

Trend of physiological growth indices of three grain sorghum cultivars affected by sowing date

M. Aghaalikhani^{1*} and M. Safari²

1. ***Corresponding Author:** Associate Professor of Agronomy Department, Tarbiat Modares University (maghaalikhani@modares.ac.ir)
2. M.Sc. of Agronomy Department, Tarbiat Modares University

Received: 8 March, 2011 Accepted: 26 October, 2011

Abstract

Given the important role of crop growth indices for explanation of cultivars yield differences in diverse environmental and agronomical circumstances, this experiment was conducted at research field of Tarbiat Modares University during 2007 growing season. Experimental treatments were arranged in split-plot layout based on randomized complete blocks with four replications. In this research, sowing dates (8th June, 28th June and 18th July) were considered as the main plots and grain sorghum cultivars (Payam, Sepideh and Kimia) were arranged in sub plots. By means of measurement of dry weight and leaf area during several sampling in growing season of sorghum, some important physiological growth indices including total dry matter (TDM), crop growth rate (CGR), relative growth rate (RGR), leaf area index (LAI) and net assimilation rate (NAR) were estimated and calculated using functional approach based on growing degree days. Results showed that delayed sowing date reduced sorghum dry weight accumulation. The CGR trend was directly related to dry weight accumulation, so that Sepideh cultivar in first sowing date obtained the highest amount of growth rate and dry matter. Dry matter increment in this cultivar in first sowing date was accompanied by dry weight panicle (165.93 g/m²). The relative growth rate of all cultivars in second sowing date had the highest amount. Results in case of the interaction between LAI and NAR showed, despite Payam cultivar having earning lower leaf area index, that NAR in this cultivar was superior. Finally, payam cultivar took an average amount of CGR. Sepideh cultivar, taking the average amount of NAR (0.763 g/m²/gdd) and LAI (2.65), showed higher amount of CGR (2.06 g/m²/gdd). Therefore, obtaining the highest amounts of CGR and RGR in second sowing date (28th June) could be introduced as the mechanism of superior grain yield (6777.2 kg/ha) and harvest index (48.75 %) in Sepideh cultivar.

Keywords: Grain sorghum, Sowing date, Growth curve, Growing degree days