Module 2: Plant Nutrition and Soil Fertility

SELF-STUDY EXAMINATION—Rocky Mountain CCA

4449-2 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 $15 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 1.5 Rocky Mountain CEU in **nutrient management**.

Questions

1. How many essential elements (nutrients) are there?
   [ ] a. 3 [ ] c. 100
   [ ] b. 17 [ ] d. over 100

2. According to Table 1, N, P, and K are necessary for plant growth because they are
   [ ] a. a component of cell walls [ ] c. necessary to make proteins
   [ ] b. involved with oxygen respiration [ ] d. necessary to make carbohydrates

3. The macronutrients generally represent more than percent of plant tissue.
   [ ] a. 0.02 [ ] b. .05 [ ] c. 0.1 [ ] d. 5

4. Which of the following is a secondary macronutrient?
   [ ] a. nitrogen [ ] b. phosphorus [ ] c. sulfur [ ] d. chloride

5. Why is it important to know the form that each nutrient is taken up by plants?
   [ ] a. It tells how much to fertilize
   [ ] b. It helps us understand what controls the movement of that nutrient in soil
   [ ] c. It's useful in determining timing of fertilizer application
   [ ] d. It explains why the micronutrients are needed in only small amounts

6. Nutrients are more easily taken up from which portion of the root?
   [ ] a. The upper part, next to the ground [ ] c. The elongation zone
   [ ] b. The middle part [ ] d. The root cap

7. Which of the following is considered to be immobile within the plant, meaning that nutrient cannot move from the lower to upper leaves?
   [ ] a. Phosphorus [ ] c. Calcium
   [ ] b. Nitrogen [ ] d. Molybdenum

8. Which accumulates fastest in the plant compared to the total amount at maturity (at least for corn)?
   [ ] a. Nitrogen [ ] c. Potassium
   [ ] b. Phosphorus [ ] d. Dry matter

9. You find from a soil survey that a soil is a silty clay loam. The maximum amount of clay that this soil could have would be:
   [ ] a. 100% [ ] b. 60% [ ] c. 40% [ ] d. 28%

10. What fraction of the soil has the highest amount of CEC per kilogram?
    [ ] a. Sand [ ] c. Clay
    [ ] b. Silt [ ] d. Organic matter

11. Between pH of 5.5 and 9, phosphorus is least available at what pH?
    [ ] a. 5.5 [ ] b. 6.5 [ ] c. 7.5 [ ] d. 8.5

12. Plants can only directly use nutrients that are in the soil solution, but exchangeable nutrients are used to estimate plant availability. Why?
    [ ] a. It's easier to measure exchangeable nutrients than soluble nutrients.
    [ ] b. It's cheaper to measure exchangeable nutrients than soluble nutrients.
    [ ] c. The root prefers exchangeable over soluble nutrients.
    [ ] d. They are only weakly bonded and can easily leave the surface as solution concentrations decrease.

13. Iron deficiency would be most expected at which of the following pH levels?
    [ ] a. 5 [ ] c. 7
    [ ] b. 6 [ ] d. 8

14. Which of the following nutrients would likely get flushed or leached out of the surface soil the fastest after a large rainstorm?
    [ ] a. NO_3^- [ ] c. Ca^{+2}
    [ ] b. K^+ [ ] d. HPO_4^{-2}

15. In Figure 6, decreased pH caused the number of negative charges (proportional to the CEC) on the clay particle to drop by a factor of 2 (from 10 to 5) and the number of positive charges (proportional to the AEC) to increase by:
    [ ] a. 50% [ ] c. a factor of 3
    [ ] b. a factor of 2 [ ] d. a factor of 4

SELF STUDY EVALUATION FORM: Nutrient Management Module 2

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