Evaluation of an indigenous technology product Kamdhenu against pathogens of soil borne diseases

Bambawale.O.M, Sangle .U.R., Ahmad Nasim, Jafri.A.A, Kanojia.A.K, Rajendran .T.P (National centre for integrated Pest Management, IARI Campus, New Delhi & CICR Regional stations, Coimbatore)

Introduction:

"Kamdhenu" is an Indigenous Technology product of **Govigyan Anusandhan Kendra,** Deolapar, Nagpur and is being used in the management of insect pests and viral diseases (leaf curl and mosaic) without any scientific evaluation. Its constituents are the fermented products of cow urine and neem leaves. The disease controlling properties of Kamdhenu were tested *in vitro* against the most serious soil borne pathogens viz., *Rhizoctonia solani*, *R. bataticola* and *Fusarium oxysporum* f. sp. *vasinfectum.*

Details of "Kamdhenu" Formulation

Raw Material:

1. Cow urine	10 Litres
2. Neem Leaves	02.5 Kg
3. Earthen Pot	
4. Copper Pot	

Preparation:

2.5 Kg of fresh neem leaves are mixed with 10 litres of cow urine in an earthen pot. The pot is then buried in soil for 21 days. After 21 days this earthen pot is taken out and the cow urine and neem leaves are mixed thoroughly and poured in a copper pot. It is then cooked in copper pot till its volume is one fourth of the original.

Recommended Usage for the management of sucking pests and viral diseases:

Mix 1 liter of prepared formulation in 100 liters of water. Spray twice in a month.

Conclusion:

The product holds high promise in the management of diseases caused by *Rhizoctonia* spp. *F. oxysporum* f. sp. *vasinfectum* appears to be favored by Kamdhenu. Critical evaluation of the product against a range of pathogens is necessary for realizing the full potential.

Microbial Analysis of Vermicompost and Biopesticide

Nautiyal C.S, Mehta S, Singh H.B.(**National Botanical Research Institute** , Lucknow)

Table 1.

Plant growth promotery effect of vermicompost on maize plant in soil

S. No.	Treatment	Shoot length (cm)	Root length (cm)	Bio mass[b] (gm)	Biomass increase (%)
1.	Control (No Vermicompost)	31.6	8.3	0.17	0.0%
2.	5% Vermicopost[c]	35	11	0.21	123%
3.	50% Vermicopost	45	11.5	0.32	188%

a. Maize plants were grown in Styrofoam trays under greenhouse conditions for 10 weeks, using garden soil. Data indicate an average value of four plants.
b. Plants were harvested after 10 weeks of growth and dried at 60^{0C} for three days before taking the dry weight.
c. Vermicompost was diluted in tap water to the desired dilution and applied to the soil at the time of the germination of seeds in soil to provide 20% final moisture, which was maintained throughout the growth of plant.

Conclusion:

Significant increases in the shoot length, root length and plant biomass were obtained, which is an indication of an excellent plant growth promotery effect of vermicompost treatment on the growth of maize. It is recommended that 5 to 10% diluted slurry of the vermicompost solution should be used for the treatment. As it gives plant growth promotery affects similar to that of undiluted vermicompost, i.e. more economical for our poor farmers.

Table 2.

Effect of biopesticide on the growth of maize plant in soil[a]

S. No.	Treatment	Shoot length (cm)	Root length (cm)	Biomassb (gm)	Biomass increase (%)
1.	Control (No biopesticide)	31.6	8.3	0.17	0.0%
2.	1% biopesticide[c]	28.3	5.6	0.70	411%
3.	10% biopesticide	35.6	9.6	0.66	388%

a. Maize plants were grown in Styrofoam trays under greenhouse conditions for 10 weeks using garden soil. Data indicate and average value of four plants.
b. Plants were harvested after 10 weeks of growth and dried at 60^0C for three days before taking the dry weight.
c. Biopesticide was diluted in tap water to the desired dilution and applied to the soil at the time of the germination of seeds in soil to provide 20% final moisture, which was maintained throughout the growth of plant.

Conclusion:

Significant increases in the shoot length, root length and plant biomass were obtained, which is an indication of an excellent plant growth promotery effect of biopesticde treatment on the growth of maize. It is recommended that 1 to 10% diluted biopesticide solution should be used for the treatment. As it gives plant growth promotery affects similar to that of undiluted biopesticide , i.e. more economical for our poor farmers

Table 3.

Effect of vermiculite and biopesticide treatment on the growth of the total root length and area of maize plant in soil[a] .

S. No.	Treatment	Root length (cm)	Root b area (sq.cm.)	Root area increase (%)
1.	Control (No vermicompost)	38.7	4.0	0.0%
2.	5% vermicompost[c]	62.3	7.5	188%
3.	50% vermicompost	74.1	8.5	213%
4.	Control (No biopesticide)	31.1	2.6	0.0%
5.	1% biopesticide[c]	45.3	4.4	169%
6.	10% biopesticide	63.3	6.7	257%

a. Maize plants were grown in Styrofoam trays under greenhouse conditions for 10 weeks, using garden soil. Data indicate an average value of four plants. Data was recorded using Biovis Image plus computer software.
b. Plants were harvested after 10 weeks of growth and dried at 60^{0C} for three days before taking the dry weight.
c. Vermiculite and biopesticide were diluted in tap water to the desired dilution and applied to the soil at the time of the germination of seeds in soil to provide 20% final moisture, which was maintained throughout the growth of plant.

Conclusion:

Significant increases in the root biomass and area were obtained, which is an indication of an excellent plant growth promotery effect of vermiculite and biopesticide treatment on the growth of maize.

Microbial Analysis Of Vermicompost And Biopesticide

(Directorate Of Non- Conventional Energy Khadi And Village Industries Commission {KVIC}, Mumbai.)

Vermicompost - Bacterial count in vermicompost was 2.7 Log 10 CFU/gm. Out of the total bacterial population, 54% bacteria demonstrated phosphate solubilisation upto optical density of 0.2, while, none could cross optical density of 0.5 at 680 nm.

Conclusion - Vermicompost has fairly good bacterial load. However, there is an scope of fortifying it with useful microbes (preferably with efficient phosphate solubilising bacteria), to enhance its efficacy. More so it will further provide to you as an value addition product.

Biopesticide - Biopesticide had no microorganisms, i.e. it is microbe free.

Conclusion - The biopesticide preparation is antimicrobial, indeed.