



Growing in New Sand-Based Greens

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Most new greens are established on high sand content greens which have very low water and nutrient holding capacities. This necessitates establishment and long-range management strategies which are different than those used on soil based greens including: a) fertilization; b) irrigation; c) topdressing; and d) cultivation and other practices. The most common problems occur with under-fertilization, over-watering, and waiting too long to begin topdressing.

Underfertilization with nitrogen and phosphorus often occur on new greens. Incorporate into the surface (3 inches or so) up to 2 lbs. N per 1000 sq. ft. with a slow release N carrier. In warmer weather any slow release carrier can be used. The natural organic carriers work well. In cooler weather, use a carrier which has a release rate that is not limited by soil temperature. These slow release carriers are not as likely to leach as water soluble carriers. Once the turf has germinated, application of N at the rate of 1/2 lb. per 1000 sq. ft. on a weekly basis (or 1 lb. per 2 weeks) is a guideline which can be followed. If the fertilizer contains some slow release N the higher rate can be applied less often. Continue this N program until there is good turf density, then reduce the N to maintain reasonable color and growth. Obviously, adjustments must be made for turf conditions and weather.

Phosphorus needs in high sand greens are high. Phosphorus deficiency symptoms have been observed on new greens on several occasions and are often misdiagnosed as a disease. Sands and peat contain very little P so fertilizer P must be applied. Based on soil tests, it is common to see establishment recommendations for P_2O_5 of 4 or more lbs. per 1000 sq. ft. However, such recommendations based on soil tests are usually made for total annual applications. Because there is little sorption capacity in these mixes, it is best to mix about 3 lbs. P_2O_5 per 1000 sq. ft. into the top 3 inches or so of the sand mix using a starter fertilizer. This will provide some soluble N in the surface as well. Then continue to add P_2O_5 during the grow in period. A total of 4-5 lbs. P_2O_5 can be applied during the first year. Then after 1 year, soil test to determine needs for additional P_2O_5 .

Because of the perched water table which is normally built into new high sand greens, water needs on these greens are often lower than is needed for soil-based greens which do not have the perched water table. It is very easy to over water greens with perched water tables which can result in a series of difficulties. During grow-in, water should be applied lightly and frequently. Once well established watering should be adjusted to water use rates.

Any new greens must be managed intensively to attain good turf density. Then the turf should be allowed to mature and develop the good root system and sod needed to support traffic. A common error is to permit play on new greens before they mature. Additionally, because fertilizer and water are applied intensively, thatch will develop quickly. Topdressing should begin as soon as thatch begins to develop and should be continued as needed. This may mean topdressing every 2 weeks or so until there is a firm sod and growth rate can be reduced to permit the turf to mature and gain some hardness.

Testing soils for available P can be done by different procedures. In many labs the extraction procedures are done with either the Bray P₁ test or the Olsen test. In our Michigan State University Soil Testing Lab routine testing is done with the Bray P₁ test. However, if the soil pH is 7.2 or above and the Bray P₁ test is below 20 lbs. per acre, the Olsen test is utilized. When sampling greens with a thatch (or sand topdressing and thatch) layer, be sure to take a sample representing that layer as most of the P (also K) is often found in the thatch layer.

Some soil tests for samples from plots are given in the table. Note the pH of each of the sand-based mixes is very high, all being above 8.0. This is common for sands in Michigan. We have run both Bray and Olsen tests on these sand mixes. At low levels, both tests give low results. Bentgrasses exhibit deficiency symptoms at Bray P₁ soil tests below 15-20 (occasionally even at 25) lbs. P per acre and very severe deficiencies under 10-12 lbs P per acre. At higher levels, the Bray test gives much higher results than the Olsen test. These data are based on tests for 3 different plots, showing both range of tests found and the mean (average). From samples which were supposedly from the same mix, there are quite wide ranges in soil P tests. Clearly, more research is needed to best determine the minimal level of P needed for sands.

Phosphorus soil tests for new soil mixes, 1993

Soil mix	pH	Bray P1		Olsen	
		Range	Mean	Range	Mean
Sand/peat 1	8.2	4-19	9	4-13	8
Sand/peat 2	8.2	9-26	15	7-21	16
Sand/soil/peat	8.1	53-98	78	11-25	20
Soil	7.1	101-146	125	---	--