



Genetic progress in oat associated with fungicide use in Rio Grande do Sul, Brazil

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ABSTRACT. The State of Rio Grande do Sul (RS) is the largest producer of oat in Brazil with the aid of consolidated breeding programs, which are constantly releasing new cultivars. The main objectives of this study were to: 1) evaluate the annual genetic progress in grain yield and hectoliter weight of the oat cultivars in RS, with and without fungicide use on aerial parts of plants; and 2) evaluate the efficiency of oat breeding programs in introducing disease-resistant genes in the released cultivars through network yield trials conducted with and without fungicide use on aerial plant parts. The data on grain yield and hectoliter weight were obtained from 89 competition field trials of oat cultivars carried out from 2007 to 2014 in nine municipalities of RS. Of the total 89 trials, 44 were carried out with fungicide application on aerial plant parts and

45 were carried out without fungicide application. The annual genetic progress in oat cultivars was studied using the methodology proposed by Vencovsky (1988). The annual genetic progress in oat grain yield was 1.02% with fungicide use and 4.02% without fungicide use during the eight-year study period in RS. The annual genetic progress with respect to the hectoliter weight was 0.08% for trials with fungicide use and 0.71% for trials without fungicide use. Performing network yield trials with and without fungicide use on the aerial plants parts is a feasible method to evaluate the efficiency of oat breeding programs in introducing disease-resistant genes in the released cultivars.

Key words: *Avena sativa* L.; Cultivars; Breeding, Genetic gain; Disease resistance