

EVALUATION THE RESIDUAL EFFECT OF CROPPING SYSTEM AND INTEGRATED NITROGEN MANAGEMENT ON SUMMER GREENGRAM (*VIGNA RADIATA* L.) IN WINTER MAIZE BASED CROPPING SYSTEM UNDER IRRIGATED CONDITION

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Abstract: A field experiment was conducted during rabi and summer seasons of 2013-14 and 2014-15 at Student's Instructional Farm Department of Agronomy, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur (Uttar Pradesh) to find out the residual effect of integrated nitrogen management (INM) and cropping system on summer greengram in winter maize based cropping system under irrigated condition. The experiment consisted of four sole cropping (sole maize, sole potato, sole linseed and sole mustard), three intercropping systems (maize + potato, maize + mustard in 3:1 row ratio and maize + linseed grown in 3:3 row ratio) and three INM practices, viz. 100% recommended dose of nitrogen (100% RDN), 75% RDN through inorganics + 25% RDN through organics (75 + 25% RDN), and 50% RDN through inorganics + 50% RDN through organics (50 + 50% RDN). The residual effect of cropping system on growth attributes of succeeding greengram such as dry matter accumulation/plant and branches/plant, yield attributes of greengram viz., pods/plant, grains/pod, grain weight/pod, grain weight/plant and 1000-grain weight and nodules/plant and their dry weight, were recorded higher values when grown after sole potato and maize + potato in 3:1 row ratio respectively, closely followed by grown after sole linseed and plots cultivated with maize + linseed respectively, during both the years over rest of the cropping system. Grain and stover yield of succeeding greengram crop were maximized when grown after sole cropping of potato, followed by sole linseed in both the years. The corresponding values, on an average, were 0.934 and 1.417 t/ha and 0.923 and 1.398 t/ha for grain and stover yield of greengram grown after potato and linseed, respectively. Among intercropping cultivated plots, greengram grown after maize + potato recorded, on an average, higher grain yield (0.906 t/ha) and stover yield (1.359 t/ha) over greengram grown after other intercropping systems. Greengram grown after maize + linseed and maize + mustard recorded similar values of grain and stover yield. Harvest index of greengram was maximized when grown after maize + mustard intercropping system (40.56% on mean basis). Minimum harvest index of 39.51% on mean basis was recorded when greengram grown after maize + linseed intercropping system. Similar the residual effect of integrated nitrogen management (INM) on growth attributes, yield attributing characters, Number of nodules/plant and their dry weight of greengram were maximized when grown in previously fertilized plots with 50% N through inorganic urea + 50% N through organics, followed by 75% inorganic + 25% RDN through organic in both the seasons. Previously fertilized plots with 50% N through inorganic urea + 50% N through organics recorded significantly higher values of biological (2.413 t/ha) as well as grain yield (0.973 t/ha) of greengram over remaining INM protocols. Similar trends were followed in respect of stover yield of greengram. On an average, maximum harvest index (40.30%) of greengram was recorded when grown after 50% N through inorganic urea + 50% N through organics fertilized plots, followed by 100% RDN through inorganic fertilized plots (40.03%).

Keywords: Cropping system, Integrated nitrogen management, Residual effect, *Vigna radiata* L.

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