Module 4: Phosphorus Cycling, Testing, and Fertilizer Recommendations

ROCKY MOUNTAIN CCA SELF-STUDY EXAMINATION

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. Dissolved P generally represents what percentage of total soil P?
   [  ] a. <1%  [  ] b. 2%  [  ] c. 4%  [  ] d. >10%

2. How much P₂O₅ would you expect 25 bu/ac of barley to remove, based on Table 2?
   [  ] a. 14 lb/ac  [  ] b. 15 lb/ac  [  ] c. 28 lb/ac  [  ] d. 30 lb/ac

3. P sorption would be expected to be highest at
   [  ] a. pH 5  [  ] b. pH 6  [  ] c. pH 7  [  ] d. pH 8

4. Banding P fertilizer is recommended over broadcast applications because banding:
   [  ] a. causes more P to precipitate  [  ] c. makes N more available
   [  ] b. substantially slows dissolution  [  ] d. saturates soil with P in small area, promoting diffusion to roots

5. Annual P mineralization rates in the U.S. have been found to range up to
   [  ] a. 4 lb P₂O₅/ac  [  ] b. 22 lb P₂O₅/ac  [  ] c. 42 lb P₂O₅/ac  [  ] d. 60 lb P₂O₅/ac

6. The conversion of organic P to available P is known as
   [  ] a. sorption  [  ] b. desorption  [  ] c. mineralization  [  ] d. immobilization

7. The conversion of available P to organic P is known as
   [  ] a. sorption  [  ] b. precipitation  [  ] c. mineralization  [  ] d. immobilization

8. What process refers to P and calcium binding together to form a mineral?
   [  ] a. sorption  [  ] b. precipitation  [  ] c. mineralization  [  ] d. immobilization

9. What minerals prevent P from being very available in neutral to high pH soils?
   [  ] a. Aluminum phosphates  [  ] c. Calcium phosphates
   [  ] b. Iron phosphates  [  ] d. Organic P

10. What is considered to be the optimum pH for P availability?
    [  ] a. 5.5  [  ] b. 6.5  [  ] c. 7.5  [  ] d. 8.5

11. According to a study by the USDA, total annual soil erosion from most of Eastern Montana is approximately
    [  ] a. 1 ton/acre  [  ] b. 2-4 tons/acre  [  ] c. 4-8 tons/acre  [  ] d. 8-16 tons/acre

12. P in solution leaving a field may begin to rise significantly when Olsen P levels exceed:
    [  ] a. 1 ppm  [  ] b. 12 ppm  [  ] c. 18 ppm  [  ] d. 60 ppm

13. P in manure may be more mobile than P applied in commercial fertilizers because
    [  ] a. Organics coat Fe/Al oxides, preventing sorption  [  ] c. Fertilizers are insoluble
    [  ] b. Organic matter doesn’t sorb P  [  ] d. Fertilizers are more soluble

14. What soil P test is generally recommended for high pH soils?
15. What will be the probability that fertilizing a soil with P that has a high soil test P level will increase yield?
   [ ] a. 0%  [ ] b. low probability  [ ] c. high probability  [ ] d. 100%

16. What is one problem with using soil test P results to estimate potential for P loss from a field?
   [ ] a. They don’t relate at all to soil solution P  [ ] c. They don’t include P mineralization
   [ ] b. They only relate to plant available P  [ ] d. They don’t consider potential for erosion

17. How much P$_2$O$_5$ is recommended for grass with a yield goal of 2 t/ac and a soil test P level of 12 ppm (from Figure 7)?
   [ ] a. 9 lb/ac  [ ] b. 12 lb/ac  [ ] c. 17 lb/ac  [ ] d. 21 lb/ac

18. How much 11-52-0 is needed to meet a P fertilizer requirement of 20 lb P$_2$O$_5$/ac?
   [ ] a. 10 lb/acre  [ ] b. 27 lb/acre  [ ] c. 39 lb/acre  [ ] d. 52 lb/acre

19. Which of the following P fertilizers should be most available for plant uptake?
   [ ] a. DCP  [ ] b. MAP  [ ] c. Triple superphosphate  [ ] d. rock phosphate

20. If the Olsen P level is below 25 ppm, manure application rates should match

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SELF-STUDY EVALUATION FORM

NUTRIENT MANAGEMENT MODULE 4

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

Name: __________________________________________

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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.

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Signature of Registrant as it appears on Code of Ethics Date