

MANAGING GREENS FOR PUTTING SPEED

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If you asked a golfer how he thought putting conditions could be better at his home course, he probably would comment some about the speed of the greens. Most low-handicap players prefer faster putting conditions than the higher-handicapped golfers are comfortable with. Extremely fast greens can be very difficult to putt especially if the surfaces are severely contoured.

A golfer should have ideal putting conditions whether he is at a daily fee golf course or at a private (members only) golf club. We are in the business of providing the best possible playing conditions for the golfer and not how much clipping yield we can harvest per green. The ball should roll with ease on a green so a putt may be stroked smoothly, not having to be struck hard as a croquet ball is on the lawn. Some golf courses mow greens at high (conservative) heights of cut and use more nitrogen fertilizer than is necessary. These cultural practices do not produce ideal putting conditions and may develop an undesirable spongy and matted turf condition. It is the superintendents responsibility to be aware of the playability of the golf course and not just growing green grass.

Top-notch putting greens have surfaces which are smooth, roll true, and are uniform in speed. These

are conditions that do not exist on greens which have a build-up of mat and thatch. Foot printing which occurs on thatchy turf, affects the smoothness of putting surfaces. The vertical growth habit of turf will influence trueness and uniformity. Turf should be dense but be free of matting and grain which will destroy putting accuracy.

Putting green turf should have leaf blades that are fine in texture. Putting surfaces must be firm - yet resilient enough to accept a properly hit approach shot.

What is Thatch? Dr. Jim Beard, says "Thatch develops when the accumulation rate of dead organic matter from actively growing turf exceeds the rate of decomposition. Any cultural or environmental factor that stimulates excessive shoot growth or impairs the decomposition process will increase the accumulation rate."

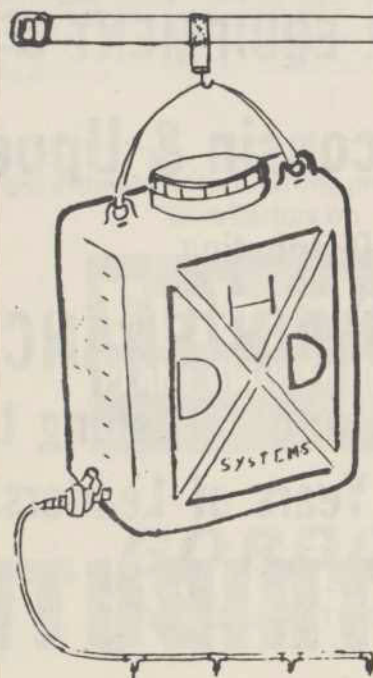
For the establishment of a firm putting surface it is absolutely necessary to eliminate thatch accumulation which causes sponginess. Depending on the severity of the thatch problem, greens may have to be aerified several times before enough matter is physically removed to incorporate lime, top-

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dressing, air, and water into the composition to permit biological decomposition.

After several years of aerification, we decided that we need regular applications of topdressing. It was impossible to find the proper ingredients for a topdressing mixture. In 1974 we found a sand that some foundries were using which was perfect, it was medium-fine in texture with 97% passing a 0.42 mm screen and 96% was retained on the 0.15 mm screen. In 1975 we began using this material alone (without peat and soil) on four (4) greens at Ozaukee Country Club. After only one (1) year of results and with information from Dr. John Madison, University of California at Davis, we decided to apply sand for topdressing on all the greens.

Since 1976, sand has been applied at the rate of 2 cubic feet per M feet² about every 4 weeks. There is little interference with golf play as an application is now completed in 3 hours with: 2 men, a lely spreader, a truckster, and a dump truck. The sand topdressing has been a preventive rather than a curative method for mat and thatch control. At the end of the 1979 season (4 years of sand use) the build-up of sand and organic matter measures $\frac{3}{4}$ inch. With no aerification, we have no surface unevenness from leaf growth in aerifier holes which is particularly noticeable in the afternoon for quite a long time following aerifying.

Wetting agents were used before sand topdressing began and we still continue the program. Aqua-Gro is applied alone at the rate of 8 oz. per M feet² in May, June, July, and August. I prefer using the 8 oz. rate rather than mixing lighter rates with fungicide applications because of compatibility problems. There is less incidence of localized dry areas with the use of Aqua-Gro.

Supplemental irrigation is applied to greens at rates of 0.10 - 0.15 inch per day during the summer stress period. With frequent, light applications of water similar day-to-day playing conditions are maintained.

Mowing begins in the spring with a triplex greens-

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mower, which is equipped with grooved rollers on both the front and rear of each cutting unit. The height of cut is bench-set at $\frac{9}{64}$ inch which is lowered to $\frac{1}{8}$ inch in May. We use thin bedknives with the underside ground off until there is $\frac{1}{16}$ inch distance between the height adjustment bar and the bottom of the bedknife with the height set at $\frac{1}{8}$ inch. The outer perimeter of the green is mowed only 4 times per week, with the triplex mower operating at the slowest possible speed to help prevent wheel tracking.

Nitrogen fertilizer use has much influence on putting speed. No more nitrogen should be used than is necessary for recuperation. High release of nitrogen during summer periods of high humidity and temperature produces a soft, lush, or succulent turf which will putt very slow. Lush turf is also more susceptible to disease injury and will tend to get fluffy and mower scaping will occur. Greens that have hardened-off or lean turf will have finer textured leaf blades than more stimulated turf.

For the past 7 years (since 1973), 8 have been on low levels of nitrogen fertility (Keep 'Em Lean Un Mean). This has helped produce better putting conditions and also prevents excessive shoot growth which contribute to mat and thatch accumulation. The most actual nitrogen applied since 1973 was 3.4 pounds per M feet². The last 3 years (1977-1979) the average annual nitrogen applied was 2.5 lbs. The following fertilizer materials were applied in 1979 per M feet².

November	35 lbs. Milorganite
April	3 lbs. Potassium Sulf.
April-Oct. every 7-10 days	2 oz. ea Fe. & Mg. Sulf.
August	6 oz. 33-0-16
September	6 oz. 33-0-16
per M feet 1/1979	

TOTAL	
Nitrogen	2.4 lbs.
Phosphorous	0.7 lbs.
Potash	1.6 lbs.

I have been using the dormant application of nit-

rogen since 1970. The past 6 years (1974-1979) 80% of the total annual nitrogen has been applied on dormant turf in late November or December, with the following results:

- (1) early spring green-up
- (2) a uniform and steady growth pattern
- (3) an increased root response
- (4) nitrogen lasts longer
- (5) less total annual nitrogen is needed

Nitrogen applications have been needed in late August for recuperation. The speed of the greens is another indicator that nitrogen is needed (ei. uphill putts start rolling back) especially on days with low humidity. A spray application of 33-0-16 water soluble fertilizer at 6 oz. per M feet² (1.8 lb. N) provides some immediate response and slightly decreases the putting speed. We do get a favorable response from foliar applications of iron and magnesium sulfate which are included at rates of 1-3 oz. each per M feet² with fungicide tank mixes.

The low nitrogen program has been successful on the 58 year old silt clay greens at Ozaukee County Club. Newer vintage greens which have a high sand content (less cation exchange capacity) will not respond the same. In September of 1974, we built a soil-less (90% sand & 10% peat) No. 9 tee,

which was planted with Penncross bentgrass and is maintained at 1/4 inch height of cut. The following annual nitrogen has been applied:

	PER M FEET ²	N
1974 - 1975		15.6 lbs.
1976		9.7 lbs.
1977		7.8 lbs.
1978		6.5 lbs.
1979		5.3 lbs.

In summary, my program of managing greens for putting speed includes: Close clipping with mowers equipped with grooved rollers; frequent, light applications of sand for topdressing; dormant application of nitrogen; no nitrogen during summer stress; and asking the grass when to fertilize. With this maintenance program we have firm putting surfaces with turf that is free of matting and grain. The putts roll smoothly, the ball does not deviate off line, and the greens are uniform in speed. Vertical mowing has not been needed because of frequent topdressings, the mowing program, and the low nitrogen fertilizer program.

It is most important that we provide a golf course with turf that is maintained at levels which will produce the best possible playing conditions for golfers.

Nutrient deficiencies, weeds, diseases, thin turf, insects.

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