



Crop Coefficient, Yield Response Factor and Water Use Efficiency of Sesame under Full and Deficit Irrigation Conditions in Humera, Western Tigray

ABADI BERHANE

Aksum University, College of Agriculture, Department of Plant Sciences, Shire, 03, Shire campus, Ethiopia

ABSTRACT:

Water is an important factor for growth and productivity of field crops. A two season field experiment was conducted in Humera in 2018 and 2019 to determine crop coefficient (K_c), transpiration rate (T_r), yield response factor (K_y), and water use efficiency (WUE) of sesame under full and deficit irrigation conditions; and to explore the relationship between K_c , T_r , and canopy cover of sesame. Soil water balance, T_r , K_c , K_y and WUE of sesame were analyzed. The results on transpiration rate of sesame during initial, development, mid and end growth stages were 8.9, 72.7, 126.7 and 18mm, respectively. Similarly, the K_c values of sesame at initial, development, mid and end growth stages were 0.23, 0.66, 0.97, and 0.34 respectively. The highest WUE of sesame 3.18kg/mm was obtained from Setit-1 under 315 mm of irrigation water (80%FC); whereas, the smallest WUE 1.74kg/mm was obtained from Humera-1 under 225mm of irrigation water (50% FC), the total K_y value was 0.83. Sesame WUE decreased with increasing with increasing irrigation water. Transpiration and crop coefficient of sesame, as a function of canopy cover, were moderately correlated with coefficient of determination (R^2) 0.75, and 0.68 respectively. The results develop understanding on the relationship of sesame to water; and the relationship between K_c , T_r , and canopy cover which could be a benchmark for further research on irrigation management under regional and national level and support in on planning and design irrigation water management, and agricultural water use efficiency. It can be used as a source of information for developing new sesame genotypes for higher WUE and K_y , to cope the triggering climate, particularly in arid and semi-arid areas; where rainfall is a limiting climatic factor for crop growth and yield in Ethiopia.



Biography – Mr. Abadi is a PhD student in Hawassa University, Ethiopia in the School of Plant and Horticultural Sciences, specialization in agronomy. He is a lecturer and researcher in the department of Plant sciences. He has published more than 8 papers in reputed journals and has been serving as head of department of plant sciences and program leader in the department.

1. Climate Change and Variability Impacts on Agricultural Productivity and Food Security.
2. Modeling irrigation and nitrogen management of wheat in northern Ethiopia
3. The challenges and opportunities for wheat production under future climate in Northern Ethiopia
4. Trends in extreme temperature and rainfall indices in the semi-arid areas of Western Tigray.

[14th International Conference on Agriculture & Plant Science, Webinar, June 22-23,2020](#)

[Abadi Berhane, Crop Coefficient, Yield Response Factor and Water Use Efficiency of Sesame under Full and Deficit Irrigation Conditions in Humera, Western Tigray, agrisummit2020,14th International Conference on Agriculture & Plant Science, Webinar, June 22-23, 2020, pp:](#)