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### Effect of organic Fertilizer- Panchagavya on Rabi crop

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#### Abstract

Synthetic inorganic fertilizers are complete balanced fertilizers when applied continuously in the soil reduces the major characters of soil like resistance to pest and diseases and also destroys the natural microbial activity. Organic fertilizers an alternative are in turn environmentally friendly by enhancing the soil fertility and provide rapid nutrients. In our present study Panchagavya, an organic fertilizers from cow ingredients was prepared and was applied on wheat crops at various concentrations (3%, 5% and 7%). Initial germination process was at a faster rate in organic manure sprayed field are at 5% concentration and in control field. It was observed that soil moisture holding capacity was insufficient in the field area where the organic manure was sprayed at 7% and 9% due to which the organic fertilizers were not able to release nutrients for the growth of plants. Nitrogen deficiency was observed in the crops and an unhealthy growing environment was observed.

**Keywords:** Synthetic inorganic fertilizers, Organic fertilizer, wheat crop, moisture content

#### Introduction

Inorganic fertilizers when used in a correct proportion provide higher benefits to farmers. Due to over usage and updated application of inorganic fertilizer can lead to the buildup of salt in the soil. Salt accumulation extracts more energy from plant to allow water from soil, which makes them dried out. Inorganic fertilizer can leach away due to heavy rainfall polluting the streams, ponds and other bodies of water. Such polluted areas supports algal growth and other aquatic plants to grow excessively mainly the water unusable. Several disadvantages of inorganic fertilizer had kindled farmers and industrialist to use an alternative which can support sustainable development. Organic farming system though an older methodology an application in cultivation field has kept the soil alive by enhancing the growth of beneficial microbes which could provide nutrients for sustainable production of crops. In our present study organic manure Panchagavya was prepared and applied on wheat crops and its effects were studied.

#### Materials and Methods:

##### Preparation of Panchagavya

Cow dung of 1 kg and cow ghee of 100 gm was taken in a plastic container and mixed thoroughly both in morning and evening hours and allowed for incubation for 3 days. The plastic container should be kept open under shade. Cow Urine of 1litre along with water of 1 litre was added and kept for 15 days with regular mixing both in morning and evening hours. After 15 days cow milk of 1 litre, cow curd of 500 gm, tender coconut water of 1 litre, jaggery of 500 gm and well ripened poovan banana of 2 no's were added. The content is to be stirred twice a day both in morning and evening. The Panchagavya stock solution will be ready after 30 days

##### Application of Panchagavya

Seeds of wheat were soaked in Panchagavya and water (1:1 ratio) for one hour and seeds soaked in water were used as control. The seeds were sown under invivo condition in the field. The Panchagavya solution was diluted to 3%, 5%, 7% solution and were sprayed during initial stage and before flowering stage of the crop. The plants were irrigated as per the requirement

of crop.

### Germination percentage

Germination percentage was calculated by using the formula

$$\text{Germination \%} = \frac{\text{Seedling Germinated} \times 100}{\text{Total number of seeds}}$$

### Result

Panchagavya's effects were studied on wheat crop in the field of agriculture at Quantum University, Roorkee. The seeds more initially sowed in Panchagavya and water of 1:1 ratio having a control as seeds soaked in water. The seeds were line sowed in the field. Basic irrigation was done as per the requirement of crop. The seeds on germination were sprayed with 3%, 5%, 7% and 9% Panchagavya solution excluding control during the initial stage and before flowering stage. The germination process initiated at a faster rate in control and 5% sprayed organic manure field. Slow germination occurred in the field sprayed with 3%, 7% and 9%. It was observed that the control field and 3% and 5% sprayed organic field area soil had good moisture content retention capacity due to which the growth of the crops were better. The soil of field where 7% and 9% sprayed organic manure was not able to withhold high moisture content and hence the growth of the crop was not remarkable. Soil deficient in moisture content has increased the water stress in plants, due to which the root development was not good. Soil texture and organic matter content make each soil different in nutrient retention capacity (cation exchange capacity). As the soil had low cation exchange capacity most of the nutrients in the fertilizer was lost when applied. Crops were not able to uptake the nutrients and deficiency in crops appeared. Application of organic manure will be effective when the moisture content level in soil is high which on other hand will favor the growth of crops. Hafiz Mohkum Hammad *et al.* (2011) <sup>[1]</sup> stated that usage of green manuring in wheat crop had increased the maximum economic yield in wheat crop. Naila Khatoon Phullan *et al.* (2017) <sup>[2]</sup> stated in their finding that application of farm yard manure in wheat crop was the best source for soil health and wheat production. An inadequate moisture content in the soil will result in cessation of growth and wilting and in more advanced stages it will cause death of the tissues (Veihmeyer and Hendrickson, 1927) <sup>[3]</sup>.

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