

# Ask Steward

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MSU EXTENSION

## Are home soil test kits accurate?

Many seed catalogs and garden stores offer home, or do-it-yourself, soil test kits, and spring is a good time for soil sampling. Unfortunately, few home test kits provide correct information to make fertilizer decisions. Their value depends on how the soil sample is prepared, the actual tests used, how results are presented, and the accuracy of results compared to lab results.

Most soil test kits combine the “raw” soil sample with water or a reagent (chemical) to make a slurry. In contrast, soil testing laboratories dry, sort, grind and sieve soils to remove rocks and residue.

Test kits generally measure nitrogen, phosphorus, potassium and soil pH. These are appropriate basics, though a laboratory test can also measure salts or other nutrients, such as iron, which may be important.

Some soil test kits don't include the correct phosphorus test for Montana's typically high pH soils. The Olsen P test is accurate for soils with pH 6 or greater, while the Bray or Mehlich tests are accurate for soil pH less than 7.3. MSU fertilizer guidelines are based on Olsen P values.

Particularly important is the quality and shelf-life of the reagents mixed with the soil to perform each test. Laboratories have standard practices to ensure materials are not out-of-date. Just like using outdated milk, using reagents that are not fresh might have undesirable results.

Many test kits provide results with a word-based rating of “low,” “medium” or “high”—or “deficient,” “adequate” or “surplus”—rather than a unit value, such as parts per million or pounds per acre. Fertilizer rates are essentially impossible to determine from these ‘qualitative’ ratings. Laboratories report actual test concentrations and fertilizer recommendations based on decades of university field trials that relate fertilizer rates and soil test values.

An article in *Crops & Soils*, which is published by the American Society of Agronomy, compared results from four test kits with laboratory test results. Only the by-far most expensive and elaborate kit provided options for testing soil phosphorus based on soil pH and results very similar to laboratory results. The simpler, less expensive, kit results differed moderately or even greatly from laboratory results.

Test kits can be cheaper and more convenient than using a lab, but the savings may not be worth low-accuracy results.

More information on soil testing for the home gardener is available at the MSU Soil Fertility Extension website at <http://landresources.montana.edu/soilfertility/home-gardening.html> and from the MSU Master Gardener program at <https://mtmastergardener.org/>.

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