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## Effect of cow-based natural farming inputs and mulching on growth and yield of pea (*Pisum sativum* L.) Under humid southeastern plain zone of Rajasthan

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### Abstract

An experiment was conducted at Agriculture instructional Farm of Department of Agronomy, School of Agricultural Sciences, Career Point University- Kota during rabi season, 2025. Experiment was laid out in Factorial Randomized Block Design with three replication at spacing of 30x10cm in a plot size of 3m X 2m accommodating 200 plants in each plot. Nine Treatments were T<sub>1</sub>(No Jeevaamrit + No Mulch), T<sub>2</sub>(No Jeevaamrit + Straw Mulch), T<sub>3</sub>(No Jeevaamrit + Live Mulch), T<sub>4</sub>(15 day Jeevaamrit + No Mulch), T<sub>5</sub>(15 day Jeevaamrit + Straw Mulch), T<sub>6</sub> (15 day Jeevaamrit + Live Mulch), T<sub>7</sub>(7 day Jeevaamrit + No Mulch), T<sub>8</sub>(7 day Jeevaamrit + Straw Mulch), T<sub>9</sub>(7 day Jeevaamrit + Live Mulch). The results revealed that treatment T<sub>8</sub>(7 day Jeevaamrit + Straw Mulch) was best treatment for most of the characters like days to 50% flowering (70.33 days), days to marketable maturity (102.33 days) treatment T<sub>2</sub>(No Jeevaamrit + Straw Mulch), plant height with treatment T<sub>5</sub> (71.33 cm), number of root nodules per plant with treatment T<sub>5</sub> (25.36), number of pods per plant with treatment T<sub>5</sub> (20.77), pod length with treatment T<sub>5</sub> (8.33 cm), pod diameter with T<sub>3</sub> (1.17 cm) and pod weight with treatment T<sub>9</sub> (7.33g).

**Keywords:** Pea (*Pisum sativum* L.), FYM, Jeevaamrit, mulch

### Introduction

Pea (*Pisum sativum* L.) is an important vegetable crop grown throughout the world. It belongs to family Fabaceae and diploid chromosome numbers are 14. Pea (*Pisum sativum* L.) belongs to family Fabaceae. This crop was grown by Greeks and Romans as an important vegetable crop in 11th century (Khan *et al.* 2013) [4]. It is herbaceous, annual in habit and self-pollinated vegetable crop. The crop is grown for its green pods and seeds. Pea is herbaceous, annual in habit and self pollinated crop grown for its tender and immature pods. It is mainly utilized as vegetable, consumed as pulse, canned, processed or dehydrated. The green and dry foliage are used as cattle feed. Green peas are nutrient-dense containing high percentage of starch, dietary fibers, proteins, vitamin A & C and minerals like Ca& P. Fresh pods contain 7.2% proteins, 19.8% carbohydrates, 0.8% mineral matter, while dried pea grain contains 19.7% proteins, 56.6% carbohydrates, 2.1% mineral matter and 4.4% iron. Leaves are pinnately compound with the rachis terminating in a single or branched tendril. There are large stipules at base of leaf. Pods are smooth, dark green, 5-9cm long containing 8 to10 seeds in single pod. The seeds may be round, angular or wrinkled depending upon type and variety.

Any material used at surface or vertically in soil to assist soil and water conservation and soil productivity is called mulch. Adoption of mulch not only conserves soil, water and energy but also increase crop yield. It is necessary to cover the soil surface as much as possible. Thus, it has become an important strategy to use bio fertilizer and mulch to bring out improvement in soil fertility and protecting environment. It also affects the sustainability of crop production, besides causing environmental pollution. Therefore, there is an urgent need to reduce the usage of chemical fertilizers and in turn increase in the usage of organics. Organic manures increases cation exchange capacity, water holding capacity and phosphate availability of the soil and reduces nitrogen losses due to slow release of nutrients (Tadesse *et al.*, 2013) [7]. There are

several reports, which show that the combined and sole application of organic manures and biofertilizers increase the yield and quality attributes in vegetables. Vermicompost and FYM are highly efficient organic manures which can enhance production and improve the quality of vegetables. Vermicompost increase the growth and yield of plant and it could be best substitute to inorganic fertilizers (Sarma *et al.*, 2011), whereas Farmyard manure is precious organic manure that can improve soil health, increase microbial population due its high humus, macro and micronutrient contents. Seeds when inoculated with *Rhizobium* and Phosphate Solubilising Bacteria produce more pod yield as compared to the un-inoculated (Vaisya *et al.*, 1983) [8]. The liquid formulation contains macro nutrients, micronutrients, vitamins, essential amino acids, growth promoting factors like IAA, GA and beneficial microorganisms (Palekar, 2006) [5]. Organic farming is becoming prominent among the farmers and consumers in India, bearing in mind the safety of food and being ecofriendly. It causes no damage comparing to the conventional farming and improves the long term fertility of soil. Therefore, keeping this in view, the present investigation entitled "Effect of cow-based natural farming inputs and mulching on growth and yield of pea (*Pisum sativum* L.) under humid southeastern plain zone of rajasthan" was carried out with the following objectives:

1. To study the effect of organic manures on growth and yield of pea.
2. To find out the promising combination of organic manures and mulching.

### Materials and Methods

The present investigation was carried out at Agriculture instructional Farm of Department of Agronomy, School of Agricultural Sciences, Career Point University- Kota during rabi season, 2025. This study was limited to one pea variety *viz.*, Azad Matar. The sample was taken in cotton bag allotted a treatment and then brought to departmental laboratory for analysis and then stored in cool place until the measurement. The experiment was conducted comprising following treatments allocated randomly to individual plots. The observations were

recorded on randomly selected plants from each plot and average value was worked out Days to 50% flowering, Days to marketable maturity, Plant height (cm), Number of root nodules per plant, Number of pods per plant, Pod length (cm), Pod diameter (cm) & Pod weight (g). The data were analyzed according to the procedure of analysis of variance as described by Gomez and Gomez (1984) [3] for Factorial Randomized Block Design.

### Results and Discussion

There was significant difference among the treatments as minimum number of days for 50% flowering (65.33 days) was recorded by the treatment T<sub>9</sub> (7 day Jeevaamrit + Live mulch) which was statistically *at par* with treatments. While maximum number of days to 50% flowering (70.33 days) was recorded with treatment T<sub>8</sub> (7 day jeevaamrit + straw mulch) observing 70.33 days. Same findings of Bahadur *et al.* (2006) [1] conducted an experiment to study the effect of organic amendments and biofertilizers on growth, yield and quality attributes of garden pea cv. Azad P-3. The treatments comprised of individual application of FYM, digested studge (DS) and combination with biofertilizers *viz.*, *Azotobacter*. Significantly the maximum days to marketable maturity was recorded by the treatment T<sub>2</sub> (102.33), while minimum number of days to marketable maturity in treatment T<sub>5</sub> (96.50). The maximum Plant height were recorded in T<sub>5</sub> (71.33 cm) and minimum Plant height in T<sub>2</sub> (64.33 cm). Same findings at Baswana and Rana (2007) [2] studied the effect of organic sources and biofertilizers on growth and yield of garden pea. The maximum Number of root nodules per plant were recorded in T<sub>5</sub> (25.36) and minimum Number of root nodules per plant in T<sub>2</sub> (16.33). The maximum Number of pods per plant were recorded in T<sub>5</sub> (20.79) and minimum Number of pods per plant in T<sub>3</sub> (14.70). The maximum Pod length were recorded in T<sub>5</sub> (8.33 cm) and minimum Pod length in T<sub>3</sub> (7.59 cm). The maximum Pod diameter were recorded in T<sub>3</sub> (1.17 cm) and minimum Pod diameter in T<sub>1</sub> (1.09 cm). The maximum Pod weight were recorded in T<sub>9</sub> (7.33 g) and minimum Pod weight in T<sub>2</sub> (6.29 g).

**Table 1:** Growth and Yield Parameters of Pea variety.

Treatment Code	Treatment	Days to 50% flowering	Days to Marketable maturity	Plant height (cm)	Number of root nodules per plant	Number of pods per plant	Pod length (cm)	Pod diameter (cm)	Pod weight (g)
T <sub>1</sub>	No Jeevaamrit + No Mulch	67.59	99.50	65.66	18.36	15.50	7.80	1.09	6.66
T <sub>2</sub>	No Jeevaamrit + Straw Mulch	68.62	102.33	64.33	16.33	15.33	7.77	1.15	6.29
T <sub>3</sub>	No Jeevaamrit + Live Mulch	69.43	100.43	66.26	17.60	14.70	7.59	1.17	6.59
T <sub>4</sub>	15 day Jeevaamrit + No Mulch	67.31	98.69	68.56	21.00	15.30	7.66	1.13	6.78
T <sub>5</sub>	15 day Jeevaamrit + Straw Mulch	65.50	96.50	71.33	25.36	20.79	8.33	1.16	7.29
T <sub>6</sub>	15 day Jeevaamrit + Live Mulch	67.15	98.15	66.25	23.50	19.25	7.98	1.10	6.80
T <sub>7</sub>	7 day Jeevaamrit + No Mulch	68.25	98.33	64.53	20.56	17.86	7.90	1.11	6.71
T <sub>8</sub>	7 day Jeevaamrit + Straw Mulch	70.33	101.00	65.33	20.80	15.95	7.78	1.14	6.88
T <sub>9</sub>	7 day Jeevaamrit + Live Mulch	65.10	97.33	69.66	21.33	20.77	8.23	1.15	7.33
	Mean	67.69	99.14	66.87	20.53	17.27	7.89	1.13	6.81
	C.D (0.05)	3.27	2.78	2.50	1.96	1.84	0.46	0.07	0.83
	SE(m)	1.13	0.96	0.86	0.68	0.63	0.16	0.02	0.28
	C.V.	2.93	1.72	2.21	5.60	5.97	3.49	3.70	7.22

### Conclusion

In view of the economic importance of the pea under humid southeastern plain zone of Rajasthan, there is a need to develop and identify the promising cultivars either through selection or hybridization among the existing treatments of the superior genotype by involving the suitable in this cultivars. In the

present investigation the cultivars Azad Matar has been found superior with respect to physical characteristics.

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