

## Screening Of Heat Tolerant Wheat Genotypes For Late Sown Conditions

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### ABSTRACT

An investigation was carried out for screening of heat tolerant wheat genotypes during *Rabi* seasons of 1997-98 and 1998-99 at Crop Research Centre, Pantnagar. Among twelve varieties; PBW 343, PBW 373, HD 2402 and NIAW 34 performed better than others under heat stress conditions. Significant genotypic differences were observed in canopy temperature depression during 1998-99. The membrane thermostability which was reported as relative injury percent had a negative correlation with the grain as well as biological yield. Days taken to maturity and grain growth duration did not show significant association with the grain as well as biological yield.

**Key words:** Heat stress, Membrane Thermostability, Canopy Temperature Depression and wheat

### INTRODUCTION

In North-west Plain Zone due to adoption of highly remunerative cropping system like rice-wheat and growing of additional crops like toria, potato etc. delayed the sowing of wheat crop. Thus, the late sown wheat exposed to both the extremes of temperature i.e. low temperature during early growth period which restricts the vegetative phase and high temperature during post anthesis period which reduced the duration of grain development and consequently the grain yield. Out of the 25.4 million ha area under wheat, heat stress at grain filling stage is of relevance to the 2.5 million ha area in North-west Plain Zone. Moist heat conditions prevail over most of the 9.0 million ha area in North-East Plain Zone and continuous warm conditions restrict the yield in the 4.7 million ha area in Central Zone (Nagrajan and Rane, 1997). So there is immense need to evaluate the wheat genotypes which can grow better under temperature stress conditions. In this experiment, efforts had been made to study the heat tolerance aspect of wheat genotypes by taking some important heat responsive traits, so that the promising heat tolerant wheat genotypes can be selected for sowing under heat stress conditions.

### MATERIALS AND METHODS

A field experiment was carried out during *Rabi* seasons of 1997-98 and 1998-99 at Crop Research Centre of G.B. Pant University of Agriculture & Technology, Pantnagar. Twelve wheat varieties comprised of HD 2402, HD 2428, Hindi 62, HP 1633, HUW 234, NIAW 34, NW

1014, PBW 343, PBW 373, Raj 3765, Raj 3777 and Tepoka were sown in Randomized Block Design with four replications. The crop was sown on December 27, 1997 and December 18, 1998 and harvested in the end of April during both the years. The crop was sown at a distance of 23 cm and fertilized with 120 kg N, 60 kg P<sub>2</sub>O<sub>5</sub> and 40 kg K<sub>2</sub>O /ha. Weeds were removed manually and the need based irrigations were given.

The membrane thermostability reported in terms of relative injury (RI %) of flag leaf at anthesis were recorded by the method described by Saadalla *et.al.*, (1990). The canopy temperature depression was recorded by using Infra-Red thermometer (Telatemp AG-42).

### RESULTS AND DISCUSSION

The significant differences in grain as well as biological yield were recorded among the varieties (table 01). Variety PBW 343 produced the highest grain as well as biological yield during both the years of experimentation. Variety PBW 373 produced significantly lower yield than PBW 343 in 1997-98 but in 1998-99, it was at par with PBW 343 along with HD 2402, NIAW 34 and Raj 3765. Higher number of ears along with higher test weight, higher canopy temperature depression (CTD) and lower relative injury might have contributed for the highest grain and biological yielding ability of PBW 343. Variety Hindi 62 was lowest grain and biological yield producing variety during both the years, probably due to the lowest grain weight/spike, lowest test weight, lowest CTD and highest relative injury. High temperature stress influenced the yield by directly affecting the various yield components (Ferrara

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