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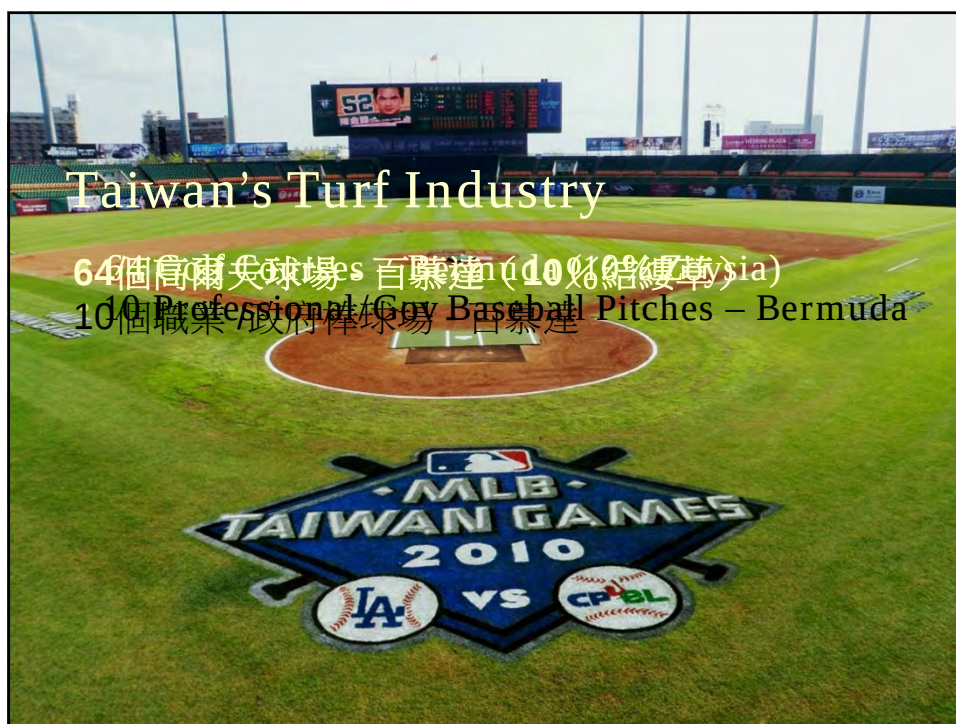
Turf in Taiwan Through Cultural Practices





Taiwan's Turf Industry

64個高爾夫球場 百慕達 (10%結縷草)



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64個高爾夫球場 百慕達 (10%結縷草)

10個職業/政府棒球場 百慕達



Taiwan's Turf Industry

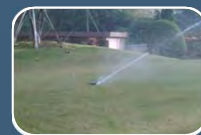
- 64個高爾夫球場 - 百慕達 (100%絡繹草) (64 Golf Courses - Bermuda (100% St. Augustine Grass))
- 10個職業/政府棒球場 - 百慕達 (10 Professional/Gov Baseball Pitches - Bermuda)
- 280練習用球場 (以縣為主) - 百慕達 (280 Practice Fields (by county) Baseball Pitches - Bermuda)
- 學校田徑場 - 百慕達/低維護 (School Athletic Fields - Bermuda/Low Maintenance)

台北市/縣 - 2401公頃的草坪
低維護草坪為主

- Taipei City/County - 2401 Hectares of turf
- Low Maintenance Turf is predominant

基本養護 Cultural Practices

- Cultural practices such as watering and mowing are essential for maintaining a dense, healthy turf. (養護，如澆水和修剪對維持高密度、健康草皮是最根本條件)



澆水atering

過度澆水 Overwatering

平均澆水 Uniformity of watering

使用濕度探測器 Use moisture meters

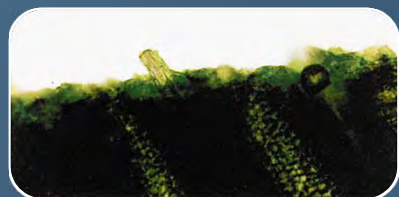


修剪wing

修剪頻率 Frequency

割草機鋒利度 Mowers

正確設定 Setup



Intermediate Cultural Practices

養護工作中為使草皮永續生長的重要條件包含養分
和栽培
Fertilization are essential for maintaining
sustainable turfgrass



Fertilizers



- 所有的養份計劃應由土壤測試開始
Start with soil Testing
- 一個經過正確採集土壤樣品後的土壤檢測報告可以
A soil test performed on a proper soil collection report can
提供有用的資料以確保植物正確生長
provide information to ensure proper plant growth
- 如何正確採樣?
How to take a proper sample?

土壤樣本包裝



使用乾淨的工具

- Use Clean Equipment
- Use a Soil Probe/Auger or Spade

每個樣品代表來自單一土壤類型或區域，例如：二個果嶺，果嶺內或果嶺外。對於各別特定區域，至少需要採集六到八個位置。將所有由特定區域採集的數個樣本放入一個塑料桶，調勻。將混合後桶中的土壤裝入土壤樣本袋約三分之二滿。

- about two-thirds full.

土壤採樣



採樣深度 看看你的根！

正確標明樣本

解讀檢驗報告

請肥料銷售人員解釋你的檢驗報告結果？

找一個專業的顧問，協助您規劃養分計畫。

尋求第二個意見是一件好事！

- A second opinion is always good!

通氣操作

為什麼你要草坪通氣? the turf?

緊實土壤 Solid Tine

氧氣交換 Gas exchange – Solid Tine

去除多餘的有機質 空心打洞? Remove excess organic matter - Coring?



通氣操作

0.63	Tine Diameter (inches)	0.307	Surface Area of each tine (sq inches)	30%	Desired Surface Area Impacted
Spacing (inches)	Number of tines per foot	Percent of Surface Area Impacted	Aerations Required		
1" x 1"	144	30.70%	1.0		
1" x 1.5"	96	20.47%	1.5		
1" x 2"	72	15.35%	2.0		
1" x 2.5"	58	12.28%	2.4		
1" x 3"	48	10.23%	2.9		
1" x 3.5"	41	8.77%	3.4		
1.5" x 1.5"	64	13.64%	2.2		
1.5" x 2"	48	10.23%	2.9		
1.5" x 2.5"	38	8.19%	3.7		
1.5" x 3"	32	6.82%	4.4		
1.5" x 3.5"	27	5.85%	5.1		
2" x 2"	36	7.68%	3.9		
2" x 2.5"	29	6.14%	4.9		
2" x 3"	24	5.12%	5.9		
2" x 3.5"	21	4.39%	6.8		
2.5" x 2.5"	23	4.91%	6.1		
2.5" x 3"	19	4.09%	7.3		
2.5" x 3.5"	16	3.51%	8.6		
3" x 3"	16	3.41%	8.8		
3" x 3.5"	14	2.92%	10.3		
3.5" x 3.5"	12	2.51%	12.0		



A 5/8" tine with 1x2" spacing would require 2 aerations a year to remove 30% surface area!
A 3/4" tine with 1x2" spacing would require 4 aerations a year to remove 30% surface area!

進階養護 Cultural Practices

- 為維持高品質草坪，養護工作中的鋪砂和垂直梳根是很重要的
- Cultural practices such as Topdressing and Vertical Mowing are crucial for maintaining high quality turfgrass



鋪砂 Topdressing

- 果嶺鋪砂養護可存在數十年了，近來這種做法已延續到高爾夫球場、球道和運動場等領域。雖然鋪砂是被普遍認同的，但是沒有fairways and sports fields。所有鋪砂養護 is almost universal agreement about the benefits of topdressing, there is not a universal sand that is appropriate for all topdressing



Topdressing



- **Testing of Topdress Sand is a Must!**
- **The topdress sand must be compatible with the existing rootzone material.**
- **Layering occurs when a discrete layer of sand or thatch is formed over the rootzone usually the result of a finer material than the existing sand.**
- **Sands without any gravel, silt, or clay are most desirable for topdressing sand based greens. This will help to reduce the potential for layering and equipment damage. A sand that is composed primarily of coarse and medium sand is preferred. Guidelines such as the USGA particle size recommendations are often used to define the desired gradation of these topdress sand.**



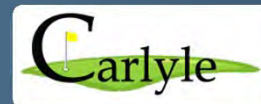
垂直梳根Mowing

- **When we vertical cut we have two main objectives**
- **thatch and thatch!**
- **A deep vertical mowing will remove excessive thatch where a light or shallow cut will remove horizontal growth that can not be cut by the mowers thus reducing thatch**





THANK YOU!



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