



DECEMBER 2015

CCA EXAMINER EXAM

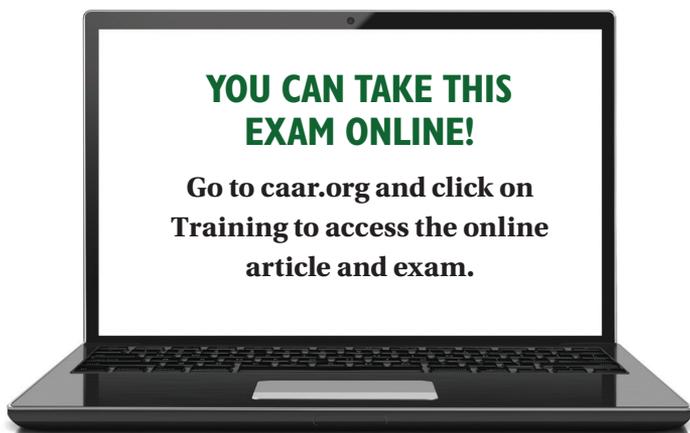
CERTIFIED CROP ADVISER – CONTINUING
EDUCATION SELF-STUDY EXAMINATION



Variation in potassium and calcium uptake with time and root depth

DIRECTIONS

1. Read the self-study exam carefully.
2. Answer the questions to this self-study exam by circling the best answer for each question.
3. Complete the self-study exam registration form.
4. Enclose a payment for processing fees of \$14.95 (Cdn) for CAAR members, and \$24.95 (Cdn) for non-members, plus GST or HST.
5. Mail your self-study exam and payment to:
The CCA Self-Study Exam
c/o Canadian Association of Agri-Retailers
628-70 Arthur St., Winnipeg, MB R3B 1G7



Click "View Module" to download and read the PDF article. Then take the 10 question test to become eligible for one Nutrient Management Continuing Education Unit for the Certified Crop Adviser Program. A passing mark of 70% or higher will earn you one CEU in Nutrient Management.

1. **What is the goal of this study?**
 - a. Reduce fertilizer usage and reduce cost.
 - b. Understand the mechanisms of root growth and nutrient uptake to help formulate nutrient management practices to improve nutrient use efficiency.
 - c. Develop accurate fertilizer rates for use in maize crops.
 - d. Reduce greenhouse gas emissions by proper nutrient application rates.
2. **What is a tracer and why would one use them?**
 - a. An element that is in low concentration in the environment (as opposed to nutrients that are in high concentrations in the soil) that will be utilized by the root and thereby help determine the precise position where the root accessed the nutrients.
 - b. An element that is in high concentration in the environment (as opposed to nutrients that are in low concentrations in the soil) that will be utilized by the root and thereby help determine the precise position where the root accessed the nutrients.
 - c. An element not found in the environment that will be utilized by the root and thereby help determine the precise position where the root accessed the nutrients.
 - d. A genetic marker used to determine which nutrients are being absorbed by the root.
3. **What are the factors that affect uptake of nutrients in row crops?**
 - a. Depth of nutrient placement.
 - b. Lateral separation of fertilizer placement from the seed row.
 - c. Placement of fertilizer has no impact on nutrient uptake.
 - d. Lateral separation of fertilizer placement from the seed row and depth of nutrient placement.



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4. **What can confound the uptake results?**
- Muscular mycorrhizal (MM Fungi)
 - Arbuscular mycorrhizal (AM Fungi)
 - Arbus mycorrhizal (AM Fungi)
 - Aqueous mycorrhizal (AM Fungi)
5. **What process was used to influence the effect of mycorrhizae on plant nutrient uptake?**
- The influence of mycorrhizae on rare-element tracer uptake was simultaneously evaluated by the sterilization treatment to eliminate mycorrhizal fungi, compared with a control not pasteurized.
 - There was no process used in this study to assess the influence of mycorrhizae on plant nutrient uptake.
 - The influence of mycorrhizae on rare-element tracer uptake was simultaneously evaluated by use of a soil pasteurization treatment to eliminate mycorrhizal fungi, compared with a control not pasteurized.
 - The influence of aqueous fungi on rare-element tracer uptake was simultaneously evaluated by use of a soil pasteurization treatment to eliminate mycorrhizal fungi, compared with a control not pasteurized.
6. **What were the tracers used in this experiment and for what nutrient?**
- Rb was used to investigate K uptake with regard to fertilizer band placement, and Cu was used to investigate Ca uptake.
 - Rb was used to investigate K uptake with regard to fertilizer band placement, and Sr was used to investigate Ca uptake.
 - Sr was used to investigate K uptake with regard to fertilizer band placement, and Rb was used to investigate Ca uptake.
 - Sc was used to investigate K uptake with regard to fertilizer band placement, and Rb was used to investigate Ca uptake.
7. **Shoot P concentration was higher in which type of soil at final harvest?**
- The shoot P concentration was higher in the pasteurized treatment than the not pasteurized treatment.
 - The shoot P concentration was higher in the not pasteurized treatment versus the pasteurized treatment
 - There was no difference in the concentration of shoot P in the pasteurized and the not pasteurized.
 - This was not evaluated in this study.
8. **When did the Ca and K uptake occur in maize?**
- Ca uptake occurs in first 2 or 3 weeks of growth from the top 5 cm of soil and K in the weeks to follow at a greater depth.
 - Ca uptake occurs in the first week of growth from the top 5 cm of soil and K in the weeks to follow at a greater depth.
 - Ca uptake occurs in first 2 or 3 weeks of growth from the top 10 cm of soil and K in the weeks to follow at a greater depth.
 - Ca and K uptake occurs in first 2 or 3 weeks of growth from the top 10 cm of soil.
9. **What depth is most effective for banded K fertilizer for early season uptake?**
- 10 to 15 cm depth
 - 0 to 10 cm depth
 - 5 to 15 cm depth
 - 10 to 20 cm depth
10. **Assessment of soil Ca for maize early season uptake should focus on what depth range?**
- 10 to 15 cm depth interval.
 - 5 to 15 cm depth interval.
 - 10 to 20 cm depth interval.
 - 0 to 5 cm depth interval.

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CERTIFIED CROP ADVISER – CONTINUING EDUCATION SELF-STUDY EXAMINATION

SELF STUDY EXAM REGISTRATION FORM:

(Please note: You must have your CCA Certification number on the form in order to be eligible for the CEU.)

CAAR Member Non-Member

Member Company: _____ Member Location (Town, Prov.): _____

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Payment Option: Cheque enclosed (*Made payable to the Canadian Association of Agri-Retailers*) VISA MasterCard

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I approve payment by credit card and certify that I alone completed this self-study course, recognizing that an ethics violation may revoke my CCA status.

Signature: _____

EXAM EVALUATION FORM (PLEASE TAKE A MOMENT TO PROVIDE US WITH SOME FEEDBACK ON THIS EXAM):

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
This article addressed the stated competency area and performance objective(s).	1	2	3	4	5

Topics I would like to see addressed in future materials: _____

