

# Module 3: Nitrogen Cycling, Testing, and Fertilizer Recommendations

## SELF-STUDY EXAMINATION—ROCKY MOUNTAIN CCA

4449-3 QUIZ

### DIRECTIONS

1. Clearly mark an “X” next to the best answer to each question. Complete evaluation form and registration form.
  2. Tear out this page and place in envelope along with a \$20 check (processing fee) payable to the American Society of Agronomy (or fill out credit card information). Payment in U.S. funds only.
  3. Mail self-study exam and fee to: ASA c/o CCA Self-Study Exam, 677 S. Segoe Road, Madison, WI 53711.
- A passing exam score (70%) is worth 2 Rocky Mountain CEU in **nutrient management**.

### QUESTIONS

1. Why might it be beneficial to a crop to have ammonium rather than nitrate as the major form of available N?  
 a. Ammonium makes the leaves greener.  c. Ammonium is more mobile.  
 b. Ammonium is less likely to leach.  d. Nitrate is toxic to the plant.
2. How much N would you expect 3 t/ac of timothy to remove, based on Table 2?  
 a. 28 lb/ac  b. 56 lb/ac  c. 108 lb/ac  d. 112 lb/ac
3. The conversion from ammonium to nitrate is known as \_\_\_\_\_.
4. The conversion of nitrate to nitrogen gas is known as  
 a. N<sub>2</sub> fixation  b. desorption  c. denitrification  d. immobilization
5. The conversion of nitrogen gas to plant available N is known as \_\_\_\_\_.
6. The conversion of organic N to available N is known as  
 a. N<sub>2</sub> fixation  b. desorption  c. mineralization  d. immobilization
7. The conversion of available N to organic N is known as \_\_\_\_\_.
8. Nitrification occurs fastest under which of the following conditions?  
 a. Water logged soils, pH 8  c. Water logged soils, pH 6  
 b. Aerobic soils, pH 8  d. Aerobic soils, pH 6
9. Denitrification amounts are highest under which of the following conditions?  
 a. Consistently aerobic  c. Oscillating between aerobic, waterlogged  
 b. Consistently waterlogged  d. Semi-arid, tilled soils
10. What conditions will minimize ammonia volatilization following a urea application?  
 a. Warm soils, incorporated  c. Warm soils, broadcast  
 b. Cool soils, incorporated  d. Cool soils, broadcast
11. Why is ammonia volatilization generally believed to be low in Montana and Wyoming?  
 a. well buffered soils/cool temperatures  c. urea is generally incorporated  
 b. high pH soils/cool temperatures  d. MAP is main N source in MT and WY
12. If the soil carbon was 2.0% and total soil nitrogen was 0.1%, how much additional N, at a minimum, would be needed to immediately have N available for plant uptake?  
 a. 0.1%  b. 0.05%  c. 0.02%  d. 0%
13. What happens to available N after applying a high C:N (>30:1) organic material?  
 a. It goes up and then down  c. It drops quickly to near 0, and then increases  
 b. It increases gradually  d. No change
14. Why might fertilizing legumes with more than approximately 40 lb N/ac not be advantageous?  
 a. It inhibits P uptake  c. It inhibits nitrification  
 b. It results in excessive denitrification  d. It inhibits biological N<sub>2</sub> fixation

