Lentil Relay Cropping in the Rice-Based Cropping System: An Innovative Technology for Lentil Production, Sustainability and Nutritional Security in Changing Climate of Bangladesh

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Abstract: Bangladesh is one of the most populous and poverty affected country in the world. To meet high demand of food against her blooming population, highest emphasis has been given to cereal production, as the population suffers from protein malnutrition. The soil condition is poor in nutrients and water content. However, growing of legumes helps in improving the soil condition and lentil (*Lens culinaris*) as a food legume has a role in human food, animal feed and sustainable agriculture. Among the pulses, lentil is mainly grown after the harvest of monsoon-rice in the winter season (October-April) in Bangladesh. But in most cases, lentil cultivation, after the monsoon-rice harvesting is delayed in medium high-medium low lands and further aggravated by higher infestation of diseases and insect pests and forced maturity, resulting in lower yields. It was also identified that global climatic changes led to more frequent high temperature during the end of crop cycle. In this perspective, lentil relay in rice field has a great opportunity which ensures timely sowing and best use of residual soil moisture. Various combinations of seed rate, fertilizer application and rice straw height along with different lentil varieties were attempted in the present study. It was observed that lentil varieties, BARI Masur-4, BARI Masur-5 and BARI Masur-7 planted with a rice straw height under 30 cm, at a seed rate of 50 kg/ha and with a fertilizer level at 30-60-30 kg/ha of N-P₂O₅-K₂O produced a lentil seed yield of 2,070 kg/ha. Hence, by inclusion of lentil in the monsoon rice field, lands could be brought under lentil cultivation to enhance lentil production, provide human nutrition and also to ensure soil health improvement for sustainable production system.

Key words: Lentil relay, innovative technology, sustainability, nutritional security, climate change.