Management & Preparation of Lawn Bowling Greens in Adverse Weather Conditions

Overview

1. Insight into the challenges faced with managing Lawn Bowling Greens
2. Description of important aspects of maintenance practices
3. Cover essential management tools
4. General management and summary

Club Introduction

- 157 years old
- Approximately 2000 members
- Whole range of facilities & sporting activities
- Predominately a cricket club
- Ground usage is broken into two seasons
  - Cricket season (September – April)
  - Bowls season (May – August)


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Introduction

1. Bowling Greens toughest form of turf management
2. Most difficult working conditions
3. Required to be most knowledgeable
4. Poor salaries

→ Other turf managers are not faced with such challenges

Arising Problems With Bowling Greens

1. Sports turf unnatural situation
2. High speed requirement
3. Wear issues
4. Compaction issues
5. Continuous moisture stress
6. Maintain very low cutting heights

Arising Problems With Bowling Greens

1. Disease & Insect attack
2. Shade issues
3. Lack of air movement
4. Maintenance constraints
5. Restricted budgets

→ Requiring management skills to be finely tuned

Key To Managing Bowling Greens

1. Research your climate
2. Knowing your grasses
3. Be familiar with your soils
4. Be clear with your goals

→ spend time gaining education

Maintenance Separation

1. Growing/improving the green

2. Maintaining & protecting the green

Managing Your Soil Profile

1. Soil health

2. Managing & developing the root system

Soil Health

1. Aeration
2. Thatch management
3. Nutrition management
4. Micro-organisms
5. Irrigation management

→ Multi-pronged approach

Aeration Benefits

1. Increases soil oxygen levels/ reduces carbon dioxide levels
2. Reduces compaction/ keeps profile open
3. Avenue for roots & water to infiltrate
4. Opportunity for fertilizer to work into profile
5. Consider all aeration options (solid/hollow/hydroject)

→ Rotation is the key


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Aeration – General

1. Avoid surface disruption
2. Alternate depths
3. Remove at least 10% of surface each year
4. Take opportunity to fertilize
5. Top-dress on completion

→ Adapt an aeration program

Thatch Management

1. Decomposed & un-decomposed organic matter in the turf surface
2. Turf accumulates thatch because it builds up faster than it can be decomposed by either decomposition or mechanical means
3. Accumulated by high inputs (water & fertilizer)
4. Unnatural situation

→ Thatch accumulation predominantly caused by our management

Thatch Related Problems

1. Slow green speed
2. Shallow rooting
3. Reduced water infiltration
4. Scalping
5. Good environment for disease & insect infestation
6. Requires regular water

→ All factors against our ultimate objectives

Reducing Thatch

1. Restrict N inputs/ maintained balanced soils
2. Limit excessive irrigation
3. Mechanical de-thatching
4. Hollow tine aeration
5. Increase microbial activity
   Good soil fungi, bacteria, worms & mites
   → Microbes decomposes thatch
6. Frequent sand topdressing → dilutes thatch

→ Combine inputs to control thatch

Nutrition Management

1. Nutrition program
2. Lean & mean ⟶ fertilize for health, not color
3. Little & often
4. 1 to 1 ration of Nitrogen to Potassium
5. Adequate soil testing

⟶ Balance inputs

Nitrogen Applications

1. Most important nutrient

2. Predominately for controlling growth

3. Balanced nitrogen applications, excess N will

   - Soften the plant
   - Make plant susceptible to disease
   - Slow playing surface
   - Concentrated top growth
   - Excessive thatch
   - 0.25kg of actual N per100m^2 per month

→ Use Nitrogen wisely

Potassium Applications

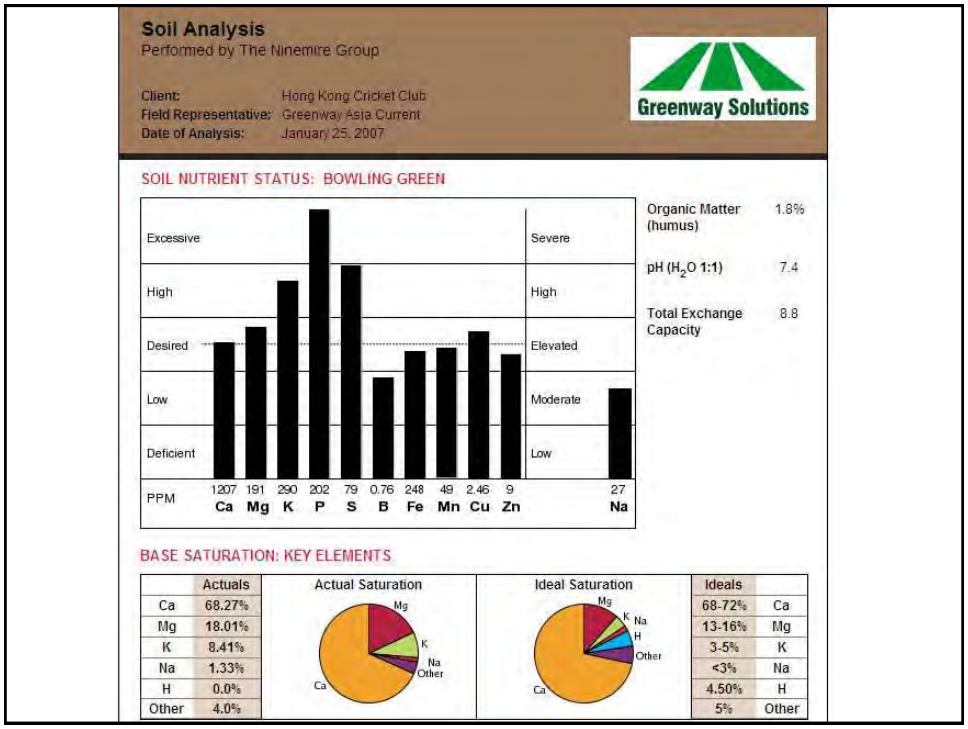
1. Hardens the plant
2. Protection against extreme weather variations
3. Mobilizes other nutrients/ Maintains water uptake
4. Resistance against disease & insect attack
5. Leaf & stem reproduction

→ Rotate forms of potassium, include silicate forms

Other Nutrients & Amendments

1. Phosphorus as required
2. Regular amounts of Mg, Mn, Fe
3. Balanced calcium/magnesium ratios
4. Maintain high CEC – preferably above 5
5. Healthy humus levels/ hormone products
6. Balanced pH at around 6.5

→ Put a nutrition program in place



Soil Analysis
Performed by The Ninemire Group

Client: Hong Kong Cricket Club
Field Representative: Greenway Asia Current
Date of Analysis: January 25, 2007

Greenway Solutions

SOIL NUTRIENT STATUS: BOWLING GREEN

	Ca	Mg	K	P	S	B	Fe	Mn	Cu	Zn	Na
PPM	1207	191	290	202	79	0.76	248	49	2.46	9	27

Excessive / High / Desired / Low / Deficient

Severe / High / Elevated / Moderate / Low

Organic Matter (humus)	1.8%
pH (H_2O 1:1)	7.4
Total Exchange Capacity	8.8

BASE SATURATION: KEY ELEMENTS

	Actuals
Ca	68.27%
Mg	18.01%
K	8.41%
Na	1.33%
H	0.0%
Other	4.0%

Actual Saturation

Ideal Saturation

Ideals	
68-72%	Ca
13-16%	Mg
3-5%	K
<3%	Na
4.50%	H
5%	Other

Wetting Agents

1. Uniform movement/availability of water through soil profile
2. Restricts water repellency, therefore avoids dry patch
3. Stretches days between waterings/reduces water use
4. Increases resilience of turf
5. Keeps the greens performance even & consistent
6. Apply monthly during warmer months

→ Don"t under estimate the value of wetting agents

Irrigation Management

1. Irrigation more art than science
2. Deep & infrequent
3. Minimize light frequent hand watering
4. Syringing during times of stress
5. Look at water quality, have it analyzed

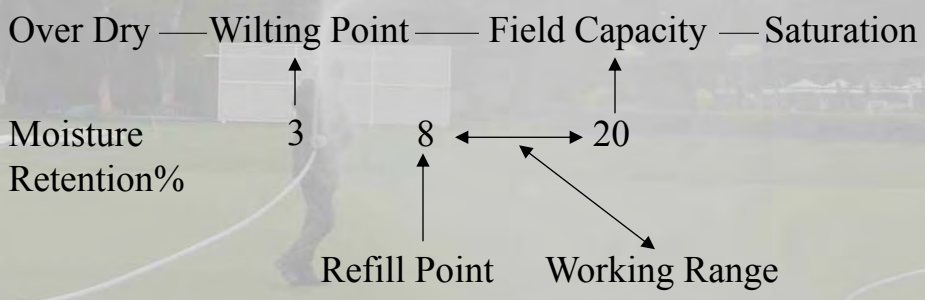
→ Arguably the most important aspect to managing good greens

Calculation, Timing & Quantities of Irrigation

1. Deep irrigation once per week (water to field capacity)
2. Additional hand water in dry areas or „hot spots" and ends
3. Avoid hydrophobic conditions
4. Understand your
   - Evaporation rates
   - Plant type and water usage rate
   - Understand your irrigation system & how much it applies
   - 1L of water on 1m^2 equals 1mm of precipitation

→ Monitor irrigation inputs very closely

Available Soil Moisture

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Managing & Developing The Root System

"Any turf sward that has a deep and vigorous root system
will have very little problems"

Managing & Developing The Root System

General Principals

1. Good root systems are about managing thatch and irrigation
2. Water finding roots are rewarded with Auxin
3. Roots chase water
4. Roots prefer to live in the thatch for this reason
   → thatch retains 33% moisture

→ Understand the operations of the root system

Encouraging A Deep Root System

1. Deep & infrequent watering
2. Mild moisture stress ⟶ Soil moisture levels will range between 10% - 25% in most soils
3. Thatch reduction
4. Aeration
5. Avoid excessive applications of Nitrogen
   ⟶ leads to carbohydrate exhaustion
   ⟶ root system is low priority

⟶ Continue training roots to grow deep

Encouraging A Deep Root System

1. Balanced soil nutrition ⟶ good phosphorus levels
2. Avoid stressing the turf with mechanical means (scalping, unnecessary mowing, observe 1/3 rule)
   ⟶these practices will stress root system
3. Understand growth cycles
   - Root systems are annual
   - New root growth will only evident when soil temperatures are 15° C and above
   - Root system is low priority for plant
4. Add Auxin to fertilizer program, consider using Primo Maxx
5. Myth⟶ higher the cut ⟶deeper the root system

⟶A good root system will eliminate most problems associated with the management of the green

Surface Preparation

Mowing

1. Cut when necessary
2. Cut diagonally & different direction each time
3. Cut in morning/always ensure mower is 100% sharp
4. Always follow 1/3 rule ⟶ avoid carbohydrate exhaustion
5. Limit „clean up“ or „ring“ cuts
6. Turn mowers on protection cloth

⟶ Remember cutting is inflicting damage on the green each & every cut

Grooming & Verticutting

1. Controls thatch
2. Improves green speed
3. Encourages deeper root system
4. Smooth playability

→ Use grooming & verticutting to control surface condition

Green speed & rolling

1. Don‟t push too hard for green speed too early in season
2. Regular cutting - Speed naturally progresses
3. Roll in morning – keeps plant down for whole day
4. Grooming & verticutting
5. Manage irrigation correctly
6. Primo Maxx

→ Major damage can be inflicted on the green pushing hard for speed

PrimoMAXX®

Turf Growth Regulator

Primo Maxx

1. Regulates plant growth
2. Sometimes called chemical mowing
3. Gibberelic acid inhibitor → same as normal mowing
4. Improves density & color
5. Redirects nutrients into root system
6. Reduces thatch accumulation

Primo Maxx

1. Increases/regulates green speed
2. Hardens the plant
3. Increases tolerance to shade
4. Protection against disease attack
5. Is tank compatible

→ Primo can give us a distinct advantage when managing our greens

Avoiding Problems With Wear

1. Direction & rink rotation
2. Machinery rotation
3. Rink protectors (scrim)
4. Ensure wear areas remain flat
5. Balanced nutrition inputs ⟶ Primo Maxx, Pottassium Silica
6. Correct irrigation scheduling

⟶ Rotation & close monitoring is vital in avoiding wear

Dealing With Stressed Turf

1. Raise cutting heights
2. Syringe watering
3. Additional aeration
4. Additional fertilizer applications – trace elements
5. Avoid cutting stressed areas
6. Re-seeding

→ Giving stressed turf what it requires is important in the recovery process

Make Hay While The Sun Shines

1. Get greens in good condition pre-season
2. Make use of good growing conditions
3. Make use of closed greens
4. Use access wisely
5. Make good applications & inputs

→ Use good growing conditions to your advantage

Record Keeping

1. Daily diary (record abnormal inputs & applications)
2. Maintain daily records including rainfall, temperatures, sunlight
3. Fertilizer/ chemical application records
4. Root depths
5. Soil testing
6. Record monthly photos
7. Machine maintenance

→ More records the better

Handling Stress & Dealing With Members

1. Communication is key
2. Record keeping ⟶ protect yourself
3. Good preparation & planning
4. Remaining calm
5. Networking invaluable
6. Take plenty of time out

⟶ Remember; we work to live, not live to work

Summary

1. Have confidence in yourself
2. Stick with what works for you
3. Maintain good relationships with colleagues
4. Maintain wide vision
5. Know your environment, soils & grasses
6. Maintain a keen eye for observations

Finally

1. Holistically manage your greens
2. Keep all inputs even
3. Get a maintenance program in place ⟶ don‟t always have to follow it/be flexible
4. Record keeping
5. Learn from your mistakes
6. Are you doing all you can? How can you improve?
7. Work closely with NZTSI