTS?

Phosphorus is one element which has many testing methods designed for its extraction from soil. This is because phosphorus is not usually present in soils in large quantities of dissolved forms. Instead it is normally in very low concentration in the soil solution, and the bulk of the phosphorus is present in mineral and organic forms of varying solubility.

Some soils, for instance, have significant amounts of phosphorus in forms involving calcium, while others have large amounts of phosphorus bound to iron or aluminium oxides. The different soil extractants are designed to extract the phosphorus from these forms in amounts that reflect the ability of the plant to eventually access this nutrient.

The acid extracts such as Bray and Mehlich will do a very good job of extracting calcium phosphates, while the fluoride extracts are designed to extract phosphorus from aluminium bound forms and alkaline extracts such as Colwell and Olsen will extract iron bound forms.

The complicating factor in this system is that soil factors such as pH profoundly affect the availability of the phosphorus forms. For instance some calcium phosphates are very insoluble in alkaline soils, but relatively available in acid soils.

If we use an acid extractant on an alkaline soil and extract a large amount of phosphorus, are we actually extracting very insoluble calcium forms of phosphorus that are not plant available? Allan et al. (1997) note that the Bray test is suited to low pH soils. They also note that in soils with high levels of aluminium or reactive iron, the Colwell test tends to overestimate the availability of phosphorus.

Aluminium is not usually an issue in golf greens, but reactive iron is often added in large amounts for aesthetic purposes. Trials have shown relatively large amounts of phosphorus being extracted by the Colwell extractant from the upper layers of greens from some Sydney golf courses where iron is frequently used. This situation was worse where iron sulphate was tank-mixed with fertilisers containing soluble phosphorus (Hull, 2005).

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These are examples of the reasons that extractants need to be carefully correlated to plant uptake in each soil type.

WHY IS SOIL NITROGEN LEVEL OFTEN NOT REPORTED?

There are several reasons that soil nitrogen is often not tested for in turf, some technical and one very practical. They include;

- Lack of accurate correlation between soil N and plant growth;
- Rapid variability of N in soil; and
- Use of N as controlling nutrient.

There have been some notable difficulties in calibrating nitrogen levels to plant growth, and one of the reasons is that much of the nitrogen in the soil at any one time is in an organic form. Even mineral nitrogen forms are rapidly taken up by plants and microbes, which then die and decay, releasing the nitrogen again as plant food.

This cycle occurs continuously in the soil and a low soil test result does not necessarily mean that there is not a sizable amount of N present in the soil

The organic cycle of uptake and release described above occurs quite rapidly and therefore the nitrogen level in the soil is not very stable. By the time you get a soil test result back the level of nitrogen is likely to be quite different to when you sent it off.

In the turf management industry the growth of the turf is normally regulated by nitrogen input. Provided levels of other nutrients are sufficient, soil test nitrogen results are largely irrelevant. If the turf is not growing rapidly, the turf manager fertilises. If it is growing fast enough, no further fertiliser is added.

There is plenty of literature on the nitrogen requirements of turf species over a period of time, and the educated turf manager soon adjusts these requirements to suit the soil and environmental conditions at his/her facilities. With a bit of recordkeeping the turf manager soon has a functioning fertiliser programme that is tailored to the fertiliser type and fertilising method that suits him/her best.

TISSUE TESTING

Tissue testing has an advantage over soil

testing as the levels of nutrient can be accurately determined, without the complications of soil chemistry and whether a nutrient is really 'available' or not. All of a nutrient within the plant is extracted by the digestion process, which normally involves prolonged boiling in hot concentrated acids. There is also very good research data regarding the concentrations of the various elements that are needed in the plant tissue of many of the major turf species.

An example of the value of tissue testing comes from the work of researchers such as Ken Johnson and John Forrest in Western Australia, who have found that in the calcareous soils in that state, iron and manganese can be quite deficient in plants, even though soil tests are producing results well within the adequate range. This is because at the alkaline pH of those soils the iron and manganese are present in very insoluble forms.

The disadvantage of tissue testing when compared to soil testing is that it cannot estimate the reserves of nutrient in the soil. Tissue testing is best for obtaining a 'snapshot' of the immediate availability of a nutrient. 🌱

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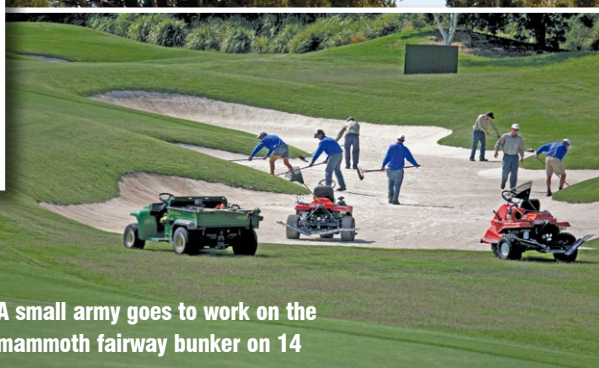
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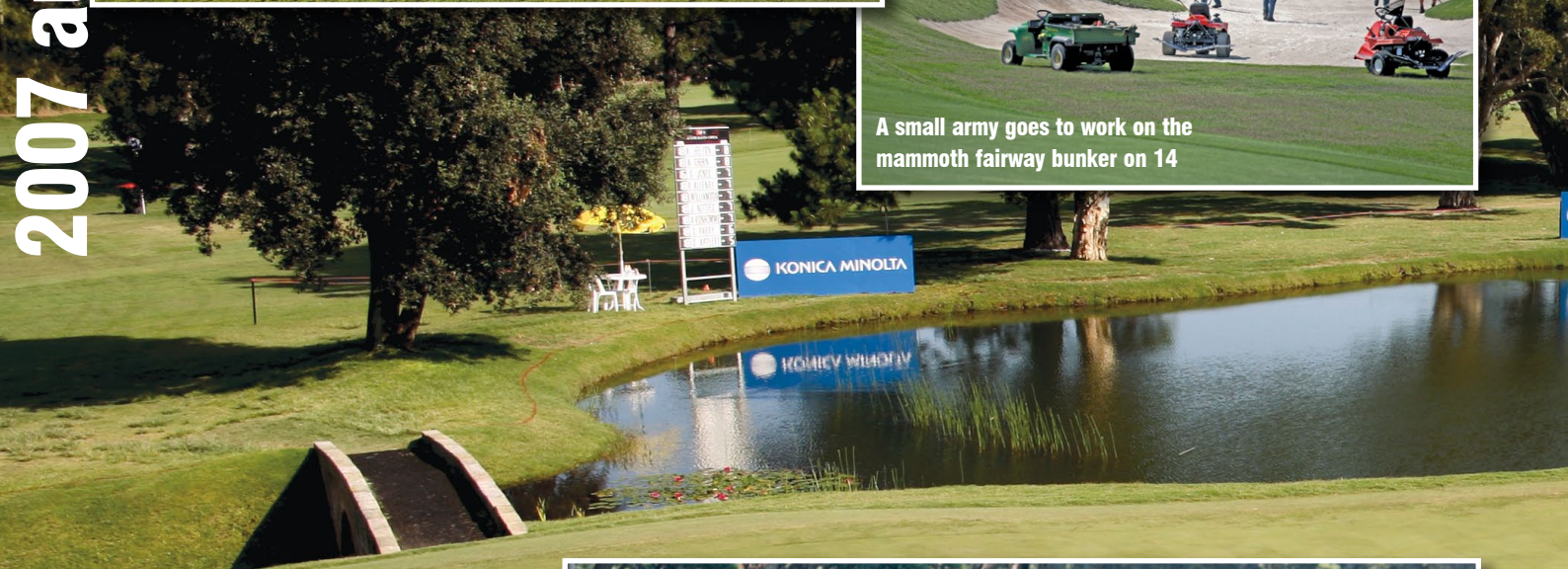
PHOTOS BY BRETT ROBINSON



The 4th proved to be the hardest par 3 over the four days



A small army goes to work on the mammoth fairway bunker on 14

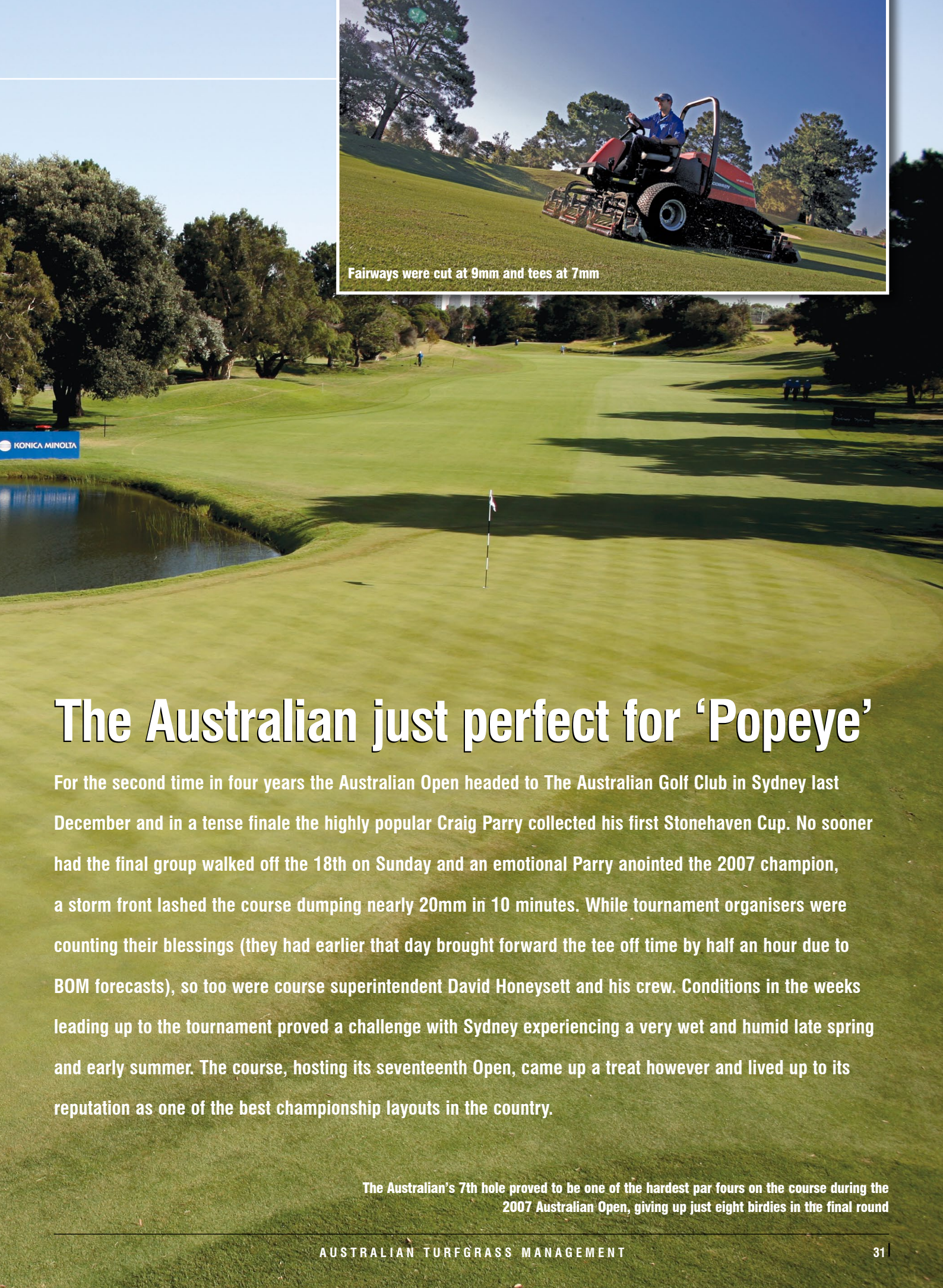


Right: The 16th lived up to its reputation as being the hardest hole on the course

Below: The Australian's greens were double cut only at 3mm and were rolling between 11.5 and 12 for most of the tournament



Perfect harmony on the flymows



Fairways were cut at 9mm and tees at 7mm

The Australian just perfect for ‘Popeye’

For the second time in four years the Australian Open headed to The Australian Golf Club in Sydney last December and in a tense finale the highly popular Craig Parry collected his first Stonehaven Cup. No sooner had the final group walked off the 18th on Sunday and an emotional Parry anointed the 2007 champion, a storm front lashed the course dumping nearly 20mm in 10 minutes. While tournament organisers were counting their blessings (they had earlier that day brought forward the tee off time by half an hour due to BOM forecasts), so too were course superintendent David Honeysett and his crew. Conditions in the weeks leading up to the tournament proved a challenge with Sydney experiencing a very wet and humid late spring and early summer. The course, hosting its seventeenth Open, came up a treat however and lived up to its reputation as one of the best championship layouts in the country.

The Australian's 7th hole proved to be one of the hardest par fours on the course during the 2007 Australian Open, giving up just eight birdies in the final round

BY JOHN NEYLAN

Water bodies can add to the beauty of golf courses, however they need to be constantly managed in order to prevent algal bloom outbreaks

ALGAE IN WATER STORAGES

Over the past few months we have had several enquiries at AGCSATech regarding the presence of algae in water storages and water bodies on golf courses. Prevailing conditions that may have contributed to these algal blooms include periods of low rainfall, warm weather and low surface flows. It would also appear that heavy rainfall, after extended dry periods, may have washed nutrients into water storages which stimulate algal growth.

General problems caused by excessive algal growth in golf course water bodies include:

- Unacceptable odour and appearance of water used for irrigation;
- Clogging of filters, meters and valves;
- Toxin release by some (blue-green algae in particular);
- Corrosion of metal tanks, pipes, etc;
- Production of unsightly scums on the surface of dams; and
- Deoxygenation of water resulting from the decay of algae. In some cases the algae completes its life-cycle and then the dead material sinks to the bottom of the water storage where micro-organisms break down the organic matter. In the process of breaking down the organic matter all the oxygen is removed from the water causing eutrophication. Under these conditions strong odours can result.

WHAT ARE ALGAE?

Algae are a diverse group of water-living primitive plants. They multiply either through vegetative propagation or the production of spores. They may be individual cells, single chains of cells or branching chains of cells. Algae are a normal part of the aquatic ecosystem and require sunlight, water, carbon dioxide and nutrients (including phosphorous and nitrogen) to grow.

Freshwater algae reproduce in a wide range of temperatures and they can multiply rapidly at moderately high temperatures if there is ample nutrient in the water. Freshwater algae are divided into four main groups as follows (Cummings, 2002);

Flagellates: Of many shapes, sizes and



Algal blooms in golf course water bodies can create a number of management headaches for superintendents. In this instalment of AGCSATech Update, John Neylan looks at the conditions likely to favour such outbreaks and ways to prevent them, as well as examines the impact that low salinity water has on turf.

colours and are capable of independent movement by means of flagella (whip-like tails). In large numbers they are often responsible for the tastes and odours in drinking water.

Green algae: Of various shapes and sizes. They are recognised by the long, green ribbons often seen in rivers and channels, on the sides of tanks and drinking troughs, and in thick tangled masses in low-lying swampy areas.

Diatoms: Microscopic and unicellular. They may exist as single cells or clump into filaments or colonies. They may be seen attached to the stems of other plants coating them with a brown slime. Some members of this family are planktonic, that is, they are suspended in the water rather than attached to anything. They are not usually a problem in water storages.

Blue-green algae: Occurs as single filaments or as clumps. Blue-green algae are capable of very sudden, explosive blooms and can produce thick scums on the down-wind surface of a water body. These scums have been described as being like a suspension of greenish paint, or curdled greenish milk. Colour can range from pale green through blue green, dark green to brown. There is frequently

a foul odour which has been compared to raw sewerage.

Some species of blue-green algae can produce harmful toxins and be a serious management problem. If such toxins contaminate a water supply both livestock and wildlife can fall ill, or die. If a blue-green algae outbreak is suspected, do not use the water. If a blue-green algae bloom is identified it is important that exposure to staff and golfers is minimised, in particular when staff are hand watering, when sprinklers are operating when the golf course is occupied or where golfers are tempted to retrieve golf balls from water storages.

CONDITIONS THAT FAVOUR ALGAL BLOOMS

Conditions which encourage the growth of algae in water are (Cumming 2002 and Mitrovic, 2007):

- High levels of nutrients (nitrogen, carbonates and particularly phosphorus);
- Warm temperatures;
- High levels of organic matter;
- Direct exposure to sunlight; and

TABLE 1: LEVELS OF NITROGEN AND PHOSPHORUS REQUIRED TO CAUSE ALGAL BLOOMS

Water body	Total nitrogen (mg/L)	Total phosphorus (mg/L)
Lakes and reservoirs	0.1–0.5	0.005–0.05
Rivers and streams	0.1–0.75	0.01–0.1

(ANZECC 1992)



On golf courses algal blooms generally occur in water bodies that are shallow and where there is poor water movement

- Still, shallow water or a dam where the surface water is strongly stratified relative to the lower waters (i.e. no mixing).

On golf courses algal blooms generally occur in water bodies that are shallow and where there is poor water movement.

Nutrient availability to algae is regarded as a major influence on blooms. It is important to note that the levels of nitrogen and phosphorus required to cause algal blooms are very low (Table 1).

It only takes a careless application of fertiliser or relatively small amounts of contaminated stormwater runoff from urban areas to add sufficient nutrients to cause an algal bloom. Where water is taken from urban catchments, the first wave of drainage water should be diverted away from the main irrigation dam. This initial nutrient-enriched 'slug' of water can be diverted through a wetland filter before entering the main water bodies. Where reclaimed wastewater, high in nutrients, is used for irrigation it is a requirement of the reuse licence that it is not allowed into any water bodies.

PREVENTING ALGAL BLOOMS

Preventing algal blooms from occurring is easier than trying to clear up a bloom once it has appeared. Understanding the dynamics of the catchment area is an important factor in putting in a control strategy to prevent future blooms from occurring. This means having an understanding of the predisposing factors for algal blooms such as depth of the water storage, sources of nutrients, source of stormwater etc.

Key factors in reducing the opportunity for algal blooms include:

- Minimising the flow of nutrients into the water storage;
- Encourage diluting and flushing of water storages during wetter months;
- Minimise sunlight load on the water storage through the use of colourants. It is important to note that there are some environmental regulations affecting the use of certain water colourants; and
- Encourage mixing of dam water to avoid stratification. A water body becomes thermally stratified when two distinct



temperature layers form. During spring the sun will warm the surface layers of water. They become less dense, but will be mixed with cooler 'bottom' water by wave action. As heating continues, the wave action will become less able to drive the mixing. When mixing ceases, the warmer surface water will lie over cooler, dense bottom waters.

During summer, algal blooms often occur in the warm stable conditions of the upper layer. The bottom layer often has very low concentrations of dissolved oxygen that creates favourable conditions for the release of nutrients from the sediments.

Artificial destratification involves increasing the circulation of water that circulates between the shallower and deeper layers of the reservoir. This can be achieved by introducing a plume of bubbles near the bottom of the reservoir or installing a propeller or impeller in the dam. A circulation pattern is set up that reduces the differences in temperature, oxygen and nutrients between the top and the bottom waters.

Artificial destratification reduces algal blooms by reducing the sediment phosphorus load and mixes the algae deeper into the water column and starving them of light.

The use of water fountains that encourage mixing of the water column have been successfully used on golf courses around Australia for controlling algae and other aquatic weeds.

DAM DESIGN

In our experience most of the algal problems in water storages are as a result of fundamental design faults in the water storage. Water storages must be:

- Large and deep to reduce the intensity of temperature stratification of the water;
- Design and locate water storages so that they are linked, there is movement between water storages and regular dilution and flushing is encouraged;
- Construct water entry path into excavation of the dam such that it does not cause excessive turbulence and scour;
- Use buffer/filter zones of thick vegetation immediately upstream of the dam to minimise entry of sediment and nutrients;
- Develop vegetation buffer strips around the perimeter of water storages to reduce the movement of sediments and nutrients into the water storage.

CHEMICAL CONTROL OF ALGAL BLOOMS

Chemical control of algal blooms is considered to be a last resort and the primary causes must be addressed if a long-term solution is to be developed. Chemical control may be required for short-term control, however, there can be side effects such as killing aquatic life, large amounts of dead plant matter will rot which in turn will cause a sudden decrease in oxygen levels and when blue-green algae die they release toxins into the water.

The use of water fountains that encourage mixing of the water column have been successfully used on golf courses around Australia for controlling algae and other aquatic weeds



An algicide is any chemical added to water which is toxic to, and kills, algae and/or cyanobacteria (blue-green algae). Examples include copper sulphate, chelated copper-based products, simazine and benzalkonium chloride (Mitrovic, 2007 and CRCQWT, 2002).

The use of any algicide must be carefully considered to ensure there is no affect on beneficial aquatic life and that irrigation water does not contain chemical residues that will damage turf. While there are registered chemicals to kill algae, however, government agencies generally recommend against chemical control.

WATER WITH NO SALTS

At a time where many golf courses and sportsturf areas have to make do with lower quality and higher salinity water, it is unexpected to observe difficulties associated with water that is 'too pure'.

With a number of desalination plants now in operation there have been some interesting observations where very low salinity water is being used. Desalination plants remove virtually all of the dissolved elements and the total dissolved salts can be less than 75mg/L. This problem is usually most often associated with monsoonal rains and water from snowmelt.

Low salinity water often causes infiltration problems within the first centimetre of soil regardless of the sodium absorption ratio. Waters are classified as low in salt when they contain less than 320mg/L total dissolved salts (0.5dS/m EC_w) and these problems become more severe when the salt concentration falls below 130mg/L TDS (0.2dS/m EC_w) (Carrow et. al. 1999).

Low salinity water tends to leach surface soils free of soluble minerals and salts, especially calcium, reducing their strong stabilising influence on soil aggregates and soil structure.

Without salts and without calcium, the soil disperses, and the dispersed finer soil particles fill many of the smaller pore spaces, sealing the surface and greatly reducing the rate at which water infiltrates the soil surface. When dry, this results in noticeable soil crusting in areas void of turf.

In Australia, water from desalination plants is principally used on greens which have a sand base and where soil aggregate dispersion is not an issue. However, it is likely that the low salinity water could have a dispersive effect on the organic matter in the thatch layer and develop 'hydrophobic' type conditions. Obviously the stripping of essential cations, such as calcium and magnesium, will also have an affect on turf nutrition and health.

The options for managing very low salinity water are to:

- Increase the salt concentrations at the soil surface with soil applications of gypsum (soil-applied treatments can be used on a trial area to determine if low water infiltration is due to ultra-pure water or from another cause like soil compaction); or
- Increase the salt concentration in the irrigation water to above 0.50dSm⁻¹ (Carrow et.al. 1999). Increasing dissolved calcium in low-salinity water by 1.0 to 4.0 meq Ca/l raises the EC_w by approximately 0.075 to 0.30dSm⁻¹. Gypsum and other soluble calcium compounds can double or triple the infiltration rate over that of untreated low-salt water.



Adding gypsum directly to the water to increase salinity is the preferred method of treatment (Peacock Pub IG11-00). Calcium must be added continuously to the irrigation water in order to maximise infiltration. When applications of gypsum are discontinued, infiltration rates drop to near control levels within a few weeks. The occasional addition of calcium to the irrigation water is not effective in maintaining infiltration rates.

Soil-applied gypsum is also effective but light and frequent applications must be made to avoid leaching. Once the amendment is leached beyond the surface, infiltration problems rapidly reoccur.

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With a number of desalination plants now in operation at golf courses, there have been some interesting observations where very low salinity water is being used for irrigation



Side-section of Motz Stabilized Turf, membrane with artificial reinforcement and natural turf

HG Turf – A year in review - 2007

2007 will be remembered as the year the drought really hit the turf industry. The market was just as challenging as the environment. However, for HG Turf, 2007 will be remembered as the year when they saw an opportunity and diversified into selling synthetic turf as well as natural turf to the domestic, commercial and sports turf markets. A real sign of the times for a turf grower. On the flip side, 2007 was a successful year for HG Turf's stadium business.

Telstra Dome's playing surface finally met expectations in 2007. HG Turf believes the design of its Motz Stabilized Turf product played a significant part in this success. Motz Stabilized Turf holds the playing surface together when the turf plant weakens from repeated use and less than ideal growing conditions. Telstra Dome had its best year yet, replacing only 9,000m² of turf. Interestingly, at its inception, advisers to the stadium forecast turf replacement of 10,000m² per annum. The notion of replacing "more turf - more often" is certainly not the answer for Telstra Dome, the answer lies in having the right product and the right maintenance program both in the stadium and on the farm. Hence artificial lighting is a major step in the right direction for the stadium. HG's Mathew Woolfe and Bradley Kidd, Andrew Peart from AGCSA and Jerry Spencer from Endeavour Turf Products deserve congratulations for their persistence in getting the product right for Telstra Dome's difficult conditions.

The **MCG** had its 8th consecutive year boasting a playing field of Motz Stabilised Turf supplied by HG Turf. The entire playing surface at the MCG is Motz Stabilized Turf. It was first installed for the Olympic Soccer Tournament in 2000 and then again during the redevelopment of the MCG in 2004 and 2005 and then again for the Commonwealth Games in 2006. Motz Stabilized Turf is the MCG's preferred turf replacement system and it continues to be so with forward orders into 2009. Motz Stabilized Turf has contributed to the improved performance and appearance of the playing surface at the MCG and will continue to do so with ongoing product research and development being undertaken with HG Turf and The Motz Group in the USA.

ANZ Stadium (formerly Telstra Stadium / Stadium Australia) in Sydney was another stadium to rely on HG Turf throughout 2007. ANZ Stadium decided on Motz Stabilized Turf for their unique mid-season turf replacement requirements, and since 2005 Motz Stabilized Turf has progressively been introduced across the entire

rugby playing surface. For each AFL fixture the lower seating is retracted to change the field from a rectangular field suited to rugby and soccer into an oval field suited to AFL. Prior to AFL being played the footings under each retracted stand must be covered with turf to complete the AFL playing surface. Motz Stabilized Turf has streamlined this process enabling the turf to be installed overnight before the AFL fixture and then removed the following night for rugby. Motz Stabilized Turf is not discarded after each AFL match, it is returned to the farm and then reused over a 2 year period (typically 8 AFL fixtures). Stadium Australia first used Motz Stabilized Turf for the 2000 Olympic Games and Paralympic Games.

Across the ditch, HG Turf was awarded its second field reconstruction contract in New Zealand, at **AMI Stadium** (formerly Jade Stadium) in Christchurch. HG Turf planted a nursery of Motz Stabilized Turf in 2007 which is currently maturing for installation after HG Turf rebuilds the playing field in late 2008. HG Turf also continues to work with Eden Park in Auckland supplying Motz Stabilized Turf for their redevelopment works for the 2011 Rugby World Cup. HG Turf excavated and rebuilt the Eden Park field in 2003.

Late in 2007 HG Turf was commissioned by the **Australian Institute of Sport** to strip two cool season grass sports fields and plant them with CT2 couch grass. HG Turf's team was headed by Mathew Woolfe and the HG works methodology enabled the couch fields to grow-in within 4 weeks of planting. In Canberra CT2 couch grass has performed well in Canberra Stadium (also a Motz Stabilized Turf field) and it is also performing well for ANZ Stadium in Sydney. HG Turf has a five year turf supply contract with **Canberra Stadium**. The playing surface at Canberra Stadium was first installed with Motz Stabilized Turf for the 2000 Olympic Soccer tournament.

To round out the year HG Turf rebuilt and turfed the main oval at **Caulfield Grammar School** in Melbourne. Again Mathew Woolfe led the project team and 22,000m² of CT2 couch grass was installed prior to Christmas. The grow-in has proceeded to plan and the school is elated to have a first class couch field for cricket and football. HG Turf in conjunction with Sports Turf Consultants is providing on-going support and recently completed a renovation of the new couch field.

For more information:

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Salt-affected sites are very complex and are influenced by a four-way interaction between the soil, water, turf species and climate



Managing salt-affected sites

Salt-affected turfgrass areas are becoming more abundant, especially with the increased use of poorer quality water mainly from recycled water treatment plants. Twelve countries were represented out of the 80 or so participants in the seminar indicating just how widespread the problem is becoming.

For Australians, the most concerning aspect of our soils is that we have the largest area by continent of ground affected by sodic (> 15 per cent sodium) soils, and only second to Asia in terms of total saline and sodic soils.

Salt-affected sites are very complex and are influenced by a four-way interaction between the soil, water, turf species (cultivar) and climate. Primary problems caused by salinity are the initial reduced water availability or physiological drought induced by high saline soils, poor soil structure and permeability problems primarily caused from excessive sodium ions, as well as nutrient imbalances and a resultant loss of root volume which is the major reason for turfgrass decline.

Secondary issues that must also be addressed include turfgrass being less competitive and therefore more susceptible to weeds and disease, more intensive cultivation being required to maintain acceptable macropores, more complex fertilisation programmes to ensure nutrient balances, the addition of soil amendments and the knowledge that the turfgrass will be less tolerant of other environmental stresses.

MANAGEMENT

The management of saline sites is complex and there is never a silver bullet solution, especially if high saline water is being applied with each irrigation cycle. To be able to successfully manage salts there must be several integral components present:

- An irrigation system with a high distribution efficiency;

During his attendance at the Golf Industry Show in Orlando, Florida in late January, Andrew Peart attended a two-day seminar conducted by

Dr Ron Duncan and Dr Bob Carrow entitled Salt-Affected Sites:

Assessment and Management. This edition's Tech Talk deals with some of the issues discussed during this forum.

- Acceptable soil profiles;
- Drainage upgrades;
- Cultivation equipment and proper scheduling;
- Equipment available to deliver water and soil amendments; and
- The possibility of a requirement to alter turfgrass species.

The ability to move the salts through the profile is the most important aspect to the management of saline soils, irrespective of the salinity of the water being applied. This process involves three components – infiltration, percolation and drainage – and the success in moving salts is directly proportional to maintaining all of those components.

Barriers to these processes can be thatch accumulation restricting infiltration, clays or compacted rootzones restricting percolation and pans that may be present affecting the final drainage.

IRRIGATION WATER

Generally the source of all saline soil problems emanates from irrigation water. The first step in assessing the likelihood of an increasing salinity problem is to have the water tested on a regular basis throughout the irrigation season. Knowing the components of the water allows you to make informed decisions regarding management strategies.

Key elements of water quality are its nutrient content (Ca, N, S, Mg, K), salt load (Na, Cl, HCO₃) and to a lesser extent pH.

Bicarbonates are generally regarded as one of the more detrimental components to irrigation water, however, it is not the absolute level of bicarbonates that is important but the relative concentrations compared with calcium and magnesium.

It is when the bicarbonate/carbonate concentration exceeds the calcium/magnesium component that acidification or gypsum applications may be required if the residual sodium carbonate (RSC) value exceeds 1.25. $RSC = (HCO_3 + CO_3) - (Ca + Mg)$, where all components are expressed in meq/L, not parts per million (ppm) or milligrams per litres (mg/L).

When the RSC value is greater than 1.25 it indicates that appreciable calcium and magnesium are being precipitated out of solution, forming insoluble calcium and magnesium carbonates and therefore cannot counteract excessive sodium ions on the exchange sites. If untreated, the problem exacerbates with every irrigation cycle.

Excessive sodium ions on the cation exchange sites can therefore be either caused by an imbalance of bicarbonate/carbonate ions compared with calcium and magnesium or directly from high sodium ions in the water. This is where additional calcium must be applied.

CALCIUM

Calcium is an integral cation on sites dominated by excessive sodium in the water or on the soil

exchange sites. It is very important and used most commonly as a soil amendment but can also be applied as a water amendment and where required as a nutrient or fertiliser.

Calcium is a very immobile ion and therefore must be applied to the soil if it is to be effective at displacing the sodium ions on the exchange sites. If applied to the leaves only certain forms of calcium will be absorbed and only effective within the plant and will not be translocated down to the roots.

Those forms of calcium that are foliar absorbed include calcium nitrate, calcium chloride, calcium citrate, calcium gluconate and calcium glucoheptonate. These should be applied as a foliar fertiliser if the plant is deficient in calcium for a faster response rather than from a source of gypsum or lime. Gypsum can be applied through an injection system, however, it will not be taken up through the leaves of the plant.

Gypsum (calcium sulphate) applications are targeted to the soil so the calcium ions can displace the sodium ions and then for the sodium ions to bind with the sulfate ions to form sodium sulphate. Sodium ions on their own are very difficult to leach, however, sodium sulphate is a leachable compound particularly when there is an effective irrigation system.

The minimum amount of gypsum applied to the soil must be enough to counteract both the residual sodium carbonates in the water as well as the actual amount of sodium being applied by the irrigation water. To be able to calculate this quantity, the amount of calcium, magnesium, sodium, bicarbonates and carbonates in the water, expressed in meq/L, must be known. The objective is to apply more calcium, in the form of gypsum, to compensate for the amount of bicarbonates, carbonates and sodium in the water, arguably the major source of sodium in the soil.

LEACHING

The ability to leach salts from the rootzone is the most critical aspect of remediating salt-affected sites. Irrespective of how much calcium is applied to the soil, the amount of sodium will not diminish unless they can be moved through the profile.

For purely saline sites, those with high total dissolved salts but low levels of sodium, the best remedial action is aeration and leaching, while sodic soils will require the addition of gypsum and possibly other calcium sources.

Leaching becomes more complex due to the accumulation of salts within the micropores of the profile. Generally salts do not accumulate in the macropores as they are more easily leached with irrigation.

To effectively leach salts from the micropores it is best that pulse irrigation cycling occurs. Pulse irrigation is where the profile is saturated then stopped, allowed to drain and then another similar irrigation cycle starts. In general, 100mm of infiltrated water will remove 90 per cent of the salts from the upper 100mm of the profile.

Pulsing is more likely to produce a more uniform leaching rather than a continuous irrigation event where the majority of water is either likely to run off or drain through the macropores and not the micropores of the profile. The use of a wetting agent will also provide more even water penetration.

It must be remembered that with any leaching activity nutrients will be leached as well as salts. This will be particularly the case on low CEC soils, namely sand greens, and regular applications of nutrients must be applied to counteract those that may be leached, potassium being the most susceptible.

NUTRIENTS

Foliar applications of nutrients can be very important on salt-affected sites particularly in

summer when the root system may be severely stressed. Those ions that are mobile within the plant and will translocate downwards are nitrogen, phosphorus, potassium, magnesium, chloride and sodium. Those that are somewhat mobile include sulphur, copper, molybdenum, zinc and boron. The four most immobile ions are calcium, (as previously stated), iron, manganese and silicon.

Ion uptake is via stomatal pores, cuticle cracks and ectodesmata pores. Once inside the leaves, nutrients can pass directly into cells through the cell walls and plasma membrane. Otherwise they can enter the apoplast (space between cells) and then be transported, depending on their mobility, up in the xylem or down in the phloem to other plant parts.

Adequate calcium within the plant is vital to prevent potassium from being lost from membrane leakage due to excessive sodium. Potassium is vital for stomatal regulation maintaining a more turgid plant as well as increasing environmental stresses.

Other nutrients to enhance salt tolerance are zinc and manganese and plant tissue analysis should be conducted to ensure there are adequate amounts of these micronutrients.

Cytokinin applications, such as seaweed-based products, are also recommended to encourage a strong root system. They stimulate photosynthesis, leaf initiation as well as lateral root initiation when turf roots are absent, very short or unhealthy.

SPECIES

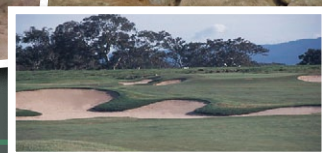
More salt-tolerant species are becoming available for turf managers, however, these must not be seen as complete panaceas for salt-affected sites. They allow more flexibility with site management, however, if salts are not well managed there will come a point where the soil will become so salt-laden that even the most salt-tolerant grasses will deteriorate. 🌱

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THE PULSE

As any golf course superintendent will attest, a top quality assistant superintendent is nothing short of gold. With a superintendent's role becoming less hands-on and complicated by the burgeoning amount of paper work covering a plethora of fields, assistant superintendents are being called upon more and more to drive turf management operations. ATM asked five assistant superintendents exactly how their role has changed in recent times and whether the attributes of a good assistant have changed as a result.

ASH DUNCAN Croydon GC, VIC



Recently I have felt my job as assistant superintendent has changed into a superintendent type role enabling the supers I have worked under to become more like business managers. As budgets have grown and with higher demands to achieve OH&S and environmental compliancy, expectations and legal responsibilities of superintendents has increased considerably. In most cases the assistant superintendent now runs the day-to-day operations, reporting issues back to the superintendent. Put simply, the superintendent allows the process to happen and the assistant makes it happen.

Dealing with recent industry trends, such as environment and water management, has become a major part of weekly planning. Courses that have recycled water (as we do), have a number of guidelines and restrictions that have to be followed which increases the workload on assistants and superintendents. Most assistants, including myself, would also be working closely in setting up procedures and policies on environment matters and operating environmental management systems.

Important qualities for a good assistant are an ability to manage time and staff, and professionalism in communicating with committees, managers and staff. One area where improvement is needed for assistants is more involvement on budgeting and communicating with committees. This is an area where assistants becoming supers can find themselves thrown in at the deep end.

The role of assistant has changed in my 13 years and for the better. Because there is, at times, little movement in the industry, assistants are now getting the opportunity to have their say and are putting into practice their ideas which is keeping good workers in the industry longer. 🙏

PETER SVENNE Eastlake GC, NSW



I have been in the industry on 20 years now and have seen different styles of management, and, accordingly, the different roles that assistants have played. An assistant now has to accept more responsibility and accountability and be more involved in the management of the course as superintendents have now become increasingly desk-bound, dealing with the many complex and sensitive issues of modern-day course management.

My role is challenging in that I am involved with daily job allocations, supervising and monitoring progress of staff and their duties, ensuring quality of completed jobs and staff training. I am also on two committees and attend regular meetings. Limited staff numbers place a strain on the need to complete tasks. I have to be the super's right hand man, his eyes and ears. We work well together.

Environmentally, Eastlake is located within the Botany wetlands and we have areas of protected Eastern Suburbs Banksia Scrub. The need to protect these two sensitive areas is paramount and accordingly we have to be very careful with chemical applications, disposal, washdowns etc. These areas of scrub are 'no go zones' and are left untouched. We participate in e-par and are about 75 per cent completed with our programme. Fortunately our water source is from below ground aquifers and the allocation is generous. Quality is good, so no 'mixing' is required.

I believe good attributes of an assistant need to be that you are the best operator and communicator on staff, as you have to teach the less experienced, establish and maintain high standards of maintenance, be a go-between to super and mechanic and ensure good staff morale. I love my work, and often walk away on Friday content that we have done our best. 🙏



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'Environmental Issues for Golf Course Architecture'
 Order through our Bookshop (Offshoot)





TRAVIS SCOTT Commonwealth GC, VIC



In the 18 months that I have been an assistant superintendent, the position and demands of the job are ever-increasing. I believe this will be a continuing trend as golf club management and committee expectations and demands grow on the superintendent.

Water management is number one on the agenda at the moment and Commonwealth is continually trying to source water whether it is recycled or groundwater. Since 2006 the club has developed a policy of not using potable water on the golf course. This has ensured that we have a solid water management programme in place which includes recording flows from bores and pump systems. Commonwealth also strives to keep ahead with environmental management issues and we have a strong OH&S presence in which staff are closely involved.

I find my role extremely challenging at Commonwealth as we are continually striving for the next level and to improve the condition of the course. I feel the areas that I need to be more efficient include time management between course and office, and budgeting is a skill which I think is needed to take the next step. I don't believe the attributes of an assistant have changed; expectations certainly have and with minimal positions available clubs expect quality.

The greatest asset an assistant can possess is communication skills. Being able to communicate with a wide variety of people and able to speak with them on different levels is a key to the position.

The assistant superintendent is a vital communication link between the ground staff and the superintendent. If this breaks down the workplace can be a pretty ordinary place to be and an unhappy workplace can lead to an array of problems. 🌱

MARK EVERINGHAM Royal Adelaide GC, SA



Over 14 years as assistant superintendent the fundamental role of the position – to support the course manager and hands-on overview of the daily operations – remains unchanged. Notwithstanding this, aspects within the role have evolved considerably.

The level of professionalism of all within the industry has been challenged and elevated. Long-standing practitioners were 'educated' through practical experience and mentoring from crafty supers. Certification was regarded as a one-way trip to an institution, not a ticket to operate machinery. Management now requires a TAFE diploma or university degree and staff numbers have increased in line with increased expectations of course presentation.

Water management has become a critical component of our lives. In the past it actually rained in winter! In summer we could water from unmetered bores without bureaucratic intervention - uncomplicated bliss! Manual irrigation systems have been replaced by automated systems that require specialised technology and knowledge. Alternate water sources, in our case an aquifer storage recharge (ASR), have ensured some interesting times during construction and commissioning. Ultimately management of the ASR will further impact on management roles.

Understanding and adherence to OH&S and environmental management legislation have also become paramount with attendant documented policies and procedures unimaginable in the not too distant past.

I could go on, and on. Back in the old days when it seemed too much we could take a Bex and have a nap. Now we can rely on networking, our character and technical expertise to see us through. Should that fail us, a well-aimed size 10 at the dog's posterior and a cleansing medicinal lager won't hurt! 🌱

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Today's assistant coordinates the day-to-day maintenance of the golf course as the superintendent is now required to spend a lot of time away from the course attending meetings with management and committees, liaising with golfers, members, contractors, suppliers and other industry professionals. The superintendent places much trust in his/her assistant to ensure that the plans and programmes they have prepared are coordinated efficiently and effectively. In order to achieve this, the assistant needs to be competent in multi-tasking and process the different happenings on course simultaneously. An assistant's mind is constantly looking into the future and planning forward to prevent incidents from occurring and making sure everything runs smoothly.

Today's assistant is required to remain educated and keep pace with new technological advances and not just within the turf industry. Attending seminars and conferences is required to keep assistants informed of the latest trends, in addition to liaising with other industries as well. Here one can acquire valuable knowledge in areas such as staff management, conflict resolution, financial acumen and planning. Such a multi-disciplinary approach to golf course management is a style that is now being demanded.

Environmental and water management issues are now such an important part in managing golf courses, more so than we could have ever envisioned when we began our trade. Assistants must have a thorough understanding of such issues and the legislation that enshrouds them to competently carry out our duties. As the next generation of superintendents, today's assistants should realise now that there is so much more to the game than just keeping it green. 🌱

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In 2006, a co-operative research project between the University of Melbourne and University of Florida set out to ascertain the size, scope and market value of turfgrass sod production in Australia. As well as providing an economic and agronomic analysis of the industry, the survey also sought to find out what firm and industry problems were confronting commercial turfgrass producers.



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Although there has been evidence of commercial sod production in Australia as early as the late 1970's, there has been relatively little documentation on the actual size, scope and structure of the industry.

In 1996 there was an estimated 200 turfgrass sod primary production farms growing over 5000 hectares in Australia. The market value of sod production at this time was estimated to be in excess of \$100 million per annum for the eastern Australian states.

In 1998 the Australian Bureau of Statistics estimated that there were some 420 sod farms in Australia, producing over 6400ha of turf and generating as much as \$350m per annum. Recently, turf research scientists found that there are some 225 production farms producing 4918ha valued at \$235.7m per annum.

This co-operative research project between the University of Melbourne and the University of Florida was funded by Horticulture Australia Ltd and the Turf Producers of Australia and carried out over 2006. It has become the nation's first economic and agronomic analysis of the Australian turfgrass industry.

The aim of the project was to provide reliable economic information on the Australian turfgrass industry so that individual producers, trade organisations, potential investors, academic institutions and policy makers

can make better, more informed decisions. The study had three major objectives, the first to determine the number of hectares in production; types and sizes of firms; number of employees; major grasses grown; production practices; harvesting methods and efficiencies; marketing channels and outlets; and marketing issues as reflected in turf quality and price.

The second objective was to identify the research and development priorities for the turfgrass industry and the third objective to assist in the determination of financial costs and returns for turfgrass producers.

The survey started in 2006 following a number of industry meetings with turfgrass industry representatives. The survey went out to two primary sources – an address list provided by Turfgrass Producers of Australia in November 2006 and an electronic address version taken of turfgrass producers by Australian Post in March 2007.

Information collected from the survey was based on the 1 July-30 June fiscal-year basis, rather than a calendar year, and sought information on production and harvesting, labour and water, financial information, harvesting methods, markets and transportation as well as operational and industry problems. A response rate of 36 per cent was achieved. For analytical purposes, farms were grouped by size — small (0-25 ha), medium (26-50 ha) and large (51-220 ha).

The collaborative research project showed there was a total of 4918ha of turfgrass sod produced in Australia in the 2006 financial year

RESULTS AND DISCUSSION

Figures show that there was a total of 4918ha of turfgrass produced in Australia in 2006. Much of this production came from small farms (32 per cent) to medium-sized (28 per cent) farms throughout Australia, with the larger farms contributing some 41 per cent of production but constituting only eight per cent of turfgrass producers.

Many of these farms were responsible for growing 85 per cent of the nation's warm-season grasses. The major warm-season grasses of importance were the couchgrass selections and hybrids (*Cynodon dactylon* x *C. transvaalensis*), buffalograss (*Stenotaphrum secundatum*), kikuyugrass (*Pennisetum clandestinum*), Queensland blue couch (*Digitaria didactyla*), zoysiagrass (*Zoysia* spp.) and paspalum (*Paspalum vaginatum*). Kentucky bluegrass (*Poa pratensis*) and tall fescue (*Festuca arundinaceae*) dominated the cool-season grass market.

An estimated total of 4246ha of warm-season grasses were grown in 2006 as well as a total of 671ha of cool-season grasses. Whereas all warm-season grasses in production were valued at \$200.9m, cool-season grass production was valued at \$34.8m.

Of the warm-season turfgrasses, the couchgrass selections and hybrids were the most important in terms of area in production (1844ha), but had only the second highest value (\$67.1m). Buffalograss had 1374 hectares in production, but was valued considerably more at \$94.7m. Kikuyugrass was ranked third in

both area (655ha) and value (\$22.2m) (Table 1, pg 42).

The number of hectares that were harvested of both warm- and cool-season turfgrasses is shown in Table 2. The harvest value also accounts for the fact that some producers are able to obtain two harvests every three years; this would mean that for any given fiscal year, there could be two harvests.

Warm-season grasses, such as couchgrass, still dominate the market with buffalograss and kikuyugrass coming in second and third respectively in terms of area harvested and value.

IRRIGATION

With water being such a crucial factor in production, the survey asked producers how many hectares of turfgrass were not irrigated due to water restrictions. Of the 15 per cent of producers that were faced with shortages, a total of 625ha was not irrigated. This estimate represents 13 per cent of industry output, with medium and large growers feeling the impact more than small growers. Assuming the industry average gross return of \$48,621 per hectare (\$181.6 M/3734 ha = \$48,621, see Table 2), non-irrigated areas represent a loss of \$30.4m in unsold product.

More recently, the Australian Bureau of Agricultural and Resource Economics has

estimated that by 2030 the effects of climate change on many agricultural crops may result in a 9-10 per cent loss of production if nothing is done to slow or adapt to rising temperatures. By withholding water from areas used for turfgrass production it could be said that Australian turfgrass producers have already made that sacrifice.

Most of the water used in sod production comes from multiple sources — either surface water, water from wells or reclaimed water. Where only one source was used, just over half (52 per cent) used surface water, 30 per cent used water from wells and three per cent used reclaimed water.

If the average revenue generated by all grass varieties of \$48,621 per hectare and dividing this by the average water application of 6.5 megalitres, this calculates to \$7480 per megalitre of water used in turfgrass production.

Again using the 6.5M average, returns per megalitre would range from a low of \$5277 per megalitre for kikuyugrass to a high of \$10,600 per megalitre for buffalograss. How these figures compare to other segments of Australian agriculture would be an interesting inquiry, but the results of such an exercise would probably be quite favourable to the turfgrass industry.

LABOUR AND INCOME

The Australian turfgrass industry employs an estimated total of 1321 people in 2006, which

An estimated total of 4246ha of warm-season grasses were grown in 2006 and 671ha of cool-season grasses. Warm-season grasses were valued at \$200.9 million and cool-season \$34.8 million



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TABLE 1. HECTARES IN PRODUCTION AND VALUE OF TURFGRASS, BY GRASS VARIETY, 2006

Grass Type	Small		Medium		Large		Total	
WARM SEASON	Ha Total	Value \$000	Ha Total	Value \$000	Ha Total	Value \$000	Ha Total	Value \$000
Couchgrass	589.4	18,981.4	527.0	19,292.6	727.4	28,796.8	1,843.8	67,070.8
Queensland Blue	111.9	4,883.2	58.5	2,079.2	13.6	479.6	184.0	7,442.0
Seashore Paspalum	0.6	43.3	80.0	0.0	17.4	1,086.3	18.1	1,129.6
Zoysiagrass	11.3	1,030.2	29.4	1,575.1	51.7	2,424.9	92.4	5,030.3
Buffalograss	538.0	37,489.6	338.3	24,532.6	497.9	32,706.2	1,374.2	94,728.4
Kikuyugrass	241.7	8,049.8	285.6	9,448.9	127.7	4,725.2	655.1	22,224.0
Carpetgrass	18.5	950.5	0.0	0.0	60.3	2,289.7	78.8	3,240.1
Sub-total	1,511.4	71,428.0	1,238.8	56,928.4	1,496.0	72,508.7	4,246.4	200,865.2
COOL SEASON	Ha Total	Value \$000	Ha Total	Value \$000	Ha Total	Value \$000	Ha Total	Value \$000
Kentucky Blue	16.6	579.3	26.8	1,603.9	16.5	984.6	60.0	3,167.9
Tall Fescue	37.9	1,571.8	128.8	6,623.1	444.6	23,483.0	611.4	31,677.9
Sub-total	54.5	2,151.1	155.6	8,227.0	461.1	24,467.6	671.4	34,845.8
Total	1,565.9	73,579.1	1,394.4	65,155.4	1,957.1	96,976.3	4,917.8	235,711.0

was made up of 857 full-time (65 per cent), 348 part-time (26 per cent) and 116 seasonal (9 per cent) workers (Table 3, pg 44). Whereas the average turfgrass producer employs 5.1 full-time workers, 1.9 part-time and 0.7 seasonal workers, in terms of farm size comparisons, the average small farm employs two full-time workers, a medium-sized farm just over six workers and large farms some 18 full-time workers.

For the industry as a whole, although the majority (43 per cent) of income was derived from the production and sale of turfgrass, a full 27 per cent came from turf related services (i.e.: transporting turfgrass, landscape installation and/or maintenance). Another 17 per cent was derived from food production (vegetables, wheat, cattle, sheep, etc.) as well as 13 per cent from miscellaneous business activities. Examples of this last group include tree and landscape nurseries, flower production, truck driving, machinery rental, waste disposal, and seed and fertiliser sales.

A more informed distribution of income

shows that expenses are grouped under three main headings — production (growing) related activities; administration, sales and marketing; and landscape services. The latter category was included because many producers engage in landscape service activities including design, installation and maintenance.

Most of the harvesting of sod (36 per cent) occurred in the spring and early summer months between October and December with some two-thirds (68 per cent) of all turfgrass harvested using semi-automated systems, meaning a fair amount of human labour was employed in the process. Nearly all Australian producers (96 per cent) harvest their own sod, with very little contracting occurring.

Most markets were relatively close to producers — 45 per cent transport turfgrass less than 50 kilometres and another 28 per cent between 50–100km. Interestingly, the most common market served by turfgrass producers was the homeowner retail market which accounted for 35 per cent, with the second largest the wholesale market to landscape

installation or maintenance companies (20 per cent). Residential developers came in third (18 per cent) with smaller sales into retail garden centres (11 per cent), other turfgrass farms (7 per cent), and golf or sportsfield venues (5 per cent).

FIRM AND INDUSTRY PROBLEMS

The final section of the survey asked producers to identify the four most important problems facing them from an individual business standpoint and industry-wide perspective. Not surprisingly, two issues were of over-riding importance — water and finances.

Given that the survey was conducted in 2006, which coincided with the prolonged drought impacting many parts of Australia, water was the number one concern (32 per cent) among turfgrass producers. Concern over water shortages was seen to impact on both producers and consumers, the latter of which ultimately compounds producer problems.

On the supply end, water shortages increase the risk that producers will not be able to adequately irrigate their turfgrass (indeed the survey shows that 625ha was not irrigated). On the demand end, producers were concerned about the impact that water restrictions will have on homeowners. Some areas of Australia are on severe water restrictions which prevent the watering of lawns.

Nearly a third of turf producers highlighted water restrictions as the number one issue confronting the industry



Research revealed that in 2006 the industry employed 1321 people

Although water was the number one concern, financial concerns ranked very closely behind (30 per cent). These worries include high operating costs (e.g.: labour, fuel, insurance, equipment, etc.) as well as over-production and competitive undercutting of prices.

Labour ranked third (8.5 per cent) and other industry problems included production-related concerns (7 per cent) including weeds and insect problems, maintaining quality, and providing the right grass varieties for the future. Regulatory issues (6 per cent), marketing concerns (6 per cent) and the lack of industry grades and standards (4 per cent) were also areas of worry.

CONCLUSIONS

This survey provides a key industry benchmark on turf production and marketing and provides Australia's turf producers a means of comparing their firm's operation with that of other industry



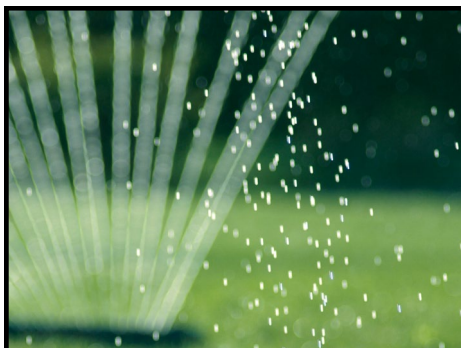
firms. The study also provides current financial information to existing turf producers, outside firms interested in becoming turf producers and the wider turfgrass industry.

ACKNOWLEDGEMENTS

This project was facilitated by Horticulture Australia Limited (HAL) in partnership with the Turf Producers Association Ltd and was funded by the turf levy. The University of Melbourne also provided infrastructure costs and

accommodation expenses and the University of Florida supplied in-kind contribution of salary and fringe benefits for one of the researchers.

We are also grateful for the assistance of Ray Moir (Turfgrass Producers Australia), Rob Davey (Evergreen Turf), John Cotter (Anco Turf), Kate Casimaty (StrathAyr), Lynn Davidson (Jimboomba Turf), Tony Cross (Caboolture Turf), Doug Fleet (Marne Valley Turf), Greg Miller (Millers Turf) in the development of this project. We also appreciate the assistance



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TABLE 2. HECTARES HARVESTED AND VALUE OF TURFGRASS, BY GRASS VARIETY, 2006

Grass Type	Small		Medium		Large		Total	
WARM SEASON	Ha Total	Value \$000	Ha Total	Value \$000	Ha Total	Value \$000	Ha Total	Value \$000
Couchgrass	527.7	17,562.1	398.7	15,196.6	453.2	18,943.9	1,379.6	51,702.6
Queensland Blue	103.3	4,744.6	44.0	1,606.7	10.5	370.7	157.8	6,722.0
Seashore Paspalum	0.5	32.1	0.0	0.0	12.7	787.0	13.2	819.1
Zoysiagrass	5.6	631.1	27.0	1,363.8	37.2	1,954.4	69.8	3,949.3
Buffalograss	393.5	28,336.3	349.5	25,353.9	380.3	25,410.2	1,123.3	79,100.4
Kikuyugrass	180.9	5,736.7	289.1	9,407.5	85.3	2,895.3	555.3	18,039.4
Carpetgrass	15.3	784.7	0.0	0.0	48.2	1,831.8	63.5	2,616.4
Sub-total	1,226.8	57,827.6	1,108.3	52,928.5	1,027.4	52,193.3	3,362.5	162,949.2
COOL SEASON								
Kentucky Blue	18.6	651.8	19.1	1,145.6	3.1	165.0	40.8	1,962.4
Tall Fescue	12.4	508.1	102.5	5,262.4	216.0	10,855.4	330.9	16,665.9
Sub-total	31.0	1,159.8	121.6	6,408.1	219.1	11,050.4	371.8	18,618.3
Total	1,257.8	58,987.4	1,229.9	59,336.6	1,246.5	63,243.7	3,734.3	181,567.5

of Stuart Burgess and Andrew Collins from HAL in administrating the project. The full report – *Economic and Agronomic Analysis of the Australian Turfgrass Industry* – can be obtained by corresponding with HAL, Level 1, 50 Carrington Street Sydney NSW 2000, ph (02) 8295 2300 or fax (02) 8295 2399. 📠

TABLE 3. LABOUR USE IN THE AUSTRALIAN TURFGRASS INDUSTRY

Farm size	Full-time		Part-time		Seasonal		
	Total	Average	Total	Average	Total	Average	Total
Small	314	1.9	166	1.0	50	0.3	530
Medium	236	6.4	83	2.3	32	0.9	351
Large	307	18.1	99	5.8	34	2.0	440
Total	857	5.1	348	1.9	116	0.7	1,321

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BY P. L. RAYMER, S. K. BRAMAN, L. L. BURPEE, R. N. CARROW, Z. CHEN, AND T. R. MURPHY.



Initially billed as a 'niche grass' for use on salt-affected sites, seashore paspalum is now gaining popularity and becoming the turfgrass of choice on many new golf course developments even where salt and irrigation water quality are not an issue

Seashore paspalum: Breeding a turfgrass for the future

In recent times USGA agronomists have noted a rapid increase in golf course developments placed on coastal venues. In addition, problems associated with salinity have become increasingly more prevalent in managed turfgrass over the past decade and the emphasis on water conservation strategies that use non-potable, alternative irrigation sources has been a primary contributor (9).

Alternative irrigation water sources include recycled water, stormwater, saline ground water, and seawater blends. Many of these alternative water sources contain much higher salt levels than traditional irrigation waters.

The trend for use of more salt-laden irrigation waters on turfgrass sites is expected to continue to rise at a rapid rate and to further increase interest in developing more salt-tolerant grasses, especially halophytes (1, 7, 8, 11). These trends have created the need for a

The University of Georgia's seashore paspalum breeding programme began in 1993 with goals to develop new turf-type cultivars to meet the increasing demands of the golf industry for a high-quality turf that could perform on salt-affected sites and withstand irrigation with salt-laden irrigation water. The programme is now well-positioned to further improve and expand the utility of this important turfgrass species.

high quality turfgrass that can tolerate stresses associated with salt-affected sites and even irrigation with brackish water.

WHY SEASHORE PASPALUM?

Seashore paspalum (*Paspalum vaginatum*) (Swartz), is a warm-season perennial grass

that is particularly well-adapted to moist and salt-affected areas common in coastal regions (3). It tolerates sandy and infertile soils, high concentrations of salt and occasional inundation by sea water as well as water-logged conditions. It also has many morphological characteristics that make it desirable.

Promising experimental lines in the UGA programme are grown in small replicated plots where they are mowed and managed similar to golf course fairways

Seashore paspalum produces both stolons and rhizomes, has an intermediate to fine leaf texture, an attractive dark green colour, good density, and good tolerance to low mowing heights. It is considered to be the most salt-tolerant warm-season turfgrass species and also holds great promise for reclamation and soil stabilisation of unmanaged salt-affected sites (4).

The first seashore paspalum breeding programme was initiated by Dr R. R. Duncan in 1993 at the University of Georgia (UGA) Griffin Campus. USGA agronomists quickly recognised the potential of seashore paspalum as a species that could meet the future needs of the golf course industry as a high-quality salt-tolerant turfgrass.

During the mid 1990s, the USGA and UGA entered into a joint project to develop seashore paspalum as a turfgrass species suitable for course-wide use on golf courses with salt-related problems.

Dr Duncan led the paspalum breeding programme until his retirement in 2003 when Dr Paul Raymer assumed leadership. During his 10-year tenure with this programme, Dr Duncan assembled a collection of ecotypes from around the world and began an intensive programme to assess the turf traits and genetic potential of this species as a turfgrass. Working closely with Dr Bob Carrow and other turf scientists, a series of management studies were also undertaken to determine proper management protocols.



The UGA seashore paspalum breeding programme is now recognised as a major contributor to the recent success of seashore paspalum as a turfgrass species. Thus far, this programme has focused on development of cultivars suitable for use by the golf course industry and has released three cultivars.

Dr Duncan released two cultivars before his retirement in 2003. Sealsle 1 and Sealsle 2000 were developed as companion grasses, with Sealsle 1 for use on fairways and tees, and Sealsle 2000 for use on greens.

The most recent UGA release, Sealsle Supreme, was licensed to sod producers in 2005 and is touted as a cultivar suitable for course-wide use. Sealsle Supreme has even better salt tolerance than the previous releases and should be well-suited for use as a fine turf in environments where salt is a problem for other turfgrasses.

Supreme is a vigorous ecotype that is suitable for use on golf courses, athletic fields, and other recreational venues as a fine turf. It is a low-growing and rapidly spreading

semi-dwarf type that tolerates a wide range of mowing heights and still maintains good turf density and quality. This property makes Supreme attractive as a grass that can be used on all parts of the golf course, from roughs to fairways to tees and greens.

Supreme also has an extremely vigorous spreading growth habit that aids rapid establishment, grow-in, and recovery from any maintenance challenges. Thus far, Sealsle Supreme licenses have been granted to five US domestic growers and it is being marketed aggressively internationally.

CURRENT BREEDING EFFORTS

The current breeding programme is an interdisciplinary effort with strong collaboration from a host of turf scientists including entomologist Dr Kris Braman, plant pathologist Dr Lee Burpee, stress physiologist Dr Bob Carrow, molecular biologist Dr Zhenbang Chen and weed scientist Dr Tim Murphy. Our primary objectives are to further improve salt tolerance, insect resistance and disease resistance ►

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as well as to improve weed management strategies and develop molecular tools to support breeding.

Previous research has demonstrated that seashore paspalum ecotypes vary greatly in their level of tolerance to salt (5, 6) and range from no better than the best couchgrass hybrids to highly salt-tolerant. Therefore, it is necessary to screen potential seashore paspalum cultivars prior to their release to document and ensure that they have high levels of salt tolerance.

The existence of salt-tolerant plants (halophytes) and differences in salt tolerance among genotypes within plant species indicates that there is a genetic basis to salt response. Furthermore, genetically controlled variability for salt tolerance among genotypes infers that it may be possible to further improve salt tolerance of this species through breeding and selection.

A pre-requisite for the development of new cultivars with improved salt tolerance is an efficient and effective salt tolerance screening method suitable for evaluation of large numbers of breeding lines. Such a screening method has been developed at the UGA (10). This screening technique is now being used as part of the breeding programme to attain even higher levels of salt tolerance in future releases.

The germplasm base for the UGA paspalum breeding programme is the largest and most diverse collection of seashore paspalum ecotypes in the world. Recent research findings now allow us to better utilise this germplasm base in our cultivar development programme.

A traditional breeding approach based on hybridisation is now being used to generate new genetic variation through recombination. This approach allows us to generate thousands of unique individuals each year. Individual plants are hand trimmed in the greenhouse and undesirable plants eliminated. Each year more than 6000 individuals are also screened for salt tolerance in the greenhouse. Salt-tolerant individuals are transplanted to field plots for further evaluation of turf quality and resistance to dollar spot.

This approach allows our breeding programme to efficiently evaluate large numbers of individuals for important traits and should ensure continued improvement in turf quality, disease resistance, and salt tolerance in our future cultivar releases.



UGA seashore paspalum breeding programme director Dr Paul Raymer

IDENTIFYING PASPALUM CULTIVARS

Differentiating seashore paspalum cultivars has been a challenge since most cultivars used commercially are morphologically very similar. The ability to accurately identify cultivars is useful in protecting intellectual property and provides an extremely useful tool for verifying the identity of cultivars and confirming off-types during the certification process.

Amplified fragment length polymorphism (AFLP) is currently the most commonly used method for DNA fingerprinting. Simple sequence repeats (SSR) are growing in popularity and can be used in conjunction with AFLP for genotype identifications. We have used AFLP and SSRs to fingerprint the most commercially available seashore paspalum cultivars as well as all accessions in the USDA germplasm collection (2).

The use of AFLP banding patterns has already proven to be useful as a new tool in resolving a number of industry issues related to cultivar identity and quality control (identification of off-types) within our commercially released cultivars.

SCREENING FOR DISEASE

Currently, the disease susceptibility of seashore paspalum cultivars is largely unknown. This relatively new turfgrass is best adapted to coastal areas of the tropics and sub-tropics but is now being commonly used in more inland areas where fungal diseases may be a significant problem.

Dollar spot, caused by *Sclerotinia homoeocarpa*, and brown patch, caused by *Rhizoctonia solani*, are likely to be major fungal diseases impacting turf quality of seashore paspalum cultivars.

A preliminary disease screening conducted at Griffin campus during autumn of 2004 indicated considerable genotypic variability for dollar spot resistance among eight standard cultivars evaluated. This finding provides encouragement for screening efforts to identify plant germplasm with superior host plant resistance that can be used by the breeding programme to develop cultivars with improved resistance.

Screening for resistance to dollar spot has become part of the routine evaluation protocol for our breeding programme. Each year about 2000 individuals in the single plant evaluation nursery are artificially inoculated in mid-September with the dollar spot fungus by Dr Lee Burpee, UGA turfgrass research plant pathologist. At about one month after inoculation, all plots are rated for dollar spot symptoms using a modified Horsfall-Barratt disease rating scale (0 = no disease and 9 = to 100 per cent disease).

These data are used as one of the major criteria for selection of individuals for advancement in the breeding evaluation scheme. Disease resistance of all selected individuals is also later confirmed in replicated field plots. All UGA breeding lines entered in advanced, regional and NTEP turf field trials are compared to standard commercially available cultivars in replicated field disease evaluations.

SUMMARY

UGA patented cultivars have been well-accepted by the turf industry both domestically and internationally. Certainly, the recent success of seashore paspalum has surprised many in the turf industry.

The grass that was originally billed as only a 'niche grass' for use on salt-affected sites or where irrigation with brackish water was necessary, has suddenly become the turfgrass of choice on many new course installations where salt and irrigation water quality are not even an issue.

Marketers of paspalum cultivars boast a host of superior traits including multiple stress resistance and reduced requirements for water, fertilisers, and pesticides. These claims could be influencing turfgrass selection by golf course developers.

However, the traits of paspalum that seem to be the most critical to course owners and superintendents are the ability to retain colour during the winter months, better ball support and the overwhelming beauty of a well-maintained paspalum golf course. Without a doubt, some course owners are using paspalum as a way to distinguish their course from others.

In summary, the rapid growth in global popularity of the latest generation of seashore paspalum cultivars far exceeds early expectations. In fact, it is now safe to state that seashore paspalum has finally earned a spot on the list of recognised turfgrass species.

Breeders of this species still face many challenges such as improving disease and insect resistance, and developing better weed management options. This seashore paspalum breeding programme is now well-positioned to meet many of the future challenges of the golf course industry.

ACKNOWLEDGEMENTS

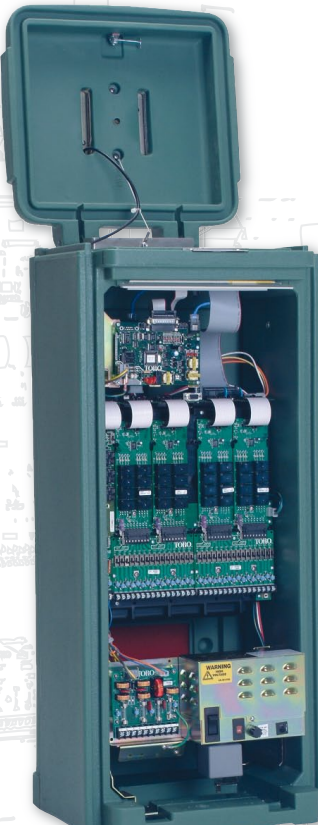
The authors wish to thank the USGA's Turfgrass



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and Environmental Research Program for its continued support. Also, support from the University of Georgia Cultivar Development Grant Program, the Georgia Seed Development Commission and the Georgia Agricultural Experiment Stations is gratefully acknowledged.

Australian Turfgrass Management is grateful for the assistance of the authors and USGA TERO for allowing publication of this research (USGA TERO Vol 6 No. 21: Nov 1, 2007). A full list of references is available by contacting the AGCSA on (03) 9548 8600. 🌱



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Dome flicks the switch on carbon emissions

Telstra Dome has purchased 15 artificial lighting rigs which will be deployed throughout the 2008 AFL season to aid surface wear and recovery

Welcome to the first instalment of ATM's dedicated environmental management section. In this and future editions, ATM will highlight turf industry practitioners who are making a concerted effort to improve their environmental management practices. In this opening feature, ATM looks at the lighting rigs recently purchased to aid turf recovery at Telstra Dome and the facility's commitment to become carbon-neutral.



Melbourne's Telstra Dome has become one of the first sporting arenas in the world to offset its carbon emissions after entering into an arrangement with Australian climate change company Carbon Planet.

The announcement came as the Dome unveiled its new artificial lighting rigs which have been purchased from Dutch company Stadium Grow Light Concept (SGL) to aid surface wear and recovery.

The Dome has become the first stadium in Australia to purchase the lighting rig technology which has been used by a number of elite sporting venues in the UK and Europe including English Premier League giants West Ham United, Liverpool, Tottenham Hotspur and Arsenal.

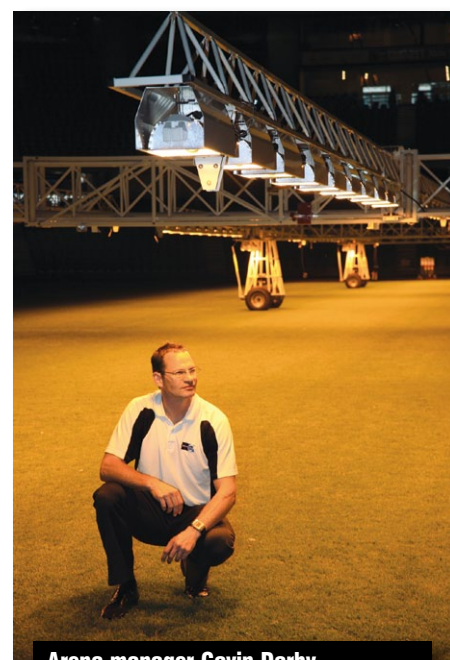
Following extensive research into the use of artificial lighting by arena manager Gavin Darby and chief executive Ian Collins AM, the Dome purchased a total of 15 rigs from SGL at a cost of \$2.2 million. Taking delivery of them in January, the rigs were switched on for the first time on 7 February and will be employed throughout the 2008 AFL season.

The Dome set up includes 13 MU360 rigs, which illuminate an area of 360m², and two smaller MU18 rigs which light up an area of 18m². The larger rigs will be used down the centre of the ground and northern pockets, while the smaller units will be specifically used

for high wear areas such as goal squares and the centre circle.

The rigs will be officially deployed in March with three of the MU360 rigs used to cover six locations at the northern end of the arena. That will increase to seven rigs in 12 locations by April and come May all 13 MU360 rigs will be deployed across 24 locations.

It is hoped that the lighting rigs will make a significant dent in the Dome's turf replacement programme. Last year the Dome replaced



Arena manager Gavin Darby

Telstra Dome has entered a partnership with Australian company Carbon Planet to provide carbon offsets for the energy used by the lighting rigs

about 8700m² of turf and it is hoped that figure will reduce to around 5000m² once the lighting rigs are fully employed.

As well as the lighting rigs, the Dome has purchased an SGL Analyser which includes sensors for relative air humidity/temperature, soil humidity/temperature and moisture. Importantly, it also contains several light sensors, including one installed on the roof of the venue. This will allow the comparison of actual natural light levels against modelled data which will enable the Dome to increase or decrease lighting hours to ensure optimal use of the system.

Committed to ensuring a carbon-neutral impact for the lighting rigs, Telstra Dome has entered a partnership with Carbon Planet to provide carbon offsets for the energy used by the lights. It is believed that Telstra Dome has become the first stadium in the world using



such lighting rigs to fully offset its carbon footprint.

Based on Carbon Planet figures, the annual carbon output of the lighting rigs, which will account for less than five per cent of the Dome's energy needs, will require 2224 NGAC (NSW Greenhouse Abatement Certificate) carbon credits.

NGAC's are a particular kind of credit issued by the NSW Government and are generated, traded and regulated under NSW law. Each NGAC abates a single tonne of carbon dioxide for 100 years which is a stronger requirement than for a Kyoto Agreement-compliant credit.

Carbon Planet is also providing additional advice on carbon reduction initiatives across the whole stadium.

Collins welcomed the partnership with Carbon Planet adding it was a further step in maintaining responsible environmental practices at the venue which hosts upwards of 80 events annually.

Editor's Note: For a detailed account of the lighting rigs and how they will be used at the Telstra Dome, read arena manager Gavin Darby's exclusive article 'Dome sees a new light' in ATM Volume 9.6 (November-December 2007). 📖



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Major components of the Pennant Hills sewer mining plant, such as the balance tank, are in place and the final piece of the puzzle – the sewer offtake connection – was due to be completed by the end of February



Final hurdle in sight for Pennant Hills plant

Pennant Hills Golf Club in Sydney is hoping to flick the switch on its new multi-million dollar sewer mining plant this month (March). Dogged by weather-related delays, the Water Reclamation Plant (WRP) is nearly two months behind schedule, however the final stage of the project – the offtake from the sewer main located in Devlin's Creek – was expected to be completed in late February.

Constructing the offtake has been hampered due to high flow levels through the creek caused by months of wet weather. Ironically, 2007 was the club's wettest since 1994, which has meant it has been near impossible to get the offtake process underway as it requires minimal flows through the water body.

Building of the plant and its various components has continued unhindered, however, and all tanks and chambers have been constructed and thoroughly waterproof tested over January. The electrical switchboard has also undergone extensive testing and the PLC has been programmed ready to start producing water.

Despite delays in the construction of its groundbreaking sewer mining plant, Pennant Hills Golf Club is just a few small steps away from ending its reliance on potable water for irrigation.

At the time of this edition going to print, Pennant Hills general manager Stewart Fenton was waiting on final approval of the Systems Management Plan (SMP) from Hornsby Council, which was expected to get the all clear in late February. Such approval allows for formal water testing to begin, subject to the sewer offtake connection being completed.

The SMP, a document which was completed totally in-house and extends to 85 pages, was part of a number of additional bureaucratic hurdles the club has had to clear

following the release of the Interim Guidelines for Management of Private Recycled Water Schemes late in 2007. As well as the SMP, an extensive risk assessment report was conducted and lodged with the council.

While the weather delays have been frustrating, Fenton says that the club had one bit of good news in that it has, as part of its SMP, been able to negotiate the formal testing period down from three months to one month. That should mean the club will be able to produce and use water on the course in late March, provided the weather comes to the party.

"The installation of the membranes will occur immediately after the sewer offtake connection is completed," explains Fenton. "We have also negotiated with Sydney Water to obtain a large quantity of 'seed' material (the bugs which eat the sludge) from one of their local sewage treatment plants. This will save time as we will not have to cultivate our own 'seed' which is so pivotal to the membrane biological reactor process."

Elsewhere on site, work on permanent

fencing around the plant was due to start in late February. Groundstaff have also incorporated some mounding down the right hand side of the 10th hole which will further add to the visual aspect of the plant which has been built into the natural contours of the area.

Two new bunkers have also been constructed on the right hand side of the 10th hole, under the direction of course architect Jim Wilcher. The bunkers have been designed to push play away from the plant but have been specifically placed to come into play for the long hitters only. They are also reasonably shallow to allow for a good shot to be played to the green.

Operation of the WRP will be undertaken in-house by course superintendent Richard Kirkby and his crew. The plant is fully automated with the high end technology allowing for water specifications to be "dialled in". This enables key components of the water, such as pH and nitrogen levels, to be continually adjusted.

It also allows a variety of operational speeds which means the club can reduce the amount of water produced during non-peak times, like



Pennant Hills Golf Club general manager Stewart Fenton

winter. However, as the plant is a bioreactor and relies on 'bugs' to feed on the sludge, it will need to run all year round to keep them alive. It is anticipated that the plant will run at 15 per cent of its capacity during winter.

The project has generated widespread interest across the golf course industry and Fenton says one of his more onerous tasks

will be whittling down the guest list for the official opening, with government ministers and officials lining up to be there. Fenton has also been called upon by other golfing associations to outline the project and in late February he presented to a gathering of Victorian golf course general managers.

"As each day passes we are one step closer to turning the dream into reality," says Fenton. "While most courses in Sydney are looking nice and green at the present time due to all the rain we've been having, we will be able to ensure ours is like this for the years to come without any reliance on weather or potable water supplies.

"This is all happening at a time when Sydney Water is currently awaiting a decision from IPART in regard to a price increase from \$1.38 per kilolitre of drinking water to \$2.08.

"There is no doubt that the price of water will continue to increase and golf clubs that do rely on potable water supplies will face significant additional financial pressures if they do not address the water challenge facing the industry." 🌊



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BY JOHN PHELAN

Educating equipment users on the dos and don'ts is one area that often falls on a mechanic's shoulders

VTETA committee member and Woodlands Golf Club turf technician John Phelan continues to look at the changing role of the modern day turf equipment technician.



Changing roles down in the workshop

In the last two editions we have read articles about changing technology in various parts of the turf industry, but the fact is that in these times turf technicians have to keep up to date and know a variety of information about many different types of equipment.

Turf technicians work on, service and source parts for a diverse array of machinery ranging from whipper-snipper, cylinder mowers, tractors, trucks, wood chippers and excavators. Workshops need to be well equipped to enable a quick and efficient turnaround on any work we undertake so that downtime is kept to a minimum.

FROM MECHANIC TO EDUCATOR...

On most occasions the turf technician is the team member responsible for ensuring operators are educated on how a piece of equipment works. This can include oil and water, hydraulic oil cleaning or simply how to operate the machine. Time spent in this area can help prevent breakdowns, downtime of

equipment and the time you spend in the workshop fixing the problem.

On a recent adjustment to one of our walker mowers, a Flex 21, I discovered the grooved front roller completely full of gum nuts (see above picture). The question was asked 'Why had the green not been blown before the grass had been cut?' and following on from this 'Why had the gumnuts not been removed when the machine was washed?' Normally grass left in the mower cylinders is the trouble.

This happened on a Monday morning and got the week off to a shaky start.

...TO ENGINEER AND MANUFACTURER

In July 2007, Woodlands Golf Club purchased a Chipstar wood chipper for use on the course. The search then started to find a truck that could tow the chipper from one end of the course to the other, as well as carry a large amount of wood chips, for a reasonable cost.



The Woodlands Golf Club chipper truck before (left) and after its makeover

A member of the club who had decided to downsize his tree lopping business offered us a good deal on his Isuzu truck. Superintendent Glenn Stuart and I took a trip out to view the truck, but on arrival we questioned whether or not to even get out of the car due to its sorry state. After considerable thought and discussion (the body was quite rusty and needed a large amount of time spent on it to bring it up to scratch) we decided to purchase it.

My first thought on delivery was this job is going to keep me occupied for the entire winter, and it did! I started the job with a 9" angle grinder and oxy acetylene torch, cutting away the rusty panels from the body. A week later the only part of the body left was the tailgate and the front of the tipper, the rest was frame.

The next step was to purchase 3mmx1500x3000 second grade sheets. I trimmed these to 2.7m long to use for the sides and the tray. The floor of the cab was also very rusty as the windows in the truck had long ago given up the ghost and stopped working.

Before any more work started the floor and windows were repaired to keep out the water and sawdust and the inside was cleaned up

and seats recovered. The last piece of rust repair was done on the cab back doors to finally make the machine ready for painting. Picking a day with no wind or rain, I gave the cab a coat of white paint and the body black paint.

Mechanically the truck ran well and all it needed was the oil, filters and water changed and the addition of a pintle hook tow bar and she was ready to take her first drive around the golf course.

The project was completed and the truck and chipper ready to go by the first week of November 2007. As I had first thought, combined with keeping all the other course equipment up to standard, the job had taken a considerable amount of time but in the end was well worth the effort.

Another undertaking during the winter months in the Woodlands workshop is rope stakes. We have developed a jig that we place in a vice to hold the rods, we then bend the pigtail on one end after which there is a position for the cross piece to sit for welding. The final task is to send the rope stake off to be powder coated or galvanised.

Another interesting problem occurred during the year with a Tru-Turf roller. A pivot

axle broke on one side of the roller while the other side axle was bent on a 45° angle. The axles on these rollers are a part of the main frame and cannot be removed.

To fix the problem I had to turn up a stub axle for both sides and cut off the old bent axles, slip on the new ones and weld them into place.

I'm sure, like me, everyone has some interesting dilemmas in the workshop and ways of solving them and this is where turf technicians come into their own. 🌱

TETA STATE CONTACTS

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Next event: 1 April, 2008 – Turflink Australia

VTETA

Membership enquiries

John Phelan

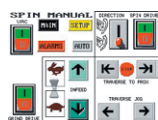
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LOCH SCALES DOWN QDPI&F RESEARCH ROLE

Eminent Queensland turfgrass researcher Dr Don Loch has stepped down from his full-time position with the Queensland Department of Primary Industries and Fisheries (QDPI&F) Turf Research Group.

Dr Loch has scaled down his involvement at the Redlands Research Station, finishing up his full-time role in late January 2008. He will continue to be actively involved with the group as part of the QDPI&F's alumni programme and will work three days a week.

In 2000 Dr Loch initiated and led the QDPI&F's Turf Research Group at Redlands. Prior to this appointment, he worked with tropical grasses for 30 years at Gympie DPI during which time he bred two new Rhodes grass cultivars and registered several other new pasture cultivars. He was also instrumental in developing technology to support the commercialisation of many new tropical herbage grasses and legumes for northern Australia.

With over 37 years of research experience in pasture and ornamental grasses, Dr Loch is recognised as Australia's leading scientist within his field. He has built this reputation through academic excellence, extensive knowledge of tropical grasses, in particular turf and industry development.

Since the inauguration of the turf research programme at Redlands, turf collections and plots were planted for observational purposes. In an attempt to contain the ever-growing collections, the concept of turf demonstration plots was conceived and construction/planting started five months after the group was formed.

The site currently contains 138 (3mx2.5m plots) unreplicated warm-season turfgrass varieties from 24 taxa, providing homeowners, the turf industry, educational institutions and researchers alike with a 'living turf library'.

This display of predominantly vegetative turf cultivars growing in a subtropical location has been sourced from breeders and other research groups from within Australia and internationally. With an ever-growing quantity of turf varieties being released, Dr Loch has been instrumental in importing turf genotypes that have demonstrated potential in a number of areas (eg: salt and shade tolerance) and are of educational significance.

"If you have had the privilege to meet Don, or held a 'quick' conversation with him over the phone or in person, you must be mistaken and we are obviously speaking of different people," quips fellow QDPI&F research scientist Matt Roche.

"Don has never been one to shy away from a lengthy conversation or debate particularly when turf is the topic of conversation. There is no such thing as a 'quickie' on turf with Don."

"If you were visiting Redlands and were under the impression you could quickly check out the turf plots and obtain a quick overview of the

history of selected turfgrasses, Don was always willing to correct that misconception.

"Don's passion and enthusiasm is quickly realised by the touring person(s) while on one of his walk and talk fests. One such occasion that instinctively comes to mind is when Don was showing a sod producer and his wife around the plots.

"The group had been walking and talking for several hours and I'm sure all was going well until the clouds opened and the rain set in. This would generally have most people ducking for cover, grabbing an umbrella or calling the tour off. Not this time. Neither Don, the sod producer nor more importantly his wife had an umbrella in reach... but the show kept on going."

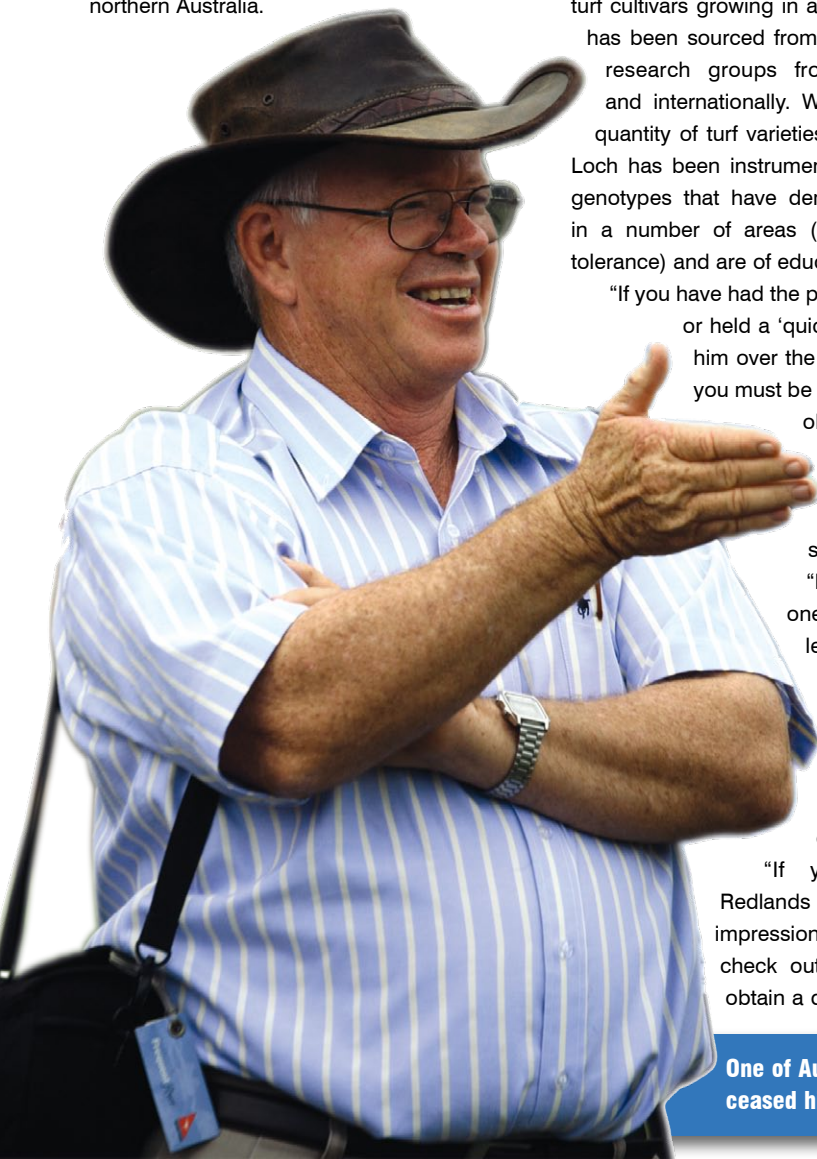
Dr Loch has been an integral part of the forward direction of the turfgrass industry within Australia over recent years and his knowledge, global networks and research skills have enabled him to position the QDPI&F Turf Research Group as Australia's leading turf research body.

The group currently consists of 10 members (principle turf scientist, four scientists, three technicians, an extension officer and a qualified greenkeeper) that have the ability to undertake research activities and provide extension on a multitude of turf disciplines critical to the turf industry and the amenity and lifestyle horticulture sectors. Such expertise was achieved by Dr Loch's forward thinking, interstate and international (NZSTI, Uni. Georgia etc...) collaborations and linkages with the wider turf industry.

Since 2000 Dr Loch has been largely involved in successfully obtaining numerous Horticulture Australia Limited funded projects, a number of Australian Research Council grants and has negotiated with many government agencies and companies selling turf related products to undertake independent research activities with their support.

"Don has requested that he still be actively involved within the QDPI&F Turf Research Group and the undertaking of such a transitional role has been widely supported by management and its staff," says Roche.

"Both welcome the opportunity and look forward to the future working relationship and how this can strengthen the activities of the Queensland-based research team."



One of Australia's leading turfgrass research scientists, Dr Don Loch, ceased his full-time position with the QDPI&F in late January

SATURATED SUPERS BATTLE THE ELEMENTS

Superintendents at a number of Queensland courses have had a start to 2008 they would rather forget following major flooding rains which had nearly two thirds of the state in a state of emergency.

Some areas on the Gold Coast received up to 600mm for the two months to February with a number of golf courses damaged by major floods in both January and February. Ironically, while most of the state was under water, Brisbane's main catchment areas missed out with dam levels rising to just above 31 per cent.

The monsoonal start to the year couldn't have come at a worse time for Royal Pines superintendent Paul McLean. Having taken over from Stuart Laing in late 2007, the former Simplot rep had to get the course up for the 2008 ANZ Ladies Masters which was held in the first week of February. In the five days leading up to the start of the tournament, the course got hammered by 217mm, eventually forcing organisers to call off the first round and reduce the tournament to 54 holes.

In a novel approach, McLean resorted to sending a text message to his turf management colleagues on the Gold Coast asking for assistance in getting the course back in play, particularly the bunkers. The message read: 'U r all invited 2 the first Royal Pines working b just bring a shovel and a hat. Start time 4.30am this Thursday c u there!'

The play obviously worked as upwards of 40 superintendents and staff from nearby courses turned up to lend a hand, much to McLean's relief.

A few kilometres south of Royal Pines and Mark Hauff and his staff at The Colonial Golf Course had to clean up the course following two major flood events inside of five weeks.

On Friday 4 January substantial rainfall began with just under 200mm recorded in two and a half days. The Colonial runs alongside Mudgeeraba Creek which is fed from the hinterland and surrounding areas to which all run-off eventually runs to the lowest point of the creek adjacent to the golf course. Sitting less than one metre above a normal tide level from the creek, the course copped major damage.

"On Friday afternoon we literally watched the creek tide rise and begin to penetrate the course and ultimately merge with our existing lakes which cover almost 15 hectares of the 60ha property," recalls Hauff.

"It was almost three days until the creek's level subsided enough to instigate our flood pumps. In those three days it gave time for the silt to settle and once the flood waters subsided, this substantially prolonged the clean-up process."

Four greens were partially affected with a 2cm film of silt, with one green totally covered. Several fairways, tees and rough areas were also affected while several tonnes of debris were removed including pot plants, drums, kayaks, a small water tank and a large hay bale. The Colonial course maintenance staff repaired the course and it was reopened a week later on 11 January.

Just over three weeks later, starting on 4 February, the course copped another 200mm in two days and flooded once again. Although silt damage and debris was less severe it took over three days until the flood pumps could be used and the course eventually opened a week later.

"In situations like this it makes you realise the camaraderie, support and respect staff can develop for each other and I couldn't be



Floods deposited tonnes of debris on the likes of The Colonial and The Glades, including pot plants, drums, kayaks, a small water tank and hay bales

happier with the way staff handled both these situations with maturity and dedication," says Hauff.

Paul Lierse at The Glades was in a similar boat as the course also backs on to the Mudgeeraba Creek. Water levels peaked around 2am and by around 6am on 5 January water had subsided enough that Lierse could initiate the course's dewatering pumps. These pumps move 1000l/s and within 48 hours the bulk of the water was removed and real story unveiled.

"It was messy," says Lierse. "All the crew came in on Sunday (6 January) and once they picked their jaws up out of the mud they got stuck in. It took four days to remove the bulk of the mud and our crew worked virtually around the clock."

"New techniques were created to get rid of the mud that you will not find in any text books but were highly effective. Constant showers allowed nothing to dry but the crew toiled away and we re-opened the course on 10 January."

"During adversity like that you can really see the true character of your staff and I couldn't be prouder of ours."

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SA CLUBS WISE UP TO WATER

South Australian golf clubs Kooyonga, Glenelg, Grange, Riverside and Royal Adelaide are among the first in Australia to adopt Waterite Irrigation System Evaluation (WISE).

Developed and manufactured by South Australian based company Aquatek Irrigation, WISE uses DGPS technology to map an entire golf course providing information on key irrigation assets such as sprinklers, pumps, drains and outlets.

"Not knowing exactly what assets you have and where they are, irrigation planning becomes a hit and miss affair, something that has become critical with water restrictions," says Aquatek managing director Darren Ferber.

"Waterite Irrigation System Evaluation provides all information so that accurate irrigation budgets and water planning are easy to create and proves very useful on a day-to-day basis for superintendents,



Royal Adelaide is one of a number of SA clubs to use Aquatek's WISE technology

regulatory authorities and their equipment suppliers.

"With water restrictions, a lot of golf courses have been put on notice. WISE has become a tool for our customers to provide accurate reporting but also analyse and plan their irrigation system so that water use is minimal.

"Golf customers now have a complete overview of their system, know exactly what assets they have in the field and can easily plan upgrades to achieve better irrigation efficiency."

For further information on WISE technology, contact Darren Ferber on 1300 887 448 or 0408 087 698.



Lee Govan

GOVAN JOINS NUTURF TEAM

Nuturf has unveiled its new technical services team. Headed by David Worrad, the team comprises

Sydney-based Albie Leggett who looks after all analytical services, while Brisbane-based Ramiro Martinez has a similar role for Queensland.

Lee Govan has also joined the team and began in early February. Based in Victoria, Govan will service the technical support and product development needs of Victoria, South Australia and Western Australia.

For more information about the Nuturf technical services team, contact David Worrad on 0408 832 318.

CALCIUM SOURCE FIRST FOR AUSTRALIAN TURF INDUSTRY

Recently formed Victorian company Endeavour Turf Products has released a novel new form of water soluble calcium that can be applied through drip or irrigation lines or sprayed from a tank.

Calcour Liquid is based on calcium thiosulphate, a highly efficient compound compared to industry standards such as calcium sulphate and the calcium EDTA

complex of chelated calcium. Calcium EDTA complex and thiosulphate are both soluble, but the EDTA molecule is bulky and difficult to get into the plant.

With calcium thiosulphate and calcium sulphate, both of their molecules are biologically active in the plant and easily taken up by the roots.

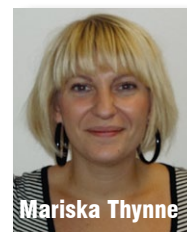
The problem with calcium sulphate is that it can be difficult to apply due to tank compatibility and settlement issues. Calcour Liquid avoids these issues by being easy to apply and not settling out in the tank.

Calcour Liquid is a combination of ammonium N, calcium, elemental sulphur and sulphate sulphur which are normally incompatible in solution. Through bacterial oxidation of the elemental sulphur to sulphate sulphur, it effectively acidifies the soil while adding calcium. This in turn makes 'locked up' nutrients such as P and traces more available to the plant. Calcour Liquid is a neutral to basic, chloride-free, clear liquid solution, containing 8.8 per cent N, 6 per cent calcium and 10 per cent sulphur.

Calcour Liquid includes four separate forms of calcium designed to improve availability and microbial breakdown. In the US, calcium thiosulphate, a clear liquid with no toxic effect, has been found to be effective for use in correcting high sodium content while acting

to dechlorinate as well and has been widely used over the past three years in arid western areas.

For more information about Calcour Liquid, contact Grant Greenway on 0419 527 209 or Jerry Spencer on 0439 019 050 from Endeavour Turf Products.



Mariska Thynne

THYNNE SIGNS UP WITH TORO

Mariska Thynne has been appointed as Toro Australia's commercial equipment division marketing manager.

Thynne started her new role in early November 2007 and takes over from Jade Gardner who left the company after five years last October.

Thynne has an interesting background having recently completed a Masters of Marketing at the University of South Australia. Thynne also has a Bachelor of Visual Arts specialising in jewellery, metal and glass, a degree which led her to have various promotions and event management roles in the creative industries.

"It has been a wonderful four months since joining Toro and I am keen to learn more about the turf market and contribute to the development, promotion and marketing of Toro Australia," says Thynne.

Check us out at the
Irrigation Australia show
May 20 - 22, 2008. Booth #515.



No more guesswork.



Sensor depth

- 1 **50mm deep.** First indication of effective water application.
- 2 **100mm deep.** Monitor changes in infiltration.
- 3 **150mm deep.** Observe root zone activity.
- 4 **200mm deep.** Prevent nutrient losses.
- 5 **250mm deep.** Confirm strategic leaching.
- 6 **300mm deep.** Monitor perched water table.

Irrigating fairways, greens and tee boxes requires real intelligence and the world's most advanced soil moisture technology.

The new generation of AquaSpy water management systems gives you a complete understanding of the turf environment right through the soil profile. No other soil moisture probe in the world provides data at every 50mm increment through to a depth of 300mm.

A modular, no-maintenance design and an open and common platform enables plug and play connectivity.

AquaSpy gives you the knowledge to promote turf health, reduce water and energy consumption, as well as cutting fertiliser costs. Competition level golf courses use AquaSpy systems to maximise these benefits while improving playability and fine tuning greens.

A growing distributor network means there are AquaSpy dealers located across Australia – and 24 hour support just a phone call away.

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GCSAQ

As many of you will no doubt be aware extreme weather conditions have been creating havoc for most of Queensland over the past couple of months. It was only in December that most of the state was in drought and receiving drought assistance, but by the middle of February two thirds of the state is flooded and receiving aid. What's the old advocate - it never rains, but it pours!

Unfortunately the one third of Queensland that wasn't flooded and saw very little rainfall was a section in the south east corner (where the dams that supply Brisbane with its water) out to Toowoomba. Brisbane's water supply has risen from 17 per cent to 31 per cent during this time, while Toowoomba's supply is still under the 20 per cent mark. All other major dams throughout the state are overflowing.

On the Gold Coast most areas have recorded over 600mm for the two months to February, while south of the border Murwillumbah was closed for close to a month, reopened and then flooded again.

Hats off to superintendent Paul McLean and his staff at Royal Pines Resort for their efforts in getting the course up for the ANZ Ladies Masters. Royal Pines recorded 217mm of rain from Saturday night leading up to the Thursday morning of the tournament.

From the GCSAQ and Paul a huge thank you to the clubs and companies that supplied

labour and machinery to bring the bunkers back into play. Over 40 volunteers turned up to shovel, push and pump out the 68 bunkers. This shows what our industry is made of and it is great to know that you are dealing with the type of people that will give up their time in a time of need.

The GCSAQ committee recently held a meeting at the DPI and had a tour of the turf trials that are going on at Redlands. It was great to see them all in A1 condition. The interesting thing for all was how the greens grade grasses were going and especially the new varieties compared with what we have now.

Thank you to our tour guide, DPI's head of facilities and head experimentalist Jon Penberthy and his able assistant, research scientist Matt Roche. The committee is looking at holding a day at Redlands later in the year so we can all experience these trials.

In other news Jason Foster has resigned as superintendent at Arundel Hills Golf Club to take up a position with Turf Force. Nigel Slade, Jason's 2IC, is moving into the superintendent position. Congratulations to both and good luck.

ROD COOK
PRESIDENT, GCSAQ

NSWGCSA

Happy New Year to everyone! New South Wales is still receiving some good rainfall and dam levels have reached 61 per cent. Rural NSW has also received some much-needed rainfall. There is not a great deal to report at the moment as everybody is busy mowing grass or installing drainage.

Congratulations to David Honeysett and all the staff at The Australian Golf Club in hosting another successful Open Championship in December. It was great to see Craig Parry win his first Open here in Sydney. Well done to all superintendents and their staff who have held tournaments this summer; the standards presented were very high and all involved should be very proud.

I would like to thank all who attended the annual Harbour Cruise on 5 December (my apologies as sick children stopped me from sampling a red or two on our fine harbour). Thanks to all the sponsors - Dad and Dave Turf Supplies, Golf Shapes and e-par. Your continued support is very much appreciated. Well done to all directors who were involved in another well-organised event.

The annual Rube Walkerden Day will be held at Killara Golf Club on 10 April. This is always a very popular event so get in early if you wish to play. Mandatory jacket and tie apply for dinner. See you there.

ANDY HUGILL
PRESIDENT, NSWGCSA

TGAA ACT

With water being such a finite resource, the majority of turf managers throughout the ACT and surrounding region are taking steps to reduce their total water usage by either incorporating couch into their already established cool-season grasses, or totally replacing these areas with warm-season grasses.

As many of you are aware there are hundreds of ways to skin a cat and by no means is there a wrong or right way. How these local managers have chosen to approach their particular area is extremely site-specific and dependent on a number of issues including budgetary constraints.

As with many facets of turf management, results can often be a slow process. We wish these turfies the best of luck and with correct practices I am sure that the desired outcomes will be achieved in good time.

The Canberra region will possibly be playing host to a couch seed trial as part of a study programme by university student Trent Frazer.

The trial will hopefully be located at the Royal Canberra Golf Club and it is expected to be supported by the TGAA ACT and the Canberra Institute of Technology. Although only in its infancy, we will keep you up to date as things progress.

For anyone who may be working or interested in working in the turf industry and is looking for a change of scenery, the Canberra and surrounding region offers a great opportunity in employment for qualified, skilled and apprenticeship based schemes in the trade.

The turf trade is well established and has a strong base in the ACT and continues to supply strong support to the industry. Please

contact Bruce Davies on (02) 6207 4623 for more information.

The past 12 months has seen the TGAA ACT expand and grow to a new level. This is made possible by our benevolent sponsors without who all our success would not be possible. It is also made possible by our valued member base.

As all TGAA members know, part of the benefits of being a member is that you receive a quarterly newsletter. We at the TGAA ACT wish to invite any submissions you may wish to include into our next edition. Please contact Gary Dawson on (02) 6207 4624 for prospective articles.

Until next time agrostologists.

JUSTIN A. K. HASLAM
COMMITTEE, TGAA ACT



The labour shortage in Western Australia continues to have a serious impact on the turf industry.

We are constantly losing skilled workers to other industries and the predictions are that it is likely to get worse. This places tremendous pressure on managers, who are responsible for delivering the same level of service without enough workers.

To address the labour shortage as an industry, the Turf and Landscape Industry Association held a meeting in December with John Nicolaou, chief economist at the Western Australia Chamber of Commerce and Industry (CCI). He has experience with a range of industries in WA dealing with the labour shortage.

The CCI can assist us by facilitating the production of a 'Workforce Plan' for the turf industry. They are also looking for case studies on the impact of the labour shortage on various industry sectors and presenting them to the government policymakers in Canberra. The aim is to influence government policy on measures to expand the workforce.

Our Christmas social function at the WACA for the interstate one-day cricket match was very popular again last year, with about 75 members attending. The TGAA WA has a number of other events planned in 2008 including a field day at Lark Hill in April and an irrigation seminar in June.

Finally, I'd like to acknowledge the sad passing of Kerry Coates last September. Kerry was a valued member of our association in his position as grounds manager at Methodist Ladies College in Claremont. Kerry was struck down by motor neurone disease in 2005.

Kerry was well respected in the sporting community and a celebrity charity walk between Perth and Albany was held last October in his honour to raise funds for the Motor Neurone Disease Association of WA. Our association made a contribution of \$500 in memory of Kerry.

PETER RUSCOE
PRESIDENT, TGAA WA



Christmas and January have come and gone so quickly. All at the TGAA VIC hope you had a great Christmas and felt the 'pitter patter' of little rain drops. We can only hope that the coming months bring sufficient rainfall where needed.

Upcoming dates to remember include the 17 April field day at Mt Scopus Memorial College and, of course, the 24th Australian Turfgrass Conference at the Melbourne Exhibition and Conference Centre (21-25 July).

The conference will include a dedicated sportsfield stream as well as the highly popular Cricket Wicket Seminar and annual general meeting. Information and registration forms will be posted to members in March and we advise you get in quick to take advantage of the Early Bird discount.

By the time you receive this edition, our office will have moved. For details and new contact numbers, keep an eye on the TGAA website and our newsletter in March 2008.

ROB SUNDBLOM
PRESIDENT, TGAA VIC

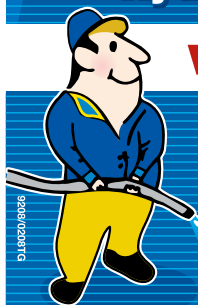
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Alan Morley, Franchisee, ex Greenkeeper Pacific Golf Club, 20 years



Love That Green!



I would like to wish everyone a wonderful and prosperous 2008 and hope all goes well for the year ahead. It has been a hot start to 2008 in WA with January averaging 32 degrees. Some scorchers were thrown in for good measure and there was no rain at all (some in the know say that could be the first time in 15 years or so).

February started the same until we received 30mm in one day, topping the averages up for the first two months. Why try and figure out these weather patterns? Hopefully we can have a wet 2008 with rains spread out evenly over the cooler months.

Speaking of hot spots, spare a thought for Dion Warr at The Vines Resort. A staff member left the ignition on in a utility vehicle which started a fire in the main machinery shed. Six greens mowers and five utility vehicles were torched before the fire brigade arrived around midnight. I'm sure Dion would have let it burn a bit longer if not beaten there by the fireys, or push a few of the older machines into the fire zone!

In all seriousness, however, Dion estimates about \$500,000 damage to buildings and machines and is hopeful that part of his fleet will be quickly replaced.

In other news, Tim Chape has resigned as superintendent at Rockingham Golf Club and taken up the assistant position with his superintendent stepson Brad Anderson at Sun City Country Club. Together they will hopefully see through major upgrades to the course, including the irrigation system.

It was sad to hear that assistant superintendent Alan Morley had left Secret Harbour to pursue a new position on the docks at Fremantle Wharf – more money and less pressure (especially working under Devo!) and more free time.

Alan's departure seems to be a worrying trend within the industry, with staff leaving for better paid jobs and superintendents finding it hard to replace them with quality personnel. A review or shake up of our industry's wage structure is needed otherwise clubs are going to struggle to retain workers.

There have also been concerns about the quality of apprentice education at South West TAFE. All I can say is that if clubs take on apprentices it is their duty of care to ensure they get the best education through TAFE. From my experience, Murdoch TAFE has quality teachers, including two ex-superintendents of high quality, ready to help out. I know the



Above and right: A fire in the maintenance facility of The Vines Resort in Perth caused about \$500,000 worth of damage to the building and machinery. Six greens mowers and five utility vehicles were gutted in the blaze

Below right: The staff room and staff equipment also received extensive damage during the fire. Fortunately no staff were on site at the time



financial costs of sending students up to Perth for two weeks, three times a year, but surely the positives must outweigh this?

The GCSAWA is gearing up for the return of its bi-annual state conference at Rottnest Island which will be held from 11-14 May. It is set to be a fantastic few days at the Rottnest Lodge, and with numbers being limited make sure you have secured your spot with Craig New.

Craig has organised a fantastic conference with some exciting guest and local speakers presenting an informative round of seminars and social activities.

The Golf Masters Cup is also on again for 2008 with Brad Anderson setting up a year of great golf at some magnificent courses, so ensure you register for the six rounds throughout the year, as well as the other annual golf events such as the Toro Cup, Management Challenge and AGM.

Elsewhere around the state, congratulations to Busselton Golf Club superintendent Callum Hitching after he got 'hitched' in March. Paul Needham has left The Cut to move to Secret Harbour under Allan Devlin, while Geoff Stephens is the new sales representative for Toro machinery in WA.

Please feel free to contact me or one of the other state committee representatives in regards to any GCSAWA matters. Have a great year and I look forward to catching up with everyone in 2008.

**DARREN WILSON
PRESIDENT, GCSAWA**

The summer weather certainly hasn't been kind to turfies in Tassie so far this year. Rainfall across the state is very much below average with only 2.4mm falling in Hobart during January, which was on top of just 3mm in November.

With well above average temperatures to boot it has had everyone nurturing their cool-season grasses through summer. Hopefully the La Nina weather pattern will get this far south and give some long awaited decent rainfalls.

Our next two TGCSA meetings will be ones not to miss. The first is on 5 March at the stunning Quamby Country Club and has been organised by Phil Hill, Peter Medwin and superintendent Nelson de Silva. The education session in the morning will look at fertiliser and nutrient requirements in relation to turf diseases, fertiliser management in combination with recycled water and a machinery presentation and demonstration by sponsor KBE. Lunch will be followed by nine holes of golf and a few quiet drinks to finish the day off.

The autumn meeting will be held on 7 May at Hobart's Bellerive Oval with curator Cameron Hodgkins giving an insight into wicket and ground preparations for the 2nd Test between Australia and Sri Lanka held earlier this summer.

We then move to Howrah Bowls Club to see how good everyone's judgement is in the game of lawn bowls. More information will be made available closer to the day but please put this date in your diary now.

On the staff movement front, Drew Ponting has left Mowbray Golf Club and Shane Knott has taken the reins. Chris Kline has left North West Bay Golf Club and the club is yet to confirm a replacement superintendent. The vacancy left by Kane McDonald at Port Sorell has been filled by Paul Derrell who hails originally from the UK.

STEVE LEWIS
PRESIDENT, TGCSA

The year is flying along so fast and 2008 will be another very busy one for TGAA NSW. Our first event for the year is the annual golf day on 18 March at Ashlar GC.

Our first seminar and tradeshow will be held on 15 May at the Sydney Showgrounds which will be followed by our annual Regional Seminar in Kurri Kurri on 19 August. We will also be holding a training workshop on 9 July and the year will conclude with our annual Sportsman's Charity Luncheon on 21 November.

On Wednesday, 20 February representatives from the various TGAA regions got together for a meeting in Brisbane to discuss plans for 2008 and to look at the establishment of a Queensland branch.

For information on any TGAA NSW event, or if you want to find out more about the Queensland branch, contact (02) 8883 4688 or email nswtgaa@bigpond.net.au

GRAEME LOGAN,
PRESIDENT, TGAA NSW

CONFERENCE REGISTRATION

Registrations are now open for the 24th Australian Turfgrass Conference.

Information on speakers, time tables, and costs can be obtained at www.agcsa.com.au or by contacting the AGCSA to request a full delegates brochure.

Online registration is the easy, no fuss way to register for all sessions, workshops and social functions. Click on the links on the conference page of the website and follow the instructions. It's that simple and confirmation is immediate.

SEE YOU IN MELBOURNE



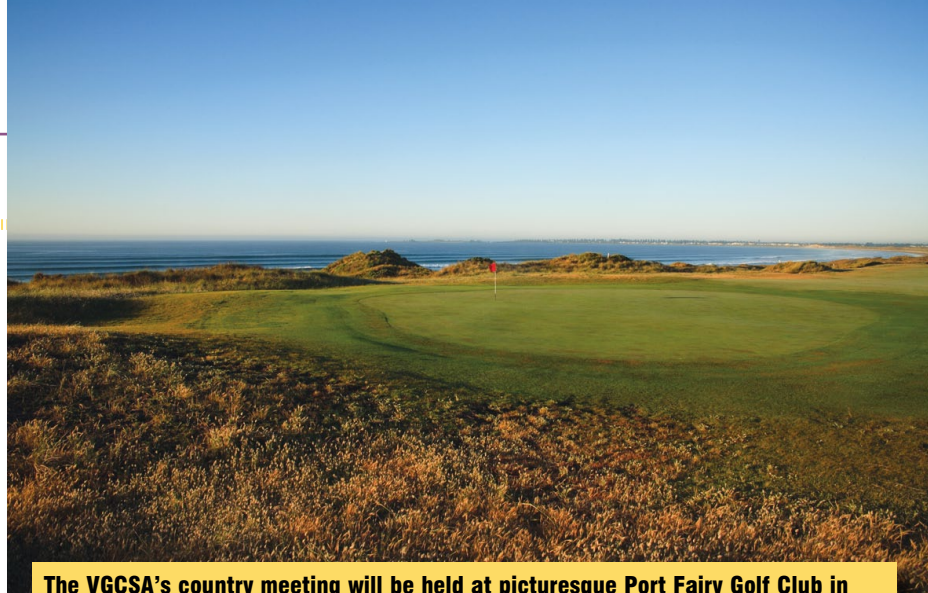
24th Australian Turfgrass Conference and Trade Show
Melbourne Convention Centre - 21-25 July 2008



**Port Fairy Golf Club superintendent
John McIlroy**

Victoria has experienced a typical summer with good rainfall in December, while January and February have been hot and dry which has tested the skills and patience of all superintendents. With 3a water restrictions in place, it makes life extremely tough when water quality is poor and your only reliance to flush imperfections out of your greens is rainfall.

The first VGCSA meeting for the year was held on 26 February at the Northern Melbourne Institute of TAFE. This education day, sponsored by Nuturf, focused on disease identification and fungicide combinations. A big thank you to Gavin Hagan (state manager Victoria), Sherwin Elias (plant protection manager) and Albie



The VGCSA's country meeting will be held at picturesque Port Fairy Golf Club in early April

Leggett (Nuturf agronomist). All panellists were very informative and I'm sure everyone got something out of the day. Water projects and water quality was the focus of the afternoon session with a passionate presentation from Paul Spencer from Greenway Solutions. The day was a great success and well supported by our members.

With the country meeting just around the corner at Port Fairy Golf Club (6-7 April), sponsored by Globe, we are encouraging members to get together and head down to one of the hidden treasures on the Victorian coastline. Port Fairy, home to superintendent John McIlroy, has been voted 42 in Australia's top 50 courses, with one panellist voting it in his top 16.

If you love your golf or you have a passion for golf course design, Port Fairy is a must visit. So join your fellow superintendents, play golf, have a couple of beers and enjoy the atmosphere at Port Fairy. With Globe sponsoring the day in partnership with

Syngenta, the focus will be on product development initiatives, while Syngenta will run a workshop on spray technology.

The VGCSA is entering the final stages of putting together its OH&S DVD. With the filming completed, only the editing remains and the committee looks forward to being able to hand it out to all VGCSA members in the not too distant future. This DVD will also be available to superintendents around Australia, so if you are interested in purchasing a Safety in the Workplace DVD we will be making these available through the state associations and the AGCSA.

Thank you to Trevor Uren who has worked extremely hard putting this DVD together. Hopefully it will be well received by the industry and can help employees safeguard against the hazards that are present in the maintenance of golf courses.

**MICHAEL FREEMAN
PRESIDENT, VGCSA**

SAGCSA

Due to ever-growing administration requirements, the SAGCSA executive has taken on a bookkeeper. Jo Cowley of Office Squad (also working at Mt Barker GC) is now acting as our part-time administration support person.

I would ask all SAGCSA members to direct their written communications to Jo as she will be organising and distributing these documents to the relevant parties. Jo will also handle data entry, processing of payments and mailouts.

Please support Jo as she will be a huge asset to our association. Jo's contact details are Office Squad, P.O. Box 951, Mount Barker, SA 5251, ph 0422 774 715.

Having the administration support person will help attract future SAGCSA executive committee members and aid the current executive to focus on pressing association matters.

I have had several superintendents mention to me in recent times how difficult it is becoming to find qualified staff. Like many other states we are experiencing a skills shortage. If you are losing staff to other industries we would like to hear about it. As an industry we need to be putting measures in place to retain the qualified staff we have and to attract quality young people.

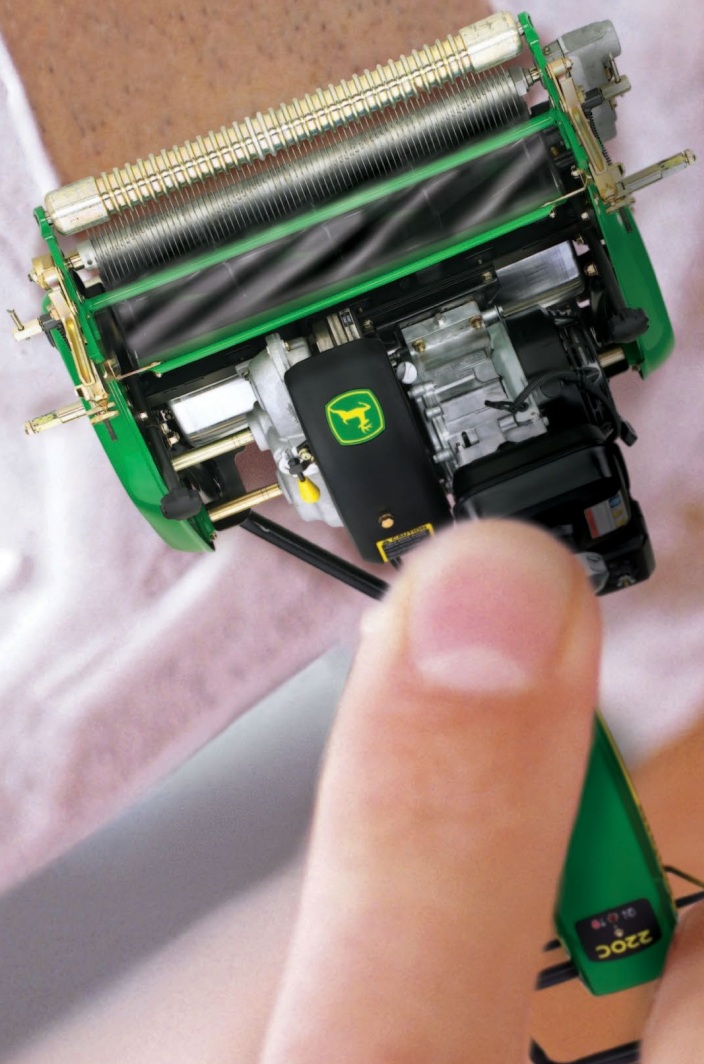
The SAGCSA executive is also keen to hear the thoughts of the members on potential

meeting themes and venues and in particular on the managers/supers meeting. We are keen to provide relevant keynote speakers and interesting topics for all of the meetings we hold. We recognise that supers want a good return on the time they give up to attend, so please pass on your views when you get the chance to either myself or one of the committee members.

I hope that everyone is well and that the autumn rains come early this year as most have suffered another long and dry irrigation season.

**ANDREW BLACKER
PRESIDENT, SAGCSA**

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"The growing-in phase of a new golf course is critical and requires detailed planning, particularly when it comes to irrigation.

When the new Settlers Run Golf Course at Cranbourne was in the early stages of planning we had no hesitation in recommending a Lowara pumping system because of its better control, long term reliability and ease of maintenance.

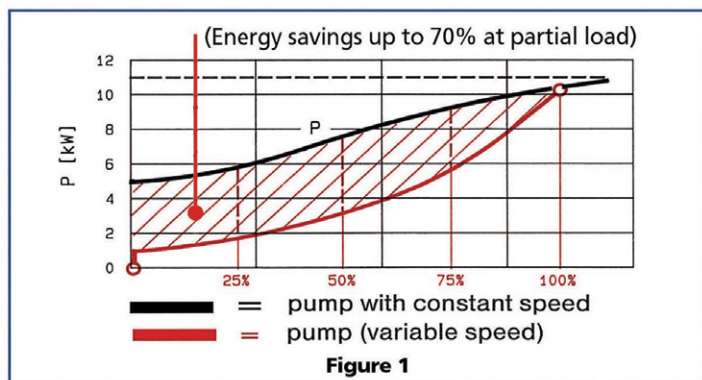
The Settlers Run pump installation incorporates 4 variable speed Hydrovars which are uniquely linked to Toro Irrigations' Sitepro software which delivers to the Superintendent precise information on the performance of the total pumping system, which is absolutely critical to the grow-in phase.

Combine that with Brown Brothers' exemplary after sales service and Settlers Run couldn't be in better hands."

Brendan Graham, A&M Watering

How the Hydrovar reduces energy consumption.

Most applications involve the pump operating either along its full speed performance curve or the pumps performance is throttled or regulated by a valve. The Hydrovar eliminates these operating methods by regulating pump speed and hence output to match the system demand. This saves wasted energy traditionally lost in these conventional pump systems. Energy savings of up to 70% can be realized. (figure 1)



What is Hydrovar?

Hydrovar has gained a reputation as THE pump mounted microprocessor pumping system controller. But it does much more than just change motor speed.

It actually manages the performance of the pump to match a wide range of system conditions and requirements.

Hydrovar is fully programmable on site as it incorporates the microprocessor and the variable drive in one compact and unique package

How Hydrovar reduces maintenance cost.

Hydrovar software is designed specifically for centrifugal pump operation, control and protection. Hydrovar can thus be setup to protect the pump from operating under various unfavourable conditions eg. cavitation, operating against closed head, low NPSHa or operation past a pumps maximum flow rate. Hydrovar will automatically shut down and alarm if adverse conditions occur.

Hydrovar provides the Golf Course Superintendent with the flexibility of watering required with substantial savings on installation, power usage and maintenance. For details about the experience of some of Australia and New Zealand's most prestigious Golf Clubs who have installed Hydrovar pumping systems, contact the Lowara distributors nearest you.

What is Flowlink?

TORO

To assist green-keepers and Superintendents in the golf course, turf and irrigation markets, Lowara and TORO Irrigation teamed up together to develop a link between the Toro Sitepro software and Hydrovar.

The link operates with up to 4 Hydrovar pump systems and monitor running / fault conditions and measures pressure and flow of the pump system.

All these parameters are displayed on the central irrigation control computer



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