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Predicting Nitrogen Fertility for Turfgrass



H&CS researcher Dr. David Gardner is developing a new test for predicting nitrogen fertility requirements for turfgrass.

Horticulture and Crop Science researcher **Dr. David Gardner** is developing a new test for predicting nitrogen fertility requirements for turfgrass.

A majority of research has indicated that turfgrass fertilization with nitrogen poses little risk to the environment. However, a recent study has found leaching of nitrogen occurs from turfgrass that has been regularly fertilized for long periods of time (10 years or more). This suggests that over time, fertilization of turf may lead to increased potential for nitrate leaching. The current practice when growing turfgrass is to apply nitrogen fertilizer based either on a predetermined schedule, or on a visual assessment of turfgrass quality.

Neither soil nor plant-tissue testing is routinely used to evaluate fertilizer needs because most forms of nitrogen are too dynamic in the plant-soil system to be accurate and reliable predictors of available nitrogen. A test has been developed for use in production agriculture, called the Illinois Soil Nitrogen Test, to identify fields that will not respond to nitrogen fertilizer. Scientists are interested in whether this test could be used to predict either nitrogen fertility needs for turfgrass, or to identify turfgrass areas that have increased potential for nitrate leaching if nitrogen fertilizer is

applied.



Dave Gardner explains current research projects at the turf facility.

Unlike other forms of nitrogen which fluctuate too rapidly in the soil to have reliable predictive power, researchers found that amino nitrogen - the form of nitrogen that is evaluated by this study - does not fluctuate very rapidly. In fact, the mean weekly fluctuation was 9%, and scientists found the same level of amino nitrogen at the beginning of the study as researchers did one year later at the study termination. By comparison, soil test levels of other forms of nitrogen, such as nitrate, fluctuate as much as 100-fold in a season.

Scientists also found that thatch contributes very little to the amino nitrogen level in the soil profile and that the spatial distribution of amino nitrogen is similar to other nutrients commonly tested, such as phosphorus. As a result, researchers believed that standard soil sampling procedures will be permissible when testing for amino nitrogen. Dr. Gardner's research group has received funding from the [United States Golf Association](#) to continue investigations. Graduate student **Ryan Beeson** will be performing the study.

Further research is planned to study how much amino nitrogen levels fluctuate on a golf course fairway. Investigations are also planned to calibrate the test to determine a critical test value above which nitrogen fertilization is not required and nitrate leaching potential is increased.

Story and web publishing by [Victor van Buchem](#). Photo Ken Chamberlain.
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