

Relative Importance of Yield Components on Final Grain Yield Affected by Daylength at Anthesis in Durum Wheat

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INTRODUCTION

Photoperiod sensitivity has been postulated as a means to increase the number of grains per unit area (NG), and thus, grain yield. It has been pointed out that NG has a prevailing importance over kernel weight (KW) in defining yield in high latitudes (Peltonen-Sainio et al., 2007), but KW is known to be a major yield component determining final yield in certain Mediterranean environments (García del Moral et al., 2003).

The objective of this work was to assess the relationship between daylength and the relative importance of NG and KW on final grain yield.

MATERIALS AND METHODS

Field experiments were conducted in four contrasting latitudes (Fig. 1) during the 2006-07 crop season. Plant material consisted on 45 inbred lines from crosses between German and CIMMYT germplasm, showing a wide range of photoperiod sensitivity. The daylength during the experiments is shown in Fig. 2.

Data recorded were date to anthesis, grain yield and thousand kernel weight (TKW). The number of grains per square meter (NGM) was calculated as the ratio between grain yield and TKW.



Experimental plots at Gimenells



Figure 2: Daylength during the experiments. Arrows indicate anthesis time

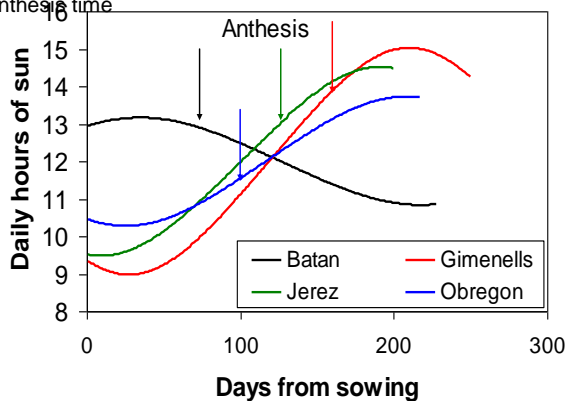


Figure 3: Relationship between daylength at anthesis and the Pearson correlation coefficient between number of grains per m² and yield.

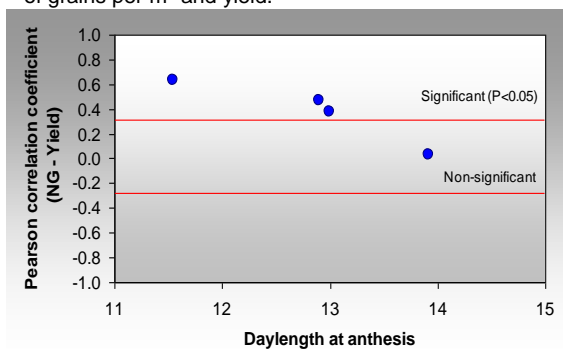
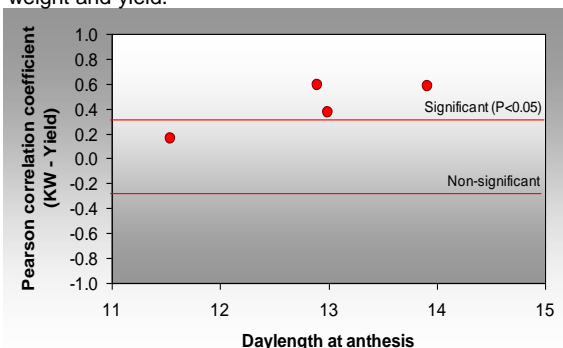


Figure 4: Relationship between daylength at anthesis and the Pearson correlation coefficient between kernel weight and yield.



RESULTS AND DISCUSSION

The relationship between yield and NG tended to decrease from sites with low to high daylengths (Fig. 3). In contrast, the relationship between yield and KW tended to increase as daylength increased (Fig. 4). This results suggest that the number of grains per unit area may be more critical than kernel weight in sites with a short photoperiod at anthesis, while long photoperiods at anthesis would enhance the role of kernel weight on yield formation. These preliminary results seem to indicate that the relative contribution of yield components to grain yield may be affected by site daylength, and this assumption is currently under further investigation.

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