

**Quantitative trait loci from two genotypes of oat (*Avena sativa* L.) conditioning resistance to *Puccinia coronata*.**

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**Contact:** J. Michael Bonman, USDA-ARS, Small Grains and Potato Germplasm Research Unit, Aberdeen, ID 83210, USA.

**Summary:**

Crown rust is the most important disease of oat worldwide. A key problem in rust disease management is that new resistant cultivars often become susceptible over time, due to the evolution of new pathogen races. One means to overcome this problem is to develop new oat cultivars with 'partial' resistance, which could prove to be more durable than other types of disease resistance. To further this goal, we studied the inheritance of partial resistance in two oat lines, the cultivar 'CDC Boyer' from Canada and the breeding line 94197A1-9-2-2-2-5 from Indiana. Newly developed oat molecular markers, called single nucleotide polymorphisms (SNPs), were used to 'genotype' the population of plants developed by crossing the resistant lines with a susceptible line. With this method, we found that there is a locus for partial resistance on chromosome 19A of CDC Boyer and on chromosome 13A of the Indiana oat line. We further used DNA sequence information associated with the oat SNP markers, and the complete rice genome sequence available online, to identify 'candidate genes' that might be similar to the oat genes responsible for the partial resistance from the two oat chromosomes. Our results are a first step towards breeding new oat cultivars with longer lasting resistance to crown rust disease.