



BIO-ENHANCER USING BIO WASTE

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ABSTRACT

Bio enhancers square measure chemical entities that promote and augment the bioavailability of the medicine which square measure mixed with them and don't exhibit synergistic impact with the drug. the requirement for bio enhancers arises thanks to medicine that square measure poorly out there, administered for long periods, toxic and Expensive. Bio enhancers will be classified supported their natural origin yet as supported the various mechanisms evoked by them once together with medicine to boost their Bioavailability. The varied bio enhancers out there square measure chemical irritant, garlic, Carum carvi, Cuminum cyminum, lysergol, naringin, quercetin, niaziridin, glycyrrhizin, stevia, and cow body waste distillation ginger. Out of those, Cuminum cyminum and niaziridin square measure the potential bio enhancers of future. Therefore, the need of the hour is to hold out in depth analysis on these bio enhancers in order that they might be utilised within the drug formulations.

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INTRODUCTION

Bio enhancers square measure organic preparations, obtained by active fermentation of animal and plant residues over specific period. This square measure made supply of microorganism consortia, macro, micronutrients and plant growth promoting substances together with immunity enhancers. In general this square measure used to treat seeds/seedlings, decomposition of organic materials thereby enrich soil and induce higher plant vigour. There is Associate in Nursing pressing ought to increase food production globally below shrinking natural resources. To our mind, the only answer to handle this drawback is change over to cow primarily based Bio enhancers merchandise rather than Progressive farming, 45 (2) 238 country to respect "Mother Cow". Organic farmer's square measure Murthy has measured energies of cow merchandise noted chemical junction rectifier farming. Several organic farmers square measure reviewing age recent practices of applying garbage, cow urine, and their merchandise within the kind of pesticides. Cow is efficient shoppers of roughages. We have a tendency to feed the cow with leftover merchandise (straw, grasses, bran etc) and cow in turn feeds our crop. We have a tendency to take the oil, and also the crude oil cakes square measure fed to the cow; therefore there's excellent harmony in nature's set up. With the decline in animal population, constraints in convenience of garbage and pee in massive quantities square measure matter of concern.

Bio enhancers thus, could be a good tool to handle multi nutrient deficiencies in most of soils within the country. It is attention-grabbing to record that these are ready at the farm with some infrastructure facilities and experienced hands on coaching. These organisms (bacteria & moulds) improve the soil health by solubilizing the complicated organic substrates in to straightforward forms and build it obtainable to the plant, leading to magnified productivity. It's pertinent to mention that "Cow" plays key role in most of the organic farming systems prevailing in Asian country and elsewhere (Pathak, et al.' 2010). Use of garbage and cow urine as bio management agents for activity plant and human diseases has long history. Writer in as early as 1657as 1657 treated recent cropped wounds with garbage to prevent apple blight. Zhang et al. (1996) reportable the control of Phythium plant disease and anthracnose diseases of cucurbits by enriching soil with compost .The 5 merchandise of cow (dung, urine, milk, ghee and curd) square measure utilized in completely different organic systems. It is said that food that enters in cow's internal organ is part assimilated by the organisms to develop its own dynamic forces. Most of that square measure excreted beside dung. It is unfortunate that with the arrival of fertilizers, slowly Indian farmers have forgotten use of cow merchandise in agriculture and so facing the present crises. Now it is high time that the farming community and scientific fraternity realize the importance of cow for reassuring property in farming and take a look at to bring the glory of cow again with our culture and agriculture. Need to be sent that it's the dung and pee that are essential element in organic farming and these are created obtainable by cow's until her death. This message needs to be communicated to farmers so all cows are cared

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until the last breath of their life. The average size of land holding in Asian country has declined to 1.32 hour angle in two000-2001 from 2.30 hour angle in 1970-71. If this trend continues the common size of land holding would be concerning zero.68 hour angle in 2020 and would be more reduced to an occasional of zero.32 hour angle in 2030 (Anonymous, 2011). Thus Majority of them farmers in Asian country nowadays square measure tiny farmers and concerning seventieth of the population has embraced agriculture as profession. With tiny holdings and small scale farming, there's no alternative higher various than involving oxen in farming system. Few decades earlier farmers had been mistreatment oxen to plough, to pick and transport harvested crops and for range of farming practices. Cow milk, curd, drawn butter for human health, manure as chemical for soil health, cow pee and butter milk for cuss and diseases management accustomed be well established apply in every farming family. While ploughing, the oxen stride field with light pace, which does not hurt the surface of the planet, not like significant machines via; tractors and combines. Whereas tilling the fields, oxen excrete and urinate and so fertilize the land. Cow so plays a key role altogether the systems of organic farming (Nana, 2003 and Pathak and Ram, 2003).

Cow dung- According to Palekar, dung from the Brahman (humped cow) is most useful and has the best concentrations of micro-organisms as compared to European cow breeds like milkier. The complete ZBNF methodology is centred on the Indian cow that traditionally has been a part of Indian rural life.

Cow urine

The use of cow excretory product is thought for an extended time in India. Gaw-mutra (cow's urine) has been represented as a liquid with in numerous therapeutic values, capable of curing many incurable diseases in persons and plants. Cow excretory product is wealthy supply of macro, micronutrients and has disinfectant and prophylactic properties. It purifies the atmosphere and improves the soil fertility. Cow urine has wonderful antiseptic power to kill wide varieties of germs. It helps within the correct functioning of the liver that ensures provider of healthy and pure blood. It provides unwellness resistance power to the body which may be summarized. Cow urine

- It contains ninety five finished, 2.5 % urea, 2.5 et al (mineral salts, hormones and enzymes)
- It contains amino acids, cytokinins, lactones, which play vital role in immunity improvement
- Cow excretory product has medicinal drug, antifungal, antiviral properties; thus it's best secretion of animal origin with in numerous therapeutic values
- The acid within the excretory product acts as fertiliser and secretion
- Cow excretory product contains copper that reworked into gold in material body. Gold has power to destroy all diseases Associate in Nursing is an remedy
- It contains iron, calcium, phosphorus, acid, potash and disaccharides and twenty four kinds of salts
- The medicines made of the cow excretory product square measure wont to cure many diseases
- It disinfectant and prophylactic and purifies and improves soil fertility

- In organic farming, cow excretory product is employed for preparation of variety of bio enhancers and bio-pesticides, which square measure effective in rising soil fertility, quick decomposition of organic wastes and management of large number of pests and diseases in varied cluster Cow drawn butter (clarified butter) may be a terribly special meditative substance and utilized in preparations of some bio enhancers via; amritpani and panchagavya and once used in agnihotra hearth, acts as a carrier agent for refined energies (Narang, 2007). Drawn butter is additionally wealthy supply of energy among all the organic compounds, it includes of glycerine, saturated and unsaturated fatty acids. On combustion and chemical reaction, it produces organic compound, aldehydes and formaldehydes. It conjointly produces glycerine, acetone, pyruvic organic compound, glyoxol, methyl radical and alkyl radical alcohol, ethanal, formic acid and ethanoic acid. Drawn butter is powerful vehicle for transport of energies that sustain life. Energies of Sun square measure captured through drawn butter and their impacts is adjoin large space that nourishes and strengthen each living being, wherever resonance purpose has been established.
- drawn butter is richest supply of energy among all organic compounds
- Special medicative substance acts as carrier of refined energies
- Helps in fast combustion of dung patties in Hamas
- On combustion and chemical reaction these type organic compound, aldehydes and formaldehydes;
- It conjointly provides glycerine, ketone bodies, pyruvic organic compound and glyoxol, methyl radical and alkyl radical alcohol, ethanol, formic acid and ethanoic acid
- drawn butter is powerful vehicle for energies that sustain life
- Energies coming back from sun square measure captured through

Ghee that nourishes and strengthen each living.

MATERIALS AND METHODS

Jivamrita/jeevamrutha could be a soured microorganism culture. It provides nutrients, but most importantly, acts as a chemical change agent that promotes the activity of microorganisms within the soil, as well as will increase dew worm activity; throughout the forty eight hour fermentation method, the aerobic and anaerobic microorganism gift within the trash and excretory product multiply as they eat up organic ingredients (like pulse flour). Some of undisturbed soil is additionally additional to the preparation, as inoculate of native species of microbes and organisms. Jeevamrutha additionally helps to forestall fungal and microorganism plant diseases. Palekar suggests that Jeevamrutha is merely required for the first three years of the transition, once that the system becomes independent.

How to prepare jeevamrutha: Put two hundred liters of water in an exceedingly barrel; add ten kilogram recent native trash and five to ten litres aged cow urine; add two kilogram of jagghery (a native kind of brown sugar), two kilogram of pulse flour and some of soil from the bund of the farm. Stir the answer well and let it ferment for forty eight hours within the

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shade. Now jeevamrutha is prepared for application. Two hundred litres of jeevamrutha is adequate for one acre of land. Jeevamrutha Application Apply the jeevamrutha to the crops doubly a month within the irrigation water or as a tenth foliar sprays.

Bijamrita/beejamrutha could be a treatment used for seeds, seedlings or any planting material. Bijamrita is effective in protective young roots from plant likewise as from soil-borne and seed borne diseases that usually have an effect on plants once the monsoon amount. It's composed of comparable ingredients as jeevamrutha - native trash, a robust natural antifungal, and cow body waste, a strong anti-bacterial liquid, lime, soil. Bijamrita Application as a seed treatment Add Bijamrita to the seeds of any crop: coat them, intermixture by hand; dry them well and use microorganisms within the soil, as well as will increase dew worm activity; throughout the forty eight hour fermentation method, the aerobic and anaerobic microorganism gift within the trash and excretory product multiply as they eat up organic ingredients (like pulse flour). Some of undisturbed soil is additionally additional to the preparation, as inoculate of native species of microbes and organisms. Jeevamrutha additionally helps to forestall fungal and microorganism plant diseases. Palekar suggests that Jeevamrutha is merely required for the first three years of the transition, once that the system becomes independent.

Composition:		
1)	Water	200 litres
2)	Desi cow dung	10 kg
3)	Desi cow urine	5 to 10 litres
4)	Jagghery	2 kg
5)	Flour of any pulse	2 kg
6)	Handful of soil from farm or forest	-

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Live Mulch (symbiotic intercrops and mixed crops): consistent with Palekar, it's essential to develop multiple cropping patterns of monocotyledons (monocots; Monocotyledons seedlings have one seed leaf) and dicotyledons (dicots; Dicotyledons seedlings have 2 seed leaves) big within the same field, to produce all essential parts to the soil and crops. For instance, legumes area unit of the angiosperm cluster and area unit nitrogen-fixing plants.

Monocots such as rice and wheat provide alternative parts like hydroxide, phosphate and sulphur.

Plant Protection

In the event of outbreak of insects and diseases the farmer can himself prepare home made pesticides and use it on the crops.

Fungicide-I

a) Neem leaves	10 kg
b) Tobacco powder	3 kg
c) Garlic paste	3 kg
d) Green chillies paste	4 kg

a) Butter milk fermented for five days	5 litres
b) Water	50 litres

Fungicide II

a) Desi cow milk	5 litres
b) Black Pepper Powder	200 grams
c) Water	200 litres

a) Desi cow milk	5 litres
b) Black Pepper Powder	200 grams
c) Water	200 litres

Insecticide- II

a) Cow dung	5 kg
b) Cow urine	10 litres
c) Neem leaves	10 kg
d) Water	200 litres

Insecticide- I

This mixture is particularly effective against aphids, jassids, mealy bugs and white flies.

Insecticide – II The above ingredients should be soaked in cow urine for ten days. About 3 litres of this mixture can be mixed with 100 litres of water and sprayed on crops. The above mentioned fungicides and insecticides can be prepared by the farmer himself and used either as prophylactic or as curative measure for control of crop pests. If the economic injury to crops due to pests is less than five percent, it should be deemed to be 'return to nature' and no plant protection measures should be taken.

Experimental Results

Field site for the experimentation

Field experiment where conducted in a own farm at Ashti taluka, Bhatkuli, Amravati

Soil and its characteristic

The land was ploughed and harrowed before the wheat plantation. The soil of experimental site was medium black clay soil. Composite soil samples were collected from the experimental site and analyzed for various physical and chemical properties. The details of soil are presented in Table 1.

Sr.No	Properties	Observed
1.	PH	6.87
2.	Available Nitrogen(kg/ha)	--
3.	Available Phosphorus(kg/ha)	29
4.	Available Potassium(kg/ha)	347
5.	Free LimeI	--

Experimental Details

Treatment for Wheat plant.

W1: Handspray Urea+ Water.
W2: Biochar + Water.
W3: Sodium Polyacrylate + Liquid Urea.
W4: Sodium Polyacrylate + Liquid Urea +Biochar.

Treatment for Soybean plant.

S1: Handspray Urea+ Water.
S2: Sodium Polyacrylate + Water.
S3: Sodium Polyacrylate + Liquid Urea



Observations and Inferences

Visit to fields wherever Zero Budget Natural Farming has been adopted and interaction with farmers whose profile has been provided with in annexure discovered that every one of them were raising crops exploitation fashionable technology of improved seeds, fertilizers and plant protection chemicals before adopting this new methodology. They found the previous methodology to be terribly price intensive and by their own estimates the value of cultivation of 1 acre of paddy was Rs.5000/- to Rs. 6000/- which of sugarcane Rs. 15000/- to Rs. 20000/-. equally the value of cultivation of 1 acre of banana was Rs. 25,000/- to thirty,000/-. This typically compelled them to lift loan from typical and institutional sources. However, the returns weren't proportionate with the investments created for raising crops. The turn out from field crops usually met the necessities of the family and also the marketable surplus wasn't enough to repay the loan. economic process were additionally some times prejudicious to the interests of the farmers leading to low value realization. it absolutely was evident from interaction with the chosen farmers that they practiced a variety of agriculture.

In this bleak state of affairs all the farmers elite for study attended orientation courses conducted by Subhash Palekar at completely different places of Mysore. They were convinced that zero budget natural farming is farmer friendly, eco friendly and specially very price effective. These reasons were cogent enough for them to administer this methodology a good trial and therefore move to the current new methodology. The expertise of the active farmers and field observations over a amount of your time lends credence to the subsequent conclusions.

1. The system of zero budget natural farming is eminently suited to the farmers notably little and marginal farmers owing to its simplicity, adoptability and forceful cut in price of cultivation of crops. The charm to the farming community lies within the proven fact that maintaining optimum levels of production and keeping the value of cultivation to the blank minimum can considerably enlarge the margin of profit. All the sample farmers

acknowledged it as farmer friendly and financially viable. But throughout the initial amount of transition to new system, the results won't be encouraging owing to the lingering effects of chemical farming. The results can become evident solely once adequate mulching and restoration of biological activity within the soil. Hence, patience and perseverance ar needed on the a part of farmers.

2. Treatment with Beejamrutha and Jeevamrutha has given very encouraging results for undefeated cultivation of crops. Beejamrutha will offer adequate protection to crops from insects and diseases throughout the initial stages of germination and institution. Mortality just in case of treated crop is reported to be virtually negligible.
3. The expertise of the farmers bears ample testimony to the actual fact that Jeevamrutha promotes fast and large biological activity within the soil. However, it ought to be plus adequate mulching in order that the soil is reworked into humans made reservoir of nutrients. it's additionally discovered that providing Jeevamrutha once during a two weeks is healthier than providing it once during a month. it's been the expertise of farmers that dispensing with the utilization of fertilizers has not adversely affected crop yields. the utilization of handmade pesticides has additionally been found to be effective in managing the crop pests while not economic injury to crops.
4. expertise with this methodology of farming corroborates the actual fact that adequate mulching promotes humus formation, suppresses weeds and greatly reduces the water demand of the crops. Live mulching notably with herbaceous plant crops has been found to be not solely a subsidiary supply of financial gain however additionally a safeguard against depletion of nutrients by crops.
5. Mixed cropping notably with short period legumes, vegetables and even medicative plants has actually swollen the financial gain supply of farmers. Vegetables made in vitamins and minerals ar usually marketed once adequately providing for home consumption and this actually augurs well for over coming back deficiency disease that is widespread in rural areas. Sri. Bannur Krishnappa obtained a further financial gain of quite Rs. 15,000/- by planting Ashwagandha and flame nettle in one acre as intercrop with sugarcane.
6. All the farmers elite for study have expressed satisfaction that shift over to the new methodology from chemical agriculture has paid them smart dividends. Savings on price of seeds, fertilizers and plant protection chemicals has been substantial. the majority the farmers have stopped borrowing crop loan. they're additionally not reckoning on employed labour because the family labour is enough to hold out all the farming operations. The yields are optimum with presumably no decline in future, owing to continuous incorporation of organic residues and filling of soil fertility. The new system of farming has freed the farmers from the debt lure associated it's instilled in them a revived sense of confidence to create farming an economically viable venture. this is often an interesting feature within the dark horizon of the many farmers committing suicide across the country.

Conclusion From the higher than enumeration, it are often over that bio enhancers may be a potent supply to boost soil fertility, crop productivity and quality. this could even be a possible different for fertigation that is becoming common in most of the crops. However, care ought to be taken that bio enhancers that square measure employed in restricted quantities cannot meet the whole nutrient demand of the crops. These merely catalyse fast decomposition of organic wastes in to humus, therefore incorporation of enough bio mass ideally combination of flowering plant and legumes punctually supplemented with animal wastes are useful in quality production of humus, that is necessity for rising soil fertility and crop productivity. Combined with manures and frequent use of bio enhancers will address several challenges of agriculture and can be pave manner for property agriculture through organic resources.

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