

**Evaluation of canola breeding lines for resistance to blackleg
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This project had two general objectives; to evaluate canola breeding lines for their reaction to blackleg, caused by the fungus *Leptosphaeria maculans*, and to identify an efficient method to inoculate plants in a nursery setting that would allow researchers to obtain consistent high disease pressure. Two hundred breeding lines from the NDSU canola breeding program were planted in a replicated trial at the Langdon Research and Extension Center and evaluated for their reaction to blackleg. Seedlings were inoculated with a mixture of three *L. maculans* (PG 2 isolates) at a concentration of 10^4 pycnidiospores per ml when seedlings were at the three-leaf growth stage. Field evaluations were conducted when plants approached physiological maturity and prior to swathing by arbitrarily taking 10 plants from each accession and replication and evaluating the severity of blackleg cankers using a 0-5 scale. The mean disease incidence per line was 24% with a range of 0-55% whereas the mean severity was 0.53 with a range of 0-1.7. Disease incidence was normally distributed with approximately 36% of lines having incidence lower than 10% and 47% with incidence higher than 40%. Severity increased linearly with incidence although no correlation could be observed between position in the field and incidence. Disease did not develop in four lines (30401, 30528, 0220881, and 0220970). This information has been shared with the new canola breeder, Dr. Mukhlesur Rahman, who will consider it when advancing lines. Laboratory trials were conducted to identify the best substrate for production of blackleg inoculum. Corn kernels, corn grits, millet seed, wheat and barley seeds were compared. All substrates were soaked in water overnight and then autoclaved for 40 minutes. Forty-eight hours later the substrates were autoclaved again for the same time and after cooling down, were inoculated with agar plugs containing mycelium of *L. maculans*. All samples were incubated at 21°C for four weeks and then dried overnight. The substrate that best supported growth and sporulation of blackleg was millet seed which produced 30% more spores per gram of dry product than wheat. The worst medium was corn kernels. This was probably due to the higher surface to weight ratio of millet. Identification of sexually compatible strains of blackleg was a bit more complicated than anticipated. Several attempts were made without much success. Thus, a decision was made to use molecular methods for this. As I write this report, DNA from 50 blackleg isolates has been retrieved and will be used to detect compatible mating types with help of specific primers. Once mating types are identified the production of ascospores will be tried again. Dr. Marcelo Melani, co-PI of this project left NDSU and returned to his native Argentina in December of 2007. His replacement, Dr. M. Rahman, was hired in early February of this year. Dr. Rahman and I have met several times already and have agreed to continue working collaboratively.