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Bhavin Soni
Department of Lifescience, (PIBS), Pacific University of Higher Education and Research, Udaipur, Rajasthan, India

Chandra Shekhar Kapoor
Department of Environmental Sciences, (PIBS), Pacific University of Higher Education and Research, Udaipur, Rajasthan, India

Correspondence
Chandra Shekhar Kapoor
Department of Environmental Sciences, (PIBS), Pacific University of Higher Education and Research, Udaipur, Rajasthan, India

Comparative study of synthetic fertilizer: Organic fertilizer & their effects on seeds germination

Bhavin Soni and Chandra Shekhar Kapoor

Abstract
Here, we are using so much types of fertilizer for the increase the ability of plant growth and plant immunity but here we have to compare the bio-fertilizer like *A. indicia* compost fertilizer and vermiform post fertilizer. It's biogenic manufacturing fertilizer. Other chemical using fertilizer like urea, pesticides, fungicides, herbicides which is chemical processed fertilizer. More use of chemical fertilizer which is harmful effect on plant and Human health but bio-fertilizer using plant and soil were not lose the ability of fertility and plant gives more yield of seeds. *A. indicia* compost fertilizer which is increase the ability against the fungi and other pathogen those who is affect the plant growth and vermicomposting fertilizer use to increase the soil fertility and adding new proteins and other nutrition which is improve the soil nutrition level.

Keywords: Synthetic fertilizer, organic fertilizer, seeds germination

Introduction
Traditionally agriculture play an important role in to getting the food demand of a growing human being, which has also use to an increasing dependent on chemical fertilizer and pesticides (Santosh *et al.*, 2012). [13] Chemical fertilizers which are produced in industries, substances made up known quantities of Nitrogen, Phosphorous and potassium and their utilization causes air and ground water pollution by eutrophication of water bodies (Youssef *et al.*, 2014). [20] In the agriculture farming organic fertilizer is increase the capacity of fertility and nutrient of soil (Araujo *et al.*, 2008). [4] Organic farming not only scheme of ensure food safety but also adds to the biological diversity (Megali *et al.*, 2013). [10] Organic farming is majorly depend on micro-flora of the which constitutes all types use useful bacteria and fungi including Arbuscular Mycorrhiza Fungi (AMF) called Plant growth promoting Rhizobacteria (PGPR). Bio fertilizer keep the soil enrichment, micro and micronutrients via nitrogen fixation, phosphate and phosphate solubilisation or mineralization release of plant regulating substance, production of antibiotics and biodegradation of organic matter in the soil (Sinha *et al.*, 2014). [14]

Plant growth promoting Rhizobacteria (PGPR) which is actively colonize plant roots and increase plant growth and yield (Cheung *et al.*, 2005). [19] Mechanically they use to promote plant growth can be classified in four distinct group bio fertilizer (Salantur *et al.*, 2006; Cattelan *et al.*, 1999). [5-12] Phytostimulator (Egamberdiyeva *et al.*, 2007), [6] rhizoremediators (Somers *et al.*, 2004) [15] and bio pesticides (Ahmed *et al.*, 2006; Jeun *et al.*, 2004). [2-9] Rhizobium bacteria (PGPR) is a major asset for biological agriculture. This environmental biotechnology is also receiving does without affecting crop yield. It can be evaluated as a component of integrated management strategies in agriculture (Adesemoye *et al.*, 2009; Zemrany *et al.*, 2006; Fuentes- Ramirez *et al.*, 2006). [1-7-8]

Vermicomposting increase the rate of germination and suppress parasitic attack in wide ranges of crops (Arancon *et al.*, 2004) [3] in similar noticed application of vermicomposting on seed germination in mung bean (Nagavallemma *et al.*, 2004). [11] The addition of compost improves soil physical properties by drop-off the bulk density and increasing the soil water increasing the soil water holding capacity (weber *et al.*, 2007). [18]

Synthetic fertilizer's major use is it should be the dangerous for the land fertility and its quality. Organic fertilizers which can help improve the quality of fertility and enrich the new minerals such as like nitrogen, carbon, hydrogen, phosphate, sulphur etc., Synthetic fertilizer is to harm the soil fertility and affect the humankind. It should be in future because the cancer and organ failure situation it may be possible.

Material and Method

Using a material in the experiments

Pasture land of soil, Earthen pots, Vermicomposting fertilizer, *Azardiracta indicia* (Neem tree) compost fertilizer, Urea, Pendimethalin 30% EC (Herbicides), Carbendazim 12% + Mancozeb 63% WP (fungicides), Chlorpyriphos 20% EC (pesticides), weight machine, Nylon mesh.

Preparation of soil

Collecting of soil from the pasture land, then dry, pulverized, sieves by the nylon mesh. After that earthen pots fill with 3 kg soil. Then Mix it well component in 3 kg soil as per given table. At last ten seeds of the *Vigna rediata* (Mung) in all the earthen pots. Note down the result every morning.

Table 1: soil preparation table

Type of Samples	No. of Earthen pots	Using component's quantity Per 3 k. g soil	Using component's quantity Per 3 k. g soil	Using component's quantity Per 3 k. g soil	Using component's quantity Per 3 k. g soil	Using component's quantity Per 3 k. g soil
Control	5	Normal	Normal	Normal	Normal	Normal
Vermi Compost	5	10 gm	20 gm	30 gm	40 gm	50 m
A. india compost	5	10 gm	20 gm	30 gm	40 gm	50 gm
Urea	5	10 gm	20 gm	30 gm	40 gm	50 gm
U/P	5					
Urea		5 gm	10 gm	15 gm	20 gm	25 gm
Pesticides		5 gm	10 gm	15 gm	20 gm	25 gm
U/F	5					
Urea		5 gm	10 gm	15 gm	20 gm	25 gm
Fungicides		5 gm	10 gm	15 gm	20 gm	25 gm
U/H	5					
Urea		5 gm	10 gm	15 gm	20 gm	25 gm
Herbicides		5 gm	10 gm	15 gm	20 gm	25 gm
UPHF	5					
Urea		2.5 gm	5.0 gm	7.5 gm	10.0 gm	12.5 gm
Pesticide		2.5 gm	5.0 gm	7.5 gm	10.0 gm	12.5 gm
Herbicides		2.5 gm	5.0 gm	7.5 gm	10.0 gm	12.5 gm
Fungicides		2.5 gm	5.0 gm	7.5 gm	10.0 gm	12.5 gm

Result

Table 2: Observation table

No. Of sample	No. Of seed put for Germination	Number of seeds germinated	Percentage of germination (%)	Average Percentage of germination (%)
Control C1	10	10	100	
C2	10	06	60	
C3	10	10	100	80%
C4	10	05	50	
C5	10	09	90	
Vermi compost VC1	10	07	70	
VC2	10	09	90	
VC3	10	06	60	76%
VC4	10	09	90	
VC5	10	07	70	
A. indicia Compost NC1	10	10	100	
NC2	10	10	100	
NC3	10	09	90	96%
NC4	10	10	100	
NC5	10	09	90	
UREA U1	10	10	100	
U2	10	07	70	
U3	10	07	70	66%
U4	10	05	50	
U5	10	04	40	
Urea + Pesticides UP1	10	07	70	
UP2	10	03	30	
UP3	10	0	0	32%
UP4	10	04	40	
UP5	10	02	20	
UREA + HERBICIDES UH1	10	07	70	
UH2	10	04	40	
UH3	10	01	10	34%
UH4	10	04	40	
UH5	10	01	10	

UREA + FUNGICIDES UF1	10	03	30	16%
UF2	10	02	20	
UF3	10	02	20	
UF4	10	01	10	
UF5	10	0	0	
UREA+PESTICIDES+HERBICIDES+FUNGICIDES= UPHF1	10	01	10	12%
UPHF2	10	01	10	
UPHF3	10	02	20	
UPHF4	10	02	20	
UPHF5	10	0	0	

Finally, In the experiment we have to take from the pasture land soil as a normal (Control) but in these earthen pots we are found 80% germination, *A. indicia* compost fertilizer having 96% germination found in the earthen pots and vermicomposting having 76% germination found in the earthen pots and lesser germination found chemical fertilizer using earthen pots in sequence Urea<U/H<U/P<U/F< UPHF in order 66, 34, 32, 16, 12. All these taken numbers of results were the experiments using fertilizers like compost fertilizer and chemical fertilizer in that *A. indicia* compost and vermicomposting giving a better result than synthetic fertilizer. Other synthetic fertilizers (urea, herbicides, pesticides, fungicides) given a less number of germination compare to than compost fertilizers (*A. indicia* compost and vermicomposting). Compost fertilizer improve the plant immunity and soil fertility.

Discussion

Whole the experiment taking the different fertilizer sample such as like (*A. indicia*) organic manure compost, vermicomposting fertilizer & synthetic fertilizer like urea and other mixture of fertilizer mixing with urea pesticides, urea fungicides, urea herbicides and at last mixture of urea, pesticides, Fungicides, herbicides. They were mix with different concentration and planting seeds that shown result of that 80% untreated soil (control), vermicomposting 76%, and *A. indicia* 96% of the germination. And the comparison of the synthetic fertilizers urea 66%, UP32%, UH34%, UF16 %, UPHF12%. All the synthetic fertilizers given a result lesser than the Organic fertilizers.

Organic fertilizer in that *A. indicia* organic manure it is the naturally NPK fertilizer and Nitrogen enriched fertilizer that help the growth of plant. Vermicomposting fertilizer enrich the Organic carbon, Nitrogen, Phosphorous, Potassium, sodium, Calcium, Magnesium, Copper, Iron, Zink, Sulphur etc., All the nutrient add by the alimentary canal of earthworm transform Organic waste to natural fertilizer. The Warm casting also contains bacteria. So, the process is continued in the soil and microbiological activity is promoted.

A. indicia Organic manure use as fertilizer beneficially it work as fertilizer, pesticides, and enrich reduce the growth of soil pest and bacteria provide the micronutrient (Subbalakshmi *et al.,* 2012). [16] *A. indicia* organic manure its totally nontoxic 100% natural product, it does not affect the environment.it improve the plant immunity (Vethanayagam *et al.,* 2010). [17] Synthetic fertilizer can severally the nutritional contain of food and decrease the soil fertility. Synthetic fertilizer it will be poisonous for living organism and human kinds.

Conclusion

In the experiment we conclude that the using of different-different fertilizer and mixture of fertilizer. All these types of fertilizers given a different result but *A. indicia* compost given A better result than vermicomposting fertilizer. So, both of compost fertilizers given a better result than chemical Fertilizer. And chemical fertilizer which is given a worst result to add a more contain of chemical fertilizer so, its effect on germination level is decrease. Therefore compost fertilizer is better than chemical fertilizers. Organic manure fertilizer should be used and chemical fertilizer avoid for the improvement of soil fertility and help of humankind.

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