Quiz for Nutrient Management Module No. 1. Soil Sampling and Laboratory Selection
1.5 CEU in nutrient management

1. In the example of nutrient variation within a field (Table 1), the soil sample with the highest nitrate-N concentration overestimated the average nitrate-N by approximately:
   - ☐ a. 30%
   - ☐ b. 80%
   - ☐ c. a factor of 2
   - ☐ d. a factor of 4

2. What is one negative consequence of using soil from only one location that has only 1 lb nitrate-N/acre, when the field's average nitrate-N amount was actually much higher?
   - ☐ a. The yield won't be optimized.
   - ☐ b. Too little fertilizer will be applied.
   - ☐ c. Too much fertilizer will be applied.
   - ☐ d. Lab costs will be higher.

3. Fields that appear heterogeneous based on color, past sampling, and yields, should:
   - ☐ a. have more samples collected than more homogenous fields
   - ☐ b. have fewer samples collected than more homogenous fields
   - ☐ c. be sampled both fall and spring
   - ☐ d. be sampled at least 2 feet deep for N, P and K

4. Zone sampling
   - ☐ a. is always recommended over grid sampling.
   - ☐ b. divides a field into areas based on topography and intended crop.
   - ☐ c. uses a combination of the following: soil slope, color, texture, and depth to subdivide a field into zones.
   - ☐ d. can be based on published soil survey maps without regard for yield patterns on the field.

5. A laboratory that provides highly accurate, but not very precise results
   - ☐ a. provides results that consistently overestimate the fertilizer required.
   - ☐ b. provides results that are consistent from one test to the other, but might not be close to the 'true' value.
   - ☐ c. provides results that are a scattering of above and below the 'true' value.
   - ☐ d. provides results that consistently underestimate the fertilizer required.

6. Why is nitrate often sampled up to 3 feet depth, whereas P and K are sampled to much less depth?
   - ☐ a. More nitrate is taken up by crop than other nutrients.

☐ b. There is generally no P or K below 6 inches.
☐ c. Nitrate is more mobile and deep nitrate can therefore be accessed by roots throughout the profile, whereas P and K fertilizer generally can't move very far.
☐ d. P and K are rarely, if ever, top-dressed.

7. Sampling before and as close to fertilizer application as possible is highly recommended, yet not always practical. Which of the below is a good reason to sample in the fall, well before seeding and application?
   ☐ a. There can be significant lag times between submitting a soil to a laboratory and receiving fertilizer recommendations.
   ☐ b. Wet or frozen spring soil samples do not provide valid N test results. The ground may be too wet prior to seeding.
   ☐ c. Fall soil tests for S are needed to base sulfate fertilizer needs.
   ☐ d. Available nutrients in the fall are a better indicator of fertility than in the spring.

8. Why should soils collected for available nutrients not be oven dried above 120 °F?
   ☐ a. It will kill microorganisms.
   ☐ b. It will evaporate too much water.
   ☐ c. It may change the availability of some nutrients.
   ☐ d. It breaks down all of the organic matter.

9. If the producer has equipment capable of variable rate fertilizer application, why might you want to submit individual rather than composited soils on this producer's fields?
   ☐ a. Nutrient levels averaged from individual samples are far more accurate than a composite.
   ☐ b. To allow more fine tuning of application amounts
   ☐ c. Because many individual samples only need to be six inches deep and are easier to collect than composites made up of 3-feet deep cores
   ☐ d. Because P and K are more variable in their distribution on the field than N

10. Analytical results from the same soil sample submitted to various laboratories:
    ☐ a. will be almost identical between laboratories
    ☐ b. will not vary with procedure
    ☐ c. can be highly dependent on the laboratory selected
    ☐ d. will lead to identical fertilizer recommendations

11. Obtaining Quality Assurance/Quality Control (QA/QC) protocols and results can help one select a good laboratory. What should a good QA/QC plan evaluate?
    ☐ a. precision and accuracy of results
    ☐ b. laboratory personnel

- [ ] c. time to complete procedures
- [ ] d. relative costs of different fertilization philosophies

12. Fertilizer recommendations are based on different 'approaches', which include:
    - [ ] a. sufficiency approach that recommends fertilizer rate that maintain soil levels above critical levels
    - [ ] b. maintenance approach that recommends fertilizer to replace nutrients removed by crops
    - [ ] c. build approach which is only used at high soil test levels
    - [ ] d. sufficiency approach which provides just enough nutrients to replace those removed by a crop

13. To help laboratories make accurate fertilizer recommendations, producers should:
    - [ ] a. supply a yield goal that reflects the soil type and area climate
    - [ ] b. supply the maximum yield goal the field could support
    - [ ] c. provide precipitation data so the lab can provide a yield goal
    - [ ] d. provide yields from the prior cropping season

14. Spring soil samples are preferable to fall soil samples:
    - [ ] a. to get accurate soil organic matter estimates
    - [ ] b. for results that better estimate growing season N availability
    - [ ] c. following dry, cold winters
    - [ ] d. to allow time for P and K fertilization

15. There are no hard and fast rules on number of samples to submit per acre. However,
    - [ ] a. 5 sub-samples composited into 1 sample are a good starting point for a homogenous 80-acre field.
    - [ ] b. sampling for K requires many more sub-samples than sampling for N and P.
    - [ ] c. fields with fertilizer applied in bands, or no-till fields tend to require more sub-samples.
    - [ ] d. in a field with visual differences, it is better to composite many sub-samples from across the field than partition the field into separate zone.