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Study on effects of Panchagavya on vegetable crop (Potato)

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Abstract

Man made artificial fertilizers are turning its negative facet to farmers slowly destroying the fertility of soil and decreasing the quality of the produce. This has set an alarming situation for farmer and other sectors in the field of agriculture. Farmers have started their race towards natural produce which fetch them economically well and creating consumer safety and satisfactory. Natural materials as fertilizers play a major role in sustainable development of agriculture. It has also enhanced the biological activities promoting biodiversity supporting the biological cycles. Panchagavya, an organic starting solution prepared by fermenting cow dung and cow urine, contains natural NPK fertilizer. The carbon sources present in the manure enhances the growth of microorganisms in soil whose activity will continuously generate nutrients needed by plants. Panchagavya was applied on growing potato seedlings. Different concentration of the organic solution (3%, 5% and %) were sprayed instead of chemical fertilizer at 15 days interval. 5% concentration solution of organic manure- Panchagavya provided a better yield than the other two concentrations.

Keywords: organic manure, panchagavya, potato, growth

Introduction

Plants can be aided with both organic and inorganic fertilizer for a healthy and strong growth. Organic fertilizer provides a healthy growing environment and inorganic fertilizer provides rapid nutrition. Inorganic fertilizers are immediately available to plants but they create serious effect on soil fertility which causes several environmental issues. Organic manure though having less nutrient content, slow decomposition process when compared to chemical fertilizer has multiple benefits due to balanced supply of macro and micronutrients. The main objective of the study was to prepare organic fertilizer with natural products and study their effect on potato seedlings.

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 1litre, cow curd of 500 gm, Tender coconut water of 1litre, jaggery of 500gm 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

Panchagavya for Potato Cultivation

Seeds of potato 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 1%, 3%, 5%, 7% solution and were sprayed on 15 days interval. The spray was done in the morning to all the plants. The plants were irrigated in one week interval.

Germination percentage

Germination percentage was calculated by using the formula

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

Result and Discussion

Germination effect was found to be 98% in the seeds soaked in organic fertilizer and the seeds soaked in water showed only 72% of germination comparatively (Fig.1). The seeds sown in the field were sprayed with 1%, 3%, 5 % and 7% panchagavya solution on 15 days interval. The growth of plant was effectively increasing with increase in concentration of panchagavya. A lot of leafy vegetation was found in 5% of spraying which had aided the plant to make plenty of food to store underground in structures that will swell into potatoes. The nutrients in the manure had aided rapid development of healthy leaves and roots that reach deep into the soil to provide potato abundance of building blocks and water. Panchagavya at 5 % spraying showed the highest yield of potato than 1%, 3% and 7% spray. Panchagavya having several macronutrients N, P, K and micronutrients are required for growth and development of plants. It also contains various amino acid, vitamins, growth regulators like auxin, gibberellins and also beneficial microorganisms which can support the growth of plants (Raghavendra *et al.*, 2014) [1].

Suchitra Rakesh *et al.*, (2017) [3] has stated that 3% of panchagavya spray on *Abelmoschus esculentus* has provided a better yield. In the findings of Gayathri *et al.*, (2015) [1] increase in concentration of panchagavya had shown better growth in seeds of ladies finger, tomato and french beans.

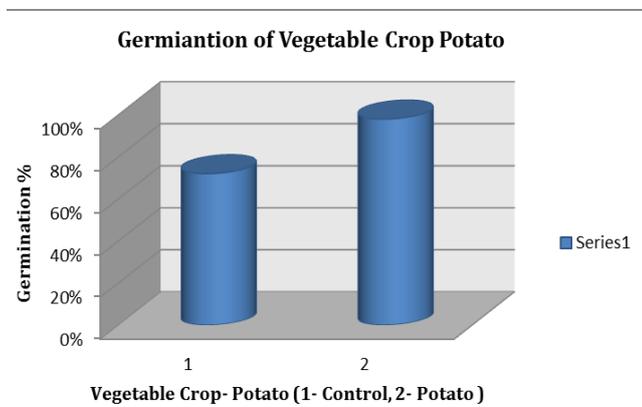


Fig 1: Germination percentage of vegetable crop (Potato)

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