

of potassium, with only three percent severely deficient. Even though many of the sands appeared to need only nitrogen and sulfur, a starter fertilizer containing phosphate and potassium is recommended.

After many years of study and observation of sand greens, it appears that they are effective solutions to problems associated with high-use putting greens, particularly when coupled with a program of light, frequent sand topdressing.

Like any green, a sand green can be mismanaged by daily irrigation during periods of low evapotranspiration, causing excess leaching of nitrogen and potassium. Overuse of all nutrients produces excess thatch. Use of natural organic fertilizers (particularly sewage sludges) can seriously reduce infiltration. Furthermore, overuse of herbicides and fungicides can be toxic to roots. Diseases are generally reduced due to the rapid drainage characteristics of sand greens.

Properly managed sand greens are firm, fast greens when cut at normal height and frequency. For the golfer, sand greens can provide a quality putting surface 365 days per year, even under high use.

*M. Ali Harivandi, Ph.D., environmental horticulture advisor, San Francisco Bay area, University of California Cooperative Extension.*

[Dr. Harivandi recommends superintendents and sports turf managers obtain a copy of "Sand Putting Green Construction and Management" by Bill Davis, environmental horticulturist emeritus, University of California, Davis. The price is \$10 and is available from ANR Communication Services, University of California, 6701 San Pablo Ave., Oakland, CA 94608. You can call in your order to (800) 994-8849. Ask for publication number 21448.]

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