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## Effects of organic products on wheat crop

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#### Abstract

Wheat is also known as *Triticum aestivum* L. which is a part of genus *Triticum*. It has different species and its chromosome no. is 42 and the major varieties of wheat are Emmer wheat, Macaroni wheat, Common Bread wheat and Bread wheat. It is cultivated worldwide and it is also known as Rabi crop (winter crop) and it is main ingredient in making chapaties, whole meal bread, cake and many more. It contains high protein percentage around 8-15% however some protein forms are insoluble in water which are known as gluten and gluten contains the highest percentage that is 16-50%. The experiment was conducted under the Agriculture Science Under-Graduate Programme of Lovely Professional University Phagwara (Punjab); to determine the yield and the plant height of wheat crop under different organic products, this experiment included five pots with different kinds of organic material such as FYM (farm yard manure), Beeja Amrit, Jeeva Amrit, Jaggery Solution and Ash. Firstly, clean the pot thoroughly and remove all the clods, dry husk and stones, prepare it for sowing purpose and mix the farm yard manure with the soil in pot one. Treat the seeds with Jaggery solution, Ash and Beeja Amrit. The analysis of the project is collecting the data of the germination Percentage, no. of leaves, leaf size and no. of branches.

**Keywords:** Wheat, yield, growth, germination

#### Introduction

wheat is cultivated all over the world for its seed, it is a staple food and genus *Triticum* is Made of most of the species of wheat and *T. aestivum* is the most widely grown wheat. Wheat was first cultivated in 9600BCE in the region of the Fertile Crescent. Scientifically kernel is a wheat fruit called caryopsis. It is cultivated worldwide and it is also known as Rabi crop (winter crop) and it is main ingredient in making chapaties, whole meal bread, cake and many more. It contains high protein percentage around 8-15% however some protein forms are insoluble in water which are known as gluten and gluten contains the highest percentage that is 16-50%. According to De Candolle, the wheat was originated in the Euphrates and Tigris and spread there to China, Egypt and other parts of the world. Bread wheat (soft wheat) probably originated in the regions of Pakistan, South Western Afghanistan and southern parts of mountainous Bokhara. Dr. Norman E. Borlaug is the father of Green Revolution. After the 1970s, three varieties Hira, Moti and UP 301 were introduced in India and were distributed to the farmers. Wheat production in India is now of 72 m.t. which is 11 times higher wheat as compare to it was in 1950-51 that is also equals to the world production. Wheat is grown in 6 states of India, Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, Rajasthan and Bihar however Haryana and Punjab productivity is much more than that of the other states. India's wheat production is expected to be around 109 m.t. by 2020 A.D. with annual increase of 2.2% however the present rate is about 1.0 percent.

#### Classification of Wheat

**Emmer wheat (*Triticum dicoccum*):** mostly it is grown in Spain, Italy, Germany and Russia whereas in India it is grown in Maharashtra, Tamil Nadu and Karnataka.

**Macaroni Wheat (*Triticum durum*):** It is widely grown in Italy, USA, Canada and Russia. It can tolerate drought and is cultivated in Punjab, Madhya Pradesh, Gujarat, Tamil Nadu and West Bengal.

**Common bread wheat (*Triticum vulgare*):** required alluvial soil for this variety mainly grown in Punjab, Uttar Pradesh, Bihar and some parts of Rajasthan.

**Bread wheat (*Triticum aestivum*):** this kind of variety is cultivated in all parts of the Country. It was introduced by the Dr. N.E. Borlaug of Mexico and also known as Mexican dwarf wheat.

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**General objective**

1. To study the different variations in plant height in various pots
2. Compare the height, leaf length, and the seeds per plant.
3. Various effects of organic materials in different pot

**Materials and methods**

This experiment was conducted in a city Kaithal of Distt. Kaithal, Haryana, India, 136027. Latitude and Longitude 29.8043° N, 76.4039° E. Soil in which experiment was conducted on alluvial soil. Six pots were selected for the experiment in the first pot the seeds were treated with Jaggery solution. Then, treated with Ash, Beeja amrut, Farm yard manure, and without any treatment. Pot should be properly cleaned and remove all the clods, stones, and dry husk. All the parameters were recorded after sowing like, Germination date, germination percentage, no. of leaves, leaf length, total yield.

**Germination date**

After 2-3 days of sowing wheat crop start growing. This happen because of the appropriate moisture level, optimum sunlight and nutrient in soil, prevent from overcrowding of plants.



**Germination percentage**

Germination percentage is dependent on spacing. More the spacing then greater the percentage of germination. After 10-12 days count the number of plants per pot. The lowest germination percentage was seen in pot 5 because the seeds were not treated with any organic material. Weeds were emerge easily.

**Plant height**

After 10-15 days of sowing plant height were measured at regular interval.

Observation of plant height

Treated with ash	Treated with jaggery	Treated with FYM	Treated with Beejamrut	Without treatment
Plant 1=22cm	23cm	23cm	20cm	25cm
Plant 2 = 26cm	25cm	23cm	16cm	24cm
Plant 3= 21cm	27cm	15cm	19cm	15cm
Average plant height = 22 cm	Average plant height= 25cm	Average = 20cm	18cm	21cm

**Beejaamrut**

It is an organic fertilizer which is made by fermentation of cow dung, organic jaggery and cow urine. It can be used for many purposes in organic agriculture by using different doses of Jeeva Amrut for different purpose. It is used as fertilizer, pesticide, for transplanting of sapling, for soaking dry leaves for mulching etc. It is rich source of nutrition for the plant and act as an instant soil fertility enhancer.

- it's application.
10. Beeja amrit is ready to use.

Requirements for the preparation of beejaamrut

Cow dung	½ kg
Cow urine	1litre
Lime	Handful
Soil	Handful
Water	5-10litre
Bucket	20 litre

**Procedure**

1. Take a container of around 20 litres and add 10 liters of water to it.
2. Add 1 litre of cow urine into the container with water and lime.
3. Make a mixture of of ½ kg fresh cow dung and soil.
4. Add this mixture to cow urine and water.
5. Cover the container with the help of cloth and leaves it for fermentation.
6. Stir the solution 5 minutes twice a day daily morning to evening
7. Repeate this process twice or thrice a day for three days.
8. By the fourth day the concentrated solution will be ready
9. Mix one part of the solution with 10<sup>th</sup> part of water for



Cow dung



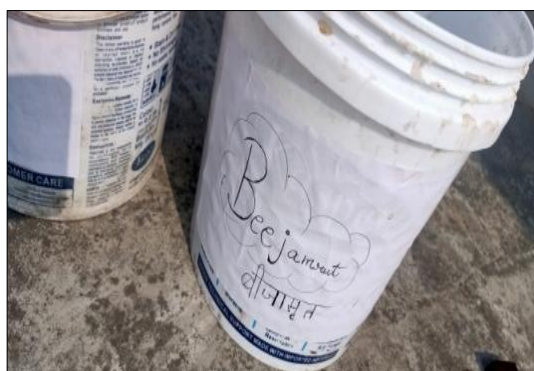
Cow urine



Handful soil



Lime



Final status

**Usage**

Seed or seedling treatment with beeja amrit can be done for better as most of the germination and management of soil borne disease. Seeds are soaked in beeja amrit for 24hrs before sowing.

It increase the fertility of soil and keeps the soil alive.

Add beeja amrit to soil at an interval of every fifteen day.

It is used to prevent pest attack in crop. It is sprayed once in a week or fortnight to prevent pest infestation. It is used as foliar spray.

**Advantage of Beejamrit**

It is very cost effective as most of the ingredients are available with the farmer in ample quantity and is very cheap when compare to chemical fertilizer.

It is organic in nature as all the ingredients used in beeja amrit is naturally obtained.

It helps in agriculture waste management hence prevent soil pollution.

**Result**

Colour –Greenish

Black texture- liquid

Odour –fermented/foul rotten smell

EC -7.72

**Jeevamrut**

- Jeevamruth is a microbial culture prepared from the dung and urine of Indian cows. It is widely used in organic farming as it has the high nutritional contents which are required for the crop. Jeevamruth is a fermented product prepared from the farm resources (cow dung, cow urine, and soil jiggery and pulses flour)
- Jeeva amrut is a microbial culture prepared from the dung

and urine of Indian cows. It is widely used in organic farming as it has the nutritional contents which is required for the crop.

- Jeeva amrut is a fermented product prepared from the farm resources (cowdung, cow urine, soil jiggery, and pulses flour).
- Jeeva amrut is a good sources of beneficial microflora, which supports the plant growth and help in obtaining a good vegetative growth and good quality yield.
- Jeeva Amrut is acidic in nature.

Ingredients	Quantity required
Cow dung	1kg
Cow urine	1litre
Pulses flour	200gm
Jaggery	200gm
Soil	Handful
Bucket	10 litre
Bucket	1

- Procedure:
- A clean drum was taken having capacity of 10 litre.
- Cow dung slurry was prepared by adding 1kg of cow dung and 1 litre of water into the bucket.1 litre of cow dung and mixed.
- 200gm of jaggery and pulses flour.
- A handful soil under the tree.
- Mix all the material into bucket and mix them properly
- Then stir the solution clockwise direction nearly 2 minutes
- Cover the bucket with cloth or jute bag
- Every morning and evening stir the solution for atleast 5 minutes for 4 days.

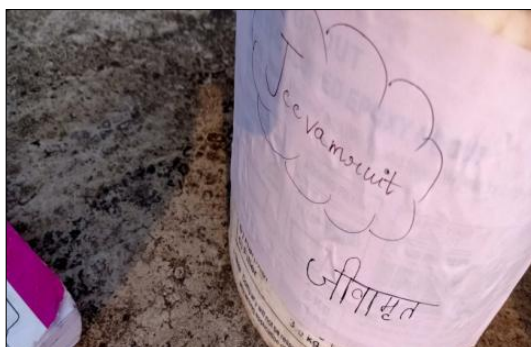


**Microbial population**

Microbial population	Cow (g/l)
Bacterial count	2.6*10*9
Fungal count	1.9*10*4

**Uses**

- It is a store house of microbes.
- It enhances the microbial activity of soil, thus improving



- soil structures.
- It increases the growth rate and yield of the crop
- It can be applied to plant through drip irrigation.
- Result :
- Colour – olive green
- Texture- Insoluble
- Liquid odour – Fermented duration 3-4 weeks.

**Result and Discussion**

From the experiment it is concluded that higher the space then higher is the germination rate. Seeds which are treated with Jaggery solutions are observed largest plant height than other treatment methods.

Those seeds which are treated with beeja amrut produce high germination rate as well as high microbial activity, resist the

crop from the disease and pests because the viscous solution of the beeja amrut produced a foul smell which repel insects and pests. It also contain a lot of essential nutrients which are very essential for the crop as well as for the fertility of the soil.

Jeeva amrut is also sprayed as a foliar on plants which protect the crop from insects and pests.

Nutrients	Cow(g/l)
Carbon	7.19
Nitrogen	0.04
Phosphorous	0.04
Pottasium	0.28
Sulphur	0.43

**Conclusion**

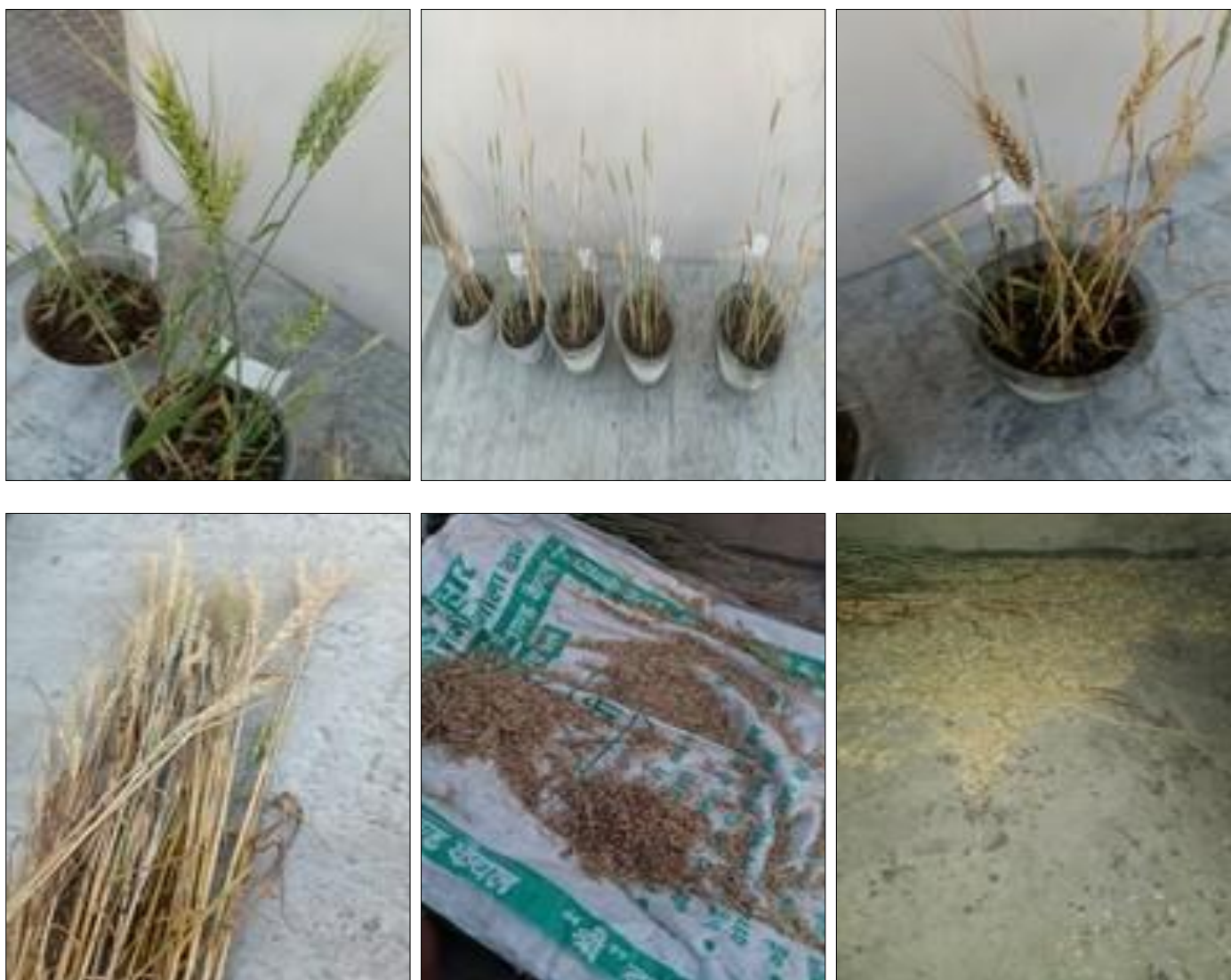
This experiment was conducted in a city Kaithal, Haryana, India. The soil is alluvial and 5 pots were selected to perform this experiment label each and every pot. First pot had soil + Ash, second pot soil+ FYM, third pot soil+ Jaggery solution, fourth pot soil+ beeja amrut, and last pot without any

treatment only soil.

Plant height was observed on a relative period of time and germination percentage was recorded after the sowing and to resist the attack of insects and pests foliar spray of jeeva amrut was provided to the crop.

Seeds per plant was observed at the end of the experiment.





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