

SUSTAINABLE SPORTS FIELDS & A WATER CRISIS

David Digby, Manager Parkswide, City of Whitehorse, Victoria, Australia

Abstract

The City of Whitehorse has 52 sports fields to maintain to a standard that is acceptable for active and passive recreation activities. In 2002 Council staff identified that the cool season grass surfaces on the sports fields were deteriorating in the dry weather conditions. Council allocated funds to convert the cool season grass to warm season grass. The first oval conversion was very successful and the program has continued.

A worsening of the drought conditions and the adverse impact the lack of water was having on the quality of the sports field surface resulted in Council allocating increased funds to accelerate the conversion of sports fields to warm season grasses. Council has during 2008/2009 in conjunction with the retail water authority (Yarra Valley Water), a suburban football league (Eastern Football League) and the tenant football, soccer and cricket clubs, converted 7 sports fields to warm season grasses.

The paper will outline the process and activities undertaken to convert 7 sports fields to warm season grasses to ensure that high quality sustainable turf is on these grounds to provide for passive and active recreation activities. Sustainable sports field management, water conservation plan, community consultation, capital works funding, project management; partnerships with local sports clubs will be discussed.

Key Words: Water Conservation, sustainable sports surfaces, community engagement

Introduction

The recent drought and ongoing water restrictions have had a drastic and negative impact on all Council sporting grounds and have affected all water-reliant sporting facilities to some degree. It is likely that reduced water availability will remain a reality with a high probability that this situation will progressively worsen given the current predictions relating to climate change. It is therefore critical that Council determine how best to manage water-reliant facilities to deliver a service that is acceptable to the community, cost effective and reduces Council's reliance on potable water supplies. To ensure effective management of our water resources Council has prepared a Water Action Plan 2008-2013 which outlines water priorities for a five year period and set water conservation goals.

Water a global perspective

Mindful of the theme of this year's conference "Global Challenges, local Solutions-Delivering for the Next generation" it is appropriate to consider the global water situation. During the National Water Summit held in Sydney in April 2009, Maud Barlow,

founder of the Blue Planet Project, and author of the book Blue Covenant presented some alarming facts in relation to the world's depleting water resources. She argues that "Water scarcity may be the most underappreciated global environmental challenge of our time." By 2050 the world population will have increased by three billion people and we will require an 80% increase in water supplies just to feed ourselves and no one knows where this water is going to come from. Barlow points to the fact that the world is running out of water due to pollution and the virtual water trade. Virtual water reflects the loss of water associated with the production of goods and services. An alarming example is that 17,000 litres of water is consumed in producing one litre of ethanol. To further illustrate the point, China consumes the equivalent of half the annual global potable water consumption in producing ethanol to fuel its economy. Barlow also states that water is increasingly being controlled by multi-nationals and we are fast reaching a stage where only people who can afford water will have access to it.

In 2006 the number of city dwellers surpassed the number of rural dwellers for

the first time in history. The ever expanding urban populations of the third world are living in urban centres half of which will be slums without access to water or sanitation services.

Water use @ Whitehorse

The global water crisis is alarming and in response many local governments around Australia have developed a range of water plans to address emerging issues surrounding water conservation and quality. Whitehorse Council is committed to ICLEI's (International Council for Local Environmental Initiatives) Local Governments for Sustainability Oceania's Water Campaign™, a performance based milestone framework to reduce water consumption and improve stormwater quality in Council's own operations and within the community.

In response to increasing water shortages Whitehorse Council adopted a Water Action Plan (2004) The plan has been updated in the context that State and Federal Governments are developing strategies designed to address such issues as water conservation, recycling, modernisation and expansion of the water grid. The updated City of Whitehorse Water Action Plan 2008–2013 outlines Whitehorse City Council's water priorities for the next five years.

Council will continue the approach of improving the water conservation of its own work practices as well as engaging with the community to encourage the adoption of sustainable water use principles and practices in local households, businesses and community activities. The plan places emphasis on actions that form a local response to water conservation and water quality issues.

Council's Water Action Plan 2008–2013 contains some challenging short, medium and long-term goals that will ensure Council continues to lead by example as a progressive municipality, and increasingly engages with the community to implement practical, achievable and affordable water conservation and quality actions. Council has established a set of water conservation goals:

- Reduce Council's water consumption by 25% by 2012 (compared with benchmark year 2002, where consumption was 247,666kL)
- To reduce corporate water consumption by 35% by 2020
- To reduce corporate water consumption by 40% by 2030
- To reduce community water consumption by 20% by 2012 (compared with benchmark year 2001/02)
- To reduce community water consumption by 25% by 2020
- To reduce community water consumption by 30% by 2030

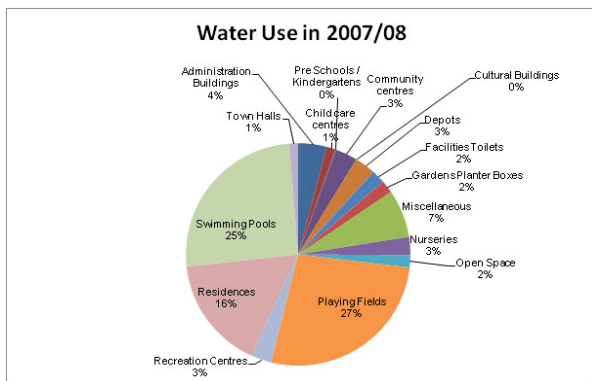
The Water Action Plan 2008–2013 details specific actions to progressively implement sustainable water practices into every aspect of Council activity, and to partner and encourage the community in reducing water consumption and improving water quality.

The actions are separated into corporate (Council owned and managed facilities) and community actions. Corporate actions focus on Council's major water users and those departments that can influence Council's water consumption. These departments take responsibility to reduce water use and improve water quality in Council's daily operations. The community actions focus on working with our community and business sectors to reduce water consumption and conserve water.

The actions within the updated Water Action Plan 2008–2013 are based on a hierarchy of avoiding and reducing water use as a first priority followed by re-using and recycling water as lower-order priorities.

The biggest user

The pie chart below clearly demonstrates that sports fields account for the greatest percentage of Council's water use. It is this water usage that presents the largest corporate water reduction challenge.



The demand for quality sporting surfaces continues to grow whilst access to potable water continues to decline. On average, 62.4% (9.1 million) of the Australian population aged 18+ participated in sport and physical activities in 2002. In Melbourne's outer eastern region of which Whitehorse is a part, 77% of the population is involved in both structured and unstructured recreational activity. These high levels of participation in physical activity places great demand on Council to provide sporting facilities that meet community expectations for service levels and underscore the need to provide social capital for community well being. Sustainable sports fields are as much about community health as they are about sport.

The City of Whitehorse has 52 sports fields that are heavily utilised. With access to potable water being severely restricted and Council's commitment to targeted reduction in water consumption funds were allocated to convert the cool season grass sports surfaces to warm season grasses. Experience had shown that warm season grasses required approximately 70% less water than cool season grasses. The first funds were made available in 2002-03 and with the success of initial programs were to become entrenched in the capital works program from 2006-07.

Prior to water restrictions Council applied approximately 240ML of water on predominantly cool season grassed sports grounds; forty of the fifty two sports grounds have irrigation systems. During the summer season of 2008/09 50ML of water was applied. Working with Yarra Valley Water in compliance with stage 3a water restrictions Council secured 50ML to apply to sporting surfaces under the principal that the

application resulted in a permanent reduction in water consumption.

Warm season grass transfer program

Having secured a water allocation and ongoing capital funding the continuation of the warm season grass transfer program was possible.

It was then necessary to decide upon the order in which grounds would be transferred and the species of grass to be used at each site.

In deciding upon the order in which grounds were selected factors including current condition, existing grass species, level of participation, level of competition and distinct user groups were considered.

Following consultation with industry experts and other municipalities the preferred turf species were agreed upon, those being two varieties of couch grass, Legend and Santa Ana. Council will also be trialling a new turf type variety of kikuyu this coming season. Both couch and kikuyu have proven to be ideal drought tolerant species both have their own merits. Couch wears well but has a relative slow recovery from wear period whilst kikuyu recovers extremely well but does not wear as well as couch. A careful analysis of each site and sport being played must be undertaken to determine which species of turf to use.

There are a number of ways in which warm season grasses can be introduced into a sports field ranging from laying instant turf to sprigging or seeding and a variety of combinations in between. In deciding upon a preferred option for the first major transfer program in 2006/07 cost and ongoing availability of sports fields for play were the determining factors.

Sprigging into existing grasses was the chosen method for grass transfer. The benefits of this particular method were that sport was not severely impacted upon with the grounds remaining available for play throughout the entire program and season. The method allowed for the transfer of five sports fields within the budgeted amount of \$125,000.

Council's desire to minimise the impact upon play was to prove to be detrimental. Couch was sprigged into existing grasses. The existing grasses were treated with a growth retardant to allow for the establishment of couch however the growth of couch was severely restricted by the competition grasses and resulted in an average 50-60% of sprigs successfully establishing.

Compounding the competition factor was the fact that under stage 3 water restrictions water could only be applied twice a week at prescribed times. This watering regime ignored the fact that we are dealing with living plants whose water requirements cannot be prescribed. Water needed to be applied to meet the requirements of establishing couch plants. Water authorities quickly acknowledged this situation and were in subsequent years to allocate a bucket of water to Councils to apply as they saw fit the proviso being that the application of water resulted in permanent savings. The monitoring of moisture levels within the soil is vital. As part of the transfer program Council will be funding the installation of water sensors at transferred grounds to avoid ineffective watering.

Excessive irrigation not only results in 'costs' and wastage due to consumption of potable water, but can also result in high rates of nutrients leaching beyond the turf root-zone.

Use of soil moisture sensor-controlled irrigation systems should enable automatic implementation of irrigation schedules that match supply of water to turf requirements and lead to an ultimate reduction in overall consumption.

The establishment rate of couch continued to decline with the commencement of the 2008 winter season. With expanded team numbers, the amount of concentrated training and the fact that training was conducted prior to the commencement of the season in some locations we were to see continuing decline of the now dormant couch plants.

A way forward

It was clear that the methodology would have to change. Water availability, competing

grasses and the amount of use a sports field accommodates proved to be the three key factors determining success. We had the water right, use and competing grasses needed to be addressed. It was clear that all competing vegetation would have to be eliminated and the amount of use reduced to allow for successful establishment during the first twelve months. Both these factors would have a significant impact upon clubs.

Councils officers agreed that the five grounds transferred during the 2006/07 program would be treated again forming the 2008/09 program. It was agreed that all existing/competition grasses be removed with couch sprigs applied to appropriately modify bare soil. This action would result in requiring summer sports initially being played on predominantly bare soil. By way of compensation it was proposed to lay a generous amount of couch sod around the central wicket in the case of cricket. Casual bookings and training would be prohibited during the summer and winter season.

Subsequent damage to newly established couch during the summer season but particularly the subsequent winter season remained a concern with this method and it was necessary to introduce restrictions on winter sport during the first winter following warm season grass transfer. To implement these significant changes it was necessary to embark upon an information and consultation strategy to ensure that Councils aims and methods were clearly understood.

Stakeholder Engagement

Prior to commencing works for the 2008/09 transfer season a forum was held in October 2008 engaging all stakeholders. Yarra Valley Water were invited and provided detailed Information regarding storage levels and trends and water restrictions. Council officers detailed modifications to ground usage the aim of which was to reduce wear on newly establishing turf. A range of restrictions were outlined and included a ban on pre season training and casual bookings and limiting training to three nights per week. Sand shoes were required to be worn on two training nights with moulded soles allowed on one evening per week.

The transfer methodology was explained in detail and the short term pain for long term gain principal was reinforced. This forum generated many questions particularly in relation to alternative training venues for clubs. The methodology was well understood and accepted.

Shortly after the forum individual meetings were held with summer and winter clubs whose grounds were to be transferred. Executives from the Eastern Football league and Cricket association were also engaged.

A monthly bulletin, was also produced and sent to all affected clubs the aim of which was to provide an update on progress and suggestions for further protection of establishing turf.

During the early phase of establishment a further round of individual site meetings were held with clubs, the Eastern Football League and Yarra Valley Water. At these meetings newly emerging couch was observed and offered a sign of things to come. This early meeting was important as it established a sense of ownership and journey among all parties, a partnership was established and has resulted in a mutual understanding and tolerance during a time of disruption. These site visits were to continue through until full establishment was achieved in March 2009.

The 2008/09 warm season grass transfer program concluded in April 2009 with results that have exceeded the expectation of all involved.

Key Points Moving Forward

Forty of Council's fifty four sports fields are irrigated and can therefore be transferred to warm season grasses. To date Council has successfully transferred sixteen sports fields to warm season grasses ten having been transferred two or more years ago, the remaining six as part of the current program.

If Council were able to secure 50ML of water going forward we are in a position to complete our transfer program by April 2012. Once transferred a 50ML allocation of water would allow an average of 1.25ML of water to be applied per oval.

By actively managing water application couch and kikuyu can be watered as little as three times per season. This is achieved by accurately monitoring soil moisture levels. These species can brown off completely before water is required, fully recharging the

soil profile is then essential. An amount of water should be reserved to allow for vigorous growth heading into the winter season. Water will also be required for use when applying chemicals and fertilisers. A minimal amount approaching 1.6ML is deemed sufficient for this approach. Such an approach will insure the integrity of the turf negating the need for major renovations or reconstructions.

A 50ML allocation would leave a shortfall of 14ML and Whitehorse Council is currently exploring options for storm water capture and reuse to supplement the potable supply. One such system has been installed at City Oval in Box Hill whereby one million litres of storm water can be captured and reused on the oval. Further to this initiative backwash water from Aqualink swimming pool in Nunawading is captured filtered and applied to Forest Hill reserve reducing potable demand by 60%.

What we have learned

The following is a summary of the most pertinent points:

- Up to date turf management knowledge and experience and a decent qualification doesn't hurt.
- Use couch or kikuyu.
- Eliminate all competing grasses
- Conduct an irrigation audit.
- Install irrigation systems of the highest irrigation uniformity possible.
- Use soil moisture sensors to determine irrigation frequency.
- Establish sustainable hours of use, over use can wear away concrete.
- Any over seeded couch surface must have the competitive species removed as soon as possible if a return to a complete couch cover is required.

Conclusion

Seven sports fields were transferred to warm season grasses during the 2008/09 program. Results have exceeded the expectations of all involved. An ability to learn and apply the lessons from previous programs, a commitment to being open and honest with clubs and associations and a strong partnership with Yarra Valley Water were all key components attributing to the success of the program.

Council's message of "short term pain for long term gain" has been delivered. Clubs,

associations, and the water authority have been a vital part of the journey and a level of confidence and trust has been established throughout the process. Using water wisely and delivering what we have promised sets the path for an ongoing journey towards sustainable sports turf at Whitehorse.

References

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Biography

David is the Manager ParksWide at the City of Whitehorse responsible for all aspects of managing Council's parks and gardens. He has extensive experience in both local government and the private sector in designing, developing and maintaining park assets including sports fields.

David has qualifications in Business administration, Parks management, Horticulture and landscape design.