

Midge Tolerant Wheat

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. Fold and place this self-study examination page in an envelope.
5. Enclose a payment for processing fees of \$15 (Cdn) for CAAR Members, and \$25 (Cdn) for non-members.
6. Mail your self-study exam and payment to:

The CCA Self-Study Exam

c/o Canadian Association of Agri-Retailers
107-1090 Waverley Street
Winnipeg, MB R3T 0P4

Self-Study Exam:

After reading the pre-approved self-study article, please answer this 10-question exam and return it to CAAR. An exam score of 70 per cent or higher will earn you one CEU in Pest Management.

1. **For an average wheat grower, yield losses from midge damage can range from:**
 - a. \$20 to \$75 per acre
 - b. \$50 to \$100 per acre
 - c. \$2 to \$10 per acre
 - d. \$2 to \$7.50 per acre
2. **Midge over-winter in what state?**
 - a. Pupa
 - b. Egg
 - c. Larva
 - d. Adult
3. **Over-wintering midge remain dormant for how long?**
 - a. One winter
 - b. Two winters
 - c. Until the following fall season
 - d. Until conditions are favourable for development
4. **Midge emergence can be modeled using:**
 - a. growing degree days
 - b. over-wintering depth
 - c. pheromone trap counts
 - d. larvae counts
5. **The varietal blend will have a midge tolerant to midge susceptible wheat variety ratio of ____, increasing the effective life of the Sm1 gene from ____ to ____ years.**
 - a. 80:20 and 20 to 80 years
 - b. 90:10 and 10 to 90 years
 - c. 80:20 and 10 to 90 years
 - d. 90:10 and 20 to 90 years
6. **When midge larvae begin to feed on the seed, the Sm1 gene controls the larvae in what way?**
 - a. elevates the level of phenolic compounds, causing the midge larvae to stop feeding and starve to death
 - b. elevates the level of photosynthetic compounds, causing the midge larvae to bloat and die
 - c. decreases the level of phytophylllic compounds, causing the midge to starve due to lack of nutrients
 - d. thickens the bran around the seed, creating a barrier that prevents midge from feeding on the seed

questions 7 – 10 continued on next page

7. **An interspersed refuge is used instead of a refuge block system because:**
- the damage to the susceptible variety is reduced
 - the damage to the tolerant variety is reduced
 - the likelihood that virulent midge mate with non-virulent midge is increased
 - the required percentage of susceptible varieties is reduced.
8. **If midge tolerant wheat is grown in a pure stand:**
- insecticide applications will be required to control non-virulent midge
 - the Sm1 gene will disintegrate in the tolerant wheat variety
 - the midge tolerance of the next generation of wheat will be increased
 - only virulent midge will survive, and the virulent population will increase rapidly.
9. **Why are farmers required to limit the use of farm-saved seed to one generation past Certified Seed?**
- To protect Plant Breeders' Rights.
 - Because the level of the refuge in farm-saved seed may change substantially over multiple generations
 - To avoid cross contamination with other wheat varieties
 - To encourage good crop stewardship by using strictly certified seed
10. **Farmers are also required to sign a stewardship agreement to:**
- make sure that the importance of the refuge is communicated to farmers and that the refuge is followed
 - ensure farmers only use certified seed
 - keep the refuge in farm-saved seed at a desired level of 20 percent of the plant population
 - avoid over-production of midge tolerant varieties

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.): _____

Name: _____ Company: _____

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

Credit Card #: _____ Expiration Date: _____

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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: _____

This exam issued October 2009 expires October 2010

