Module 7: Micronutrients: Cycling, Testing and Fertilizer Recommendations

ROCKY MOUNTAIN CCA SELF-STUDY EXAMINATION

4449-7 Quiz

Directions

1. Clearly mark an "X" in the brackets 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. Which of the following groups of micronutrients are all cationic metals, and thus behave similarly in soil?
   [ ] a. B, Fe, Mn, Ni, and Zn
   [ ] b. Cl, Cu, Fe, Mn, Ni
   [ ] c. Cu, Fe, Mn, Ni, and Zn
   [ ] d. Cu, Fe, Mn, Mo, and Zn

2. Why are plant available concentrations of metals much lower than total soil concentrations in Montana and Wyoming?
   [ ] a. Arid conditions [ ] b. High soil pH [ ] c. Limited fertilization [ ] d. Few industries

3. Why are micronutrients called micronutrients?
   [ ] a. They have low atomic weights
   [ ] b. They exist in lower concentrations in soil
   [ ] c. They aren't used very often
   [ ] d. They're needed in lower amounts by the plant

4. Which of the following crops would you expect to have the smallest yield loss in a Zn-deficient soil?
   [ ] a. Barley [ ] b. Winter wheat [ ] c. Oat [ ] d. Durum wheat

5. What is meant by 'chelation'?
   [ ] a. The binding of lime to metals
   [ ] b. Precipitation of organics with metals
   [ ] c. Complexation of organics with metals
   [ ] d. Formation of a calcareous layer

6. At which of the following pH levels are soluble Fe concentrations the lowest in soil?
   [ ] a. 5.5 [ ] b. 6.5 [ ] c. 7.5 [ ] d. 8.5

7. Is leaching generally a concern with the metal micronutrients, and why or why not?
   [ ] a. Yes, because they're toxic
   [ ] b. Yes, because they're mobile
   [ ] c. No, because they bind strongly to soil
   [ ] d. No, because rainfall is never high enough

8. Which of the following micronutrients is generally most mobile, and available, in soil?
   [ ] a. B [ ] b. Cl [ ] c. Mn [ ] d. Mo

9. What fertilizer could most aggravate a Cl deficiency?
   [ ] a. KNO_3 [ ] b. MAP [ ] c. KCl [ ] d. Urea

10. B sorbs most strongly near which of the following pH levels?
    [ ] a. 6 [ ] b. 7 [ ] c. 8 [ ] d. 9

11. On what type of soil would you expect the highest likelihood of Fe deficiencies?
    [ ] a. High pH, calcareous [ ] b. Organic rich [ ] c. Tilled [ ] d. Low pH

12. If your soil test Fe was 4 ppm, how much Fe would be recommended by Montana Fertilizer Guidelines?
    [ ] a. 0 lb/acre [ ] b. 1 lb/acre [ ] c. 2 lb/acre [ ] d. 4 lb/acre

13. Your wheat has a unique leaf spot. What micronutrient do you suspect is deficient?
    [ ] a. B [ ] b. Cl [ ] c. Mo [ ] d. Ni

14. A field with unhealthy looking beans has soil test P level of 100 ppm. What micronutrient do you suspect is deficient?
    [ ] a. B [ ] b. Cu [ ] c. Fe [ ] d. Zn

15. What characteristic of Zn fertilizers has been found to greatly affect yield?
[ ] a. Mn content [ ] b. Water solubility [ ] c. Granule size [ ] d. S content

16. What forms of metal micronutrient fertilizers are most effective per pound of micronutrient?
[ ] a. Chloride forms [ ] c. Dry products
[ ] b. Sulfur forms [ ] d. Chelated forms

17. What application method has been found to be most effective per pound of micronutrient?
[ ] a. Broadcast [ ] b. Incorporation [ ] c. Foliar [ ] d. Soil applied suspensions

18. If ferrous sulfate and iron oxalate were the same price, which one would you apply, and why?
[ ] a. Iron oxalate because it has higher solubility and Fe content
[ ] b. Iron oxalate because the carbon in oxalate will be useful for photosynthesis
[ ] c. Ferrous sulfate because it has higher solubility and Fe content
[ ] d. Ferrous sulfate because soils that are deficient in iron are also deficient in sulfur

19. If you decide to apply 4 lb Fe/ac, how much $FeSO_4 \cdot 7H_2O$ would you need to apply?
[ ] a. 4 lb/ac [ ] b. 8 lb/ac [ ] c. 20 lb/ac [ ] d. 80 lb/ac

20. What is a disadvantage of liquid fertilizers compared to dry products?
[ ] a. Less effective per pound of micronutrient [ ] c. More costly per pound of micronutrient
[ ] b. Lowers soil pH [ ] d. Can be toxic

SELF STUDY EVALUATION FORM: Nutrient Management Module 7

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:

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

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