Original Research Article

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

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 with Twelve 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 (Pisum sativum~~Phaseolus vulgaris~~ L.) and common bean (Phaseolus vulgaris ~~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 America~~s~~ and 0.4 percent in Europe). The chickpea, ~~or Cicer arietinum L.~~, is a member of the tribe

Cicerae, which contains~~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.

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~~ produced 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). It is an important source of high-quality protein in the human diet and also provides high-quality crop residues for animal feed. Using fermented organic fertilizers and bioenhancers such as panchagavya and jivam root are inexpensive eco-friendly formulations made from cow products: manure, urine, milk, tofu and ghee. Panchagavya is a powerful plant growth stimulant that improves the biological efficiency of crops. It is used to revitalize the soil, protect plants from disease, and enhance the nutritional value of fruits and vegetables. It is used as a foliar application, as a soil application together with irrigation water, seed or seedling treatment, etc. 3% Panchagavya is an ideal concentration for foliar application. The biochemical properties of Panchagavya indicate that it has almost all important nutrients such as N, P, K and micronutrients required for plants and growth hormones such as IAA and GA required for plant growth. **(Selvaraj et al., 2007).**

Seeds treated with bacterial cultures isolated from Panchagavya showed the effect of Panchagavya on seed germination, seedling length, seedling vitality index, and significantly higher germination rate (99%). Similarly, Jeevamrut is also rich in a variety of microorganisms such as Azospirillium, PSM, Pseudomonas, Trichoderma, Yeast and Molds, which promotes vast bioactivity in soil and makes nutrients available for harvesting **(Devakumar et al., 2008) Sreenivasa et al. (2010)** r~~R~~eported the presence of many beneficial microorganisms, namely nitrogen

Comment [HP1]: I could not understand the last paragraph

Comment [HP2]: I assume that panchagavya and jivam are plants, if so, please provide their scientific names

Comment [HP3]: What kind of seeds?

Comment [HP4]: What jeevamrut is?

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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 resistancet~~-~~ against~~.~~ w~~W~~ilt 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 p~~P~~re-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 were ~~are~~ as follows, TO- 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 and intensities for a given duration. 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: The organic product Panchagavia may play a growth-promoting and immune role in plant systems. Panchagavya he is made up of nine

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Comment [HP8]: Is there some written and published evidence to support last paragraph?

Comment [HP9]: It is not clear if they are weeds or crops ; scientific names are necessary

Comment [HP10]: The objective was set in the last paragraph

Comment [HP11]: Selected organic?

Comment [HP12]: They look like new, different objectives

Comment [HP13]: What does rabi means?

Comment [HP14]: What is the difference between concentrations and intensities?

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products. Cow dung, cow urine, milk, cottage cheese, jaguary, ghee, bananas, soft coconut, water. Great results can be achieved with proper mixing.

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 Mechanism of action of Jeevamruth: Ingredients such as cow dung and bovine urine serve as sources of beneficial microbes, which are increased by the use of legume diets and jaguaries. Jeevamruth's beneficial microorganisms help mineralize soil nutrients and make them available to plants when applied to the soil.

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 Mechanism of action of Beejamrutha: Beejamrutha is the processing of plants, seedlings, or any planting material. It is effective in protecting young roots from fungi, soil and seed infections that afflict plants after the monsoon season. It is composed of the same ingredients as Jevamrutha. Take 20 liters of water, 5 kg of local cow dung, 5 liters of local cow urine, 50 grams of lime, and a handful of soil from the farm's outer sea. How to prepare: • Put 5 kg of local cow dung in a cloth and tie it with tape. Hang this in 20 liters of water for up to 12 hours. •Take 1 liter of water, add 50g of lime and leave overnight. • Then, the next morning, push this bunch of cow dung into this water three times in a row so that all the essence of the cow dung is accumulated in this water. • Add a handful of soil to this aqueous solution and stir well. •Finally, add 5 liters of deci cow urine or human urine to this solution, add lime water and stir well.

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RESULTS AND DISCUSSION:

Pre - harvest:

Comment [HP19]: How were these results obtained? What kind of experiment was carried out?

Plant height: minimum field emergence was exhibited .by treatment T0 [control] (62.39), while maximum plant height was recorded in treatment T8 – Jeevamrutha – 9% - (71.41), followed by, T4 – Panchagavya – 9% (70.29) 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).**

Comment [HP20]: Is this a germination percentage? If so, why is it mixed with plant height data?

Days to 50% flowering and pod setting: The minimum dDays to 50% flowering

was exhibited .by treatment T8 - Jeevamrutha – 9% - (63.67) and dDays to 50% pod setting was exhibited .by treatment T8 - Jeevamrutha – 9% - (72.67). 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.

Post - harvest:

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 (g~~m~~): The minimum seed yield per plant (g~~m~~) was exhibited .by treatment T0 [control] (7.06),while maximum seed yield per plant (g~~m~~) 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 than other 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 dDays to 50% pod setting was exhibited .by treatment T8 - Jeevamrutha –9% - (106.00) while maximum dDays to 50% pod setting was

recorded in treatment T0 -[control]- (111.23), followed by, T4 – Panchagavya – 9% (106.33) was significantly higher than other significant treatments. The beneficial effects of the jivam root cause a more vigorous and extensive root system of the crop, resulting in increased vegetative growth, more efficient sink formation and larger sink size, greater vegetative plant parts to grains. Carbohydrate migration, and higher dry matter accumulation during grain filling time. 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).**

Comment [HP21]: Jivam was not used in the experiment¡¡

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.

TREATMENT	PLANT HEIGHT	DAYS TO 50% flowering	Days to 50% pod setting
T0 – Control	**62.39**	**70.00**	**79.00**
T1	64.92	66.00	75.00
T2	67.28	65.00	74.33
T3	68.91	69.33	78.00
T4	**70.29**	**64.00**	**73.33**
T5	65.81	69.00	78.00
T6	67.99	64.67	74.33
T7	69.25	65.00	74.00
T8	**71.41**	**63.67**	**72.67**

T9	63.80	64.33	73.67
T10	66.66	66.00	75.33
T11	67.62	65.00	75.00
T12	68.10	68.00	77.00
F test	S	S	S
S. Em (±)	0.50	0.53	0.59
CD (p=0.05)	1.47	1.56	1.74

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

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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
F test	S	S	S	S	S
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

Comment [HP23]: What does S mean?

Comment [HP24]: What does CD mean?

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