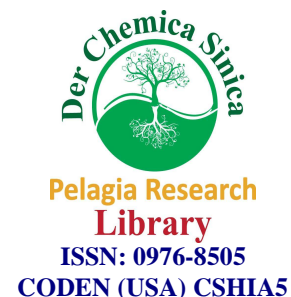




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Study of germination effect of fertilizers like urea NPK and biozyme on some vegetable plants

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ABSTRACT

The common fertilizers (Biozyme, NPK and Urea) were used to study the plant growth regulators on vegetable plants. These vegetable plants have high nutritional and medicinal value. The growth parameters like germination, survival, seedling height and root/shoot ratio etc were studied on the seeds of *Pisum sativum*, *Vigna radiata* and *Vigna catjang* at 0.5 % (v/v) solutions of fertilizers. The results found were used to assay the effect of fertilizers on vegetable plants.

Key words: Urea, NPK, Biozyme, Plant growth parameters, Vegetable plants.

INTRODUCTION

Recently increases the demands of the fresh vegetables in day to day life of human being because the vegetable plants and human being have unique relationship since time immemorial and they played vital role in the human life. People should consume several hundred grammes of plant-based diet a day since it is a good source of nutrients and dietary fibre. A plant-based diet – focusing mainly on vegetables, fruits and whole grains – has become one of the most important guidelines for lowering the risk of human diseases. Therefore, need to improve the nutritive value of the final products of vegetables plant. The important contributions of the nineteenth Century, experimental plant physiology to agriculture was discovery that soil fertility and crop yields could be increased by adding several nutrients to the soil. Even though crop plants require micronutrients in very minute quantities, their deficiencies may affect fundamental physiological and biochemical processes, leading to drastic reductions in yield [1]. Germination is an economical and simple method for improving the nutritive value and several studies have reported [2-5] higher levels of nutrients and lower levels of antinutrients in sprouts compared to the ungerminated seeds. Future agricultural research programs will continue, as in the present, to have as their major goals the production of new and better varieties and strains of crop plant, the important of plant protection against insects, diseases and weeds, the control the soil fertility and increase the mechanization efficiency. But, in addition, this will be a sharp intensification of demands of plant physiologists not only to supply basic information regarding how plants grow and develop also to undertake research programs designed specifically to increase yields of plant products. Biozyme which is toxin free eco-friendly bio-degradable product containing growth hormones, trace element, minerals and vitamins. It is used for higher yield and effective growth of plant and agricultural produces. It also increases the resistance of plant against various pest disease and climatic stress. Effects of Biozyme like to increase the yield of crop and quality of fodder and milk. Compatible with fertilizer and pesticides, increase the tollens capacity of the plant against pest disease and climatic strain. Increase the quality and rate of germination and flowers and fruits,

setting by improving the size, colors, vitamin and proteins and starch in agriculture. NPK is a compound Fertilizer with additional ammonia in standard phosphate for better use base fertilizers prior to growing. NPK is used as fertilizer. when applied as plant Food ,it temporarily increase the soil PH but over a long term the treated ground become more acidic than before upon the nitrification of the ammonium. It is incomplete with alkaline chemicals because it is converting to ammonia in a high pH environment. These are important effect in fighting wild fires as lowering the pyrolysis temperature and increasing the amount of char formed reduces that amount of available fuel and to the largest component of some popular commercial firefighting products. NPK is also used as a yeast nutrient in winemaking and brewing mead, as an additive enhancer, to prevents after glow in purifying crops. Naik *et al* [6] have studied the effect of binary complexes of Pr (III) with some pyrazoles and metal, ligands and control solution on germination survival, seedling height etc. on *Brassica* (Mohari) and *Trigonella* (Methi) plants. The effect of micronutrients on germination and certain growth parameters in *Cicer arietinum* L. have been studied [7] by Shirgave and Ramteke. Ramteke *et al* [8] have studied the effect of common fertilizers on germination on *Trigonella foenum graecum*, *Anethum graveolens* and *Brassica campestris*. Studied [9] the effect of some thiosemicarbazides on the germination pattern of *Brassica campestris* (L.) germination parameters like speed of germination index, Vigor index, root length, shoot length and dry matter were determined after 10 days treatment. These factors are affected by different condition. Sreedevi and Damodharam [10] have studied Exterminate consequence of NaF on seed germination and some morphological changes of major pulse crop *Cicer aritinum* L. Cv. Anuradha (Bengal gram). Hence, some common fertilizers are uses to increase the crop production. So necessitate concentrating on the study of common fertilizers for study the germination pattern. Since, Biozyme, NPK and Urea have intense germination capacity because it's used as common fertilizers in the agriculture field because its increases the nutrients in the soil and since no work is reported on the plant growth regulators of mentioned vegetable plants (*Pisum sativum*, *Vigna radiata* and *Vigna catjang*). Therefore, the aim of this work was to study the effects of Biozyme, NPK and Urea on germination process and growth regulators of *Pisum sativum*, *Vigna radiata* and *Vigna catjang* plants because all these plants have high edible, nutritional and medicinal values.

MATERIALS AND METHODS

The reported [8] method was used to measured the PGR parameters.

Fertilizers Solutions:- For the study of effect of fertilizer on germination, survival and seedling height of plants, 0.5% solution of fertilizers as Urea, NPK Biozyme were prepared using distilled water.

Seeds:- Healthy 15 seed of *Pisum sativa*, *Vigna radiant* and *Vigna catjang* were selected for study.

Soil:- Fertilized soil was collected from around the town of Nipani and it was grind and filtered .This soil was then filled in the petri dishes and then moisture with water then sowing of seeds in this soil after half an hour.

Experiments performed:-

Healthy seeds of *Pisum sativum*, *Vigna radiant* and *Vigna catjang* seeds, are equal size were selected. The selected seeds were soaked in water and kept in refrigerator for 3 hours. These healthy seeds of equal size were chosen were immersed in distilled water, urea solution, biozyme solution and NPK with 7 hours. The seed soaked were taken out of each so in and washed with distilled water the seeds were sowed in the Petri dishes in circle. The experiment carried out during 16 November to 26 December 2012, the petri dishes were kept under the atmosphere pressure and room temperature and it give the sun light treatment at morning 11.00 am to 12.00 am only alternate days. These plants are ideal system to study the germination and growth patterns.

RESULTS AND DISCUSSION

Plant growth is decided on the basis of parameters such as percentage of germination, survival height, shoot length, root length & Root/shoot ratio and thickness of young leaves, this value compare to control system. Germination and survivals were noted after 6 days, 10days. The seedling height, shoot length, root length, root/shoot ratio and thickness of young leaf of survival plants were measured. Plant growth regulator technique (PGR) is most important to study the parameters such as percentage of germinations, survival, seedling height, shoot length, root length and leaf area of young leaves having high values compared to control system. In the present investigation, study the effect of fertilizers and it is represented in the table 1, 2 and 3. The present work, studied effect of the common fertilizers (Urea, NPK, Biozyme) on percentage of seed germination, root length, shoot length, and seedling height it

is presented in the table 1, 2, 3 on crop plants in terms of PGR and their general order of plant growth regulators were found as –

- 1)For *Vigna radiant* Biozyme > control> urea> NPK
- 2)For *Pisum sativum* Biozyme>urea>control>NPK
- 3)For *Vigna catjang* Biozyme>Urea>NPK >Control

The above order of fertilizer for plant regulator determined from the table 1, 2, 3 and Biozyme fertilizer can function as good plant growth regulators for selected crop plants.

Percent Germination:-

Seed Germination is one of the major aspects of plant physiology. To understand an actual development in an organism one has to go through in its life cycle. Germination is an important phenomenon will be affected by different conditions, It was cleared from the observation & that the percent germination in two fertilizers (Biozyme, Urea) system increased than the control and percentage of survival is greater than that of percentage of germination due to fact that remaining seeds were germinated after 3 days.

Root length, shoot length and Root/shoot ratio:-

Germination starts when starts when the seed shows emergence phase of growth which begins with penetration of embryo from the seed coat and end with the development of root/shoot system. The root and shoot development starts within a further fraction of time that the development may vary according to the nutrients required for the development of root and shoot independently. Therefore root and shoot is differ and table 1, 2, 3 clearly indicates that average root length in increase in order like-

- 1)Biozyme > Control > Urea > NPK-For *Vigna radiant*
- 2)Biozyme > Urea > Control > NPK-For *Pisum sativum*
- 3)Biozyme > Urea > NPK > Control-For *Vigna catjang*

The change in the growth pattern of root and shoot were studied by the proportional growth the root/shoot ratio effect the same and represent the development in the root and shoot simultaneously A quantity of seedling have as low a root/shoot ratio as possible to ensure the best survival. The root/shoot ratio low for NPK system hence, the above given plants were best survival in NPK system.

Table No 1: Effect of Fertilizer on Germination, Survival, and Seedling height on *Vigna catjang*.

Sr.No.	PARAMETER	CONTROL	UREA	BIOZYME	NPK
1	Germination Seed No	15	15	15	15
2	% Germination After 3 days	80%	66.66%	73.33%	66%
	%of survival After	73.33%			
3	6 Days	86%	86.66%	93.33%	80%
	10 Days	93.33%	93.33%	100%	80%
	15 Daye	93	100%	100%	80%
4	Seeding High in cm	0.4	0.5	0.7	0.3
	Shoot length in cm				
5	6Days	4.2	2.8	2.5	3.2
	10 Days	4.4	5.8	4.9	5.4
	15 Days	6.5	6.8	7.0	6.2
	Root length in cm				
6	6 Days	0.6	0.4	0.9	0.7
	10 Days	2.2	2.4	2.8	2.6
	15Days	4.1	3.9	5.4	5.9
	Length of young leaf,				
7	6 Days	0.3	0.3	0.4	0.4
	10 Days	0.5	0.7	0.9	0.4
	15Days	0.5	0.7	0.9	0.8
8	Root/Shoot Ratio	0.14	0.14	0.36	0.21

Table No 2: Effect of Fertilizer on Germination, Survival, and Seedling height on *Vigna radiata*.

Sr. No.	PARAMETERS	CONTROL	UREA	BIOZYME	NPK
1	Germination Seed No	15	15	15	15
2	% Germination After 3Days	77.77%	66.66%	80.0%	66.66%
	% of survival				
3	6Days	100%	100%	76.66%	76.66%
	10 Days	100%	100%	100%	76.66%
	15 Days	100%	100%	100%	76.66%
4	Seeding High in cm	2.5	2.7	2.9	2.2
	Shoot length				
5	6Days	1.0	1.3	1.1	0.7
	10 Days	4.1	4.3	5.8	4.1
	15 Days	4.8	5.3	6.2	5.5
	Root length in cm				
6	6 Days	2.2	3.1	3.2	2.3
	10 Days	3.2	3.3	3.6	2.6
	15Days	3.5	3.8	3.7	2.8
	Length of young leaf				
7	6 Days	0.7	0.6	0.8	0.5
	10 Days	1.9	0.9	1.7	0.7
	15Days	2.5	1.5	2.7	0.9
8	Root/Shoot Ratio	2.5	9.2	3.2	2.2

Table No 3: Effect of Fertilizer on Germination, Survival and Seedling height on *Pisum sativum*.

Sr. No.	PARAMETERS	CONTROL	UREA	BIOZYME	NPK
1.	Germination seed no.	15	15	15	15
2.	% Germination after 3days	66.66%	53.33%	60%	73.33%
	% of survival after				
3.	6days	93.33%	86.66%	100%	80%
	10days	100%	93.33%	100%	86.66%
	15days	100%	93.33%	100%	86.66%
4.	Seedling high in cm.	0.7	0.6	1.9	0.3
	Shoot length in cm,				
5.	6day	3.0	3.2	3.4	2.8
	10day	5.3	5.8	6.8	3.5
	15day	7.3	7.6	7.8	7.2
	Length of young leaf,				
6.	6day	0.4	0.3	0.3	0.3
	10day	0.5	0.5	0.3	0.3
	15day	0.5	0.9	0.6	0.7
	Root length in cm,				
7.	6day	1.5	2.4	3.9	1.5
	10day	2.8	4.1	4.3	1.9
	15day	6.8	6.5	6.8	5.9
8.	Root /shoot ratio	0.50	0.75	1.14	0.53

CONCLUSION

In the present work, the biozyme fertilizers are function as a good plant growth regulator than other two fertilizers with all the selected crop plants which tested Urea and control as also functions as good plant growth regulator than the NPK with the same plants.

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