Effect of moisture regimes in clusterbean-wheat crop sequence planted on raised beds

Field experiment entitled `Effect of moisture regimes in clusterbean-wheat crop sequence planted on raised bed` was conducted during 2003-04 and 2004-05 at Research Farm of Department of Soil Science, Chaudhary Charan Singh Haryana Agricultural University, Hisar. The experiment was laid out in strip plot design on sandy loam soil and treatments comprised of two methods of planting viz. bed and conventional planting on main plot and three moisture regimes viz. clusterbean: irrigation at 150mm, 200mm and 250mm CPE and wheat; irrigation at CRI + 100 mm, CRI + 150mm and CRI + 200mm CPE in sub plots, replicated thrice.

The bed planting of clusterbean produced higher yield attributes, yield and WUE in both the years. The growth parameter of wheat viz, plant height, LAI and number of tillers were favourably influenced under bed planting than the conventional flat sowing in both the years. But, dry matter accumulation at anthesis and milk stage and biological yield during both the years were higher in conventional flat sowing than bed planting. Grain yield of wheat was not affected due to planting method in both the years. Yield attributing parameters (except grain spike-1 and grain wt. Spike-1), NPK and protein content and PAR value were not influenced by planting methods in both the years. Total water use and irrigation water use was more in conventional flat sowing while the root depth, leaf water potential, stomatal conductance, photosynthesis rate, irrigation WUE and net returns were more in bed planting in both the years of experimentations.

The effect of various moisture regimes on grain yield and WUE of clusterbean was not significant in 2003, due to adequate and well distributed rainfall. During 2004, increase in frequency of irrigation increased the grain yield of clusterbean, being maximum under 150mm CPE. Plant height and number of tillers of wheat in 2004-05 at all the growth stages, LAI and leaves dry weight at anthesis stage and dry weight of all the plant parts at maturity in both the years were significantly higher in higher moisture regimes (CRI + 100mm CPE) than the lower ones (CRI + 150 mm CPE and CRI + 200mm CPE). Grain yield in both the year and straw yield in 2003-04 were significantly higher with higher moisture regime as compared to lower ones. Harvest index and total water use and irrigation water use in both the years and leaf water potential and stomatal conductance at anthesis and milk stage in 2003-04 decreased markedly with decrease in each level of moisture regimes from higher to lower. However the WUE achieved was highest with irrigation at CRI + 200 mm CPE in both years.