Effectiveness of the Visual Symptom Score in Selecting Germplasm for Resistance to the Barley Yellow Dwarf Virus Disease in Wheat (*Triticum aestivum* L.)

By

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ABSTRACT

The effectiveness of the visual symptom score in selecting germplasm for resistance to barley yellow dwarf (BYD) was studied using 33 F5 wheat (Triticum aestivum L.) lines from crosses between tolerant x tolerant and tolerant x susceptible parents (experiment 1), and 28 advanced lines (experiment 2). In both cases the material had been selected on the basis of low visual symptom scores for 2 to 5 years. Replicated paired Hill-plots were established in the field at Davis, California. One of the paired plots of each genotype was sprayed with insecticide to reduce the aphid population. Each hill-plot was scored for BYD symptom expression using a visual 0 to 9 scale.

Data were collected for plant height, biomass weight, grain yield, spike number/hill-plot, number of kernels/hill-plot, number of kernels/spike, and 200-kernel weight were collected in both experiments to examine the relationships with the BYD symptom score.

The results showed that spike number, biomass weight, and number of kernels per hill can be used as selection criteria for tolerance to BYD. These characters showed negative and significant correlations with BYD score and grain yield. The visual symptom score proved to be effective in discarding the susceptible material during the segregating generations but, it did not help to discard the material with low score and low yield as well as genotypes with relatively
high score but high yield potential, especially among advanced lines. Twenty-six segregating (F6) lines from experiment 1 and six lines from experiment 2 were identified as tolerant to BYD, which can be used for future research studies or in breeding programs.