



Reduce wheat stem sawfly impact with lower seeding rate in solid-stemmed wheat

CATEGORY [insects](#) | March 27, 2019

Seed solid-stemmed CWRS and CNHR wheat varieties at 30 to 35 seeds per square foot to maximize stem solidness and reduce the impact of wheat stem sawfly. For hollow-stemmed CWRS varieties and durum wheat, seed at 40 to 45 seeds per square foot.

Growing solid-stemmed wheat varieties is an important management tool that growers use to reduce the yield impact of wheat stem sawfly (*Cephus cinctus*). However, pith development in the stem of these varieties is highest under intense sunlight, which is influenced by row spacing and seeding rate – narrower rows and higher seeding rate produce a denser stand that reduces sunlight infiltration.

A research study was conducted in southern Alberta at two sites to determine the optimum seeding density that would provide the best pith development and protection against the wheat stem sawfly. Wheat was planted into a field of spring wheat stubble that was naturally infested the previous growing season with wheat stem sawfly. A total of 7 site-years of data were collected. While the

research was conducted in the late 2000s with older wheat varieties, the findings on pith development provide seeding rate guidance for current wheat varieties.

Lillian (solid stemmed; CNHR), CDC Go (hollow stem; CWRS), a 1:1 blend of Lillian and CDC Go, and AC Avonlea (hollow stem; CWAD) were seeded at 15, 25, 35, and 45 seeds per square foot (150, 250, 350, 450 seeds/square metre) on 10 inch (26 cm) row spacing. These seeding rates resulted in stand establishment of 11, 16, 20 and 21 plants per square foot (115, 157, 196, 214 plants per square metre).

Seed solid-stemmed wheat at 30 to 35 seeds per square foot

Pith expression was greatest in the solid-stemmed variety Lillian, lowest in the hollow-stemmed CDC Go, and intermediate in the blend treatment. AC Avonlea had higher pith expression than CDC Go that was attributed to the thicker stem wall of the durum wheat.

Increased seeding rate in solid stem Lillian resulted in increased wheat stem sawfly damage, indicating a reduction in pith expression at higher seeding rates. Lillian generally had high and stable pith development and the highest grain yield of 43 bushels per acre (2.9 t/ha) at 25 to 35 seeds per square foot seeding rate. This compared to 35 bushels per acre (2.35 t/ha) at the lowest seeding rate of 15 seeds per square foot.

For CDC Go and the blend, the opposite was true. Increasing seeding rates from 15 to 45 seeds generally reduced rates of wheat stem sawfly infestation by 25%. Yields at the 25, 35 and 45 seeding rate were statistically similar, however, a significant linear trend for yield indicated that higher seeding rates could achieve higher grain yield, which also provides greater weed competitive ability.

AC Avonlea durum had the highest yield at 45 seeds per square foot seeding rate.

Parasitism of wheat stem sawfly by a parasitic wasp, *Bracon cephi*, was also higher at the higher seeding rates in the hollow-stemmed varieties.

Based on these findings, solid stemmed wheat varieties should be sown at no less than 30 seeds per square foot to optimize pith expression and yield. Hollow-stemmed wheat varieties should be sown in the 40 to 45 seeds per square foot range for optimum yield and increased parasitism of wheat stem sawfly.

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Beres, B. L., H. A. Cárcamo, R. Yang, and D. M. Spaner. 2011. Integrating Spring Wheat Sowing Density with Variety Selection to Manage Wheat Stem Sawfly. *Agron. J.* 103:1755-1764.

<https://dl.sciencesocieties.org/publications/aj/pdfs/103/6/1755>

Photo by Cam Barlow: Larvae of wheat stem sawfly (bottom) being attacked by the juvenile stage of *Bracon cephi*.