

## Check soil fertility prior to seeding

**B**EFORE establishing any crop, it's important to check soil fertility. Good soil fertility is crucial prior to seeding alfalfa, with adequate soil potassium levels especially important when seeding alfalfa-grass. That's because grass is an aggressive "forager" for potassium.

Perennial grasses have dense, fibrous root systems; while the effective rooting zone is about 24 inches, grass roots are particularly dense in the soil's top 12 inches. By contrast, alfalfa is a tap-rooted species and its roots in the top foot of soil aren't nearly as dense as are those of grass.

Although most alfalfa is clear-seeded there are several advantages to seeding alfalfa with a cool-season companion grass, particularly where soil drainage is less than ideal.

Midwest research has shown alfalfa-grass to be less susceptible to attack by potato leafhoppers, which may leave an alfalfa-grass field and head for the nearest clear alfalfa stand. The impact on alfalfa weevils isn't as clear, but California research indicates that there's a slight preference for weevil feeding on pure alfalfa stands.

Alfalfa-grass is also more resistant to frost heaving, provides better soil erosion control and suffers less wheel traffic damage. There's often a yield advantage to having some grass in the stand, both during the seeding year and in established stands.

On dairy farms there's the added advantage of providing a good place for summer-applied manure, especially on older alfalfa-grass stands. Alfalfa in the Northeastern U.S. (particularly in N.Y. and New England) is usually seeded with a cool-season forage grass such as orchardgrass or tall fescue, while most alfalfa in the Midwest and Western U.S. is clear-seeded.

Soil test lab nutrient recommendations often assume that as long as the soil fertility status of a field is adequate for one forage crop, it's adequate for another. However, this isn't always the case. Once established, grasses will thrive at soil test potassium levels that are too low for alfalfa to even survive.

A field at Miner Institute (Chazy, N.Y.) had the first "0" (zero) soil test potassium (K) analysis that Cornell University's soil test laboratory manager had ever seen. The field was retested with almost identical results. However, reed canarygrass growing in this field had a forage K of 2.6 percent which is a normal level for grasses. (The DairyOne forage lab average for grass silage, based on over 45,000 samples, is 2.5 percent K.)

The field had been seeded to alfalfa-grass and fertilized with potassium

both at seeding and during the first growing season. The alfalfa grew well at first, but then the reed canarygrass, slow to germinate, started growing and expanded the density of its root system. The result: Almost all the alfalfa died over the first winter while the reed canarygrass thrived. In one year this field went from what appeared to be a successful alfalfa-grass seeding to a stand dominated almost entirely by reed canarygrass.

Fertilizing crops isn't like seasoning a steak, where you sprinkle on some salt with immediate results. Topdressed fertilizer has to react with the soil, going into solution before the nutrients in the fertilizer become available to plant roots. In the case of the alfalfa-grass field at Miner Institute, when the topdressed potassium became plant-available the canarygrass root system used most of it, leaving little for the alfalfa.

It's recommended that all crop fields be sampled for soil pH and fertility at least once every three years. Doing

**Fertilizing crops isn't like seasoning a steak, where you sprinkle on some salt with immediate results.**

a proper job of soil sampling takes time, so it's less of a chore if you sample one-third of your fields each year.

While soil samples can be taken anytime the ground isn't frozen, it's best to take them at about the same time each year, especially if you're in an area where the ground freezes. That's because research has shown that in regions where the soil freezes the soil analysis can vary meaningfully between spring and fall.

Our preference is late summer or fall, because it avoids the spring rush and also because you'll have results back before it's time to order fertilizer for the next growing season. In deciding which fields to sample, make sure that you include all fields that will be seeded to perennial forages the following spring, especially if there's a chance that fertility will be low.

Potassium fertilizer is expensive, so you may not want to apply very high rates in an attempt to correct a very low soil fertility level all at once. Dairy farmers can use a combination of manure and fertilizer to correct serious deficiencies. But even if you apply a considerable amount of potassium as fertilizer, manure, or a combination of the two, don't assume that this will correct a low or very low soil test value. Rely on follow-up soil tests to measure changes in soil fertility.

Work on raising soil test potassium to adequate levels before seeding alfalfa or alfalfa-grass. Then make sure that you apply potassium regularly and based on soil analysis, with the fertilizer recommendations coming from a reliable, unbiased source. 🐄

Thomas is retired from the William H. Miner Agricultural Research Institute and is the president of Oak Point Agronomics, Hammond, N.Y. Mahanna is with DuPont Pioneer and an adjunct professor at Iowa State University.

Used by permission from the March 10, 2013, issue of Hoard's Dairyman. Copyright 2013 by W.D. Hoard & Sons Company, Fort Atkinson, Wisconsin.