

## **Is it a good time to soil sample?**

Summary: Soil testing as late in the fall as possible, or even in the spring, improves reliability of fertilization recommendations.

10/29/14 Contact: Clain Jones (406) 994-6076 or [clainj@montana.edu](mailto:clainj@montana.edu)

To: News-dailies, News-weeklies, AgMedia, News-local, News-tv, News-radio, MSU-All-News, News-internal, NatResourcesNonmedia, Producers, Web. From Sara Adlington, (406) 994-4602

Filename: Soil Testing

Web: Ag, Extension

Database: University/College of Agriculture, LRES, Extension

From MSU News Service

BOZEMAN – Guided by their research, experts at Montana State University have developed guidelines for soil sampling to help growers get the maximum benefit out of their fertilizer.

Soil sampling can increase yield and/or save on fertilizer costs and decrease environmental risks. The worth of soil testing is influenced by when the sample is taken. Soil testing as late in the fall as possible or even in the spring improves the reliability of fertilization recommendations.

In Montana, soil sampling is often conducted from late summer to late fall because of better soil sampling conditions than in winter or spring, and because it gives growers time to make fertilizer decisions prior to application.

However, MSU fertilizer rate guidelines are based on spring soil test levels because spring levels are more indicative of growing season nutrients than fall nutrient levels.

Clain Jones, soil fertility specialist with MSU Extension and the Department of Land Resources and Environmental Sciences, cautions that if soil nutrient levels are substantially different between fall and spring, then fertilizer would be either over or under applied.

While phosphorus and potassium levels have not been found to change much between fall and spring, nitrogen in the form of nitrate can change dramatically. Over-application is an economic loss and excess nitrate may contaminate groundwater. Under-application of nitrogen may cause sub-optimal yields and grain protein.

Based on a three-year study led by Jones, changes in nitrate levels from August to April can be large and highly variable. Jones found nitrogen fertilizer would be over-applied by an average of 18 pounds of nitrogen per acre if August samples were used to make spring nitrogen recommendations.

“But, one in three times, it would be under-applied, and sometimes by a lot,” said Jones.

The large range suggests that late summer or early fall soil samples may not accurately determine spring fertilization rates.

In short, high nitrate levels on shallow and/or coarse soils can be lost over winter, and using fall test results would result in under-fertilization. In contrast, nitrate levels can increase over winter due to decomposition of plant residue, especially in deep soils and following broadleaf crops such as annual legumes or oil seeds. Such fields would be over-fertilized if rates were based on fall soil samples.

Jones suggests sampling in late fall or later to best capture growing season nitrogen availability. If fall fertilizing is preferred, soil test as late as possible while still allowing time for test results before fertilizing. If fall nitrate levels are very high (e.g., greater than about 60 pounds nitrogen per acre) and soil depth is less than two feet, Jones strongly suggests a second sampling in spring because there is a higher likelihood of overwinter nitrate losses.

Although it may seem wasteful to soil sample twice, laboratory soil analyses often cost less than \$40, yet under- or over-applying by just 10 to 15 pounds of nitrogen per acre can often affect the bottom line more than this for a 160 acre field.

For more information on soil testing, see the new “Soil Scoop” on Jones' website <http://landresources.montana.edu/soilfertility/>, or contact Jones at 994-6076 or [clainj@montana.edu](mailto:clainj@montana.edu).