



Tropentag, September 19-21, 2012, Göttingen -
Kassel/Witzenhausen

“Resilience of agricultural systems against crises”

Effect of Sowing Date, Irrigation Intervals and Fertilisers on Safflower (*Carthamus tinctorius* L.) Yield

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Abstract

Despite the importance of safflower in the world, this crop has received only little research attention in Sudan. Therefore, a field experiment was conducted at the College of Agricultural Studies, Sudan University of Science and Technology in Khartoum, to study the effects of sowing date, irrigation intervals and different types of fertilisers on yield, yield components and pigment of safflower (*Carthamus tinctorius* L.) Geeza cultivar during 2010/11 and 2011/12. To this end a split-split plot layout was used with four replications. The main plots were two sowing dates (S1) on 13th and (S2) 28th November. Subplots were three irrigation intervals (7, 14 and 21 days) and sub-subplots were three fertiliser levels (urea 80 kg ha⁻¹, pellet granules 105 kg ha⁻¹ and farm yard manure 2000 kg ha⁻¹).

Sowing date had significant effects on seed yield in the first season and on seed yield, dry weight and pigment yield in the second season ($p < 0.05$). Irrigation significantly affected seed yield and pigment ($p < 0.05$) and on shoot dry weight in first and second season ($p < 0.01$), respectively. The interaction of sowing date and irrigation intervals had significant effects on seed yield in the first season and on pigment in the second season. There were no significant effects of fertilisers on all parameters, but farm yard manure had some influence on yield components at S2.

The results showed negative correlations between harvest index, shoot dry weight (-0.3), number of seeds per head (-0.04), between pigment and 1000-seed weight (-0.08) and also between seed yield and seed per head (-0.004) in the first season. Moreover, there was a negative correlation between pigment yield kg ha⁻¹ and seed per head (-0.13) in season two. The higher seed yield of 2700 kg ha⁻¹ and 2300 kg ha⁻¹ achieved from S1 and S2 in season one, respectively, as compared to 1600 kg ha⁻¹ and 1000 kg ha⁻¹ from S1 and S2 in season two, respectively. Decreased seed yield in season two was due to infestation by *Orabanche crenata* which was the first record in Sudan. It can be concluded that for safflower under this condition the most suitable sowing date was 13th November with an irrigation every 14 days.

Keywords: Irrigation interval, pigment, safflower, sowing date