

## Effect of Deficit Irrigation on Photosynthesis Pigments, Proline Accumulation and Oil Quantity of Sweet Basil (*Ocimum basilicum* L.) in Flowering and Seed Formation Stages

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**Abstract :** *O. basilicum* plant was subjected to deficit irrigation using four treatments viz. control, irrigated with 70% of soil water capacity (SWC), Treatment 1, irrigated with 50% SWC, Treatment 2, irrigated with 30% SWC and Treatment 3, irrigated with 10 % SWC. Photosynthesis pigments viz. chlorophyll a, b, and the carotenoids, proline accumulation, and oil quantity were investigated under these irrigation treatments. The results indicate that photosynthesis pigments and oil content of deficit irrigation treatments did not significantly reduced than that of the full irrigation control. Photosynthesis pigments were affected by the stage of growth and not by irrigation treatments. They were high during flowering stage and low during seed formation stage for all treatments. The lowest irrigation plants (10 % SWC) achieved, during flowering stage, 0.72 mg/g fresh weight of chlorophyll a, compared to 0.43 mg/g fresh weight in control plant, 0.40 mg/g fresh weight of chlorophyll b, compared to 0.19 mg/g fresh weight in control plants and 0.29 mg/g fresh weight of carotenoids, compared to 0.21 mg/g fresh weight in control plants. It has been shown that reduced irrigation rates tend to enhance *O. basilicum* to have high oil quantity reaching a value of 63.37 % in a very low irrigation rate (10 % SWC) compared to 45.38 of control in seeds. Proline was shown to be accumulated in roots to almost double the amount in shoot during flowering stage in treatment 3. This accumulation seems to have a pronounce effect on *O. basilicum* acclimation to deficit irrigation.

**Keywords :** deficit irrigation, photosynthesis pigments, proline accumulation, oil quantity, sweet basil flowering formation, seed formation

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