



APRIL 2016

CCA EXAMINER EXAM

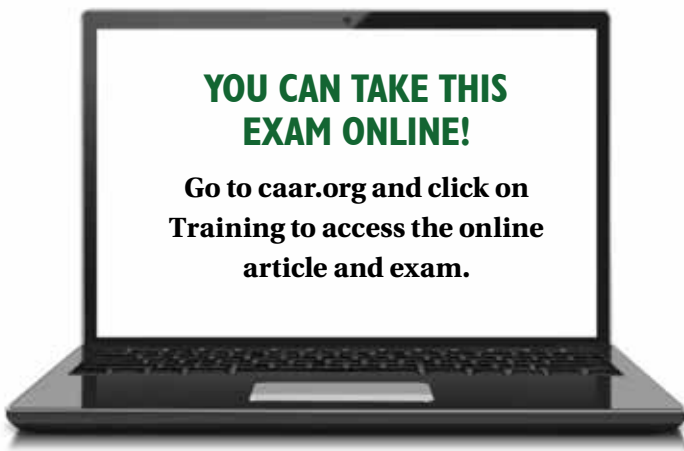
CERTIFIED CROP ADVISER – CONTINUING EDUCATION SELF-STUDY EXAMINATION



Clubroot in Canola – Overview, Identification, Prevention & Management Strategies

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 Pest Management Continuing Education Unit for the Certified Crop Adviser Program. A passing mark of 70% or higher will earn you one CEU in Pest Management.

1. **Clubroot is a soil-borne disease, regarded as a protist, which means it is an organism with which characteristic(s)?**
 - a. Plant characteristics
 - b. Animal characteristics
 - c. Fungal characteristics
 - d. All of the Above
2. **Why is clubroot a very different disease than others in canola?**
 - a. This pathogen can overwinter in the soil.
 - b. This pathogen has the ability to produce mobile zoospores to seek-out host plants.
 - c. This pathogen requires a micro-climate for infection to take place.
 - d. This pathogen relies solely on distribution and transfer via wind and rain.
3. **How long can the spores survive in soil?**
 - a. Up to 20 years
 - b. Up to 10 years
 - c. Up to 5 years
 - d. Less than 4 years
4. **What environmental conditions favour the infection and severity of clubroot disease development?**
 - a. Warming soils (10-15°C), soil moisture and a neutral pH (pH 7)
 - b. Cool Soil (10°C), saline soil, and dry conditions
 - c. Warm soil (20-24°C), high soil moisture and acidic soil (pH less than 6.5)
 - d. Dry soil, soil with pH greater than 7.2

SOURCE: This article is adapted from the Canola Council of Canada Website. Summary reprinted with approval from the Canola Council of Canada.



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5. Symptoms differ according to the growth stage the canola is in when infected. What symptoms result when infected very early, at the seedling stage?
- Poor germination, loss of vigour.
 - Wilting, stunting, and yellowing of canola plants in the late rosette to early podding stage.
 - Robust, green seedlings.
 - Mottled leaves, brown stems at early podding stage.
6. What is the quickest and most accurate way to determine if canola is infected with clubroot.
- Test the soil.
 - Look for premature yellowing in canola field.
 - Look for shrivelled seeds in the pods.
 - Dig up roots and examine for the presence of white or grey galls on the roots.
7. What other disease may exhibit similar above ground symptoms to clubroot?
- Sclerotinia
 - Blackleg
 - Fusarium Wilt
 - All of the above
8. Which is not a recommended strategy for prevention of clubroot in canola?
- Restrict access, and prevent the spread of the disease by washing and sanitizing equipment with weak bleach solution before entering or leaving field.
 - Direct seed with clubroot resistance varieties and avoid the use of common untreated seed.
 - Work the soil in spring to spread out any existing spores in the soil and mitigate transfer to seedlings.
 - Use a long canola rotation; once every four years.
9. How long does it typically take for gall formation to begin after initial infection?
- 2-4 days
 - 2-4 weeks
 - 4-6 weeks
 - 6-8 weeks
9. What rare occurrence on canola roots may be confused with clubroot?
- Fatty root deposits
 - Hybridization nodules
 - Gall mite infection
 - Leguminous root nodules

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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.)

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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

Credit Card #: _____ Expiration Date: _____

Name on Card: _____

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: _____

