

# 6<sup>TH</sup> INTERNATIONAL TRITICALE SYMPOSIUM

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of  
oral and poster  
presentations



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## Mitotic analysis of triticales, wheat and rye

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Roots tip cells of ten octoploid and hexaploid triticales genotypes , four hexaploid wheat varieties and one rye variety were studied employing five glass slides (replications) per genotype. In each replication mitotic cells were studied in batches of 100 so as to provide sample sizes of 100; 200; 300; 400; and 500 cells (for a total of 500 to 2,500 cells / genotype). In every batch of 100 cells, those in prophase, pro-metaphase, metaphase, anaphase and telophase and presenting mitotic abnormalities (chromosome bridges or lagging chromosomes) were counted. The average incidence of abnormalities was 2.16%, ranging from 0.44% to 2.80% for "Frontana" wheat and "Embrapa 53" hexaploid triticales, respectively. There was no significant difference among the results obtained using 100; 200; 300; 400 or 500 cells per glass slide, suggesting the possibility of reducing the number of cells to be analyzed per replication. It can be concluded that triticales and its parental genera have low levels of mitotic abnormalities. There were no statistically significant differences among the three genera or between the hexaploid and octoploid triticales that were evaluated.

### Introduction

Aiming to evaluate if the genotypes of triticales and their parental can be differentiated by using the mitotic division frequency of the root tip cell cycle and further correlation can be made with agronomic characteristics, the mitotic cycle of the root tip cells of ten octoploid and hexaploid triticales genotypes, four hexaploid wheat varieties and one rye variety were analyzed.

### Materials and Methods

Young roots with ± 1.5 cm were collected from disinfected seeds placed in a moistened germination paper, and fixed in 3:1 (ethyl alcohol: acetic acid). The material was hydrolyzed in 5N HCl for 20 minutes at room temperature. The root tips were later squashed in 45% acetic acid. The slides were air-dried, after rapid immersion in liquid N, and stained with 2% Giemsa solution, pH 6.8. Each slide was

made with one root tip and five glass slides (replications) per genotype were employed. In each replication mitotic cells were studied in batches of 100 so as to provide sample sizes of 100; 200; 300; 400; and 500 cells (for a total of 500 to 2,500 cells / genotype). In every batch of 100 cells, those in prophase, pro-metaphase, metaphase, anaphase and telophase were counted, and that presenting mitotic abnormalities (chromosome bridges or lagging chromosomes) also.

### Results and Discussion

Lagging chromosomes were observed in 0.08% only in the genotype Tcl PFT 305. Anaphasic bridges occurred only in four genotypes (Frontana wheat, Tcl Embrapa 53, Tcl PFT 305 and Tcl Octo 71) ranging from 0.04% to 0.16%. For all genotype, cells in interphase were observed in high frequency, ranging from 96.44% (Tcl Embrapa 53) to 99.36% (Frontana wheat). The average frequency of

division cells was 2.16%, ranging from 0.64% (Frontana wheat) to 3.56% (Tcl Embrapa 53). There was no significant difference among the results obtained using 100; 200; 300; 400 or 500 cells per glass slide, suggesting the possibility of reducing the number of cells to be analyzed per replication. The general frequency of cellular division was the same (2,2 %) in considering all the

counting groups. But when 2,500 cells were considered, practically all genotypes differed from each other. It can be concluded that triticale and its parental genera have low levels of cells in division and that the mitotic abnormalities are rare. There were no statistically significant differences among the three genera or between the hexaploid and octoploid triticale that were evaluated.