# POTASSIUM for HIGH SAND ROOT ZONES

With the recent trend to the use of a high sand content rooting zone for sports field turf more attention must be paid to the potassium nutrition of the turf. The high maintenance level of the turf and frequent traffic make the grass prone to environmental and wear stress.

Potassium may be more readily leached from the root zone due to the low cation exchange capacity of the sands and to the heavy application of irrigation water. Soil testing, unless it is done frequently, may not reflect the potassium available to the grass during peak periods of stress.

Fortunately potassium is not considered a ground water contaminant, thus there is no environmental risk to having some potassium loss from the rooting zone. The only negative factor is the cost of the fertilizer.

Prof. Robert N. Carrow of the University of Georgia reported on some interesting data on nitrogen - potassium interactions on turf in the Summer, 1994, issue of the Better Crops Magazine. The study was conducted on a green containing 96.7% sand.

Four rates of potassium, as potassium sulphate, were applied to 'Penncross' creeping bentgrass on a golf green as a split application of 1/3 in March, 1/6 in June, 1/6 in late July and 1/3 in September. The rates of potassium were 0, 3.0, 6.0 and 9.0 lb. $K_2O$/1000 ft.$^2$ to plots receiving either an average (6.0 lb. N/1000 ft.$^2$) or high (9.0 lb. N/1000 ft.$^2$) rate of nitrogen. The rates were repeated each year for a two year study.

The second summer was dry and water stress was often evident. At low N increasing the rate of potassium improved the quality of the turf (Fig. 1) The visual quality of the turf was rated inferior at high rates of N, however, the application of high rates of potassium in conjunction with the high N overcame much of the adverse effects of high N.

Potassium increased the clipping yield of the turf in August of the dry season at the low N rate (Fig. 2). At high N the lack of potassium depressed clipping yields below that of the low N treatment. At higher rates of K, however, the yield surpassed that obtained at a low level of N fertilization.

The improved quality and growth may be a reflection of the ability of potassium rich turf to withstand moisture stress. It is known that without sufficient potassium plants are unable to maintain adequate turgor pressure in the leaves and wilt will be observed.

Prof. Carrow recorded an assessment of the percent of a plot showing wilt in August (Fig. 3). While wilt symptoms were reduced by potassium at low N, at high N fertilization wilt was worse without potassium, yet was reduced to the same level as observed a low N when adequate potassium was provided.

As mentioned previously high sand content rooting zones will seldom show adequate potassium on a soil test. The turf manager, therefore requires a 'rule-of-thumb' which he may use to estimate the potassium requirements of the turf. From Carrow's study it would appear that a 2:1 ratio of nitrogen (N) to potassium ($K_2O$) would be satisfactory.

The frequency of application would be dictated by the nitrogen required to maintain the colour and density of turf that the manager desires.

For sports fields growing on normal loam or finer textured soils the turf manager should still rely on the soil test analysis to predict his potassium requirements.

*[Editors Note: This study was conducted in Georgia with at least a two month longer growing season than most of Canada, hence the nitrogen rates used in this study may be 1/3 higher than would be suggested for Canadian conditions].*

Figure 1

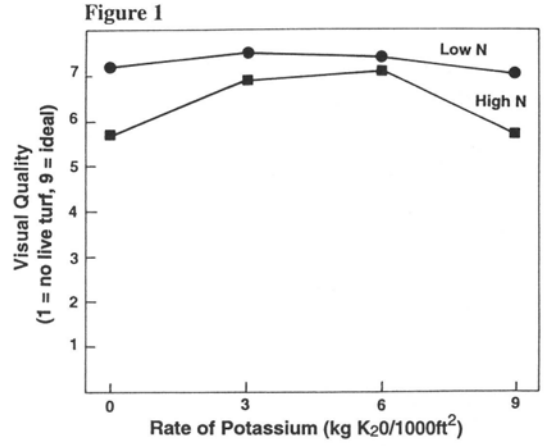



Figure 2

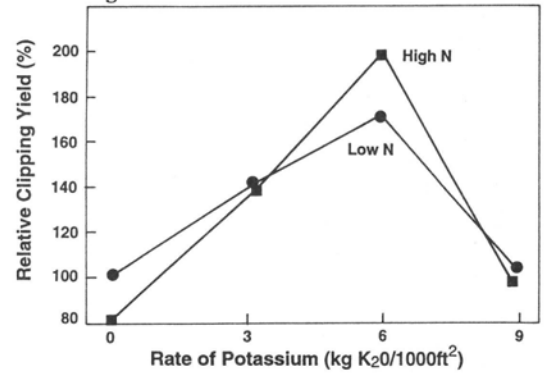
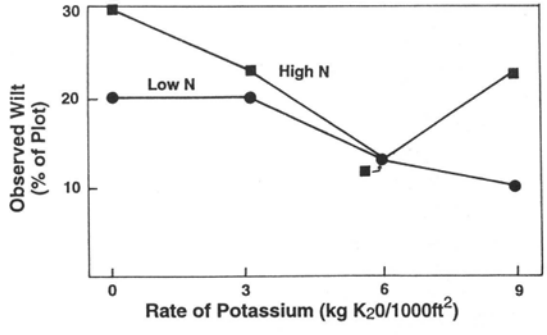



Figure 3

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