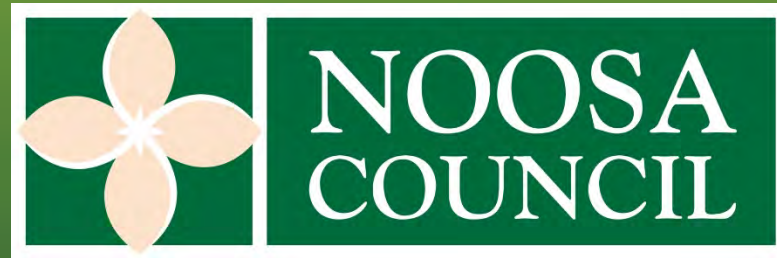


Noosa Council 2016 Sports Field Audits



M +61 412 197 218 E admin@ASTCs.com.au
PO Box 1242, Coorparoo QLD 4151



ABOUT ASTC

Australian Sports Turf Consultants (ASTC) provides independent consultancy advice and specialist services to the sports turf industry, turf production industry, commercial and environmental sectors.

ASTC also undertakes research, development and extension activities for the Australian and international organisations.

Our office is located in Brisbane, Australia.



OVERVIEW OF PRESENTATION

- Player safety and turfgrass
- Auditing and benchmarking
- What was undertaken
- Results
- Turf Management
- Turf Finder
- Sports Turf Association QLD

PLAYER SAFETY



AUDITING OR BENCHMARKING

The phrase auditing or benchmarking of a sports field often makes people anxious. However, as a participant or turfgrass manager you must know what your goal is by undertaking such a service. For example:

- To know your limitation of your playing field (e.g. hours of play).
- Is the design of your field a limiting factor (e.g. turf type, drainage, soil).
- To determine if your inputs (labor, fertiliser, irrigation etc.) are

There is an important difference between the term recommendation and standard when used during benchmarking and the reporting process.

UNREALISTIC EXPECTATIONS

- Too much is expected of our turf at times. Particularly if the available grass species is less than desirable.
- Turf has finite usage capacity and resilience.
- All parties involved need to appreciate that a turf surface is a natural medium that requires TLC.
- Performance guidelines provide a common language for the turf manager and or facility manger or sporting body.

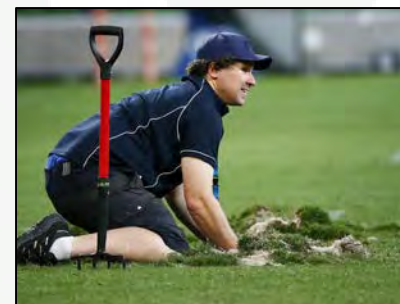
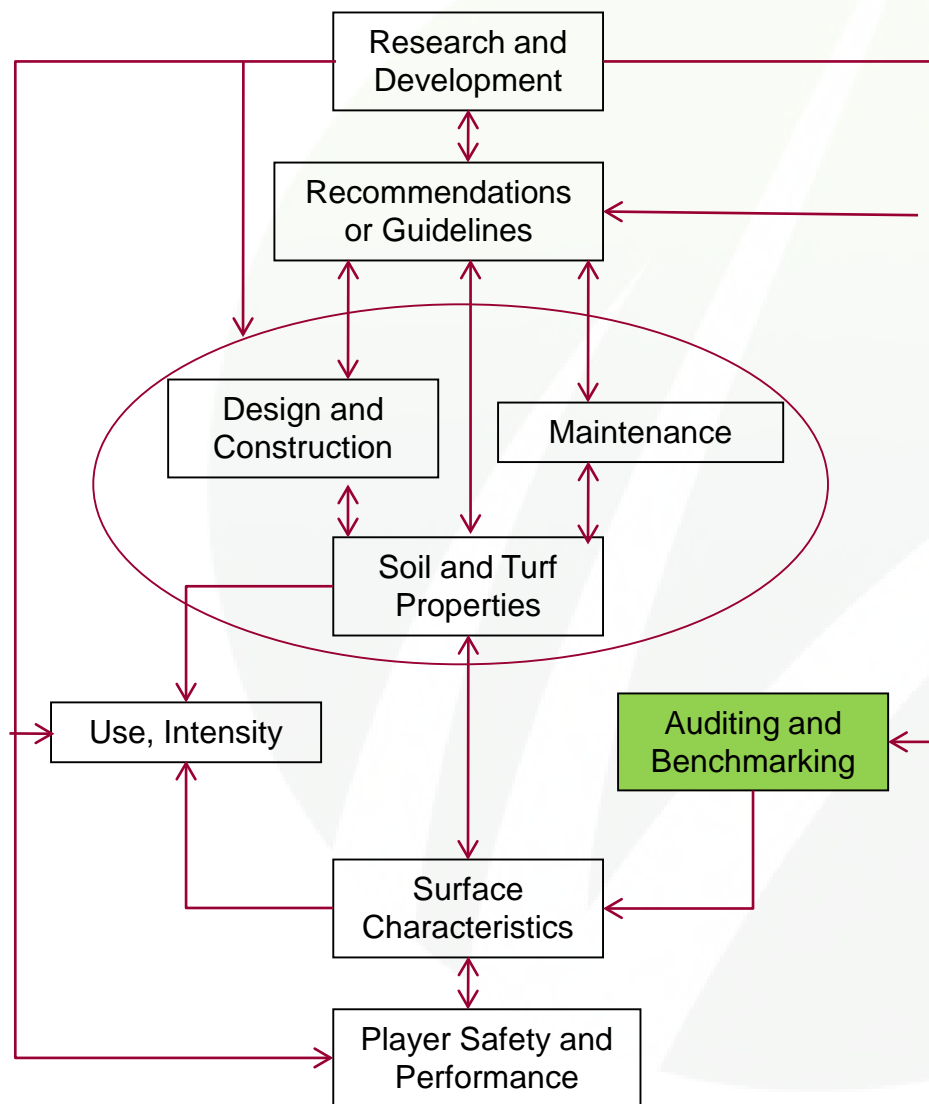


PROBLEMS

- Agronomic issues
- Poor design
- Wear
 - overuse and multi-use
- Stability and divoting
 - root development
 - Disease
- Budget
- Resources
 - Volunteers or paid staff
 - Equipment



PLAYER SAFETY AND TURFGRASS



(left) modified from Waddington et al., 1997.

WHERE DO YOU WANT TO BE?



OR



AUDITING AND BENCHMARKING

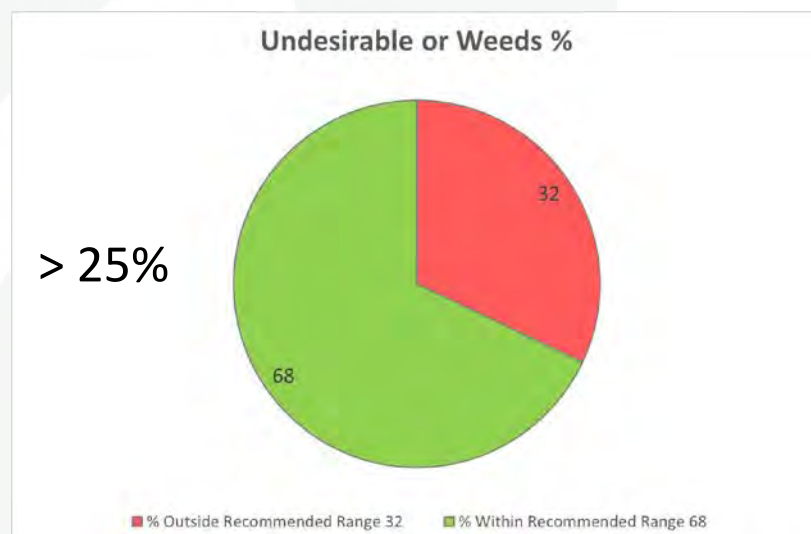
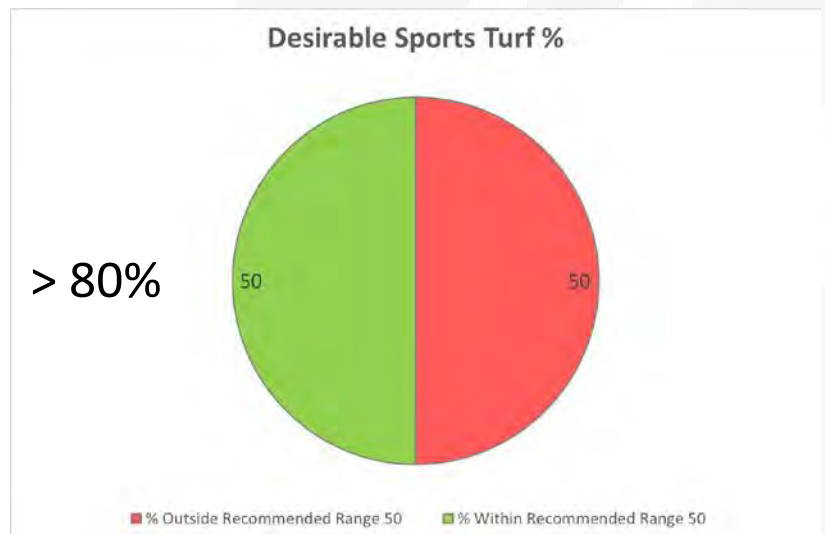
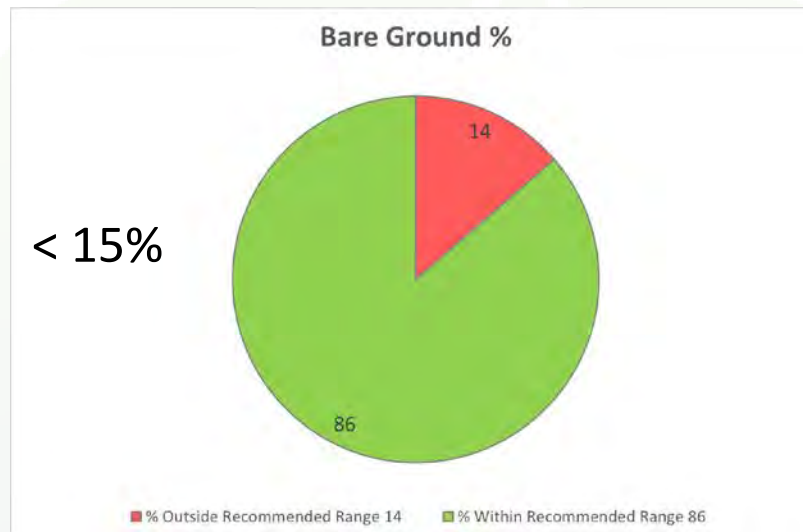


AUDIT – WHAT WAS MEASURED AND HOW DID WE PERFORM

Below provides an example of what type of parameters can be measured.

- Surface hardness (Clegg Impact Hammer)
- Species composition and weed, pest & disease identification
- Soil moisture (Field Scout Meter) and nutrient testing
- Water infiltration (single ring infiltrometer)
- Penetration (Penetrometer)
- Turf colour (Turf Colour Meter)
- Root zone testing – depth, thatch & soil properties
- Agronomic and safety particulars

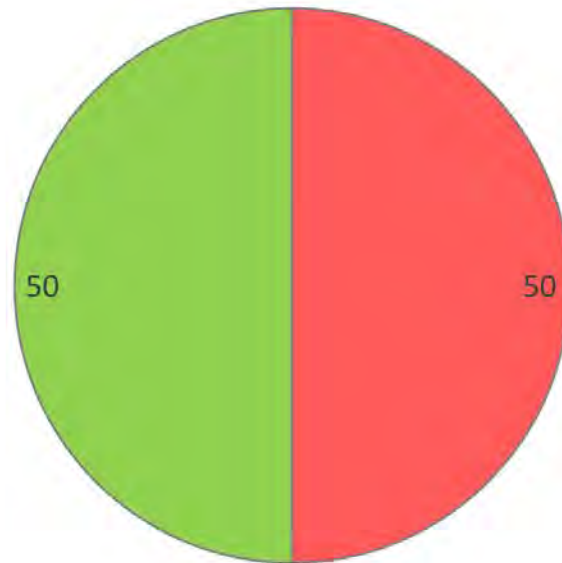
GROUND COVER



HEIGHT OF CUT



Height of Cut %



■ % Outside Recommended Range 50

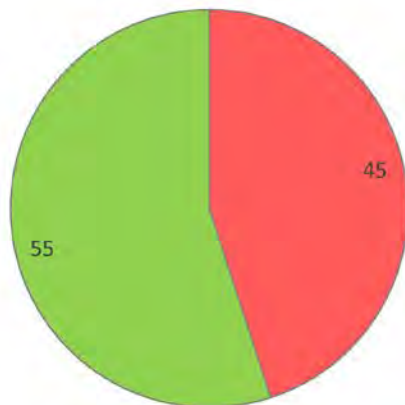
■ % Within Recommended Range 50

Recommended

- 20 – 40 mm
- 15 to 20 mm (cricket)

TURF QUALITY AND COLOUR - SUBJECTIVE

Turf Quality%

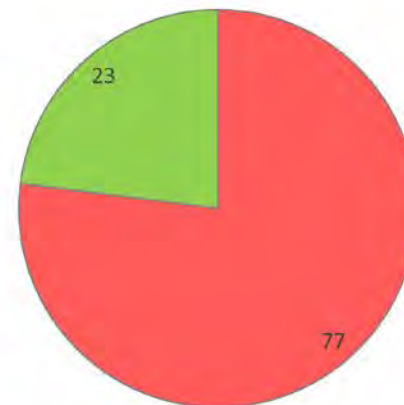


■ % Outside Recommended Range 45 ■ % Within Recommended Range 55

Recommended Quality

- Rating 1 to 9
- ≥ 6 being acceptable

Turf Colour %



■ % Outside Recommended Range 77 ■ % Within Recommended Range 23

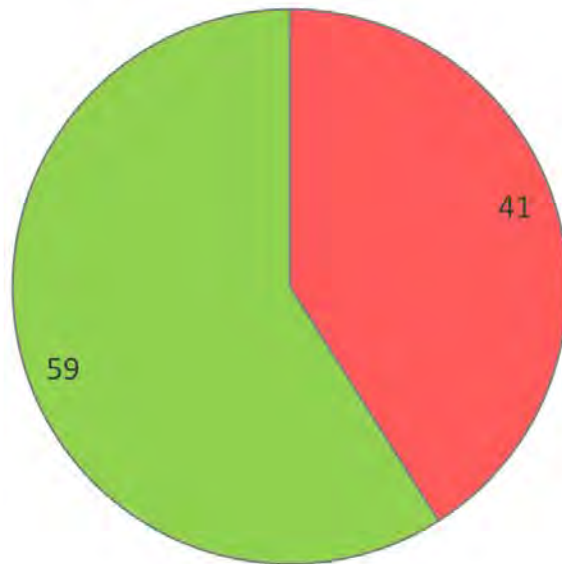
Recommended Colour

- Rating 1 to 9
- ≥ 6 being acceptable

WATER INFILTRATION



Water Infiltration %



■ % Outside Recommended Range 41

■ % Within Recommended Range 59

Recommended

- > 50 mm/hr

UNDULATIONS AND EVENNESS



Surface Undulations%



■ % Outside Recommended Range 5

■ % Within Recommended Range 95

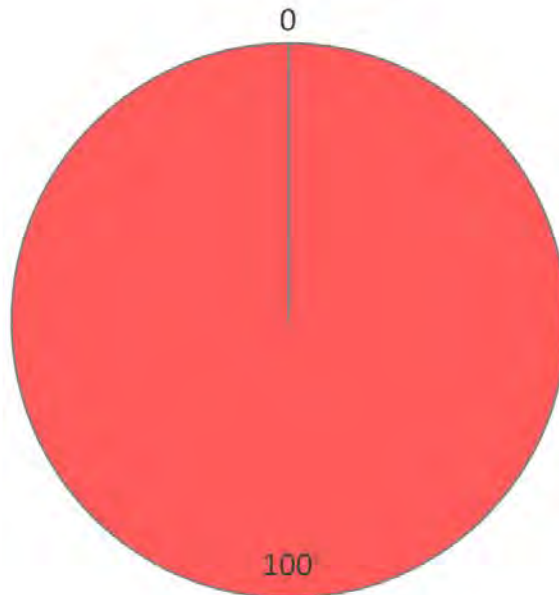
Recommended

- < 30 mm

THATCH



Thatch %



■ % Outside Recommended Range 100

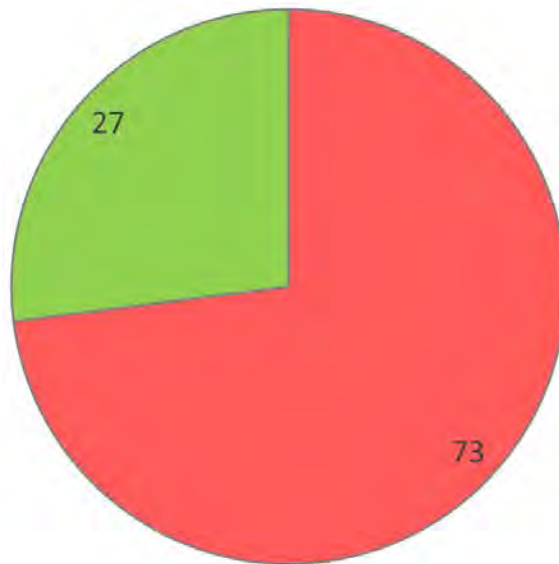
■ % Within Recommended Range 0

Recommended

- < 20 mm

MAXIMUM ROOT DEPTH

Max. Root Depth %



■ % Outside Recommended Range 73

■ % Within Recommended Range 27



Recommended

- > 180 mm

BENCHMARKING



Why:

- provide consistency
- benchmarking vs. time and resources
- assist turf managers in undertaking or altering management practices to obtain the best results of their field.

Benefits:

- regular communication between the auditor & turf managers
- acquiring independent scientific & performance based data
- assists Management in providing a duty of care to the hirers of the facility/venue
- helps justify an investment and or identifies your asset
- provide value for money.

TURFGRASS SELECTION



TURFGRASS SELECTION – POINTS TO CONSIDER

- Purpose/use
- Available resources
- Availability
- Supply (e.g. sod, sprigs)
- Cost – protected vs non-protected grasses
- Morphological attributes
- Wear tolerance and recovery (usage)
- Maintenance requirements
- Soil type
- Location (environment, including weather)
- Turfgrass manager(s)



WEAR DAMAGE - SPECIES VARIATION

An example of surface damage incurred following weekly applications of simulated wear “traffic” across green couch, blue couch and kikuyu cultivars



Green Couch



Blue Couch



Kikuyu

Source: HAL TU08018 study.

A COMPARISON OF 4 COUCH VARIETIES USED IN AUSTRALIA



Variety	Wear tolerance ¹	Thatch production	Fertility requirement	Mowing frequency	Salinity tolerance ³
AgriDark (2010)	Good	Moderate	Moderate	Moderate	Good
Grand Prix (2006)	Good to High	High	Moderate	Moderate	Moderate
OZ TUFF® (2006)	Good to Very High	High	Moderate	Moderate	Good
TifSport® (1994)	Good to High	Moderate to High	Moderate to High	Moderate to Low	Low ²
Wintergreen (1983)	Moderate to High	Moderate	High	High to Moderate	Good

Information obtained from: ¹ Roche et al. (2012) as seen in Table 1 with available data, ² Bauer et al. (2009), ³ Poulter and Bauer (2010)

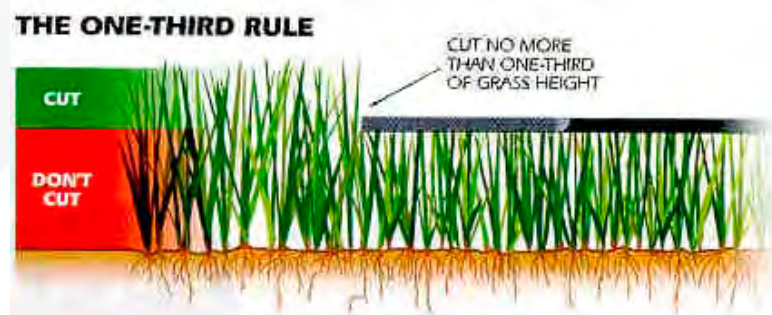
TURFGRASS MAINTENANCE



Desired cutting heights. Will my turf handle the hair cut?

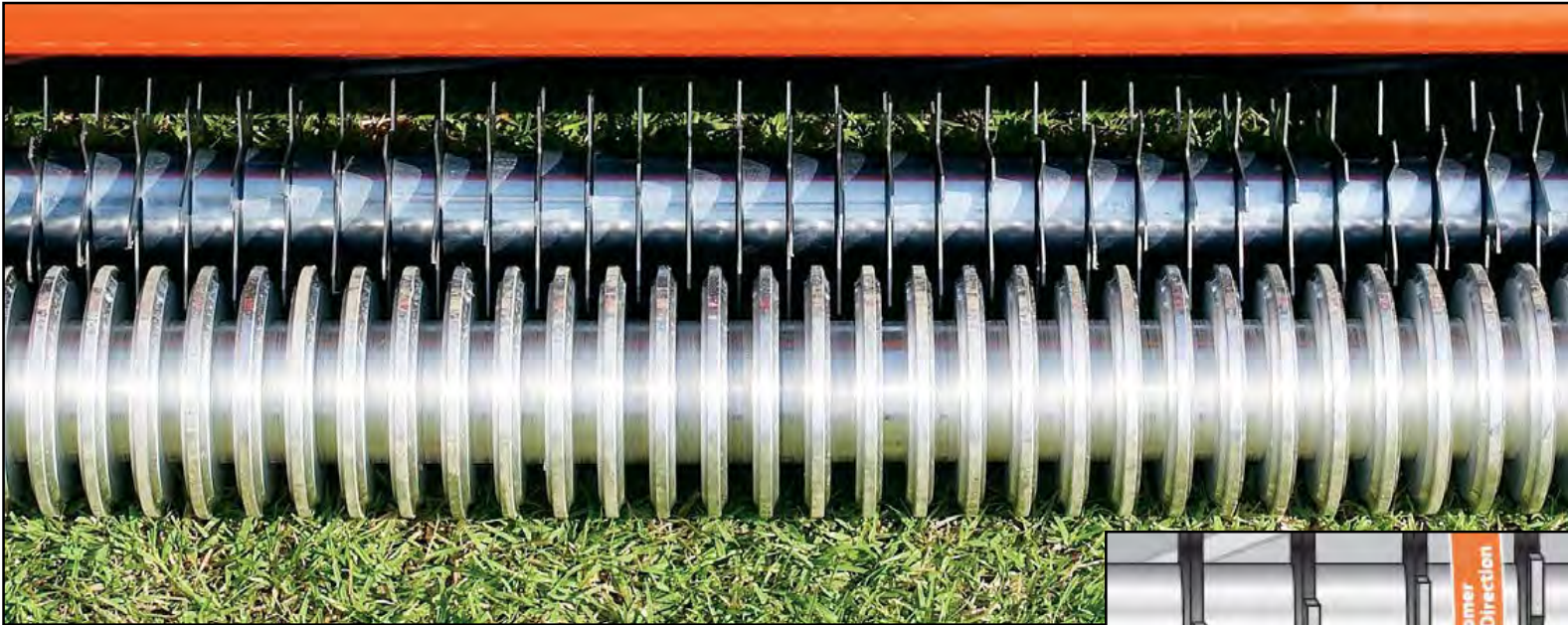
Multi-use venues are a headache for turf managers. Trying to accommodate a verity of sports, including cricket, can be testing. Give your turf the best chance during change over.

- Turf height on wicket block could be between 10-15 mm during the football season
- Reduce the HOC gradually (1/3 mowing rule)
- Desired height ≈ 4 mm
 - < 4 mm will damage the turf sward
 - > 4 mm may provide variation off the seem
- Using groomers or a scarifier to reduce thatch and reduce your mowing height



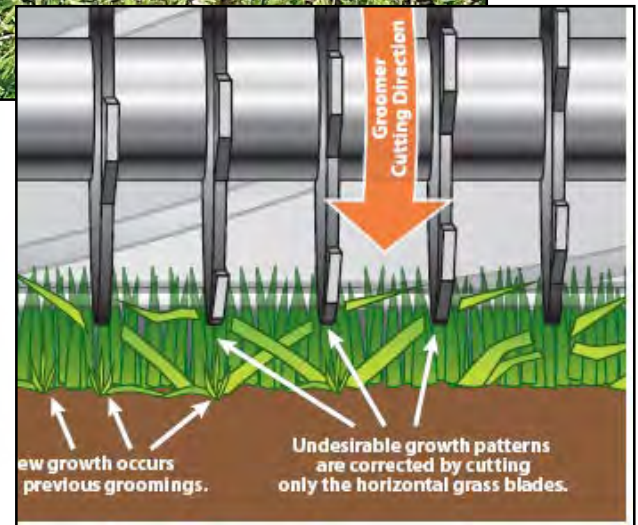


GROOMING

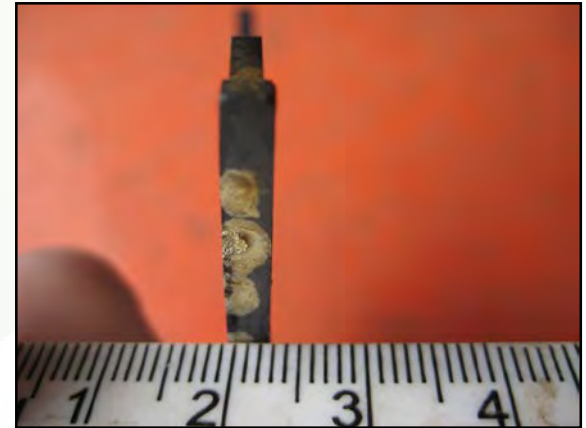
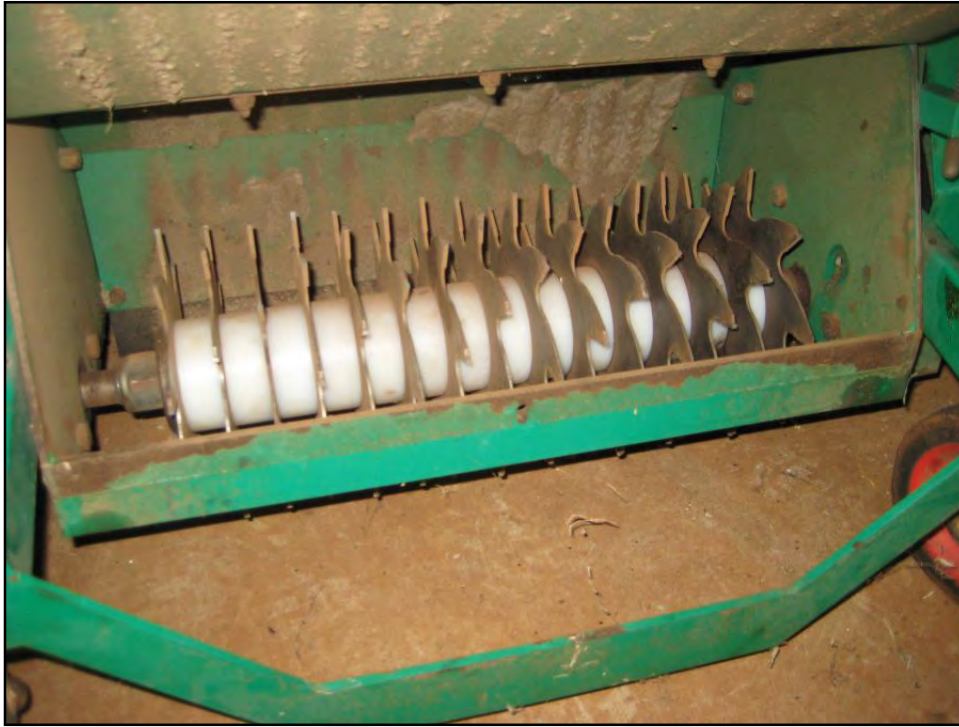


Source: **JACOBSEN®**

Groomers are designed to condition or stimulate new growth from the plant's crown



SCARIFICATION OR DETHATCHING



Interchangeable blades to allow for variable spacings and blade widths



COMMON PESTS AND DISEASE



DO YOU HAVE A PEST OR DISEASE PROBLEM?

- Get to know your site(s)
- Season changes (timing)
- Soil types present within your sports fields or recreational areas
- Types of pests and diseases
- Council and community (or venue hirer) expectations
- Record and monitor results (outbreaks and changes)
- Conduct Integrated Pest Management (IPM) practices and adjust activities accordingly (test and adjust)
- Environment and staff / community safety

Source: Modified from D. Moore

PESTS



CARL SPACKLER

'License to kill gophers by the government of the United Nations.
Man, free to kill gophers at will.'

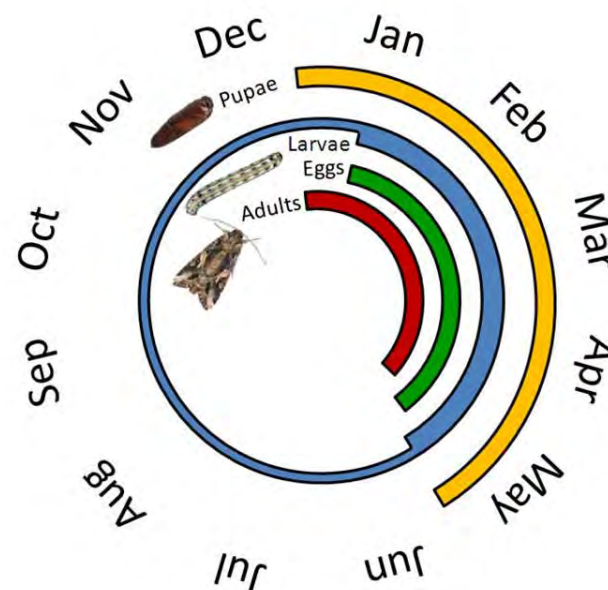
\o/ MotivatedPhotos.com

LIFE CYCLE

The key to understanding and managing pests is to take the time to understand and learn the pest you wish to manage.

Several of the major pests you will have to deal with have a specific life cycle of which there is a potential danger to your turfgrass. At the same time, there may be only a small window of opportunity within their life cycle upon which you can successfully control the pest.

Armyworm Life Cycle Example



Source: AgPest NZ

PEST ACTIVITY PERIOD

Insect	Main Insect Activity Period											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
African Black Beetle												
Argentinian Scarab												
Argentine Stem Weevil												
Armyworm												
Billbug												
Blackheaded Cockchafer												
Couch Mite												
Cutworm												
Funnel Ant												
Ground Pearl												
Mole Cricket												
Pruinose Scarab												
Sod Webworm												

Source: Nuturf

LAWN ARMYWORM

Spodoptera mauritia (Boisduval)

The larvae are grey to green caterpillars with longitudinal stipes. They live in the thatch layer. Leaf and crown damage from feeding, and they produce distinct lines/ patches when they feed.



Source: Soil Crop and More

All turfgrasses are susceptible. However, some genus and particularly grasses that have good nutrition are preferred. Armyworm prefer warm humid weather.

Control: cultural practices including nutrition and that control will help. Birds will also play their part. Pesticides are another option when levels are out of control. A good way to keep an eye on development before they strike is by using a moist hessian bag.

SOD WEBWORM

Herpetogramma licarsisalis

Sod webworms may be green, brown or grey. Most have dark circular spots. They live in silk-lined tunnels and chew grass off close to the crown. Birds can often be seen feeding on heavily infested areas. Sod webworm will only feed at night



Control: Application of pesticide before sunset and then lightly water into the soil profile.

NEMATODES



AFRICAN BLACK BEETLE

Heteronychus arator

Adult black beetles can cause significant damage by feeding on stolons and rhizomes. Active all year round.

The larvae are approx. 5-25 mm long and 1-5 mm thick. They begin feeding on organic matter in the root zone, initially near the surface and then deeper as they grow. Active from late spring till early summer.

Controls: cultural practices and pesticides.



Top: African Black Beetle

Bottom: 3rd stage Black Beetle Larva



Source: D. Nickson

MOLE CRICKET

Scapteriscus spp., *Gryllotalpa* spp.

Mole crickets damage turf by feeding on the plant roots, stems and leaves and by tunnelling through the soil.

However, feeding is not considered as damaging as the cricket's tunnelling. They are 3-4 mm in size. Active during the summer. Life cycle of eggs, nymph, then adult.



Source: Flickr. Farm 2.

The *Gryllotalpa* spp. and the Changa mole are currently confined to an area centred within Newcastle, NSW. However, the *Scapteriscus* spp. is located across Australia.

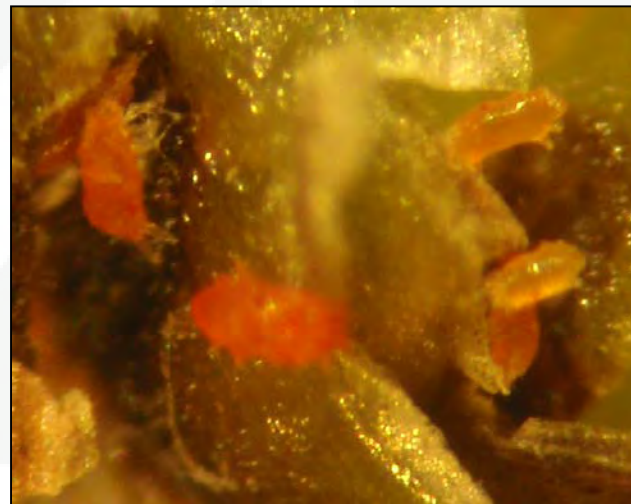
Control by insecticide.

MITES

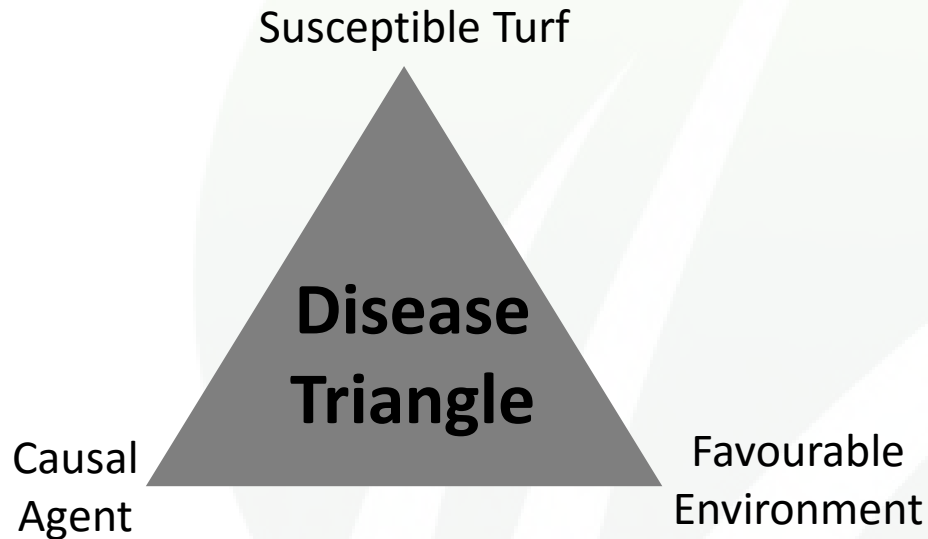
Dolichotetranychus spp., *Aceria* spp.

Effects warm-season turfgrass species by stunting or inhibiting growth.

Control: Multiple applications of varied insecticides that possess different active constituents. This is because their life cycle is short and their population is likely to be high i.e. you may miss the window of opportunity to provide an effective control.



DISEASES



If one of these factors is incompatible with the other two at a specific time, there will be no disease development.

- Susceptible grasses and pathogens (usually fungi) are present in all lawns.
- Favourable conditions must exist
- Turfgrass loss can occur in an instance

BROWN PATCH

Scientific name: *Rhizoctonia* spp.

Host: Warm- and cool-season turfgrasses

Background: Brown patch is sensitive to high temperature and humidity.

Symptoms: Often starting as small brown discoloured circles or patches as small as a few centimetres in size. The patch can grow in diameter up to a metre and a distinct “smoke ring” can be observed around the perimeter of the affected area in the early morning. Infected leaves look water soaked and dark in colour, later dying.

Control: To reduce the severity of brown patch, irrigate only when needed and do so early in the morning. Although several fungicides are labelled for control of brown patch, effectiveness is much greater when applied before the disease becomes well established. Brown patch severity is directly related to the fertility status of the turfgrass. High nitrogen tends to increase disease severity.



COUCH SMUT

Causal agent: *Ustilago cynodontis*

Host: Varieties of green couch (not blue couch)

Background: This disease, flower smut, was first recorded in NSW in 1907 and is prevalent mainland states of Australia. In most circumstance it is an annoyance to home gardeners. However, it can become a more severe problem and, like it's cousin sugar cane smut, it is difficult to control once established.



Symptoms: Flower smut symptoms are expressed when green couch forms flower heads. Instead of a healthy open arrangement of 2-6 spikes, the spikes fail to mature and open and become infected with a mass of black powdery spores.

Control: No chemical control. Mowing will reduce the spread of the disease. However, the disease remains in the turfgrass plant and weakens the root system too.

DOLLAR SPOT

Causal agent: *Sclerotinia homeocarpa*

Host: All warm and cool season turfgrass are susceptible.

Conditions: Dry soil conditions, extended leaf wetness and low nitrogen levels in soil.

Symptoms: Circular straw-coloured areas only a few inches across, although spots may merge, resembling brown patch. Live blades may have straw-coloured lesions along one edge. Lesion moves across blade, causing tip to dieback. Webbing may be evident early in the morning.

Control: Fertilize as necessary; water adequately. Recommended fungicides can help prevent further infection while corrective cultural measures are taken.



FAIRY RING

Causal agent : mushroom-producing fungi (Basidiomycetes).

Host: In all turfgrasses.

Conditions: Presence of fungus and moist, warm weather.

Symptoms: Circular or semi-circular band of darker-than-usual green grass. Grass inside ring usually is not as vigorous and may be declining.

Grass may be dead inside young rings; a band of dead grass with greener grass in the middle may be seen in older rings. During rainy, moist conditions, a ring of mushrooms may appear.

Control: Physical – aeration and deep irrigation in an attempt to move the fungal toxins further into the soil profile. Apply fertiliser to promote new growth.

Relevant fungicides can also be applied to help prevent further infection.



LEAF SPOT

Causal agent: *Drechslera* and *Curvularia* spp.

Symptoms: The causal fungi usually first invade the leaves, producing small brown spots. As the disease worsens, the spots on leaf blades expand and produce a dark purplish-red oval border around a tan centre. The spots enlarge until the entire width of the leaf blade is blighted.



Source: Managing Turfgrass Diseases

Control: By altering the nutritional requirements of the plant and chemical control.

RUST

Causal agent: *Puccinia* spp.

Host: Warm- and cool-season turfgrass.

Symptoms: Early infection appears as a light yellow flecking of the leaves. As these flecks enlarge, they may become somewhat longer than broad and when numerous they are arranged in rows parallel with the veins of the leaves. Prolonged leaf wetness will increase infection.



Control: Nutrition and chemical control as a last resort; one or two sprays applied after the onset of symptoms should be suffice.

SLIME MOULD

Causal agent: Various species.

Host: Various species. Blue couch is pictured on the right.

Conditions: Wet, rainy weather.



Symptoms: Grass blades covered with black, bluish-grey (pictured), yellow, or tan fruiting bodies. May look like soot or spray paint on grass.

Control: Slime moulds grow on the surface of grass blades, but don't infect. Mow turf to remove effected clippings and or irrigate to remove spores from leaf blades.

SPRING DEAD SPOT

Causal agent: *Ophiosphaerella* (formerly *Leptosphaeria*) *korrae*

Host: Green couch and hybrid varieties

Background: Commonly seen in mature turfgrass swards that are intensively managed (e.g. greens). Temperature and humidity sensitive, as too with applications of nitrogen in late summer.



Source: Managing Turfgrass Diseases

Symptoms: Circular patches of bleached, straw coloured turfgrass that (commonly) appear in spring or when conditions are right. Scars can remain for several years following damage. Patches may appear in the same spot for multiple years. Extra attention is warranted.

Control: Physical (thatch control, irrigation, fertility monitoring) and chemical control, including preventative insecticides.

TAKE-ALL PATCH

Causal agent: *Gaeumannomyces graminis*

Host: Green couch and hybrid varieties and cool-season turfgrasses.

Background: Most severe in cool wet years on poorly drained turf.



Symptoms: Small, light brown dead patches appear on the turf and spread if not controlled. Patches may reach up to 3 m in diameter. Vegetative growth including rhizomes once effected become dark brown to black before they are killed.

Control: Increasing acidity tends to suppress the disease. Other physical measures such as improving drainage will help. A preventative fungicide application can also be used.

Disease in Blue Couch



OTHER MANAGEMENT



SOILS



DECOMPACTION



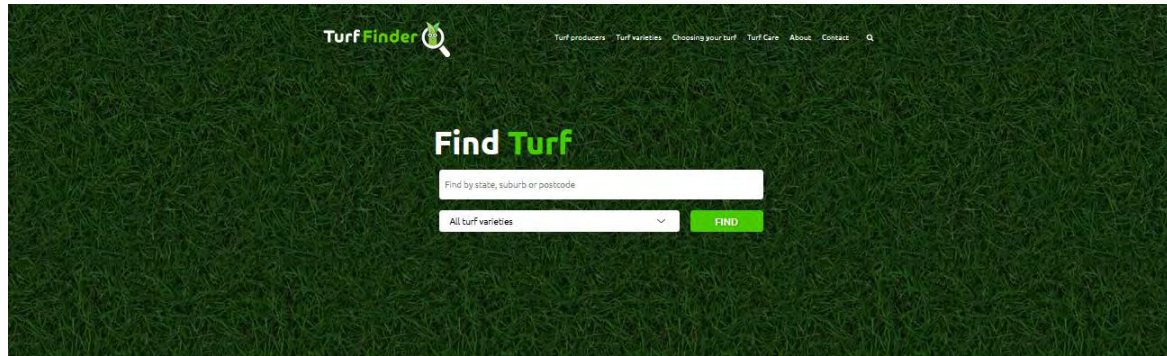
TURFGRASS REPLACEMENT



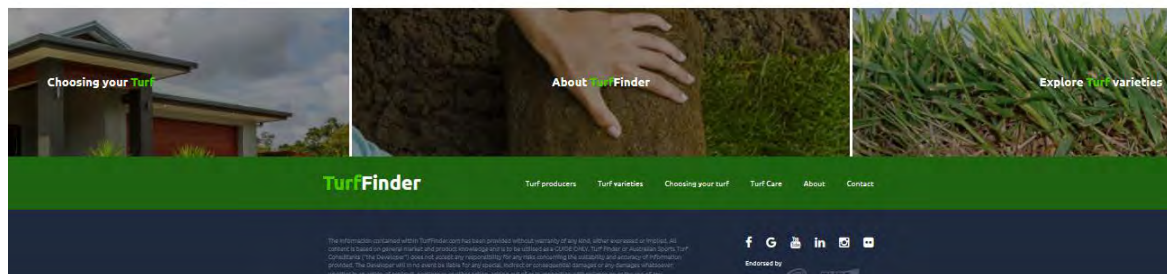
- Appropriate field usage
- Communication
- Barriers and signage

TURF FINDER – INDEPENDENT WEB SITE

Developed by ASTC to assist professional turf managers & homeowners to choose and find where to buy turf



TurfFinder is an independent web site to assist home owners and professional turf managers in selecting the best available turfgrasses to meet their needs. TurfFinder provides factual independent information on commercially available turfgrasses being sold by professional turf producers.



- 122 turf farms
- 76 commercial varieties
- 12 non-commercial varieties



www.staql.com.au

CONTACT DETAILS

Matt Roche

Director & Principal Turf Consultant

Australian Sports Turf Consultants

E: matt.roche@ASTCs.com.au

M: +61 412 197 218

W: www.ASTCs.com.au

