# Farm Level Water Management through Plastic Mulching Under Furrow Irrigation System in Northern India

*R. C. Maurya[1*], Ratna Sahay[1], Sunil Singh[1]. A. K. Singh[2], Vikash Chandra[1], D. K. Tiwari[1], and Archana Singh[1]*

[1]*Scientist, ICAR- Krishi Vigyan Kendra, Unnao-229881 (UP)*

[2]*Senior Scientist and Head, ICAR- Krishi Vigyan Kendra, Unnao-229881 (UP)*

*Corresponding author*

[*]*Scientist, ICAR- Krishi Vigyan Kendra, Unnao-229881 (UP)*

*Email:- rctechite@gmail.com*

## Abstract

*Continuous extraction of ground water put a threat to agriculture in northern states of India. In many regions, extensive use of flood irrigation deplete the groundwater level to out of cavity well drafting capacity. Cost of irrigation and lack of know-how of available irrigation methods are always remain a matter of concern to the farmers. In this context, use of black plastic mulching (BPM) under conventional furrow irrigation (CFI) may prove to be cost-effective water saving techniques for the farmers in water scarcity region. A farm trail was conducted on farmer's field in 2 villages of Unnao district of Uttar Pradesh, India to demonstrate the effectiveness of BPM under CFI in brinjal crop. Three treatments were organized as T1 farmer's practice (FP), T2 as ridge bed with CFI, and T3 as ridge bed covered by black plastic mulch under CFI with 8 replications. Results revealed that CFI significantly saved 6.93 cm (46%) irrigable groundwater than farmers practice whereas the combination of furrow and mulch saved it as 13.70 cm (79%). Mulch affected the significant physiological growth of crop like height, the number of branches, girth, root depth of the plants, also leaf area and fruit weight which affected the yield of brinjal to 21.29 t/ha significantly than FP i.e. 16.81 t/ha while in T2 it was 18.21 t/ha. High yield and low consumption of irrigation water hiked water use efficiency (WUE) significantly to 88.49 Kg/ha-mm from 31.34 Kg/ha-mm (FP). Only in CFI increased WUE marginally by 17.98 Kg/ha-mm from T1. Though the use of plastic mulching involved high cost of cultivation i.e. Rs 56818/- in comparison of farmers practice i.e. Rs 53113 but gave the largest return. The average benefit-cost return (BCR) for the treatments T1, T2, and T3 were recorded as 2.21, 2.58 and 3.26 respectively. Mulch practice with furrow irrigation could be beneficial practice in perspective to reduce the depleting groundwater trend as well as getting higher yield of the crop.*

**Keywords:** Furrow Irrigation, Black Plastic Mulching, Water Use Efficiency, Brinjal Crop, Water Conservation