

Recycled Organics in Sports Turf Construction & Renovation



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Overview

- What are recycled organic products?
- Types of products manufactured from recycled organics
- Working with Councils and others to develop markets
- Uses for compost in turf management
- Trials with Councils and other organisations
- Further work underway by DECC



What are recycled organic products?

- Recycled organic products are a form of stable, composted material
- >60 licensed composting facilities in NSW producing compost
- Composting is a thermal process – destroys weeds and pathogens - into humus
- Over 1.4 M tonnes of organic wastes recycled p.a. in NSW and used to manufacture compost
 - garden and food organics
 - biosolids, manures
 - wood, sawdusts, barks etc



Types of products manufactured from recycled organics

- Compost is often used as a base material to manufacture:
 - Potting mixes
 - Mulches
 - Soil conditioners
 - Blended or organic soils
 - Top dressing
 - Low density soils



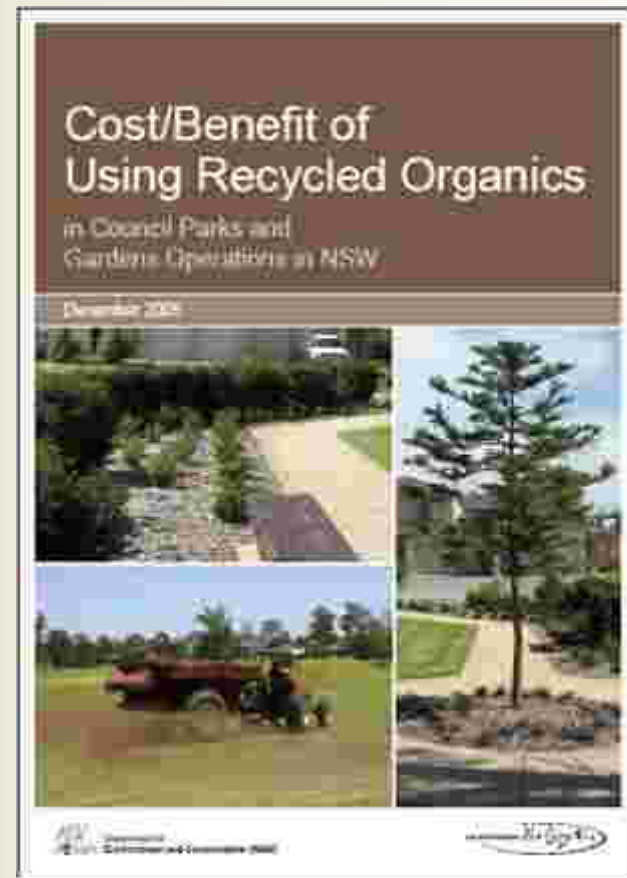
Aerial view of a 50,000 tpa composting facility

Australian Native Landscapes, Wyong



Working with Councils and others to develop markets

- Recovery and beneficial re-use of organic materials diverted from landfill - NSW Government priority
- Important greenhouse, water and sustainability benefits
- DECC guide to help Councils and others consider use of recycled organics
- Helps evaluate financial benefits
- Justify procurement decisions



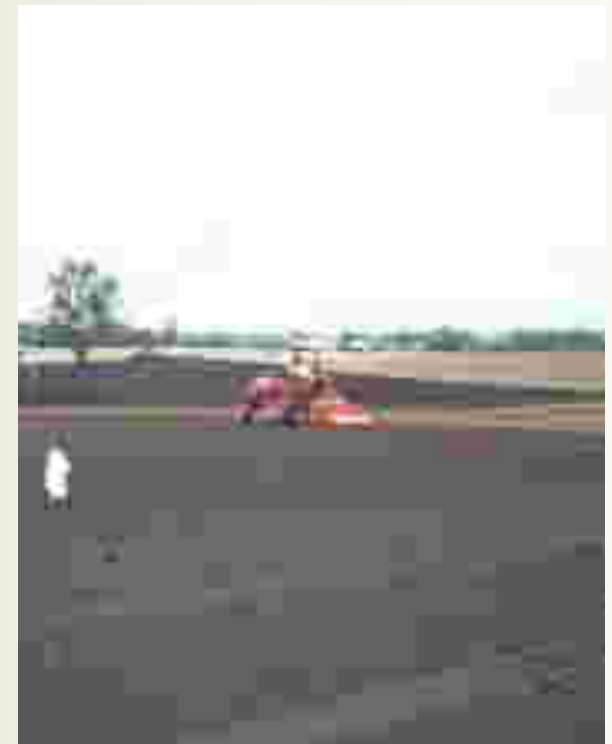
Applications for compost in turf management

- National and international review of studies undertaken
- Evaluation of performance, sustainability and financial benefits
- Two main applications in turf:
 - Composted soil conditioner in sports turf construction
 - Topdressing for turf renovation



Why use compost in sports field construction?

- Improves existing site soils
- Reduces the need for topsoil
- Major project cost savings
- Improves physical properties
 - soil texture, drainage and reduces bulk density
- Improves soil fertility and soil health
 - slow nutrient release of N, P, K and micro-nutrients
 - microbiota involved in disease suppression
- Increases turf vigour and establishment



Why use compost in sports field renovation?

- Research has demonstrated:
 - Up to 30% saving in irrigation needs
 - Improved turf surface under low rainfall or stressful conditions
 - Better, softer, safer playing surface
 - Supplies nitrogen and iron for long term greening
 - Reduces mineral fertilisers by up to 30%



Trials with Penrith City Council

- Drought over past 5 years impacted on quality of fields
- Water restrictions in place had meant limited irrigation
- Dry conditions results in:
 - Increased turf wear and tear
 - Poor turf re-growth after play
 - Hard and compacted surfaces for play
 - Public liability risks



Outcomes sought from trials

- Improve turf quality under low soil moisture conditions
- Reduce long term irrigation and fertiliser requirements
- If successful, Council could consider introducing an organics recycled service in the region
- Use compost for improving the sustainability of sporting facilities



Trial #1: Sports field reconstruction

- Ched Towns Oval, Glenmore Park
 - Soccer and cricket
 - Heavy, regular usage by over 50 teams
 - Watered from a nearby water course
 - Poor soil conditions
 - Site development involved excavation to B-horizon with little topsoil imported



Trial site #2 and #3

- Andromeda Drive and Greygums Rd, Cranebrook
 - Soccer, cricket and AFL
 - Heavy, regular usage >50 teams
 - Hard sub-soil conditions
 - Has relied on natural rainfall since L3 water restrictions



Set up of trials

- **Ched Towns**

- Field re-built in December 2005
- 4,000 m³ of topsoil from Penrith Stadium reapplied to 150 mm deep
- Composted soil conditioner incorporated (meeting AS4454, 2003) (Camden Soil Mix)
- Leveling, irrigation system installed
- Sited planted with Kikuyu
- Topdressed with 25 mm compost/sand/soil mix



Set up of trials...

- Andromeda Drive and Greygums Rd
 - Field subjected to subsoil aeration (Earth Quaking Decompactor™)
 - Topdressed with 25mm compost/sand/soil mix in December 2005 (Camden Soil Mix)
 - Topdress raked into surface
 - Supplementary gypsum applied to correct Ca, S and K deficiency

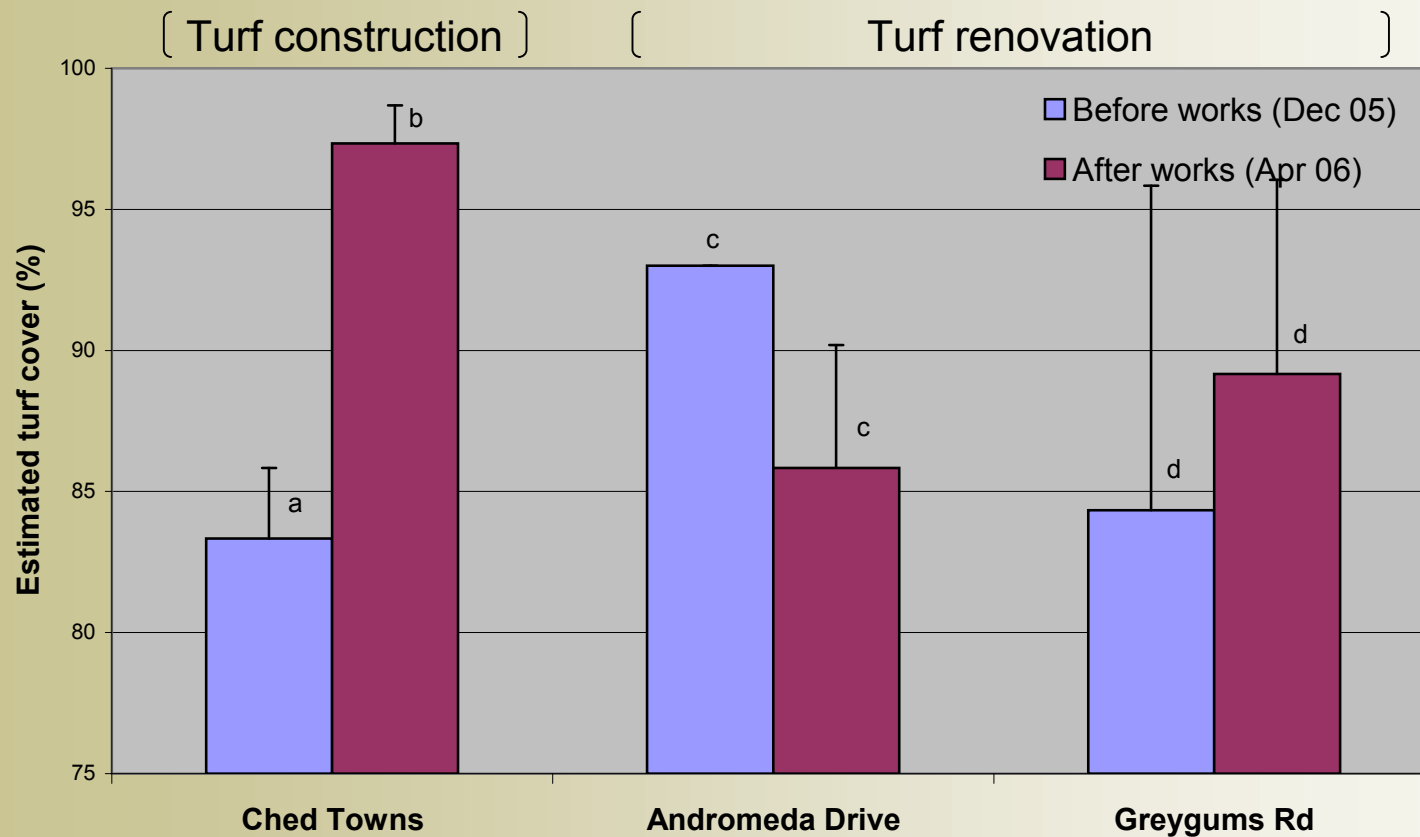


Trial monitoring

- Tests performed before and 5 months after works to evaluate field condition:
 - Turf cover & soil nutrients
 - Turf leaf tissue nutrients
 - Surface hardness (Clegg Impact Hammer)
- Testing work by SESL and AGCSATech



Results – turf cover



Results – turf cover

- Cover increased significantly on Ched Towns after works
- No major differences on Andromeda Dr and Greygums Rd
- Likely to be due to continuing drought conditions
- Only 55% (245 mm) of average rainfall (445 mm) fell in Penrith over the five month trial period



Ched Towns 5 months after works

Results - soil and turf properties

- Soil bulk density decreased by 28-35% on all fields
- Organic matter levels increased from 3.4 to ~9.5% in topsoil layer on all fields
- Responsible for a 'softer' playing surface
- Small changes in soil nutrients & turf foliar nutrient status

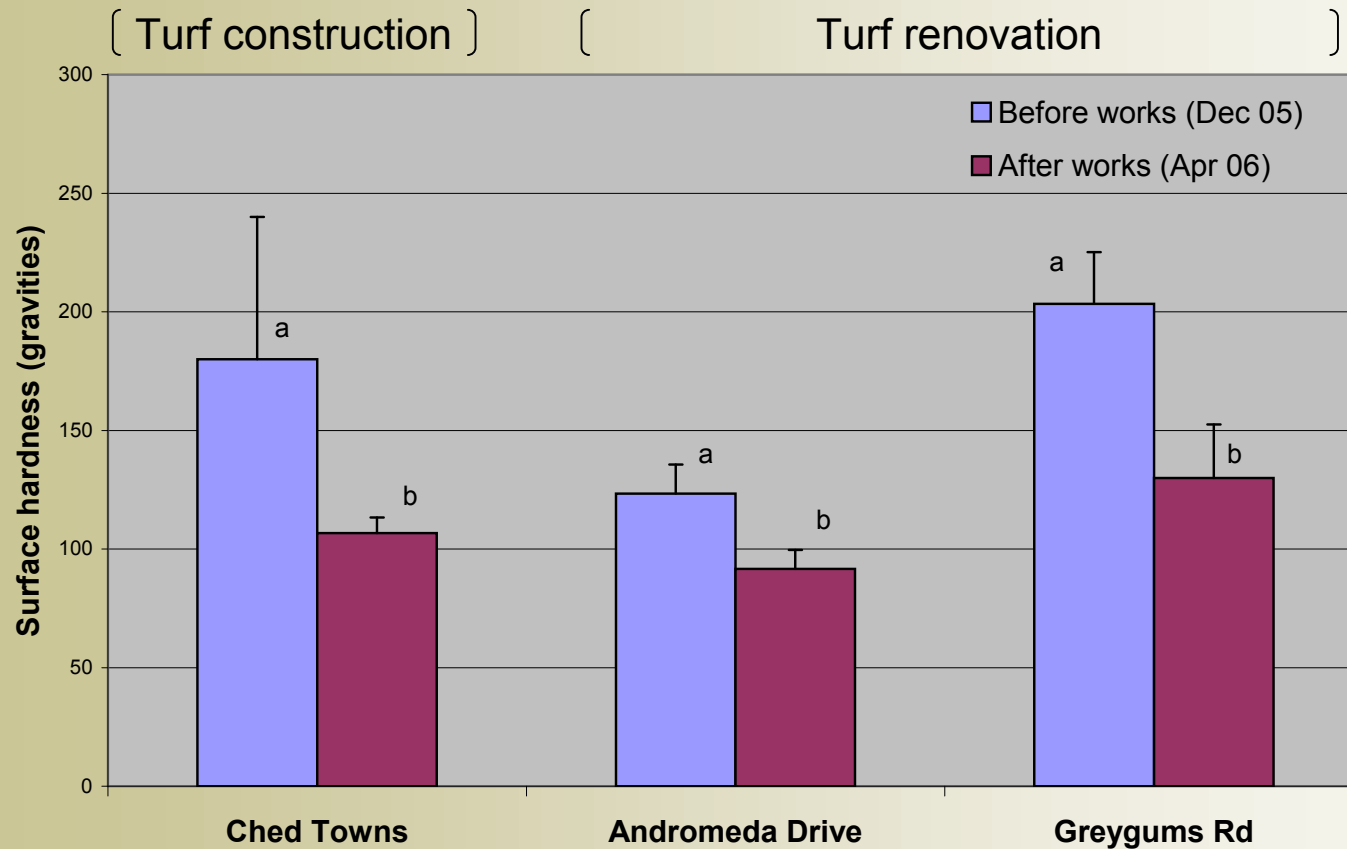


Ched Towns before works



Ched Towns 5 months later

Results - surface hardness



Surface hardness

- Reduced significantly by 25-40% across all fields
- Combined effect of compost and sub-soil aeration



Main findings

- Compost in soil mix at Ched Towns clearly helped to provide a superior turf surface that was softer for play
- Major benefit across all fields involved a reduction in soil bulk density and surface hardness – fields safer for play
- Combined effect of sub-soil aeration and compost



Main findings...

- No major changes in soil nutrients, but slow nutrient release expected over time – will provide fertiliser savings
- Topdressings best used where some supplementary irrigation on fields is possible
- Benefits of compost as topdressing may be maximised with better soil contact (e.g. verticutting then sweeping)

ORGANICS

Using Compost Materials on Council Sporting Fields

CASE STUDY

The use of compost is established from recycled organic material in the production of sporting fields, or as an annual topdressing to existing fields to improve soil as an important way to improve the quality of turf surfaces for sporting activities.

Because of water and nutrient availability, grasses grow fast and need regular watering. Fertiliser topdressings for turfgrass, are applied in winter and spring conditions.

Compost can also reduce reliance on mineral salts and waste used in turf production and maintenance, which are costly and have an environmental impact through their transport from the book and the natural environment.

The five pilot communities supported by a grant from the Council of NSW, are evaluating the viability of compost in the production and maintenance of their sporting fields used by the community.

About the sporting fields

Three sporting fields managed by Parramatta Council were selected to participate in a case study. All three had a history of heavy usage for sporting teams, were compacted and had established turf grass that often suffered alkalinity. Water restrictions were the biggest issue further exacerbated the problems on these fields.

All fields experience high rates of water and poor turf growth due to high clay, locally particularly infertile soils in the field. Overgrazing of the fields is also a major issue in the soil, which is a problem.

A soil analysis of each field is given below.

Field 1: Central Oval, Blaxland Park

The soil is used for soccer and other sports. It is periodically irrigated with water from a nearby water source. There is no mow but grass on the field.

Field 2: Central Oval, Blaxland Park

The soil is also used for soccer and other sports. The soil has high clay, locally particularly infertile soils in the field. Overgrazing of the field is also a major issue in the soil, which is a problem.

Field 3: Central Oval, Blaxland Park

The soil is used for soccer and other sports. It is periodically irrigated with water from a nearby water source. There is no mow but grass on the field.

Field 4: Central Oval, Blaxland Park

The soil is used for soccer and other sports. It is periodically irrigated with water from a nearby water source. There is no mow but grass on the field.

Field 5: Central Oval, Blaxland Park

The soil is used for soccer and other sports. It is periodically irrigated with water from a nearby water source. There is no mow but grass on the field.

Department of Environment and Conservation

Trials with Ku-ring-gai Council

- Trials established on four sporting fields
 - Cliff No 2, North Wahroonga
 - Primula, Lindfield
 - Wellington, East Lindfield
 - Norm Griffiths, West Pymble
- All fields heavily used, turf quality affected by high use & drought
- Council interested in sustainability and financial benefits of compost topdressing compared to sand/soil topdressing



Renovation works undertaken

- Cliff #2 and Primula
 - Vertityning
 - 20 mm deep compost topdressing (Nitrohumus™ - 80% compost fines; 20% sand from Australian Native Landscapes)
 - Mechanical sweeping
- Wellington & Norm Griffiths
 - Earthquaking
 - 20 mm deep compost topdressing (Nitrohumus - 80% compost fines; 20% sand from Australian Native Landscapes)
 - Drag matt



Wellington Oval – week 1



Wellington Oval – week 3



Wellington Oval – week 8



Monitoring and interim results

- Turf audit performed before and after renovation works by SESL
- Soil physical, chemical and turf properties
- Turf vigour and greening response with compost
- Very positive feedback from clubs
- Results to be promoted via a field day later in the year



Further work underway by DECC

- Port Macquarie-Hastings Council
 - Port Macquarie Regional Stadium field construction project
 - Wayne Richards Oval construction project
- Wollongong City Council
 - Cricket and football renovation trials – 4 sites
- NSW Department of Education and Training
 - Playing field renovation trials - 4 schools
- NSW Golf Course Superintendents Association
 - Trials at 5 golf courses across Sydney – fairways

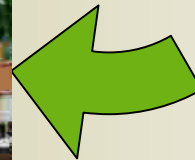
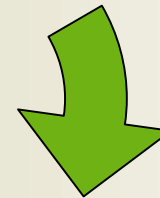
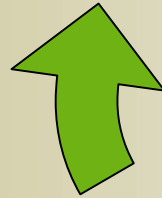


Further work underway by DECC...

- Detailed scientific trials
 - currently being established to underpin demonstration trial work
 - two year trial
- Compost specification and application guideline
- Case studies
- Field days



How can turf management contribute to regional sustainability?



Acknowledgments

- Raphael Collins, Penrith City Council
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