RESPONSE OF WHEAT (*Triticum aestivum* L.) UNDER DRIP FERTIGATION SYSTEM

ABSTRACT

Key words: Drip Irrigation, Fertigation, Wheat, FUE, WUE

The experiment was carried out in winter season of 2017-18 (November-March) at Instructional Farm, College of Agricultural Engineering and Technology, JAU, Junagadh to study the response of wheat (*Triticum aestivum* L.) under drip fertigation system.

The experiment was undertaken with four fertigation levels viz; 40% RDF-N (F₁), 60% RDF-N (F₂), 80% RDF-N (F₃) and 100% RDF-N (F₄) and three fertigation level viz; 0.6 ETc (I₁), 0.8 ETc (I₂) and 1.0 ETc (I₃). Large plot technique was adopted with three replications of each treatment. Fertigation levels and irrigation levels were taken as a main and sub factor respectively. The effect of these factors on plant height, ear length, number of grains per ear, number of tiller per m², number of ear per m², grain yield (kg/ha), biological yield (kg/ha), straw yield (kg/ha), Harvest index, test weight, fertilizer use efficiency, water use efficiency and economics of wheat was analyzed.

Higher plant height at harvesting, grain yield, straw yield and yield attributes were observed at fertigation level 100% RDF-N and irrigation level 1.0 ETc but, it was found that 0.8 ETc statistically at par with 1.0 ETc. So, optimum irrigation level for wheat under drip irrigation system is 0.8 ETc.

Higher fertilizer use efficiency of 84.58 kg/kg was observed at fertigation level 40% RDF-N(F₁) combination with irrigation level 1.0 ETc (I₃). Higher water use efficiency 17.12 kg/ha-mm was observed at irrigation level 0.6 ETc (I₁) combination
with fertilizer level 100 % RDF-N (F4). The highest net return was found as ₹65650.49/ha under treatment F4I3 (100 % RDF-N @1.0 ETc) and lowest net return was found as ₹26247.24/ha under treatment F1I1 (40 % RDF-N @0.6 ETc). Highest benefit cost ratio (2.52) was found with treatment 100% RDF-N with 1.0 ETc, while lowest benefit cost ratio (1.64) was found at 40% RDF-N and 0.6 ETc. Nitrogen concentration reduced as distance from dripper increases. The expansion of fertilizer distribution bulb is more in case of 1.0 ETc as compare to 0.8 ETc and 0.6 ETc.

Considering above facts, wheat crop should be irrigated at 1.0 ETc and fertilized at 100% RDF-N to attain higher grain yield, straw yield, yield attributes and benefit cost ratio.