constructed greens, which require higher nitrogen fertilization to promote turf recovery from ball marks and concentrated traffic.

Timing is partially based on minimum and optimum temperatures necessary for turfgrass growth. Table 1 lists growth temperatures for cool- and warm-season turfgrasses. If temperatures are outside the growth range of the grass, fertilizer applications will be inefficiently utilized by plants that are not actively growing.

Table 1. Air temperatures affecting turfgrass shoot growth, and soil temperatures at 4 inches affecting root growth.

	Shoot Growth		Root Growth	
	Minimum	Optimum	Minimum	Optimum
Turfgrass	°F			
Warm-season grasses	55	80 to 95	50 to 60	75 to 85
Cool-season grasses	40	60 to 75	33	50 to 65

b. Nitrogen Rates

As mentioned, many factors determine the fertilization rates required by a particular golf course. Due to year-round play, Florida golf greens need from 12 to 24 lbs N per 1,000 sq. ft. Courses with sufficient resources, excessive traffic, and elevated player demands need the higher rate range. Course managers maintaining a less intensive playing surface or operating with limited labor and financial resources should use nitrogen rates in the lower range. Exceptions to these values may occur. For example, courses recovering from excessive traffic, pest, or low-temperature stresses or those establishing new greens may require approximately 25% more nitrogen than the amounts listed.

c. Frequency

To maintain optimum color and density during periods of active growth, highly maintained bermudagrass golf greens need approximately 1/2 lb soluble N per 1,000 sq. ft. every 7 to 14 days. For courses without these resources and those with lower player expectations, bermudagrass can be maintained adequately when 1/2 lb N per 1,000 sq. ft. is applied every 2 to 3 weeks. On intensively maintained courses, higher rates (e.g., 1 lb N per 1,000 sq. ft. every 7 to 14 days) may be necessary to encourage quicker turf recovery during times of heavy play. These higher rates can lead to other problems, however. Excessive thatch can quickly accumulate, putting speeds will be slower due to the production of more leaf area, and a decrease in turfgrass rooting may result.

d. Overseeded Greens

Once established, overseeded greens should be fertilized every 2 to 3 weeks with 1/2 lb soluble nitrogen per 1,000 sq. ft. (plus potassium during the fall and winter). The objective is to provide enough nitrogen to maintain desirable color but not so much as to weaken overseeded grasses and promote premature growth of bermudagrass. In addition, the use of highly soluble nitrogen on overseeded grass often leads to excessive turf growth, slower putting speeds, and the occurrence of disease (e.g., brown patch or pythium). Many superintendents have discovered that an application of