USING SOIL TESTING TO SOLVE NUTRITIONAL PROBLEMS IN SOD PRODUCTION

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Soil testing has been overlooked as an important tool in determining fertilization needs for sod production in Michigan. This tool cannot only predict nutrient needs for phosphorus and potassium for the present, but when used wisely over a period of years, can be used to determine the direction of your fertility program.

Unfortunately, we do not have a practical test for nitrogen needs, so fertilization with nitrogen must be based on our understanding of soil, grass and environmental conditions and experience.

Soil testing provides information on pH and lime requirements, along with determination of available levels of phosphorus, potassium, calcium and magnesium. Availability of other nutrients can also be evaluated including manganese, zinc, copper, iron, boron and sulfur. The latter groups are needed in lesser quantities, but are still essential for growth of sod. We have not had reports of supplemental needs for this group of nutrients in sod production in Michigan, although as we continue to remove the topsoil with the sod from mineral soils farms in Michigan we may experience micronutrient deficiencies at some time in the future. We might do well to test for some of these micronutrients and maybe even make spot applications to watch for responses on sod farms where sod has been removed for years.

Calcium and magnesium have not been a problem on soils which have adequate pH levels. Potentially on acid sand soils there might be a concern for magnesium, while calcium should be very adequate whenever pH is acceptable.

Phosphorus and potassium soil tests are the most important nutrient soils test in sod production. Because we keep removing the top layer of soil we are removing these topsoil nutrients with the sod. The phosphorus and potassium levels of subsoils in Michigan are very low. As we incorporate these subsoils with the remaining topsoil, the available levels of phosphorus and potassium tend to decrease markedly.

Not only do growers remove topsoil with the sod, but some fertilize only on the surface at or after establishment time. Thus, much of the phosphorus and potassium fertilizer which has been applied, even if liberally, is removed with the crop.

In studies conducted recently on a low potassium muck soil taken from a sod farm we found that in the absence of applied potassium, rhizome initiation was nearly nonexistent while topgrowth and turf density were very limited. Applying potassium increased rhizomes, topgrowth and turf density dramatically.

Phosphorus was also very low in this soil, limiting topgrowth significantly, but had less effect on rhizome growth. Applying phosphorus and potassium at rates recommended by soil test resulted in adequate responses.

Based on this study and previous work by Satari (2), we believe our soil test recommendations for phosphorus and potassium in sod production are adequate. But this information will be of no help to the grower if soil testing is not practiced. An earlier soil testing survey of growers' fields (Rieke, 1) pointed out the limiting levels of phosphorus and potassium on many sod fields. Growers are encouraged to utilize soil testing more effectively. In the sod field where the most recent fertilization study was conducted, the grower had hired a company to apply fertilizer to the field. It is very apparent from soil tests and the results of the study that no fertilizer had been applied. A soil sample taken from this field would have verified that in a short time.

Further, growers are encouraged to incorporate their fertilizer applications into the seedbed to a depth of at least 4 inches. This will allow you to keep some of the phosphorus and potassium in the soil for the next crop rather than shipping most of it off with the sod. With all costs rising and markets depressed, do not send this valuable resource of nutrients away with the sod. Keep it down on the farm for future use.

Literature cited

1. Rieke, Paul E. 1980. Using soil testing in sod production. 50th Ann. Michigan Turfgrass Conf. Proc. Vol. 8: pages 84-91.

2. Satari, Achmad M. 1967. Effects of various rates and combinations of nitrogen, phosphorus, potassium and cutting heights on the development of rhizome, root, total available carbohydrate and foliage composition on Poa pratensis L. Merion grown on Houghton muck. Ph.D. Thesis. Michigan State University.