

Irrigation scheduling and crop establishment techniques in cluster bean-wheat sequence under semi-arid conditions of India - a review

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Received : February 2016 ; Revised Accepted: September 2016

ABSTRACT

Conserving natural resource and maximizing factor productivity have been a great task to accomplish sustainability of the production system in semi-arid regions. Legume-cereal based cropping system plays a predominant role under changing climatic scenarios by conserving natural resources sustainably. Off which, area under cluster bean and wheat crops is increasing over the years in the parts of Haryana and Rajasthan. Farmers in these regions usually following conventional method of cultivation, which leads to destroying the soil structure, high moisture loss and enhances soil erosion, disrupt the cycle of beneficial microorganisms and reduced factor productivity. In such situations, conservation tillage along with scheduled irrigation could leads to better establishment of crops by conserving resources by increasing the factor productivity in the long run. Adoption of bed planting technique could save 15-25% water in the cluster bean-wheat system through improvement in water use efficiency by 15-22% and pulse yield by 18-35% and wheat yield by 10-20%.

Key words: FIRBS, irrigation scheduling, WUE, yield, zero-tillage.

Cluster bean (*Cyamopsis tetragonoloba* L. Taub), locally called guar, is an important legume cash crop, and grown as an industrial crop especially in semi-arid and arid regions of India. Now a days cultivation of guar is gaining ground because of its seeds (guar gum) containing gelling agent thus has important industrial use. This crop is a source to replenish nutrient, especially nitrogen of the low fertility soils and can withstand moisture stress. Wheat (*Triticum aestivum* (L.) emend. Flori and Paol) is the most important strategic cereal crop grown during rabi

season after harvesting cluster bean in semi-arid conditions. Although, these crops are grown under improved irrigation practices coupled with better crop management practices, the individual factor productivity has been declining over the years.

Water is a renewable natural resource and god gift for sustaining all forms of life, food production, economic development, and for general well-being. To feed ever-increasing population coupled with scarcity and gradual decrease in the share of water for agriculture. The only option available is to produce more food per unit of available water (Abdin and Salem, 2009). In future, due to competing demands for non-agriculture sectors, the share of water to agriculture will further reduce to about 72 to 75% by 2050 (IWMI, 2002). Off which, about 52% of

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