IRRIGATION SCHEDULING OF FENNEL (*Foeniculum Vulgare* Mill.)
UNDER TRICKLE IRRIGATION

**ABSTRACT**

*Key words:* Irrigation frequency, fennel, irrigation regime, irrigation scheduling

Fennel being a remunerative crop, is moisture stress sensitive hence, to maintain congenial soil moisture content through the season is very crucial for crop performance. For that actual irrigation requirement of the crop with optimum frequency of irrigation provides the ready information for irrigation scheduling of fennel crop. In order to address the issue the research work was conducted at Instructional Farm, College of Agricultural Engineering and Technology, JAU, Junagadh. The treatments of the experiment were; three irrigation frequency viz; 2 Day (F₁), 3 Day (F₂), and 5 Day (F₃) as main factor and four irrigation levels viz; 0.4 IW/ETᵣ (I₁), 0.6 IW/ETᵣ (I₂), 0.8 IW/ETᵣ (I₃) and 1.0 IW/ETᵣ (I₄) as sub factor and subjected to split plot design with three replications of each treatment. For irrigation requirements, the crop coefficient (Kᵣ) were assessed for various irrigation frequencies. The effect of both irrigation frequency and irrigation levels on growth parameters, yield attributes and yield of fennel was evaluated.

Based on the result analysis, it was found that at initial stage of fennel crop Kᵣ value is high in 2 days frequency which decreases with decrease in irrigation frequency. The Kᵣ adjusted is found to be less than Kᵣ FAO for all the stages of fennel crop. Also the water requirement of the fennel crop more or less similar in all the frequency of irrigation for particular level of irrigation when irrigated up to 120 DAS (Days after sowing). Plant growth in terms of plant height at 30, 60, 90 DAS and at harvest stage was recorded higher 22.34 cm, 55.16 cm, 171.99 cm and 179.21 cm, respectively in treatment combination of 2 days frequency and 1.0 IW/ETᵣ irrigation level. While, in case of yield attributing characters; higher number of umbels per plant (36.67), umbellate per umbels (24.21), and seeds per umbels (509) were recorded in treatment combination of 2 days frequency and 0.8 IW/ETᵣ. Significantly higher number of seeds per umbel (509) and test weight of fennel seed (6.00 g) were recorded in same treatment combination. The same treatment combination (2 days frequency and 0.8 IW/ETᵣ) gave significantly higher seed yield (2288 kg/ha) and harvest index (23.57) than others. The plant growth, yield attributing and yield parameters was found the lowest in treatment combination with less frequency and lower level (5 days frequency and 0.4 IW/ETᵣ).

The response of yield to total water applied (crop water production function) could be described using a second order polynomial function. The highest net return was attained 71928.86 ₹/ha with cost benefit ratio of 2.60 under treatment combination of (at 2 days frequency and 0.8 IW/ETᵣ). Thus, considering the higher seed yield and net return, this combination may be adopted for fennel cultivation under drip irrigation.