Progress report
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Luis del Rio

Project: Evaluation of canola breeding lines for resistance to blackleg
PI: Luis del Rio, Department of Plant Pathology, NDSU Fargo, ND 58105
Co-PI: Mukhlesur Rahman, Department of Plant Sciences, NDSU Fargo, ND 58105

A blackleg nursery was established in Langdon in the summer of 2008 to evaluate 37 NDSU canola breeding lines that already have a gene for herbicide-tolerance. A similar nursery was established in Prosper. The Langdon nursery was supplemented with blackleg-infected stems collected from commercial fields in 2007. The Prosper nursery was inoculated with a mixture of three PG2 isolates when plants were at the three leaf stage, but was later abandoned because the plots were heavily flooded. In the Langdon nursery, four breeding lines 0330455, 0427667, 30525, and 0330662 had on average less than 8% incidence with a combined severity of less than 2 in a scale of 0-5 compared to the commercial controls DKL 38-25 and Invigor 5550 who had an average incidence of 34% and a combined severity of 3.2. In a separate trial conducted in Manitoba, Canada, 40 breeding lines were planted in single rows with no replications in a nursery where PG2, PG3 and PGT were naturally established. Lines BS-113, BS-122, BS-128, and BS130 had the lowest levels of blackleg with an average of 18% incidence and a mean severity of 1.4 in a 0-5 scale. Other lines, like BS132, and BS123 had 100% incidence and a mean severity index of 4.0. The information generated in these trials is being used by the breeder, who is also a Co-PI in this project.

Project: Characterization of the reaction of *Brassica napus*, *B. rapa*, and *B. juncea* plant introductions to isolates of pathogenicity groups 3 and 4 of *Leptosphaeria maculans*
PI: Luis del Rio, Department of Plant Pathology, NDSU, Fargo, ND 58105
Co PIs: Mukhlesur Rahman, Department of Plant Sciences, NDSU, Fargo

This project started in the summer of 2008. The project proposes to systematically screen the collections of *Brassica napus*, *B. rapa*, and *B. juncea* maintained by the USDA with isolates representative of these new PGs with the goal of identifying sources of resistance that could be used in breeding programs. Initial screenings are being conducted. The first batch of 50 accessions were evaluated with a composite mix of spores from three PG 3 isolates and, separately with an isolate of PG 4. All accessions evaluated were completely susceptible to both isolates. A second set of 50 accessions are being evaluated at the time this report is being prepared. Similarly, plants from accessions in the *Brassica rapa* and *B. napus* collections that had been identified as having high levels of resistance against *S. sclerotiorum*, another pathogen of importance for North Dakota canola growers, are also being evaluated. Efforts to characterize additional PG 4 isolates are under way. In a separate activity, in collaboration with French

scientists blackleg isolates were identified to race level using a select set of differentials. Results indicated that the race structure in North Dakota is somewhat similar to that of Canada, with four races identified. One of them, race 1-2-3-(5)-(8)-9 is the most prevalent, being recovered from 76% of the isolates used in the study. Trials are being prepared in the greenhouse to evaluate the reaction of commercially available cultivars to this race. No publications have been produced by this project at this time.

Publications produced in previous projects:

Project: Validation of a Disease-warning Model for Sclerotinia Stem Rot of Canola for the North Central Region (2005).

Qandah, I.S., and **L.E. del Río**. 2006. *Sclerotinia sclerotiorum* ascospore dispersal gradients in canola fields in North Dakota. Phytopathology 96:S95.

Qandah, I.S., **L.E. del Río**, and C.A. Bradley. 2006. Dispersal of *Sclerotinia sclerotiorum* ascospores in canola fields from area source of inoculum. Proc. 2006 Sclerotinia Initiative Annual Meeting pp. 19.

Project: Impact of Environmental Variables on Reaction of Canola Germplasm to Inoculation with *Sclerotinia sclerotiorum* (2005)

Bradley, C.A., R.A. Henson, P.M. Porter, D.G.LeGare, L.E. del Río, and S.D. Khot. 2006. Response of canola cultivars to *Sclerotinia sclerotiorum* in controlled and field environments. Plant Dis. 90:215-219.

Project: Evaluation of canola breeding lines for resistance to blackleg (2007)

No publications from this project in 2007.