

Fall Soil Nitrate Test (FSNT)

Introduction Recent research has demonstrated that winter wheat and barley grain yields and economic return to fertilizer applications are not reliably improved by a fall nitrogen application when an adequate amount of nitrate already exists in the soil.

Regulations effective October 2012 require that farmers who plant wheat and barley for grain production must test for soil nitrate concentration before they may apply nitrogen in fall.

What is it?

The Fall Soil Nitrate Test (FSNT) is a test that measures the concentration of nitrate in the soil as an indicator of whether a fall nitrogen application is needed at the time of planting wheat and barley.

Where can samples be tested for nitrate?

Soils can be tested for nitrate concentration by most soil testing laboratories for a nominal fee. Many private-sector nutrient management consultants and nutrient management advisors in each University of Maryland Extension office are equipped to analyze soil samples for nitrate using a field-based meter.

How should samples be collected?

- 1) Randomly collect 15 – 20 soil cores to a depth of 8 inches across each field or management unit. Avoid areas that are not representative of the entire field (rock outcrops, wet areas, etc.). Sampling within 2 weeks of intended planting date is recommended.
- 2) Put all of the soil cores in a clean plastic bucket, making sure to break up any clods. Mix the soil thoroughly.
- 3) Collect a sub-sample (approximately 1 cup) by scooping soil from several different locations in the bucket.
- 4) Spread soil in a thin layer on clean plastic or paper and dry quickly (over several hours) to prevent further microbial activity which could affect test results. Use of a fan is acceptable to hasten drying. However, never use a microwave or conventional oven to dry soil.
- 5) Place soil in a soil test bag or a plastic bag, labeling the bag with field name or number.
- 6) For nitrate analysis: a) send soil sample to a soil testing laboratory, b) deliver it to the private-sector nutrient management consultant who developed your nutrient management plan, or c) deliver it to the University of Maryland Extension office in your county for soil nitrate analysis.

If testing will be performed by a University of Maryland Extension nutrient management advisor, please coordinate with the advisor before delivering samples.

Must a sample be collected from each wheat and barley field?

Under some circumstances, several fields may be aggregated into one management unit for sampling. If **all** the following are true, soils from up to three fields may be aggregated into one sample (management unit):

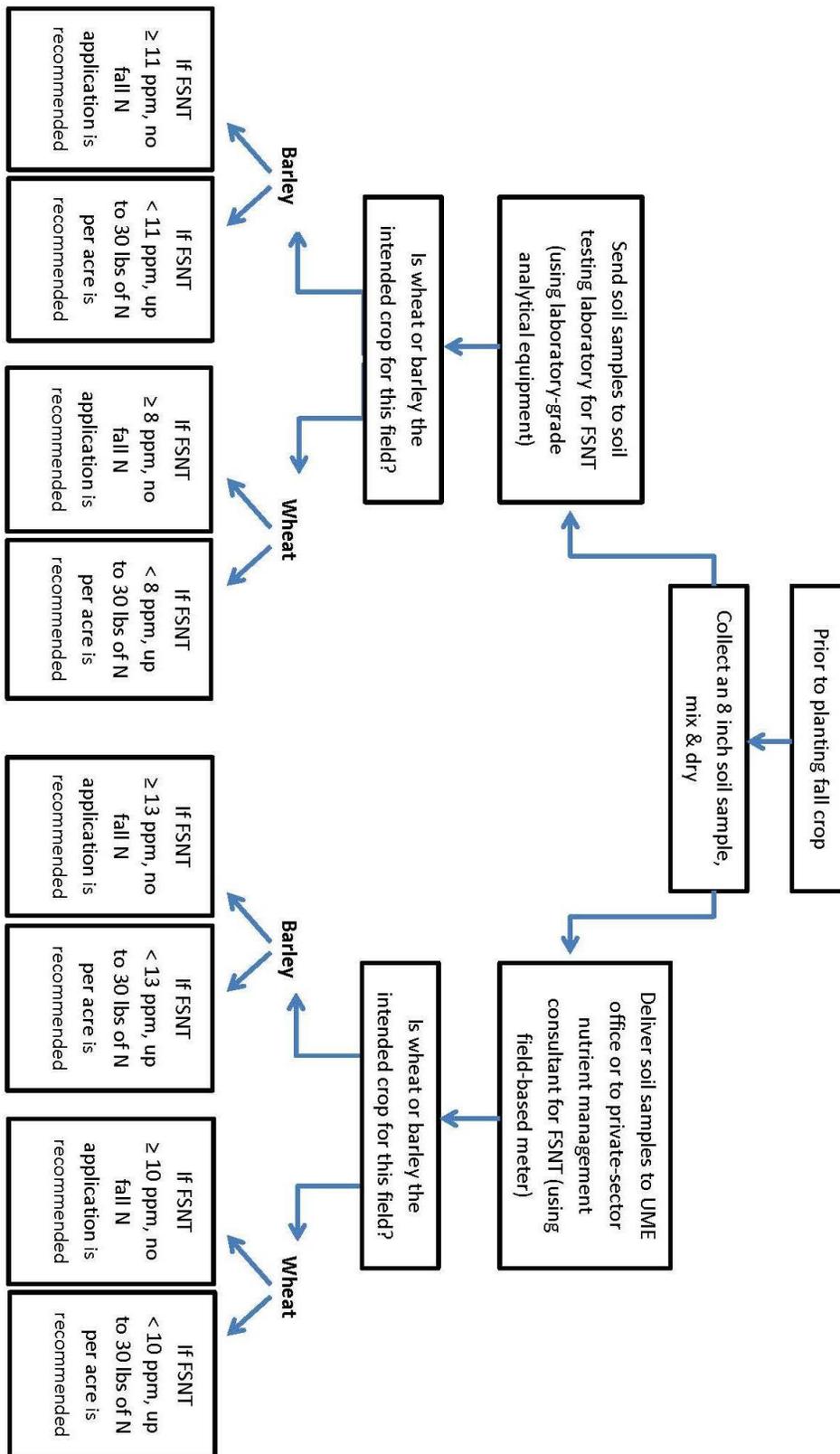
- 1) same cropping history for 5 years;
- 2) same fertility history (fertilizer and manure applications) for at least the past 5 years; and
- 3) similar complex of soil types.

Make sure to take soil cores from each field that will be included in the management unit.

How is the test interpreted?

The interpretation of the numerical soil nitrate test results depends upon whether the soil extract is analyzed with precise laboratory equipment or field-based equipment like a Nitratechek™ meter. See the decision-making flowchart in Figure 1 to determine if fall nitrogen should be applied.

Figure 1. Decision Flowchart for Fall Soil Nitrate Test (FSNT)



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