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RESPONSE OF DIFFERENT LEVELS OF ORGANIC MANURES AND INORGANIC FERTILIZERS ON SOIL HEALTH, GROWTH AND YIELD ATTRIBUTES OF CHICKPEA (*CICER ARIETINUM* L.) C*V*. PUSA-362. IN AN INCEPTISOL OF PRAYAGRAJ

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Abstract– The field explore was completed at soil science research ranch of Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj during Rabi season 2021-22. Soil present in the region was sandy soil in surface. The plan was spread out in randomized block plan with three degrees of Organic excrements (0%,50%,100%) and three degrees of Inorganic composts (0%,50%,100%) separately. The outcomes got with treatment T9 (20:40:20 kg NPK + 5 t ha - 1 FYM + 0.4 t ha - 1 Neem cake) showed that the slight lessening in pH, and Bulk thickness, Particle thickness there is critical expansion in pore space, water holding limit, EC, natural carbon, Available Nitrogen, Phosphorus, Potassium and plant development and yield credits T9 (20:40:20 kg NPK + 5 t ha - 1 FYM + 0.4 t ha - 1 Neem cake) gave best outcomes regarding plant level, no of branches, no of pods plants, no of seeds pod-1, seed weight, absolute pod yield. No huge was seen in yield and development of chickpea taken care of and full NPK manure treatment. Application of Organic fertilizers well as it combination with full NPK consider expansion in development and complete yield ascribes of chickpea. As opposed to any remaining medicines, joint utilization of 100% Organic excrements (FYM+Neemcake) +100% NPK shows the main effect on chickpea development.

INTRODUCTION

Chickpea is a leguminous yield normally known as Bengal gram and the biggest delivered leguminous food crop in South Asia getting third position creation wise universally after normal bean (Phaseolus vulgaris L.) and field pea (*Pisum sativum* L). What's more, logical name of chickpea (*Cicer arietinum* L.) hence Cicer got from 'Cicero' notable Roman family and 'arietinum' from 'aries' importance slam's head shape. Two particular sorts of chickpeas are perceived. Chickpea with shaded and thick seed coat are called desi type. The seeds are for the most part little and rakish with a harsh surface. The blossoms are by and large pink, and the plants show different levels of anthocyanin pigmentation, albeit some desi types have white blossoms and no anthocyanin pigmentation on the stem The desi sorts of record for 80-85% of chickpea region. The parts (dal) and flour (besan) are constantly produced using desi type. Among the beats, Chickpea (*Cicer arietinum* L.) is the main heartbeat crop in India, a decent wellspring of protein, which is lacking in the eating regimen of Indian individuals. The significant chickpea creating nations incorporate Pakistan, Turkey, Iran, Myanmar, Australia, Ethiopia, Canada, Mexico, and Iraq. From one side of the planet to the other, chickpea involves an area of 11.56 m ha with a development of 8.78 m and efficiency ranges around 756 kg ha-1 (Annonymous *et al*., 2008). Among the wide range of various nations, India represents

delivering the biggest measure of chickpea contributing 64% of the chickpea creation around the world, (Gaur *et al*., 2010). Today, chickpea is the third most significant heartbeat crop and around 15% of the world's absolute heartbeat creations have a place with this harvest (FAO, 2010). While in 2013, it's creation in India has expanded to 67% and turned into the significant chickpea developing country on the planet bookkeeping 76% of absolute region. The complete region utilized is around 9.18 million hectares with absolute creation of 8.22 million tons and a typical efficiency of 900 kg ha^{-1} (Anon, 2013). Nitrogen is a significant component for the blend of chlorophyll, amino acids and other natural mixtures which add to the structure units of proteins in the plant framework. Phosphorus is a significant manure in chickpea creation, a vital substance compost can raised the expense of creation (Dotaniya *et al*., 2013). Potassium is extremely successful in the nodulation of heartbeat crops hence builds the seed yield through better obsession of nitrogen (Das *et al*., 1975). Utilization of natural wellsprings of supplements on development might function as the 'main thrust" in manageable harvest creation while further developing soil wellbeing and richness (Singh and Singh *et al*., 2012). FYM represents Ranch Yard Fertilizer. On a normal, deteriorated FYM contains 0.5% N, 0.2% P ,and 0.5 % k. FYM worked on physical, substance and natural property of soil alongside the rising accessibility of supplements and contain, full scale and minor supplements. (Lal *et al*., 2021). Neem Cakes can likewise work on the natural substance of the dirt by giving heaps of miniature and full scale supplements (Bhadana *et al*., 2013).

MATERIALS AND METHODS

The strategies utilized and material which are utilized for leading the review relating to the current point under field examination are named "reaction of various degrees of natural excrements and inorganic manures on soil wellbeing, development and yield credits of chickpea (*cicer arietinum* L.) C*v*.pusa-362." In Rabi season 2021-2022 at Research Farm, Department of Soil Science and Agricultural Chemistry, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj during Rabi Season 2020, was 25° 24'30"N scope, 81° 51'10"E longitude, and 98 m above ocean level. Area of Uttar Pradesh have been executed in this section under fitting headings. Subtleties of the test site, soil and environment are portrayed in the section as well as the investigation configuration, building plan, social practices and procedures utilized in the limits. The Prayagraj district is underneath the subtropical belt in South East Uttar Pradesh, encountering outrageous summer temperatures and harsh winters. The greatest nearby temperature is 46 °C - 48 °C and is seldom essentially as low as 4 °C - 5 °C. The overall mugginess was between 20-94%. The typical precipitation in this space is roughly 1100 mm. It goes under a heat and humidity getting a typical yearly precipitation of 1100mm, the heaviest precipitation from July to the furthest limit of October. Sometimes, nonetheless, the downpour was intriguing in winter. The cold weather months were cold and the late spring months were extremely blistering and dry. The base temperature during the developing season was 27.1 °C and the base was 39.94 °C. Mugginess least was 57.70% and most extreme was 75.37%. The analysis was led at sandy topsoil soil. The preliminary comprised of 9 medicines and the field was set in a Randomized Block Design with three copies by taking Neem Cake (0%,50%,100%) and FYM (0%,50%,100%) with various levels. Nitrogen, Phosphorus and Potassium are applied basal does into the field. The wellsprings of NPK were urea, SSP, MOP. The soil sample from 0-15 cm and 15-30 cm depth were taken for investigation of soil physic-synthetic properties. Actual properties are mass thickness, partical thickness, pore space, water holding limit and compound properties are PH, EC, Organic carbon, accessible nitrogen, accessible phosphours, accessible potassium.

RESULTS AND DISCUSSION

Response on soil physical properties

use of Organic and Inorganic compost change in mass thickness at 0-15 cm and 15-30 cm soil profundity. Greatest mass thickness was kept in outright control into T_1 for example 1.356 Mg m^{-3}, 1.358 Mg m^{-3} and Lowest mass thickness was recorded into (20:40:20 kg NPK +5 t ha^{-1} FYM +0.4 t ha^{-1} Neem cake) T_9 i.e. 1.348 Mg m^{-3}, 1.350 Mg m^{-3} at 0-15 cm and 15-30 cm soil profundity separately. Most minimal molecule thickness was recorded into T_9 i.e. 2.461Mg m^{-3} and 2.483Mg m^{-3} at 0-15 cm and 15-30 cm soil profundity individually and greatest molecule thickness was kept in outright control into T_1 for example 2.511 Mg m^{-3} and 2.523Mg m^{-3} at 0-15 cm and 15-30 cm soil profundity separately.

Comparative outcome were recorded by Ambrin Rajput *et al*. (2018). The most elevated pore space (%) of soil found at T_9 54.58, 54.89 and the insignificant impact (%) of pore space values found in T_1 49.93, 50.37 at 0-15 cm and 15-30 cm soil profundity individually. Most extreme Water holding limit was recorded into T_9 for example 56.12, 52.79 percent and least water holding limit kept in outright control into T_1 for example 53.41, 48.97 percent at 0-15 cm and 15-30 cm soil profundity individually. Comparable outcome revealed by S. Verma *et al*., (2018).

Response on soil Chemical Properties

Utilization of Organic and Inorganic manure influence the dirt pH at 0-15 cm and 15-30 cm soil profundity. Greatest soil pH saw in outright control for example T_1 7.56,7.62 and least into (20:40:20 kg NPK +5 t ha-1 FYM +0.4 t ha-1 Neem cake) T_9 for example 7.37, 7.44 at 0-15 cm and 15-30 cm soil profundity individual. Comparative outcome were recorded by R.K. Singh *et al*. (2014). Greatest electrical conductivity (dSm^{-1}) was seen in outright control T_9 for example 0.339, 0.335 dSm^{-1} and least in outright control for example T_1 0.318, 0.314 dSm^{-1} at 0-15 cm and 15-30 cm soil profundity individual. Comparative outcomes were recorded by Nitin Gudadhe *et al*. (2015). Percent natural carbon greatest found in T_9 (20:40:20 kg NPK +5 t ha^{-1} FYM +0.4 t ha^{-1} Neem cake) for example 0.573 %, 0.570 % in 0-15 cm and 15-30 cm soil profundities separately and least natural carbon were kept in outright control for example T_1 0.535,0.533 % 0-15 cm and 15-30 cm soil profundities separately. Comparative outcomes were accounted for by Singh *et al*. (2014). Greatest measure of Nitrogen (kg ha^{-1}) was kept in treatment T_9, i.e. 252.18kg ha^{-1} and 251.17kg ha^{-1} 0-15 cm and 15-30 cm soil profundity respectively. Minimum accessible nitrogen was kept in treatment T_1, i.e. 215.48 kg ha^{-1} and 214.28kg ha^{-1} 0-15 cm and 15-30 cm soil profundity separately. Comparative outcome announced by Lakum *et al*. (2014). Most extreme accessible phosphorus was kept in treatment T_9 for example 20.82 kg ha^{-1} and 19.31 kg ha^{-1} 0-15 cm and 15-30 cm soil profundity individually and least accessible phosphorus was kept in treatment T_1, i.e 17.05kg ha^{-1} and 16.02 kg ha^{-1} 0-15 cm and 15-30 cm soil profundity separately. Comparable outcome detailed by Das *et al*., (2016). Most noteworthy accessible phosphorus was kept in both soil profundity T_9 for example to 20.82kg ha^{-1} and 19.31kg ha^{-1} 0-15 cm and 15-30 cm

Table 1. Response of Organic manure and Inorganic Fertilizer on Physico-Chemical Properties of Soil

Treatments	Depth (cm)	BD (Mg m^{-3})	PD (Mg m^{-3})	Pore Space (%)	WHC (%)	pH	EC dSm^{-1}	OC (%)	N (kg ha^{-1})	P (kg/ha^{-1})	K (kg/ha^{-1})
	0-15	1.280	2.511	49.93	53.41	7.56	0.318	0.535	215.48	17.05	150.24
T_1	15-30	1.284	2.523	50.37	48.97	7.62	0.314	0.533	214.28	16.02	150.12
T_2	0-15	1.275	2.506	49.97	53.89	7.53	0.322	0.539	216.53	17.85	151.18
	15-30	1.281	2.518	50.87	49.12	7.60	0.317	0.536	215.79	16.60	150.54
T_3	0-15	1.270	2.497	50.02	54.62	7.51	0.325	0.541	220.68	18.36	152.50
	15-30	1.276	2.512	51.79	49.87	7.58	0.319	0.538	218.76	17.12	151.67
T_4	0-15	1.264	2.485	50.68	54.88	7.49	0.327	0.544	226.77	18.91	155.93
	15-30	1.271	2.496	51.92	50.23	7.55	0.323	0.542	224.37	17.42	152.41
T_5	0-15	1.259	2.481	51.12	55.17	7.47	0.329	0.549	231.45	19.26	157.59
	15-30	1.268	2.492	52.88	50.87	7.54	0.325	0.546	230.42	18.30	155.56
T_6	0-15	1.252	2.474	51.60	55.31	7.45	0.331	0.552	236.47	19.82	159.78
	15-30	1.261	2.490	52.64	51.46	7.52	0.327	0.551	234.87	18.45	156.62
T_7	0-15	1.247	2.470	52.48	55.78	7.42	0.334	0.557	242.59	20.17	160.62
	15-30	1.257	2.488	53.52	52.16	7.50	0.329	0.553	241.17	18.76	159.21
T_8	0-15	1.243	2.467	53.38	55.80	7.39	0.336	0.566	247.64	20.62	163.32
	15-30	1.247	2.485	53.18	52.79	7.47	0.332	0.562	246.62	19.46	161.46
T_9	0-15	1.235	2.461	54.58	56.12	7.37	0.339	0.573	252.18	20.82	164.44
	15-30	1.241	2.483	54.89	52.79	7.44	0.335	0.570	251.17	19.31	163.52
F-test	-	NS	NS	S	S	NS	S	S	S	S	S
	-	NS	NS	S	S	NS	S	S	S	S	S
S.Em. (±)	-	-	-	0.005	0.007	-	0.002	0.005	0.086	0.121	0.097
	-	-	-	0.004	0.001	-	0.005	0.003	0.099	0.086	0.083
C.D. at 5 %	-	-	-	0.016	0.023	-	0.007	0.013	0.258	0.365	0.291
	-	-	-	0.013	0.005	-	0.001	0.016	0.298	0.258	0.251

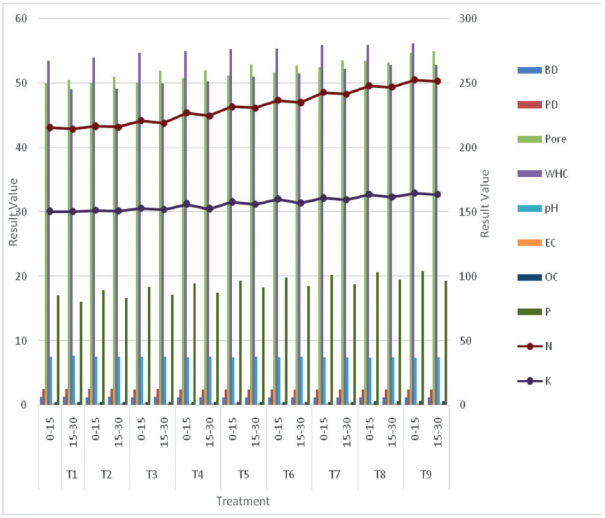

Fig. 1. Response of Organic manure and Inorganic Fertilizer on Physico-Chemical Properties of Soil

soil profundity individually. Most extreme Available potassium (kg ha^{-1}) in 0-15 cm and 15-30 cm soil profundity for example 164.44 kg ha^{-1} and 163.52kg ha^{-1} individually. Comparable outcome announced by Sahu *et al*. (2018).

CONCLUSION

From the analysis trail it was inferred that the treatment mix T_9 (20:40:20 kg NPK + 5 t ha^{-1} FYM + 0.4 t ha^{-1} Neem cake) was found to best in term of molecule thickness, pore space (%), Water holding limit, natural carbon (%), Available Nitrogen, Phosphorus, and Potassium 54.89 (%), 56.12 (%), 0.573 (%), 252.18 (kg ha^{-1}) N, 20.82 (kg ha^{-1}) P, 164.44 (kg ha^{-1}) K as and separately. It's viewed as the best treatment for greatest development and yield boundary and gave most elevated net benefit of (Rs.179426) ha^{-1} and recorded most noteworthy Benefit Cost proportion (1:4.63). It very well may be suggested for beneficial development of chickpea and keep up with the dirt wellbeing.

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