

EFFECT OF ALTERNATE PARTIAL FURROW IRRIGATION AND ORGANIC MATTER ON APPLIED WATER DEPTH AND YIELD OF SUNFLOWER.

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ABSTRACT

A field experiment was carried out during the autumn season 2011 in Alrashid District southern of Baghdad to assess the impact of water shortages when applying Alternate partial furrow irrigation and organic matter during growth stages of sunflower compared with Conventional furrow irrigation on the growth and yield of sunflower. The experiment was conducted at two levels of organic fertilizers (with and without organic fertilizer). The experiment was designed according to Randomized Complete Block Design (RCBD) Split Plot Design with three replications. The experiment included six treatments: Conventional furrow irrigation (CFI), Alternate partial furrow irrigation during growth stages except initial stage the conventional irrigation was applied (APFI_i), Alternate partial furrow irrigation during growth stages except the vegetative growth stage the conventional irrigation was applied (APFI_v), Alternate partial furrow irrigation during growth stages except the flowering stage the conventional irrigation has been applied (APFI_f), Alternate partial furrow irrigation during growth stages except phase composition of winning stage the conventional irrigation has been applied (APFI_m) and finally Alternate partial furrow irrigation during all growth stages of sunflower (APFI). The treatment of irrigations was distributed on the main plot randomly while the treatment of manure was distributed on secondary plot. The depth and time of irrigation were identified depending on the attrition of soil moisture by assessing the moisture content until the depletion of 50-60% of available water. The equation of water balance was used to determine depth of water for each stages of plant growth (initial, vegetative growth, flowering, grain maturity). The results showed that the depth of irrigation water differ depending on irrigation methods and levels of organic manure. The average depth of irrigation water for two levels of manure were 800 mm.season⁻¹ for the CFI, but when Alternate partial furrow irrigation applied the depth of water decreased at 37, 21, 35, 35 and 42% for APFI_i, APFI_v, APFI_f, APFI_m, and APFI respectively. No significant differences among the irrigation treatments in high plant, leaf area, head diameter, number of seeds, weight of 500 seeds and seeds yield. This means that partial irrigation did not reduce sunflower growth factors when followed Alternate partial furrow irrigation.

Key words: Alternate partial furrow irrigation, Organic manure, Water balance equation, *Helianthus annuus* L, ground water.