



Get a CEU!

This exam is worth 1 CEU in **Nutrient Management**. An exam score of 70% or higher will earn CEU credit. The International CCA program has approved self-study CEUs for 20 of the 40 CEUs required in the two-year cycle.

DIRECTIONS

1. Read the self-study article on pages 38-40 carefully.
2. Answer the questions by clearly marking an "X" in the box next to the best answer for each question.
3. Complete the self-study exam registration form on the back of this page.
4. Clip out this self-study examination page, fold and place in envelope.
5. Enclose a check for \$10.00 made payable to the American Society of Agronomy, for processing fees. Payment in U.S. funds only.
6. **Mail your self-study exam and fee to:**
ASA c/o CCA Self-Study Exam, 677 S. Segoe Road, Madison, WI 53711. *Please allow 60 days for processing.*
7. An electronic version of this test is also available at www.AgProfessional.com. Go to the Certified Crop Advisers section (lefthand column) and access the "CCA Advantage" link.

Phosphorus Bioavailability Following Incorporation of Green Manure Crop January Self-Study Examination

1. **Lupine and sweet clover are examples of plants that:**
 - a. are invasive species.
 - b. can absorb more P than most cover crops from soils testing low in P.
 - c. require supplemental P.
 - d. remove excessive amounts of P from the soil.
2. **Decomposition processes can further increase P availability by:**
 - a. releasing CO₂ which forms H₂CO₃.
 - b. releasing H₂O.
 - c. releasing H₂CO₃.
 - d. releasing O₂.
3. **Repeated incorporation of green manure:**
 - a. leaches N.
 - b. fixes P.
 - c. decreases bulk density.
 - d. reduces water retention.
4. **Most studies report that net P immobilization occurs when total P concentration of plant tissues incorporated into soil is below:**
 - a. 10 g kg⁻¹.
 - b. 7 g kg⁻¹.
 - c. 5 g kg⁻¹.
 - d. 3 g kg⁻¹.
5. **This study conducted 2 crop rotation experiments using:**
 - a. perennial forages and winter annual cover crop green manure.
 - b. 2 rounds of perennial forages.
 - c. 2 rounds of winter annual cover crops.
 - d. applied organic P.
6. **In the perennial forages experiment, sorghum P uptake was greatest following:**
 - a. Medium Red clover.
 - b. Yellow Blossom yellow sweet clover.
 - c. Riley alfalfa.
 - d. Nitro alfalfa.
7. **In the winter cover crops experiment, sorghum P uptake was lowest following:**
 - a. Hope white lupine.
 - b. common Austrian winter pea.
 - c. common hairy vetch.
 - d. Arkan winter wheat.
8. **Lupine absorbed almost 2 to 3 times more P than other winter crops:**
 - a. and Bray -1 soil P during lupine's growth increased 2 to 3 fold.
 - b. and Bray -1 soil P during lupine's growth increased 4 to 6 fold.
 - c. however Bray - 1 soil P during lupine's growth changed by the same amount as it did in other crop treatments.
 - d. suggesting lupine is able to solubilize more available P than other winter crops.
9. **Results from the winter cover crop experiment:**
 - a. suggest residue application rate is more important than plant type in influencing subsequent P bioavailability.
 - b. suggest plant type is more important than residue application rate in influencing subsequent P bioavailability.
 - c. are similar to results from the perennial forages experiment.
 - d. yielded very little data.

Over

Continuing Education Self-Study Test

Nutrient Management Test (continued)



10. Measuring relative changes in P uptake and release among green manure crops and other organic P sources:

- a. can be accurately measured using the Bray – 1 soil test.
- b. will require replications of this experiment.
- c. will require a less sensitive measure of bioavailable P.
- d. will require a more sensitive measure of bioavailable P.



SELF-STUDY EXAM REGISTRATION FORM

Name: _____
Address: _____
City: _____ State/Province: _____ Zip: _____
CCA Certification #: _____
Credit Card #: _____ Type of Card: Visa Mastercard Discovery Am Express
Expiration Date _____ Name on Card: _____

A \$2 processing fee will be added to all credit card charges, or enclose \$10 check payable to American Society of Agronomy.
X

Signature of Registrant as it appears on Code of Ethics
I certify that I alone completed this self-study course and recognize that an ethics violation may revoke my CCA status.

This exam issued January 2004 expires January 2007.

SELF-STUDY EXAM EVALUATION FORM

Rating Scale: 1=Poor 5=Excellent

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
This 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: _____

DETACH HERE