

CLOGGING RATIO OF EMITTERS AS AFFECTED BY SINGLE AND DOUBLE INLET LATERALS AND SUB-MAIN SIZES

B. MOHANTY¹, S. C. SENAPATI², A. P. SAHU³ & B. PANIGRAHI⁴

¹Research Scholar, Department of Soil & Water Cons. Engineering, CAET, OUAT, Bhubaneswar, Odisha, India

²Professor, Department of Soil & Water Cons. Engineering, CAET, OUAT, Bhubaneswar, Odisha, India

³Associate Professor, Department of Soil & Water Cons. Engineering, CAET, OUAT, Bhubaneswar, Odisha, India

⁴Professor and Head, Department of Soil & Water Cons. Engineering, CAET, OUAT, Bhubaneswar, Odisha, India

ABSTRACT

Experiments were carried out during three growing seasons of 2011 to 2013 in the farmer's field at village Jamunali of Chhendipada block in the district Angul, Odisha, India. The effect of five different single and double inlet lateral connections with three different commonly available sub-main pipe sizes (40, 50 and 63 mm) on clogging ratio of emitters in drip irrigated brinjal (*Solanum melongena* L.) crop was studied. Measurement of discharge of new emitters (at the starting of the cropping season) and discharge of emitters after harvest of crop was taken which exhibited greater values than the corresponding single inlet systems. Maximum mean discharge at starting of cropping season (1.992 lph) and after harvest of crop (1.964 lph) was observed in case of double inlet system with two sub-mains laid at two sides of the plot and the lateral connecting to both the sub-mains at two ends (L₅). For this situation, value of clogging ratio of emitters (CRE) is found to be minimum (1.37) and CRE value (1.41) is very close to the lateral connection where sub-main is laid at the centre of the plot and laterals are laid and looped at both sides of the sub-main (L₄). Value of CRE in case of the single inlet lateral connection where sub-main is laid at one side of the plot and laterals are laid on one side of the sub-main and closed at the tail end (L₁) is maximum (6.51) amongst all the lateral connections. When single inlet laterals laid at one side of sub-main (L₁) is converted to L₂ by looping the laterals, CRE value decreases to 2.52. Similarly CRE value in case of single inlet laterals laid at both side of the sub-main (L₃) is 3.15 and it decreases to 1.41 when L₃ is converted to L₄ by looping the laterals. Values of CRE along the different sub-main sizes are less in case of higher diameter pipes and more in case of small diameter pipes i.e. the CRE value is minimum (2.92) in case of 63 mm pipe (S₃) and maximum (3.05) in case of 40 mm pipe (S₁). Combining both the factors, it is observed that S₃ L₅ (T₁₅) is the treatment with minimum value of CRE. It is also observed that when single inlet systems with laterals laid at one side or both sides of the sub-main are converted to the corresponding double inlet systems by looping the laterals (L₁ to L₂ and L₃ to L₄), the clogging ratio gets reduced which has a direct bearing on the life of the system.

KEYWORDS: Clogging Ratio of Emitters, Double Inlet Lateral, Single Inlet Lateral, Sub-Main