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Contribution of main stem and tillers to durum wheat (*Triticum turgidum* L. var. durum) grain yield and its components grown in Mediterranean environments

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Abstract

Under terminal drought conditions, cereal varieties with limited tillering have been suggested to be advantageous, because they have fewer nonproductive tillers, thereby limiting water consumption prior to anthesis. In this study, four field trials were conducted over two growing seasons in southern Spain, under rainfed and irrigated conditions. Twenty-five genotypes were studied to evaluate the contribution of the main stem (MS) and tillers to grain yield and its components. Significant differences were found among genotypes for these contributions under non-stressed environments, but these differences were not significant under water-stress conditions. The contribution

of the MS to plant grain yield was higher than that of tillers (68% *vs.* 32%) and was stable between years in irrigated trials. However, in the rainfed trials, MS contributed differently depending on year-to-year climate variations. Thus, under favorable weather conditions the contribution of MS to grain yield was higher than in the unfavorable year (85% *vs.* 59%). In irrigated environments, MS and tiller grain yield depended on the number of grains per spike, spikelets per spike, and thousand kernel weight (TKW). Under water-limited conditions, MS yield depended on the number of grains per spike and grains per spikelet, whereas the number of spikelets and TKW had less influence on MS grain yield. Furthermore, under water-stress conditions, high tillering genotypes showed yield levels similar to the genotypes with restricted tillering. Additionally, there was no significant evidence of a positive or negative effect of maximum tiller number on grain yield under rainfed conditions.



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## Keywords

Uniculm ideotype; Breeding; Crop yield; Durum wheat; Mediterranean environment

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