

Module 6: Secondary Macronutrients: Cycling, Testing and Fertilizer Recommendations

ROCKY MOUNTAIN CCA SELF-STUDY EXAMINATION

4449-6 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 2.0 Rocky Mountain CEU's in **nutrient management**.

QUESTIONS

1. How do plants access most of the S that they take up?
 a. Diffusion c. Mass flow
 b. Atmospheric absorption d. Root interception
2. Plant utilization of which macronutrient is most closely affected by S deficiency?
 a. N b. P c. K d. Fe
3. Mineralization is most significant in supplying S to crops in soils with:
 a. High C:S residues b. Low organic S c. High OM d. Low OM
4. Which of the following residues would release the most available S during a single growing season via mineralization?
 a. Municipal wastewater c. Corn stalks
 b. Cow manure d. Sawdust
5. Which soil will sorb SO_4^{2-} most strongly?
 a. Calcareous soil (pH>7.5) c. High CEC soil
 b. Low AEC soil d. Fe/Al oxide dominated soil
6. How much S would be removed by a 30 bushel per acre barley crop?
 a. 5 lb/ac b. 6 lb/ac c. 10 lb/ac d. 15 lb/ac
7. Why did the text point out that a low S soil test might not result in an S deficiency in the crop?
 a. Crop is using S from below 6 inches c. Inaccurate soil test
 b. Desorption is high d. High N counteracts low S
8. Why is gypsum common in most of Montana and Wyoming?
 a. Abundance of ore deposits c. Low precipitation
 b. Atmospheric deposition d. Other minerals leach out of soil quickly
9. Which material, if applied at the same rate, would lower the pH of the soil most significantly?
 a. Potassium sulfate b. Elemental S c. Gypsum d. No difference
10. Leaching may be a significant S loss in some areas of Montana and Wyoming soils because of:
 a. Low precipitation b. Low AEC c. High Ca and Mg d. High S sorption
11. What plant N component, expressed as a percentage of N, can be increased with S additions?
 a. Amides b. Amino acids c. Protein d. Carbohydrates
12. Tissue tests show a N:S ratio of 17 for an alfalfa crop grown in a soil with 3.5 ppm SO_4^{2-} -S. Is this crop deficient in S and why?
 a. Yes, because soil tests are more accurate than tissue tests in predicting deficiency.
 b. Yes, because both the soil and tissue test suggest deficiency.
 c. No, because tissue tests are more accurate than soil tests in predicting deficiency.
 d. No, because both soil and tissue tests suggest abundant S available to the crop.
13. What is a potential disadvantage of applying elemental S⁰ to meet crop needs?
 a. Transport b. S toxicity c. Slow availability d. Volatilization

14. If the fertilizer recommendation for a forage crop is 20 lb S/ac, how much dispersible, granular S⁰ should be added?
 a. 20 lb/ac b. 22 lb/ac c. 44 lb/ac d. 83 lb/ac
15. How much N is applied in a 100 lb/ac application of (NH₄)₂SO₄?
 a. 2 lb/ac b. 20 lb/ac c. 21 lb/ac d. 22 lb/ac
16. How is Ca/Mg cycling different from the K cycle?
 a. Organic Ca/Mg compounds c. No Ca/Mg fixation
 b. Ca/Mg leaching d. Ca/Mg volatilization
17. By which process does Ca improve soil structure, water-holding capacity, and aeration?
 a. Leaching b. Dissolution c. Dispersion d. Flocculation
18. Why does Mg limit crop yield more commonly than Ca?
 a. Plants require more Mg
 b. Ca minerals are more resistant to weathering
 c. Mg minerals are more resistant to weathering
 d. Ca additions are common in this region
19. Why is gypsum (CaSO₄) generally better at flocculating the soil than CaCO₃?
 a. It increases available levels of S c. It is more soluble
 b. It raises pH d. It better flushes out salts
20. What soil characteristic would most likely lead to Mg deficiency in crops?
 a. High pH c. High Na⁺, K⁺, and Ca⁺² levels
 b. Low pH d. High concentrations of dolomite

SELF-STUDY EVALUATION FORM

NUTRIENT MANAGEMENT MODULE 6

Rating Scale: 1 = Strongly Disagree 5 = Strongly Agree

Information presented will be useful in my daily crop advising activities:	1	2	3	4	5
Information was organized and logical:	1	2	3	4	5
Graphics/tables were appropriate and enhanced my learning:	1	2	3	4	5
I was stimulated to think how to use and apply the information presented:	1	2	3	4	5
The article addressed the stated competency area and performance objective(s):	1	2	3	4	5

Briefly explain any "1" ratings:

Topics you would like to see addressed in future self-study materials:

SELF-STUDY EXAM REGISTRATION FORM-FOR ROCKY MOUNTAIN CCA CREDIT

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A \$2.00 Processing Fee will be added to all credit card charges.

I certify that I alone completed this self-study course and recognize that an ethics violation may revoke my CCA status.

Signature of Registrant as it appears on Code of Ethics

Date