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

By

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THESIS

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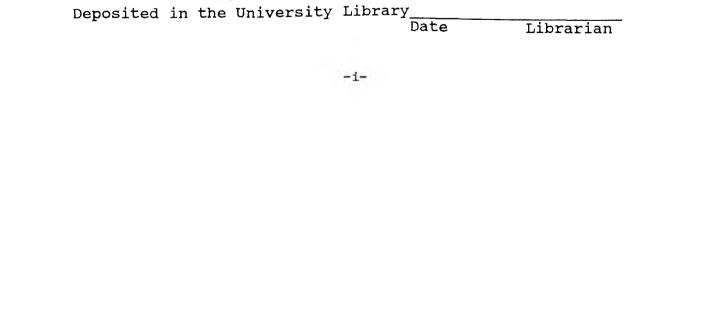
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ABSTRACT

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 stablished 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.