

**M.Sc. Opportunity**  
**Department of Entomology**  
**University of Manitoba**

**Effects of Midge Damage on Gluten Strength of Resistant and Susceptible Wheat Genotypes**

Co-supervisors: Drs. Alejandro Costamagna and Harry Sapirstein

**Study Description:**

The study will focus on the effects caused by the wheat midge (*Sitodiplosis mosellana*) on developing seed of a few tolerant and susceptible wheat varieties. Apart from reducing yield, the midge insect can cause significant damage to wheat kernels that are not visually obvious. The study will be carried out in controlled laboratory conditions and will involve midge exposures during wheat head emergence, with unexposed wheat plants used as the control. Ultimately, mature wheat grain will be analyzed for gluten strength-related properties as revealed by gluten protein composition, protease activity, and micro-scale dough mixing of ground whole wheat flour. A related study will also attempt to develop a better understanding of the hypothesized mechanism of midge resistance which involves induction of toxic levels of phenolic acids in developing seeds exposed to newly hatched midge larvae.

The large interdisciplinary project that includes this study is examining the physical and biochemical factors underlying Canada Western Red Spring wheat processing quality for breadmaking, primarily gluten strength, as a function of genotype (G), the crop growing environment (E) and G x E interactions. Wheat and other crops grown in the Prairie region typically experience an enormous range of environmental influences including weather and biotic factors such as disease and insects. The variability in growing conditions creates the potential for a very wide range in breadmaking quality of CWRS wheat. This is a major concern for wheat customers, who require a reliable source of wheat of consistent and expected quality, from shipment to shipment, and from year to year.

**Position Details:** The M.Sc. position starts May 1, 2017. It is based in the Department of Entomology. The student will be co-supervised by Dr. Alejandro Costamagna (Department of Entomology) and Dr. Harry Sapirstein (Department of Food Science) and will work within a team of Research Associates, Technicians and other graduate students in the Departments of Entomology and Food Science.

**To apply:** Please send transcript, resume and names of two references to: Dr. Alejandro Costamagna, Department of Entomology, University of Manitoba (Ale.Costamagna@umanitoba.ca ) by **March 15, 2017**. Applicants should hold (or expect to hold by Fall 2017) a Bachelor's degree with a strong background in natural or agricultural sciences. Interest in insect biology and experience in entomology laboratory activities is desired. Annual MSc stipend: \$20,000 per year, for a maximum of two years. There are scholarship and teaching assistant opportunities to supplement the stipend above this base level.