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## **Yield, returns and water productivity of cropping systems in hot arid north western Rajasthan**

V.S. Rathore<sup>1</sup>, N.D. Yadava<sup>1</sup>, M.L. Soni<sup>1</sup>, Birbal<sup>1</sup>, V. Nangia<sup>2</sup>,  
A. Kumawat<sup>1</sup> and Mariya Glazirina<sup>2</sup>

*ICAR-CAZRI, Regional Research Station, Bikaner (Rajasthan), India*  
*International Centre for Agricultural Research in Dry Area, Amman, Jordan*  
*Email: rathoreiari@yahoo.co.in*

Assessing yield, returns and water productivity of crops and cropping systems under existing agro-climatic, crop management and socio-economic conditions prevailing in a region are prerequisite to develop and/or identify suitable management options for improving CWP. As the information pertaining to yield, returns and WP of crops and quantification of different variable determining yield and WP are scarce for IGNP command area of India; the present study was undertaken during 2012-2013 and 2013-2014 in Indira Gandhi Nahar Project (IGNP) Stage-I of North western Rajasthan, India.

The EY (economic yield) and ABY (above ground biomass yield) varied considerably amongst studied cropping systems. The EY varied from 4017 to 6259 kg ha<sup>-1</sup>; and ABY varied from 11865 to 17699 kg ha<sup>-1</sup>. Averaged across years, cotton-wheat system had greatest EY followed by cotton-barley, clusterbean-wheat, cotton-mustard and clusterbean-mustard cropping systems. Thus, cotton based cropping system was more productive compared to clusterbean based cropping systems. The profitability of cropping systems measured in terms of net return varied from Rs. 108467 to 191113 ha<sup>-1</sup>. Averaged across the years, clusterbean-wheat cropping system had greatest returns followed by clusterbean-mustard, cotton-wheat, cotton-barley, cotton-mustard cropping systems. The clusterbean based cropping system earned 1.5 to 1.6 folds higher returns than cotton based cropping systems. The water productivity of total water applied measured in terms of economic yield (WP<sub>TWY</sub>) varied from 0.41 to 0.63 kg m<sup>-3</sup>. Averaged across the years, the WP<sub>TWY</sub> for cotton-wheat, cotton-mustard, clusterbean-wheat, clusterbean-mustard and cotton-barley cropping systems were 0.51, 0.41, 0.63, 0.53, and 0.56 kg m<sup>-3</sup>, respectively. The water productivity of total water applied measured in terms of return (WP<sub>TWR</sub>) varied from Rs. 10.2 to Rs. 25.1 m<sup>-3</sup>. Averaged across the years, clusterbean-mustard and clusterbean-wheat cropping systems had higher WP<sub>TWR</sub> than