

An Adventure in Life

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After 30 years of maintaining and dealing with cool season grasses, I took on the challenge of growing and maintaining three golf courses with warm-season grasses. As with most aspects of life, there are positives and negatives when comparing warm season to cool season grasses.

The golf courses are composed of a multitude of strains of

Bermuda grass, Zoysia, Carpet grass, and most recently, Paspalum. Of all the grasses, Bermuda grass dominates. Green and tees are composed of Bermuda grass, fairways are Bermuda grass and zoysia, and roughs are a mixture of carpet grass, Bermuda, and zoysia. There are a multitude of different varieties within the Bermuda, covering the gamut of command Bermuda up to and including a new variety called Tifeagle. A major downside to Bermuda is that the species will mutate into various mutations within a particular variety. When establishing a new Bermuda grass area, purity becomes a major issue. Over a period of time, a particular variety may mutate into a number of different strains within the variety. For the sake of purity and consistency, a green may have to be regrassed about every 10 years.

The Bermuda grasses are able to beat up and recover well. They have proven to be relatively durable, but need sunlight to flourish. For maintaining a good putting surface, a program of verticutting, grooming, and topdressing is essential. Generally, the Bermudas will not tolerate as short a cutting height as a good bentgrass variety will. We are trying a new variety, Tifeagle, which tolerates a very low cutting height, but is high maintenance. This variety needs constant grooming, verticutting, and topdressing, usually on a weekly basis. Without a good cultural program, these grasses can develop an extensive thatch problem very quickly. Leaf spot seems to be the most troublesome disease problem.

Maintaining a high level of Ca is essential for health and good disease control. During the hot, wet summer months, it is not unusual to apply a fungicide about every 5 days for disease control and prevention. A heavy application of topdressing seems to trigger the onset of leaf spot rather quickly. I attribute this to the



Bermudagrass on a putting green at Hong Kong Golf Club.

wounding of the leaf surface during the dragging in process. Initially I expected Pythium and Brown Patch to be potential problems, but that has not proven to be the case.

Zoysia is aggressive, especially in warm, wet weather. Carpet grass is very coarse, durable, and tough to play out if left to grow very long in the rough. During wet, warm weather, this grass grows vigorously. Paspalum is the new grass we're trying due to its tolerance of low light and poor water quality. This grass has a nice color, comparable texture to that of bent grass, and has low nutrient needs. To date, this grass has performed very nicely. The renovation of the Old Course includes sodding all of the fairways to Paspalum.

One of the major differences with warm season versus cool season is that there is no aerifying or slit seeding into damaged areas. To replace the majority of warm season grasses, you must either re-sod or start over with the use of sprigs.

For instance, if you have a weak or worn area on a green, you either have to cut out and re-sod, or core, spike, topdress, fertilize, and wait for the turf grass to spread into the weak area.

June through August is summer and the rainy season in Hong Kong. In May and June of this year, we received in

excess of 400 mm or 16 inches of rainfall each month. The rainfall, coupled with humidity that ranges from 60% to 100%, and temperatures that show lows in the 80's and highs in the 90's makes for some interesting challenges. Also, the cloudy weather and lack of sunlight really affects the ability of the turf grass plant to carry on photosynthesis.

I have found that it is essential to make extensive use of foliar products during the cloudy weather. Also, adequate levels of Ca are extremely important for the plants health. As soon as the Ca levels drop, the color suffers and leaf spot becomes an issue. We do soil testing

every three weeks to keep a close eye on our nutrient levels, especially the Ca. Once a cumulative total of four inches of rainfall is reached, it is usually time to apply Ca. We may have to apply Ca weekly during an extremely wet period of rainfall. The Bermuda grass really reacts quickly to an application of Ca in color, growth, disease resistance, and overall health. It is essential to closely monitor the amount of nitrogen applied to all the turfgrasses, especially the Bermuda grass. Any excess of nitrogen seems to bring on a disease outbreak, especially leaf spot.

At times, insects can be very problematic. As with cool season grasses, insects can adversely affect warm season grasses, especially grubs. With 12 months of warm weather, numerous generations of a particular insect maybe encountered. The Asiatic beetle grub can be very troublesome and destructive. Probably the most

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destructive insect is the Mole Cricket. This insect can produce a multitude of generations, and can do a lot of damage to the turf very quickly. The longer they are ignored, the larger they become and the more difficult they are to control. To stay ahead of the insect battle, it is essential to be on a good preventative, pre-emerge insect control program.

Grassy weeds are the biggest weed problem that we face.

Goose grass can survive and flourish in a big way if not controlled. The warm, wet weather is ideal for the goose grass. A good pre-emerge program is essential if you want to have any luck in controlling the goose grass. Let unchecked, the goose grass will grow and enlarge as if it was on steroids. The mature plant can be very difficult to control; at times the best control for the mature goose grass is just physical removal.

Probably the single most important factor that affects the management programs as the relate to the warm season grasses is the weather, especially the heavy rainfalls that occur during the summer months. When the temperatures are in the 90's with humidity readings in the 80 plus range and abundant rainfall, scouting and timing are essential. Many times you may only have a one afternoon or one-day window to apply a pesticide when trying to work around rainstorms and other weather related factors. That scenario coupled with a lack of sunlight can at times be quite challenging.



Zoysia grass maintained at two inches.

On another note, ice damage and winter desiccation have not proven to be a major worry! Surprisingly, annual bluegrass is alive and well and persists in some poorly drained areas. An old friend stays around and keeps me company in Hong Kong.

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The photos below illustrate the difference in particle size and uniformity between the Andersons small and mid-size fairway fertilizer and a competitor's product. Notice no nutrient segregation with Andersons mid-size due to uniform particle sizing versus significant nutrient segregation with competitor.

Andersons 25-3-9 + 2% Fe (150 SGN)



1 lb. of N per 1,000 = 175 lbs/acre = 3.7 particles per sq in.

The matrix shown below demonstrates a dramatic increase in particle coverage (PPSI) by using smaller particle products versus increasing the rate (lbs.) of a larger particle product.

POUNDS/ACRE	Particles Per Square Inch Matrix 20-3-20 Fertilizer with 55% Nutralene					
	SGN 125	SGN 150	SGN 175	SGN 215	SGN 240	SGN 300
100	3.9	2.3	1.4	0.8	0.6	0.3
125	4.9	2.8	1.8	1.0	0.7	0.4
150	5.9	3.4	2.1	1.2	0.8	0.4
175	6.9	4.0	2.5	1.4	1.0	0.5
200	7.9	4.5	2.9	1.5	1.1	0.6
225	8.9	5.1	3.2	1.7	1.2	0.6
250	9.8	5.7	3.6	1.9	1.4	0.7
300	11.8	6.8	4.3	2.3	1.7	0.9

Avg. SG (g/ml) = 1.8

Local Competitor 15-5-10 (215 SGN)

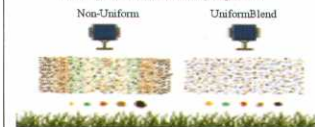


1 lb. of N per 1,000 = 290 lbs/acre = 2.0 particles per sq in.

The illustration below shows the effect of using a non-uniform fertilizer product. Note the severe skewing and banding of different nutrients.

Uniform Particle Distribution
Spreadability : Particle Flight

Varying particle sizes and density cause irregular ballistic behavior resulting in inconsistent delivery of product



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