TITLE

PRE - SOWING SEED TREATMENTS WITH PANCHAGAVYA, JEEVAMRUTHA AND BEEJAMRUTHA ON GROWTH, YIELD AND YIELD ATTRIBUTING TRAITS IN Chickpea (*Cicer arietinum* L.) VARIETY-RVG202

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ABSTRACT

The field experiment entitled **Pre-sowing seed treatments of Panchagavya, jeevamrutha and beejamrutha on growth, yield and yield attributing traits in chickpea (*Cicer arietinum* L.) variety- RVG 202** was conducted during *Rabi* 2021at field experimental center, Department of Genetics and Plant Breeding, SHUATS,Prayagraj, (U.P). The trail was laid out in Randomized Block Design withTwelve treatments and control which were replicated thrice. The treatments are as follows, TO- Control, (T1, T2, T3, T4, - Panchagavya – 3%, 5%, 7% and 9%), (T5, T6, T7 and T8 – Jeevamrutha -3%, 5%, 7% and 9%), (T9, T10, T11, T12 – Beejamrutha - 3%, 5%, 7% and 9%) respectively. The experiment results revealed that seeds treated with T8 – Jeevamrutham – 9% gave better than other treatments *viz*, Field emergence, days for 50% flowering and has matured earlier, Days to 50% pod setting, Plant height, number of pods per plant, number of seeds per pod, seed yield per plant, biological yield per plot, Harvest index, Seed index, were significantly higher compared to the other treatments.

Key words: Chickpea, Panchagavya, Jeevamrutha, Beejamrutha,

INTRODUCTION:

After field pea (Phaseolus vulgaris L.) and common bean (Phaseolus arietinum L.), Chickpea *(Cicer arietinum L.)* is the most widely cultivated edible legume in South Asia (Pisum sativum L.). More than 50 countries cultivate chickpeas (89.7 percent area in Asia, 4.3 percent in Africa, 2.6 percent in Oceania,2.9 percent in Americas and 0.4 percent in Europe). The chickpea, or Cicer arietinum L., is a member of the tribe Cicerae, which is in the family Fabaceae. In addition to providing high-quality agricultural waste for animal feed, it is a significant source of high-quality protein in the human diet. The Latin word cicer, which alludes to the Fabaceae plant family of legumes, is where the word "chickpea" originates. It is also known as the garbanzo bean, a common name with Spanish ancestry. Other well-known foods in this legume family include peanuts, black beans, lima beans, kidney beans, and peanuts. These plants yield pulses, which are edible seeds with a high nutritional value. The larger, round, light-colored Kabuli-type chickpea, which is popular in the United States, and the smaller, dark, asymmetrical Desi-type chickpea, which is popular in India and the Middle East.

Among temperate legumes, chickpea is the most resistant crop to heat and drought stress and is suitable for cultivation in low fertility soils. Chickpeas also help maintain soil fertility through biological nitrogen fixation and contribute to the sustainability of crop systems in grain-legume rotations. Chickpea plants cover 80% of their nitrogen (N) requirements by symbiotic nitrogen fixation and can bind up to 140 kg N ha / 1 from the air. Andhra Pradesh will produce 56,600 tonnes in an area of 465,000 hectares with a productivity of 1218 kg / hectare in 2020-21. According to several private sources, the data given are summarized in Table 1, with production increasing from 95.17 lactones in 2019-20 to 106.51 in 2020-21, Bengal gram's supply and demand scenario. It shows that we are monitoring demand (101.5 lactone). It can be easily filled with the total supply (127.23 lactone).

Panchagavya and Jeevamruth fixatives, phosphorus solubilizers, actinomycetes, fungi. The use of fertilizers leads to increased soil microbial activity and microbial biomass. The introduction of liquid organic matter such as Panchagavya and Jeevamrut leads to an increase in the number of beneficial microorganisms and has a significant effect on the enzymatic activity of the soil. Therefore, they promote plant growth and help maintain a safe environment and plant productivity. Therefore, this study was conducted to assess the effects of Panchagavya, Jeevamrutha, and Beejamrutha on chickpea growth, yield, and yield-induced properties.

Objectives:

Hence, present study were undertaken to assess the effect of panchagavya, jeevamrutha and beejamrutha on growth, yield and yield attributing traits of chickpea.

MATERIALS AND METHODS:

Variety details: RVG202, it was released in the year 2012 from Sehore research center. This variety is suitable for planting under late sown conditions, it showed resistant against. Wilt and moderately resistance reaction against dry root rot and collar rot. The maturity index was about 102 days. It is one of the best high yielding variety and was about 20q/ha. **(ICAR – IIPR, KANPUR).**

The present research on Pre-sowing seed treatments of selected organic on growth, yield and yield attributing traits in chickpea (*Cicer arietinum* L.) variety- RVG 202 was made to identify the effect of seed priming of different kinds on seed quality parameters of chickpea and to find out suitable seed priming method for chickpea. The experiment was laid out in Randomized Block Design with thirteen treatments including control which were replicated thrice in rabi 2021. The treatments are as follows, T_O- Control, (T1, T2, T3, T4, - Panchagavya – 3%, 5%, 7%, 9%), (T5, T6, T7, T8 – Jeevamrutha -3%, 5%, 7%, 9%), (T9, T10, T11, T12 – Beejamrutha - 3%, 5%, 7%, 9%) respectively. The chickpea seeds were primed with above different priming agents in above different concentrations for a given duration 12 hours. After priming seeds were dried to initial moisture content at room temperature. After that the primed seeds were used to grow under field conditions.

Methodology:

 Mechanism of action of Panchagavya: Physico-chemical properties of Panchagavya revealed that they possess almost all the major nutrients, micro nutrients and growth harmones (IAA & GA) required for crop growth. Predominance of fermentative microorganisms like yeast and lactobacillus might be due to the combined effect of low pH, milk products and addition of jaggery/sugarcane juice as substrate for their growth. The low pH of the medium was due to the production of organic acids by the fermentative microbes as evidenced by the population dynamics and organic detection in GC analysis. Lactobacillus produces various beneficial metabolites such as organic acids, hydrogen peroxide and antibiotics, which are effective against other pathogenic microorganisms besides its growth. GC-MS analysis resulted in following compounds of fatty acids, alkanes, alconol and alcohols. **(TNAU AGRITECH PORATAL**)

 Mechanism of action of Jeevamruth: The dung and urine of cow, hybrid cow, were prepared by using 1kg dung, 1 litre urine, 200 g jaggery, 200g flour and 100 g soil from the same field mix them in a big tank properly and keep the tank in shade and cover it with jute bag and it should be breathable and leave it. The mixtures were kept for incubation under shade for 5 days and stirred vigorously for 10–15 minutes three times a day with a wooden stick. The average minimum and maximum

temperatures during the study period were 13.4 and 31.1ºC, respectively. The final volumes of the mixtures were made to 20 litres with water in plastic containers (Ashmeet Kaur 2020)

 Mechanism of action of Beejamrutha: The Beejamrit input was prepared as described before (Bishoi et al. 2017) with a minor modification by mixing the cow dung, and the cow urine, and the lime at fixed quantitates. In India, this is a custom to collect these ingredients from indigenous cattle breeds, 5-times more limestone was added i.e., 250 gm per 20 liters of the Beejamrit preparation as compared to the earlier method (Bishoi et al. 2017). Then, the mixed components were further enriched with forest soils. It may be noted here that the forest soils are considered to be crucial to enriching this input with a microbial load

RESULTS AND DISCUSSION:

Plant height: minimum plant height was exhibited .by treatment T0 [control] (62.3), while maximum plant height was recorded in treatment T8 – Jeevamrutha – 9% - (71.4), followed by, T4 – Panchagavya – 9% (70.2) was significantly higher than other significant treatments. Panchagavya is a powerful plant growth stimulant that increases the biological productivity of plants. It is used to revitalize the soil, protect crops from disease, and improve the nutritional value of fruits and vegetables. It can be sprayed on the leaves, applied to the soil together with irrigation water, or used to treat seeds and seedlings. The optimum concentration for foliar application is 3% Panchagavia. The biochemical properties of Panchagavya include almost all important nutrients such as N, P, and K, as well as micronutrients and growth hormones necessary for plant growth, such as IAA and GA. **(Selvaraj et al., 2007).**

Days to 50% flowering and pod setting: The minimum Days to 50% flowering was exhibited .by treatment T8 - Jeevamrutha – 9% - (63.00) and Days to 50% pod setting was exhibited .by treatment T8 - Jeevamrutha –9% - (72.00). The panchagavya and jeevamrut is a powerful plant growth stimulant that improves the biological effectiveness of crops, fosters intense biological activity in the soil, and makes nutrients available to crops. The use of these organic liquid formulations increased soil microbial activity and population to a higher extent and was beneficial for phosphate solubilization, nitrogen fixation, and other processes.

Number of pods per plant (32.80) and seeds per pod (1.91) were recorded significantly higher in the treatment higher in the treatment panchagavya with concentration of 9% compared to treatments jeevamrutha and Beejamrutha concentrations levels of 7 to 9% and control, due. The fast cell proliferation and elongation that panchagavya may have favoured due to the presence of growth enzymes.

Seed yield (gm): The minimum seed yield per plant (gm) was exhibited .by treatment T0 [control] (7.06), while maximum seed yield per plant (gm) was recorded in treatment T8 – Jeevamrutha - 9% - (13.87), followed by, T4 – Panchagavya – 9% (13.15) was significantly higher than other significant treatments. Moreover, in Panchagavya, when used as foliar sprays, IAA and GA may have stimulated the plant system to increase the synthesis of growth regulators in the cell system and promote substantial growth and development. Both "**Kumar et al. (2010) and Balakumbahan et al. (2010)".**

Biological yield per plot: was exhibited .by treatment T0 [control] (**22.28**),while maximum biological yield per plot was recorded in treatment T8 – Jeevamrutha –9% - (35.82), followed by, T4 – Panchagavya – 9% (35.64) was significantly higher thanother significant treatments.

Harvest index: was exhibited .by treatment T0 [control] (**31.64**), while maximum Harvest index was recorded in treatment T8 – Jeevamrutha – 9% - (38.73), followed by, T4 – Panchagavya – 9% (37.68) was significantly higher than other significant treatments.

Days to maturity: The minimum Days to 50% pod setting was exhibited .by treatment T8 - Jeevamrutha –9% - (106.00) while maximum Days to 50% pod setting was recorded in treatment T0 -[control]- (111.00), followed by, T4 – Panchagavya – 9% (106.00) was significantly higher than other significant treatments. It also increased the biological efficiency of crops, increased the activity level of soil enzymes, facilitated the recycling of soil nutrients in the ecosystem, and enhanced the uptake of cations and anions present in soil particles. These are released slowly during plant growth. , improves the soil structure up to the presence of a favorable nutrient environment under the influence of organic fertilizers, which has a positive effect on vegetative and reproductive growth, ultimately leading to the realization of higher values of growth attributes and higher yields. yielded a yield. **Patel et al. (2021).**

CONCLUSION:

It is concluded from the present study that the seeds of chickpea *(Cicer arietinum L.)* were treated with Jeevamrutha – 9% (T8) for 12 hours, showed significant increasein seed yield per plant (13.87 g), followed by Panchagavya – 9% (T4) for 12 hours. Findings are based on research done in one seasonin Prayagraj (Allahabad) U.P. further trails may be required for considering it for the recommendation.

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Table 1: Influence of Panchagavya, Jeevamrutha, Beejamrutha on plant height, days to 50% flowering, Days to 50% pod setting.

TREATMENT	PLANT HEIGHT	DAYS TO 50% flowering	Days to 50% pod setting
T0 – Control	62.3	70.00	79.00
T1	64.9	66.00	75.00
T2	67.2	65.00	74.00
T3	68.9	69.33	78.00
T4	70.2	64.00	73.00
T5	65.8	69.00	78.00
T6	67.9	64.00	74.00
T7	69.2	65.00	74.00
T8	71.4	63.00	72.00
T9	63.80	64.00	73.00
T10	66.6	66.00	75.00
T11	67.6	65.00	75.00
T12	68.1	68.00	77.00
S. Em (±)	0.50	0.53	0.59
CD (p=0.05)	1.47	1.56	1.74

Table 2: Influence of Panchagavya, Jeevamrutha, Beejamrutha on number of pods per plant, number of seeds per pod, seed yield per plant, biological yield per plot, days to maturity.

TREATMENT	Number of pods per plant	Number of seeds per pod	Seed yield per plant	Biological yield per plot	Days to maturity
T0 – Control	25.96	1.15	7.05	22.28	111.33
T1	27.86	1.22	7.23	22.17	108.33
T2	28.56	1.28	9.20	25.09	108.00
T3	30.02	1.40	11.26	30.57	109.67
T4	31.84	1.78	13.15	35.64	106.33
T5	28.21	1.29	7.93	22.16	111.00
T6	29.60	1.53	10.17	30.07	107.67
T7	30.43	1.67	11.84	33.51	107.00
T8	32.80	1.91	13.87	35.82	106.00
T9	27.85	1.32	7.64	22.31	109.00
T10	28.14	1.35	9.03	30.05	108.33
T11	29.23	1.62	11.08	29.60	107.33
T12	30.39	1.77	12.46	33.06	110.00
S Em (±)	0.32	0.04	0.13	0.31	0.59
CD (p=0.05)	0.93	0.11	0.39	0.91	1.72

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