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Minerals Rich Organic Manure (MROM)

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Abstract: ***Indiscriminate use of synthetic chemical fertilizers over past few decades in India and other countries of the world, has become a cause of great concern to maintain long term soil fertility, the soil environment, and its components. The soil microbial community plays a major and important role in fostering soil health and plant growth. While the use of synthetic chemical fertilizers has a profound impact on plant growth, it significantly alters the structure of the microbial community towards a detrimental degradation.***

Sustainable farming practices help in reducing the depletion of natural resources and maintain both productivity and soil fertility. The use of natural minerals that contain fertilizer nutrients in their native state is a very promising approach to reducing emissions associated with the manufacturing industries. Organic material from natural sources (biodegradable agricultural waste, food waste, Cow Dung, Gomutra (Cow Urine), etc.) and the waste obtained from saturated filters of Bunkerman CO2/TVOC Removal Systems, acts as a source of microbial culture and encourages the release of nutrients into the soil during mineral weathering. The combination of nutrient based minerals and their biological weathering agents together with organic matter, has the potential to remediate, restore, and sustain depleted agricultural soils.

In the present invention, four types of "Minerals Rich Organic Manures (MROM-1 to MROM-4)" have been manufactured by making use of the waste obtained from saturated filters of Bunkerman CO2/TVOC Removal Systems, the biodegradable agricultural waste, Cow Dung, Gomutra (Cow Urine) and other important minerals like Rock Phosphate, Zeolite, Bentonite, Gypsum, Kaolin, Carbon, Silica etc, available in nature.

The emphasis has been on the significance of sustaining agricultural productivity and microbial diversity in the rhizosphere, the region of soil in the vicinity of plant roots in which the chemistry and microbiology is influenced by their growth, respiration, and nutrient exchange.

Keywords: mineral fertiliser, organic manure; sustainable farming; pollution, microbes, phosphate

I. INTRODUCTION

It is a well-known fact that normal atmospheric air generally contains 79.03% Nitrogen, 20.94% Oxygen and 0.03% Carbon dioxide by volume. Nitrogen is not absorbed by lungs. Exhaled air contains an average of 4.38% Carbon dioxide [1,2,3]. It is a well known fact that the carbondioxide (CO2) level in the atmospheric air was naturally maintained around 280 ppm over the past many centuries till about 1776 or a little later until beginning of the Industrial Era. However, due to industrial revolution, the CO2 level has started increasing exponentially over the past few decades and it has already reached a world average of about 420 ppm. If it is not controlled by innovative solutions, it is likely to cross a figure of about 520 ppm by the year 2050.

To overcome the above problem of CO2 increase, Bunkerman in India, has recently invented an indigenous technology for which the patent has been filed vide Docket No 128656 dated 17 Nov 2022 with Controller General of Patents, Designs & Trade Marks, India [1,2]. It is observed that when the CO2, TVOC and other pollutants are absorbed/adsorbed in the filter material of Bunkerman a reasonably high value minerals and compounds are generated inside the saturated filters[1,2]. On saturation the filters may be replaced by the new filters and the saturated material of old filters can be utilised as a raw material to obtain "Minerals Rich Organic Manure (MROM)" by mixing and reacting it with other organic materials and compounds such as biodegradable agricultural waste, Cow Dung, Gomutra (Cow Urine), Rock Phosphate, Zeolite, Bentonite, Gypsum, Kaolin, Carbon, Silica etc.

Minerals are also an important component of the soil; they are the skeleton of the soil and the source of mineral elements[4]. Minerals play an important role in the improvement of soil's physical and chemical properties and the growth and metabolism of microorganisms [5 to 8]. However, the beneficial effects of the use of appropriate minerals in the soil have long been neglected. In addition, our research has found that forms of mineral weathering, such as silicate weathering, are often accompanied by the formation of secondary carbonate minerals in the process of biological weathering, which undoubtedly increases the potential of cultivated soil carbon sinks.

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Further studies have shown that secondary minerals formed with mineral weathering have a good remediation effect on heavy metal pollution[9,10]. In addition to the formation of secondary minerals, the cations released by mineral weathering can also combine with the soil's organic complexes through co-precipitation, which in turn mediates the formation of soil aggregates, preserving soil organic carbon, thereby reducing the potential of soil carbon depletion. Therefore, "Minerals Rich Organic Manure (MROM)" has a positive impact on agriculture, soil health and the ecological environment. It provides a new vision and a new dimension for the development of sustainable agriculture in line with reducing the environmental pollution and help in arresting the climate change and global warming.

II. EMBODIMENT

A. Embodiment 1

MROM-1. The material obtained from the saturated BUNKERMAN filters has been found to contain a high value of minerals like N, P, K, Ca, Mg, S, C etc. The constituent and composition depends on the design of the filter adopted and the area in which it has been used. The constituents of the filters used in residential area may well differ from those used in industries and high toxic areas. However, in general, the material contains a good amount of minerals like N, P, K, Ca, Mg, S and C which are useful for the growth of the plants and to maintain biodiversity and clean environment. Therefore, the simplest method of preparing MROM from this waste material is just to crush it into a powder form in dry condition and test its constituents. Additional quantity of minerals or even some additional minerals like Fe, Cu etc can also be added at this stage, if required. The final product is tested in the laboratory to check whether it meets the requirements of the MROM and packed as per the laid down norms for packaging. The Process Flow Diagram is given at Figure 1 below.

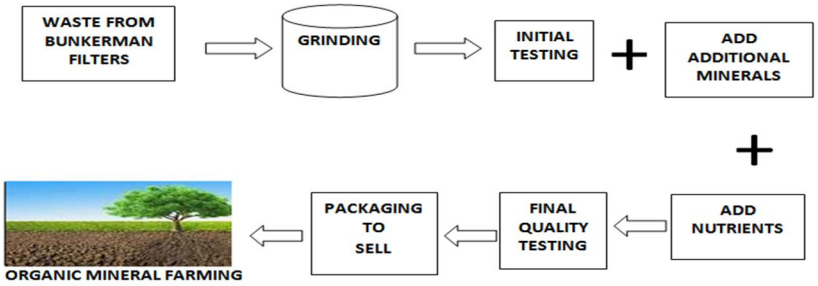


Figure 1 : Simplified Process of Manufacturing MROM-1 From Waste of Saturated Filters of BUNKERMAN's CO2/TVOC and Pollution Removal System

B. Embodiment 2

MROM-2. The preparation of MROM-2 involves simple biological and physical methods as indicated in Figure 2. In this method, the biodegradable agricultural waste, Cow Dung, Gomutra (Cow Urine), the waste obtained from saturated filters of Bunkerman CO2/TVOC Removal Systems and other important minerals like Rock Phosphate, Zeolite, Bentonite, Gypsum, Kaolin, Carbon, Silica etc, depending on the local availability, are used to manufacture MROM.

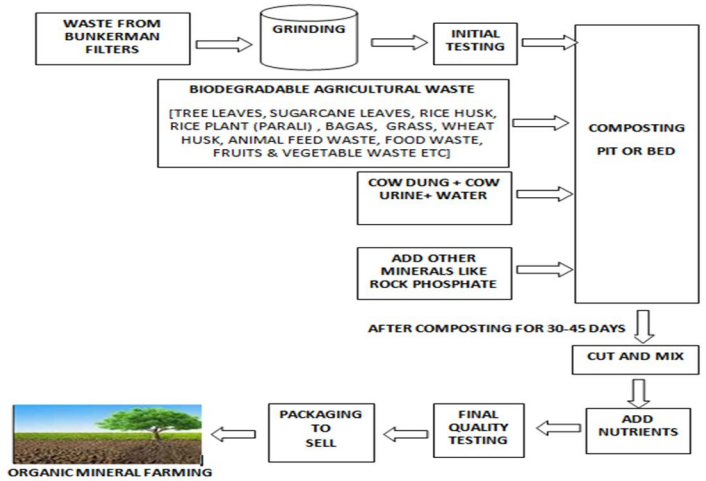


Figure 2 : Simplified Process of Manufacturing MROM-2 From Waste of Saturated Filters and Biodegradable Agricultural Wastes

The detailed stepwise procedure is listed below:-

1) Cut open the Filter cover and collect the waste (absorbents/adsorbents/molecular sieves and other ingredients) from the filter into an open tray.
2) Grind the waste in a grinder to form a fine powder.
3) Carry out laboratory tests to determine its constituents.
4) Collect the biodegradable agricultural wastes available (such as tree leaves, sugarcane leaves, rice husk, rice plant (parali) , sugarcane bagas, grass, wheat husk, animal feed waste, food waste, fruits & vegetable waste etc). Spread this waste in a composting pit or bed in 3 to 5 layers, one by one and spread a mixture of cow dung, cow urine and water on it so that complete waste material becomes property wet by this fluid mixture.
5) Now spread a fine layer of waste material obtained from filters as explained in steps 2 and 3 above.
6) Spread a thin layer of any additional minerals such as Rock Phosphate, if required.
7) Repeat the steps 4 to 6 above in three to five layers depending on the amount of material available and quantity of MROM required to be manufactured.
8) Cover the entire bed or pit with about 5 to 10 cm thick soil layer all around and leave it for natural fermentation/composting for 30 to 45 days.
9) After 30 to 45 days, remove the soil from a portion of the bed/pit and check whether the agricultural waste has been properly composted. If not, cover it with soil again and wait for few more days. If yes, then remove the top soil layer from the bed/pit and cut and mix the composted material with a spade or any other tool to obtain a nearly uniform material.
10) Add any additional minerals or nutrients, if required and carry out the final quality check in the laboratory for the prepared MROM.
11) Your MROM-2 is now ready for packaging, sale and use in organic farming.

C. Embodiment 3

MROM-3. In this method, first the vermi compost is prepared from the agricultural waste by using cow dung and the earth worms. Then the waste obtained from BUNKERMAN filters is processed and mixed with this Vermi compost in appropriate proportion in a mixing bed. Additional minerals/nutrients are then added to it, if required. The prepared MROM is then tested in the laboratory for quality check and then sent for packaging and further use in organic farms. The manufacturing process is illustrated in Figure 3 below.

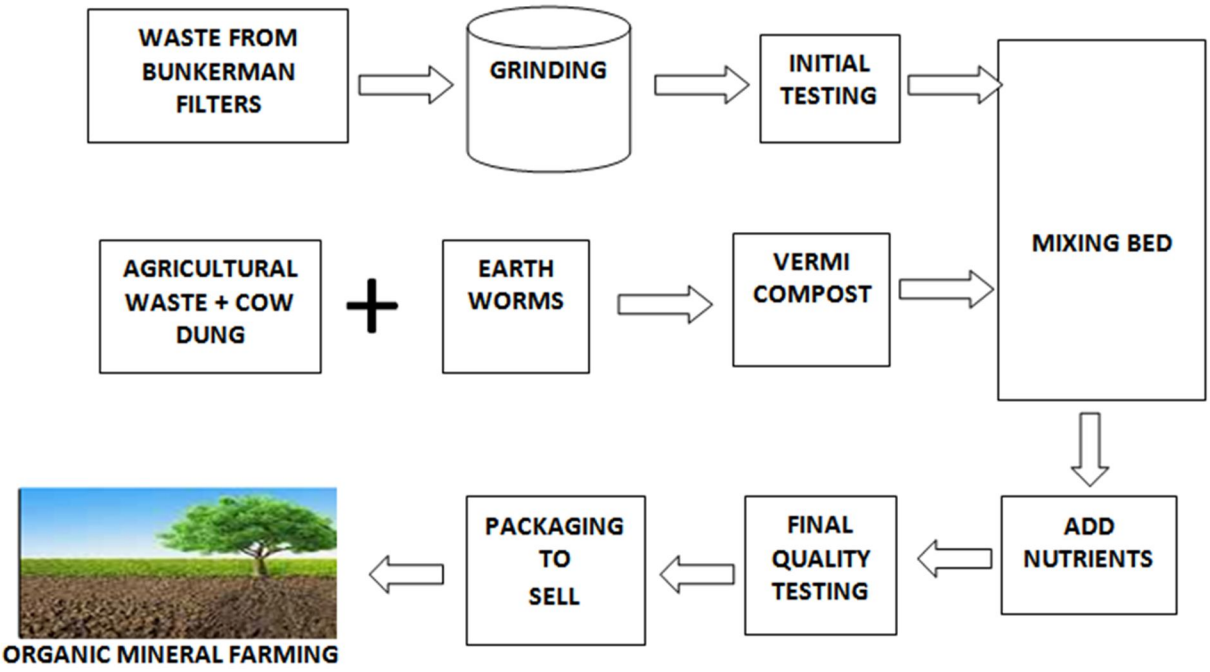


Figure 3 : Manufacturing Process of MROM-3 From Waste of Saturated Filters and Vermi Compost

D. Embodiment 4

Experiments conducted on Earthworms have shown that the earthworms grow better and faster on mineral rich diet. Earthworms need a continuous supply of calcium. South Australian research found that earthworm numbers doubled when pH($CaCl_2$) in their feed/soil rose from 4.1 to 6.7. Experiments were conducted by adding the waste of BUNKERMAN's saturated filters to the feeding material supplied to the earth worms and it was found that the size and number of earthworms was considerably increased in this process. The resulting vermi compost was also found to be rich in mineral contents. Therefore, the fourth type of MROM i.e. MROM-4 was prepared as per the process illustrated in Figure 4 below.

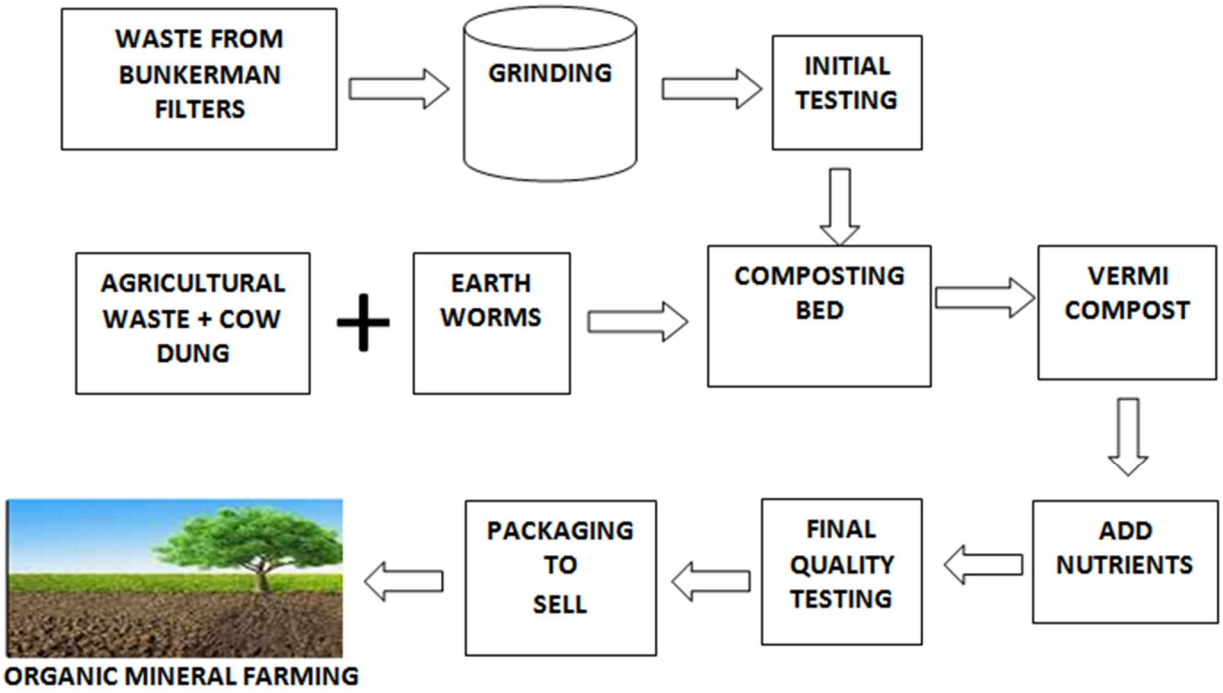


Figure 4 : Manufacturing Process of MROM-4 From Waste of Saturated Filters and Agricultural Wastes by Using Earth Worms

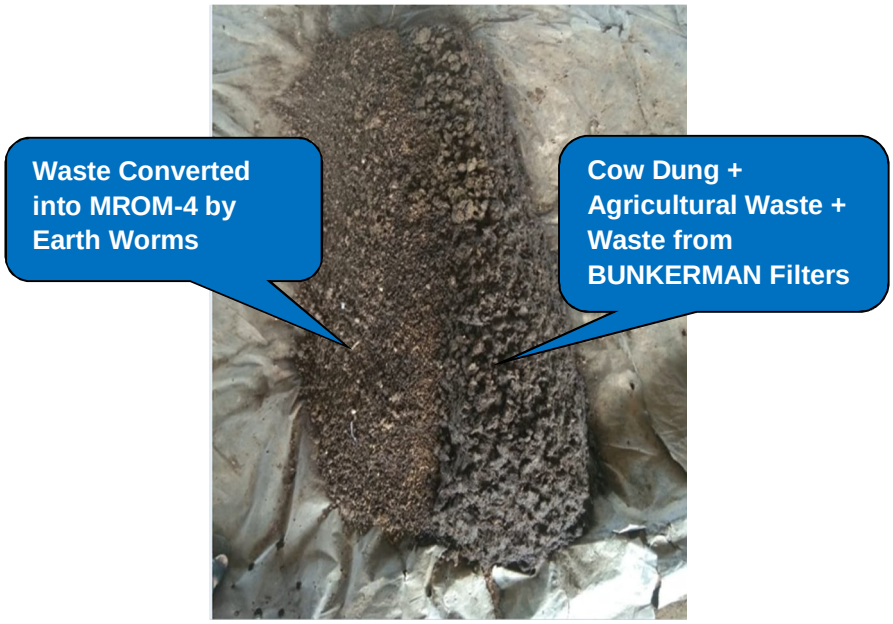


Photo 1 : Photo of Vermi Composting Bed Showing How Worms Convert the Waste Material into MROM-4



Photo 2 : Composting Pits for MROM-2 During Experiments



Photo 3 : Vermi Composting Beds for Manufacturing MROM-4



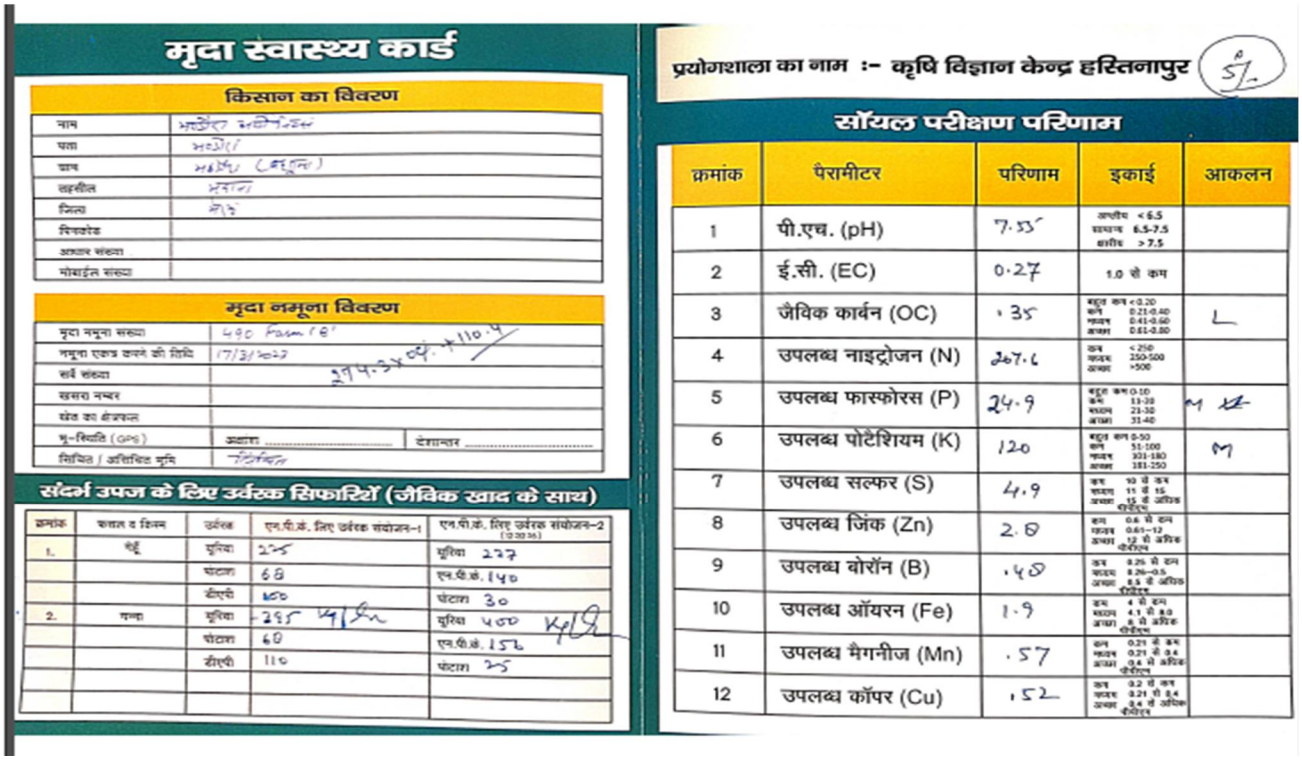
Photo 4 : Final packaging of MROM-3

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III. RESULTS

A. *Test Results*

Table 1 : Soil Health Card & Soil Test Results : Sample 1 (Soil Only)



मृदा स्वास्थ्य कार्ड

किसान का विवरण

नाम	भण्डोरा अग्निहोत्र
पता	भण्डोरा
ग्राम	भण्डोरा (खुर्द)
तहसील	सवाना
जिला	सीहोर
विलेखोड	
आधार संख्या	
मोबाईल संख्या	

मृदा नमूना विवरण

मृदा नमूना संख्या	492 Farm 'C'
नमूना एकत्र करने की तिथि	17/3/2023
सर्वे संख्या	
खसरा नम्बर	
खेत का क्षेत्रफल	
भू-स्थिति (GPS)	अक्षांश ..... देशान्तर .....
सिंचित / असिंचित भूमि	सिंचित

संदर्भ उपज के लिए उर्वरक सिफारिशें (जैविक खाद के साथ)

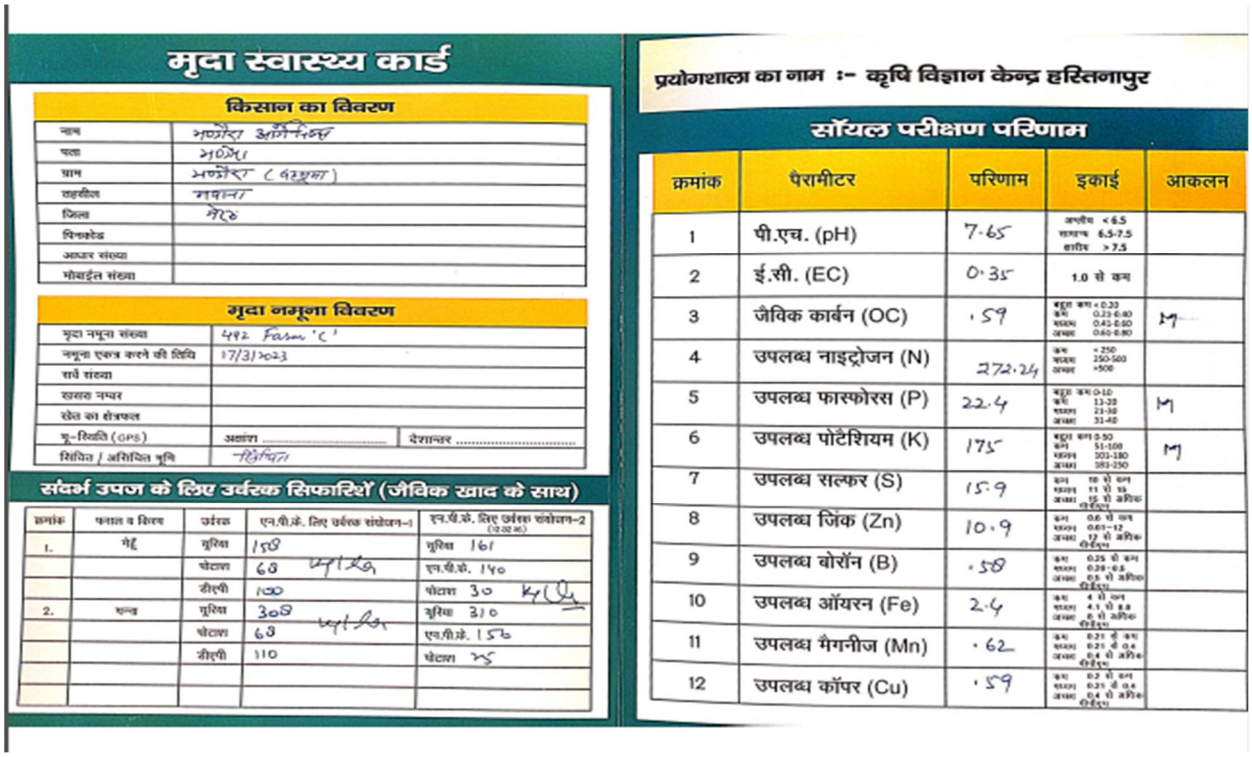
क्रमांक	फसल व किस्म	उर्वरक	एन.पी.के. लिए उर्वरक संयोजन-1	एन.पी.के. लिए उर्वरक संयोजन-2 (12:32:16)
1.	गेहूँ	यूरिया	275	यूरिया 227
		पोटाश	68	एन.पी.के. 140
		डीएपी	100	पोटाश 30
2.	चना	यूरिया	285	यूरिया 430
		पोटाश	60	एन.पी.के. 156
		डीएपी	110	पोटाश 25

प्रयोगशाला का नाम :- कृषि विज्ञान केन्द्र हस्तिनापुर

सॉयल परीक्षण परिणाम

क्रमांक	पैरामीटर	परिणाम	इकाई	आकलन
1	पी.एच. (pH)	7.55	अम्लीय < 6.5 सामान्य 6.5-7.5 क्षारीय > 7.5	
2	ई.सी. (EC)	0.27	1.0 से कम	
3	जैविक कार्बन (OC)	.35	बहुत कम <0.20 कम 0.21-0.40 मध्यम 0.41-0.60 अधिक 0.61-0.80	L
4	उपलब्ध नाइट्रोजन (N)	267.6	कम <250 मध्यम 250-500 अधिक >500	
5	उपलब्ध फास्फोरस (P)	24.9	बहुत कम 0-10 कम 11-20 मध्यम 21-30 अधिक 31-40	M
6	उपलब्ध पोटैशियम (K)	120	बहुत कम 0-50 कम 51-100 मध्यम 101-180 अधिक 181-250	M
7	उपलब्ध सल्फर (S)	4.9	कम 10 से कम मध्यम 11 से 15 अधिक 15 से अधिक पोटाश	
8	उपलब्ध जिंक (Zn)	2.8	कम 0.6 से कम मध्यम 0.61-12 अधिक 12 से अधिक पोटाश	
9	उपलब्ध बोरॉन (B)	.48	कम 0.25 से कम मध्यम 0.26-0.5 अधिक 0.5 से अधिक पोटाश	
10	उपलब्ध ऑयरन (Fe)	1.9	कम 4 से कम मध्यम 4.1 से 8.0 अधिक 8 से अधिक पोटाश	
11	उपलब्ध मैगनीज (Mn)	.57	कम 0.21 से कम मध्यम 0.21 से 0.4 अधिक 0.4 से अधिक पोटाश	
12	उपलब्ध कॉपर (Cu)	.52	कम 0.2 से कम मध्यम 0.21 से 0.4 अधिक 0.4 से अधिक पोटाश	

Table 2 : Soil Health Card & Soil Test Results : Sample 2 (Soil + 10% Vermi Compost)



मृदा स्वास्थ्य कार्ड

किसान का विवरण

नाम	भण्डोरा अग्निहोत्र
पता	भण्डोरा
ग्राम	भण्डोरा (खुर्द)
तहसील	सवाना
जिला	सीहोर
विलेखोड	
आधार संख्या	
मोबाईल संख्या	

मृदा नमूना विवरण

मृदा नमूना संख्या	492 Farm 'C'
नमूना एकत्र करने की तिथि	17/3/2023
सर्वे संख्या	
खसरा नम्बर	
खेत का क्षेत्रफल	
भू-स्थिति (GPS)	अक्षांश ..... देशान्तर .....
सिंचित / असिंचित भूमि	सिंचित

संदर्भ उपज के लिए उर्वरक सिफारिशें (जैविक खाद के साथ)

क्रमांक	फसल व किस्म	उर्वरक	एन.पी.के. लिए उर्वरक संयोजन-1	एन.पी.के. लिए उर्वरक संयोजन-2 (12:32:16)
1.	गेहूँ	यूरिया	158	यूरिया 161
		पोटाश	68	एन.पी.के. 140
		डीएपी	100	पोटाश 30
2.	चना	यूरिया	300	यूरिया 310
		पोटाश	68	एन.पी.के. 156
		डीएपी	110	पोटाश 25

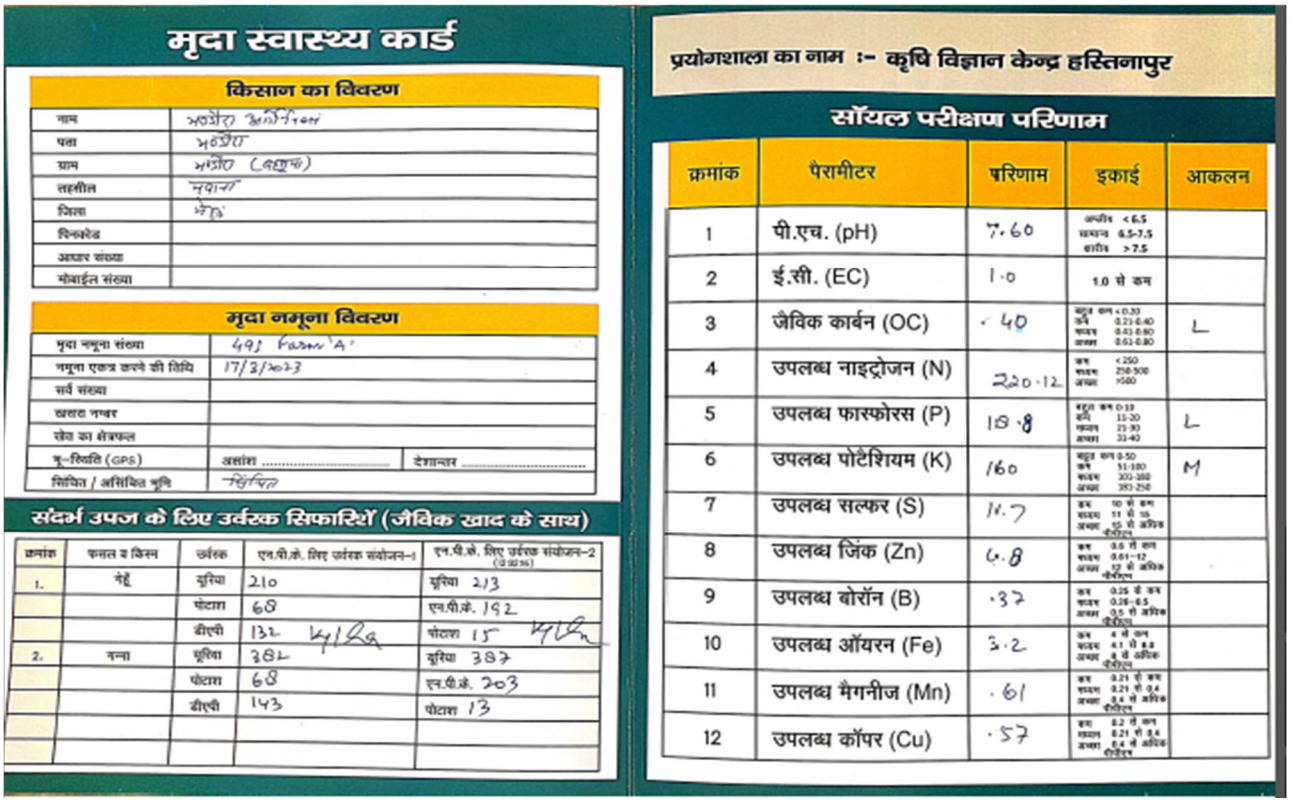
प्रयोगशाला का नाम :- कृषि विज्ञान केन्द्र हस्तिनापुर

सॉयल परीक्षण परिणाम

क्रमांक	पैरामीटर	परिणाम	इकाई	आकलन
1	पी.एच. (pH)	7.65	अम्लीय < 6.5 सामान्य 6.5-7.5 क्षारीय > 7.5	
2	ई.सी. (EC)	0.35	1.0 से कम	
3	जैविक कार्बन (OC)	.59	बहुत कम <0.20 कम 0.21-0.40 मध्यम 0.41-0.60 अधिक 0.61-0.80	M
4	उपलब्ध नाइट्रोजन (N)	272.24	कम <250 मध्यम 250-500 अधिक >500	
5	उपलब्ध फास्फोरस (P)	22.4	बहुत कम 0-10 कम 11-20 मध्यम 21-30 अधिक 31-40	M
6	उपलब्ध पोटैशियम (K)	175	बहुत कम 0-50 कम 51-100 मध्यम 101-180 अधिक 181-250	M
7	उपलब्ध सल्फर (S)	15.9	कम 10 से कम मध्यम 11 से 15 अधिक 15 से अधिक पोटाश	
8	उपलब्ध जिंक (Zn)	10.9	कम 0.6 से कम मध्यम 0.61-12 अधिक 12 से अधिक पोटाश	
9	उपलब्ध बोरॉन (B)	.58	कम 0.25 से कम मध्यम 0.26-0.5 अधिक 0.5 से अधिक पोटाश	
10	उपलब्ध ऑयरन (Fe)	2.4	कम 4 से कम मध्यम 4.1 से 8.0 अधिक 8 से अधिक पोटाश	
11	उपलब्ध मैगनीज (Mn)	.62	कम 0.21 से कम मध्यम 0.21 से 0.4 अधिक 0.4 से अधिक पोटाश	
12	उपलब्ध कॉपर (Cu)	.59	कम 0.2 से कम मध्यम 0.21 से 0.4 अधिक 0.4 से अधिक पोटाश	

Table 3 : Soil Health Card & Soil Test Results : Sample 3 (Soil+10% MROM-1)

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मृदा स्वास्थ्य कार्ड

किसान का विवरण

नाम	[illegible]
पता	[illegible]
ग्राम	[illegible]
तहसील	[illegible]
जिला	[illegible]
विकासखंड	
आधार संख्या	
मोबाईल संख्या	

मृदा नमूना विवरण

मृदा नमूना संख्या	491 Form 'A'
नमूना एकत्र करने की तिथि	17/3/2023
सर्वे संख्या	
खसरा नम्बर	
खेत का क्षेत्रफल	
भू-स्थिति (GPS)	अक्षांश ..... देशान्तर .....
सिंचित / असिंचित भूमि	सिंचित

संदर्भ उपज के लिए उर्वरक सिफारिशें (जैविक खाद के साथ)

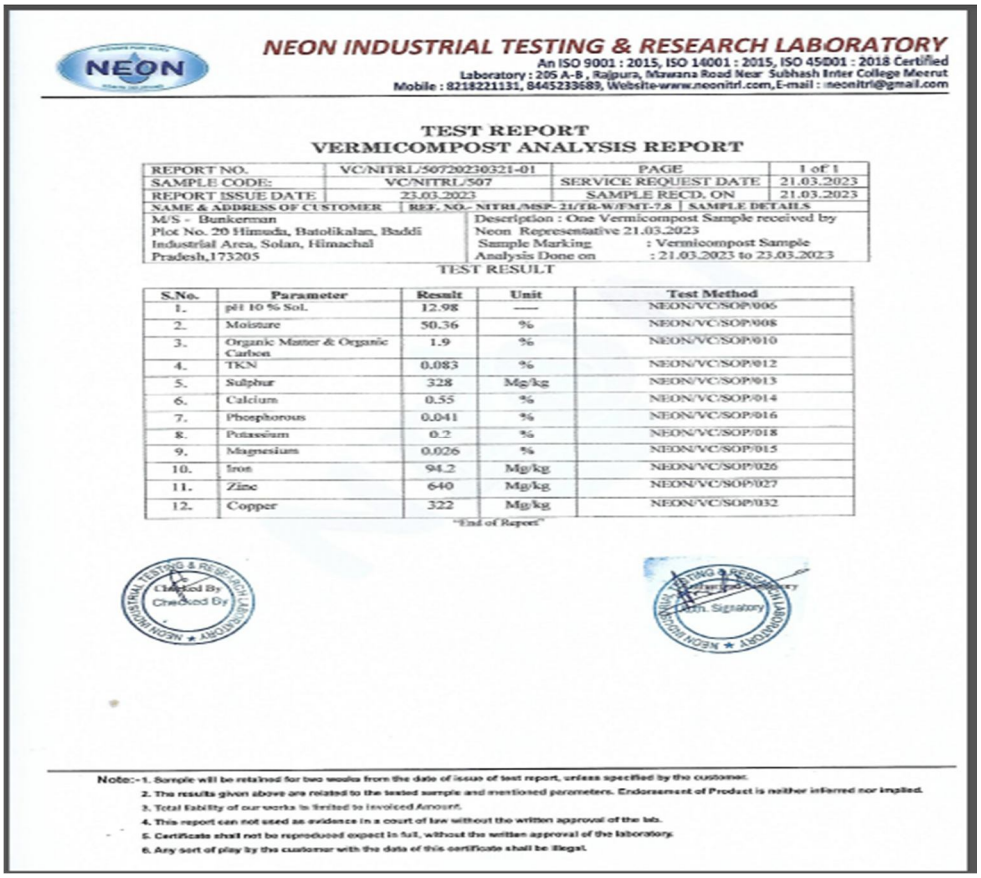
क्रमांक	फसल व किस्म	उर्वरक	एन.पी.के. लिए उर्वरक संयोजन-1	एन.पी.के. लिए उर्वरक संयोजन-2 (उपयोग)
1.	गेहूँ	यूरिया	210	यूरिया 213
		पोटाश	68	एन.पी.के. 192
		डीएपी	132	पोटाश 15
2.	चना	यूरिया	382	यूरिया 387
		पोटाश	68	एन.पी.के. 203
		डीएपी	143	पोटाश 13

प्रयोगशाला का नाम :- कृषि विज्ञान केन्द्र हस्तिनापुर

सॉयल परीक्षण परिणाम

क्रमांक	पैरामीटर	परिणाम	इकाई	आकलन
1	पी.एच. (pH)	7.60	अम्लीय <6.5 सामान्य 6.5-7.5 क्षारीय >7.5	
2	ई.सी. (EC)	1.0	1.0 से कम	
3	जैविक कार्बन (OC)	.40	बहुत कम <0.20 कम 0.21-0.40 पर्याप्त 0.41-0.60 अधिक 0.61-0.80	L
4	उपलब्ध नाइट्रोजन (N)	220.12	कम <250 पर्याप्त 250-500 अधिक >500	
5	उपलब्ध फास्फोरस (P)	18.8	बहुत कम 0-10 कम 11-20 पर्याप्त 21-30 अधिक 31-40	L
6	उपलब्ध पोटैशियम (K)	160	बहुत कम 0-50 कम 51-180 पर्याप्त 300-350 अधिक 351-250	M
7	उपलब्ध सल्फर (S)	11.7	कम 10 से कम पर्याप्त 11 से 15 अधिक 15 से अधिक पोषित	
8	उपलब्ध जिंक (Zn)	0.8	कम 0.6 से कम पर्याप्त 0.61-12 अधिक 12 से अधिक पोषित	
9	उपलब्ध बोरॉन (B)	.37	कम 0.25 से कम पर्याप्त 0.26-0.5 अधिक 0.5 से अधिक पोषित	
10	उपलब्ध ऑयरन (Fe)	3.2	कम 4 से कम पर्याप्त 4.1 से 8.0 अधिक 8 से अधिक पोषित	
11	उपलब्ध मैगनीज (Mn)	.61	कम 0.21 से कम पर्याप्त 0.21 से 0.4 अधिक 0.4 से अधिक पोषित	
12	उपलब्ध कॉपर (Cu)	.57	कम 0.2 से कम पर्याप्त 0.21 से 0.4 अधिक 0.4 से अधिक पोषित	

Table 4 : Test Results of Vermi Compost : Sample 1



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Mobile : 8218221131, 8445233689, Website-www.neonitrl.com, E-mail : neonitrl@gmail.com

TEST REPORT
VERMICOMPOST ANALYSIS REPORT

REPORT NO.	VC/NITRL/507202303321-01	PAGE	1 of 1
SAMPLE CODE:	VC/NITRL/507	SERVICE REQUEST DATE	21.03.2023
REPORT ISSUE DATE	23.03.2023	SAMPLE RECD. ON	21.03.2023
NAME & ADDRESS OF CUSTOMER	REF. NO.- NITRL/MSP- 21/TR-W/FMT-7.8	SAMPLE DETAILS	
M/S - Bunkerman Plot No. 20 Himoda, Batolikalan, Baddi Industrial Area, Solan, Himachal Pradesh,173205		Description : One Vermicompost Sample received by Neon Representative 21.03.2023 Sample Marking : Vermicompost Sample Analysis Done on : 21.03.2023 to 23.03.2023	

TEST RESULT

S.No.	Parameter	Result	Unit	Test Method
1.	pH 10 % Sol.	12.98	----	NEON/VC/SOP/006
2.	Moisture	50.36	%	NEON/VC/SOP/008
3.	Organic Matter & Organic Carbon	1.9	%	NEON/VC/SOP/010
4.	TKN	0.083	%	NEON/VC/SOP/012
5.	Sulphur	328	Mg/kg	NEON/VC/SOP/013
6.	Calcium	0.55	%	NEON/VC/SOP/014
7.	Phosphorous	0.041	%	NEON/VC/SOP/016
8.	Potassium	0.2	%	NEON/VC/SOP/018
9.	Magnesium	0.026	%	NEON/VC/SOP/015
10.	Iron	94.2	Mg/kg	NEON/VC/SOP/026
11.	Zinc	640	Mg/kg	NEON/VC/SOP/027
12.	Copper	322	Mg/kg	NEON/VC/SOP/032

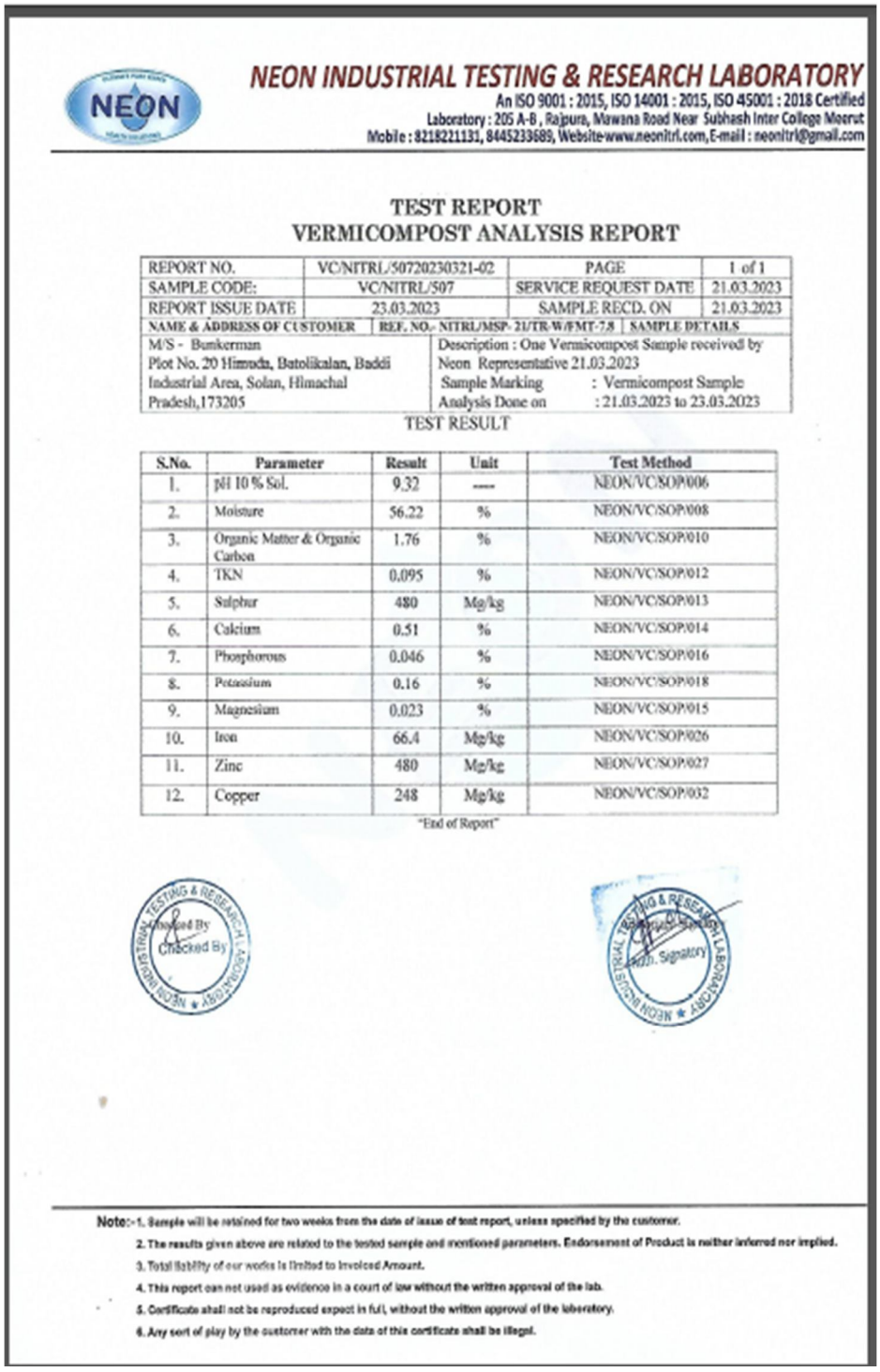
"End of Report"

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Note:- 1. Sample will be retained for two weeks from the date of issue of test report, unless specified by the customer.
2. The results given above are related to the tested sample and mentioned parameters. Endorsement of Product is neither inferred nor implied.
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Table 5 : Test Results of Vermi Compost Plus Waste of BUNKERMAN Filter Material (MROM-1) : Sample 2



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Mobile : 8218211131, 8445233689, Website-www.neonitrl.com, E-mail : neonitrl@gmail.com

TEST REPORT
VERMICOMPOST ANALYSIS REPORT

REPORT NO.	VC/NITRL/50720230321-02	PAGE	1 of 1
SAMPLE CODE:	VC/NITRL/507	SERVICE REQUEST DATE	21.03.2023
REPORT ISSUE DATE	23.03.2023	SAMPLE RECD. ON	21.03.2023
NAME & ADDRESS OF CUSTOMER	REF. NO.- NITRL/MSP- 21/TR-W/FMT-7.8	SAMPLE DETAILS	
M/S - Bunkerman Plot No. 20 Himuda, Batolikalan, Baddi Industrial Area, Solan, Himachal Pradesh,173205	Description : One Vermicompost Sample received by Neon Representative 21.03.2023 Sample Marking : Vermicompost Sample Analysis Done on : 21.03.2023 to 23.03.2023		

TEST RESULT

S.No.	Parameter	Result	Unit	Test Method
1.	pH 10 % Sol.	9.32	----	NEON/VC/SOP/006
2.	Moisture	56.22	%	NEON/VC/SOP/008
3.	Organic Matter & Organic Carbon	1.76	%	NEON/VC/SOP/010
4.	TKN	0.095	%	NEON/VC/SOP/012
5.	Sulphur	480	Mg/kg	NEON/VC/SOP/013
6.	Calcium	0.51	%	NEON/VC/SOP/014
7.	Phosphorous	0.046	%	NEON/VC/SOP/016
8.	Potassium	0.16	%	NEON/VC/SOP/018
9.	Magnesium	0.023	%	NEON/VC/SOP/015
10.	Iron	66.4	Mg/kg	NEON/VC/SOP/026
11.	Zinc	480	Mg/kg	NEON/VC/SOP/027
12.	Copper	248	Mg/kg	NEON/VC/SOP/032

"End of Report"

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Note:- 1. Sample will be retained for two weeks from the date of issue of test report, unless specified by the customer.
2. The results given above are related to the tested sample and mentioned parameters. Endorsement of Product is neither inferred nor implied.
3. Total liability of our works is limited to Invoiced Amount.
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IV. DISCUSSION

The test results conducted on soils (Table 1 to 3) indicate that the mineral contents of the soil get improved by addition of Vermi Compost and MROM-1. The test results shown in Tables 4 and 5 indicate that the mineral contents of Vermi Compost get significantly enhanced by addition of MROM-1 to the Vermi Compost. This mixture of Vermi Compost and MROM-1, in fact, forms MROM-3 discussed above. The tests results of MROM-2 and MROM-4 also showed a significant amount of mineral content in the manure which are useful for the plant growth.

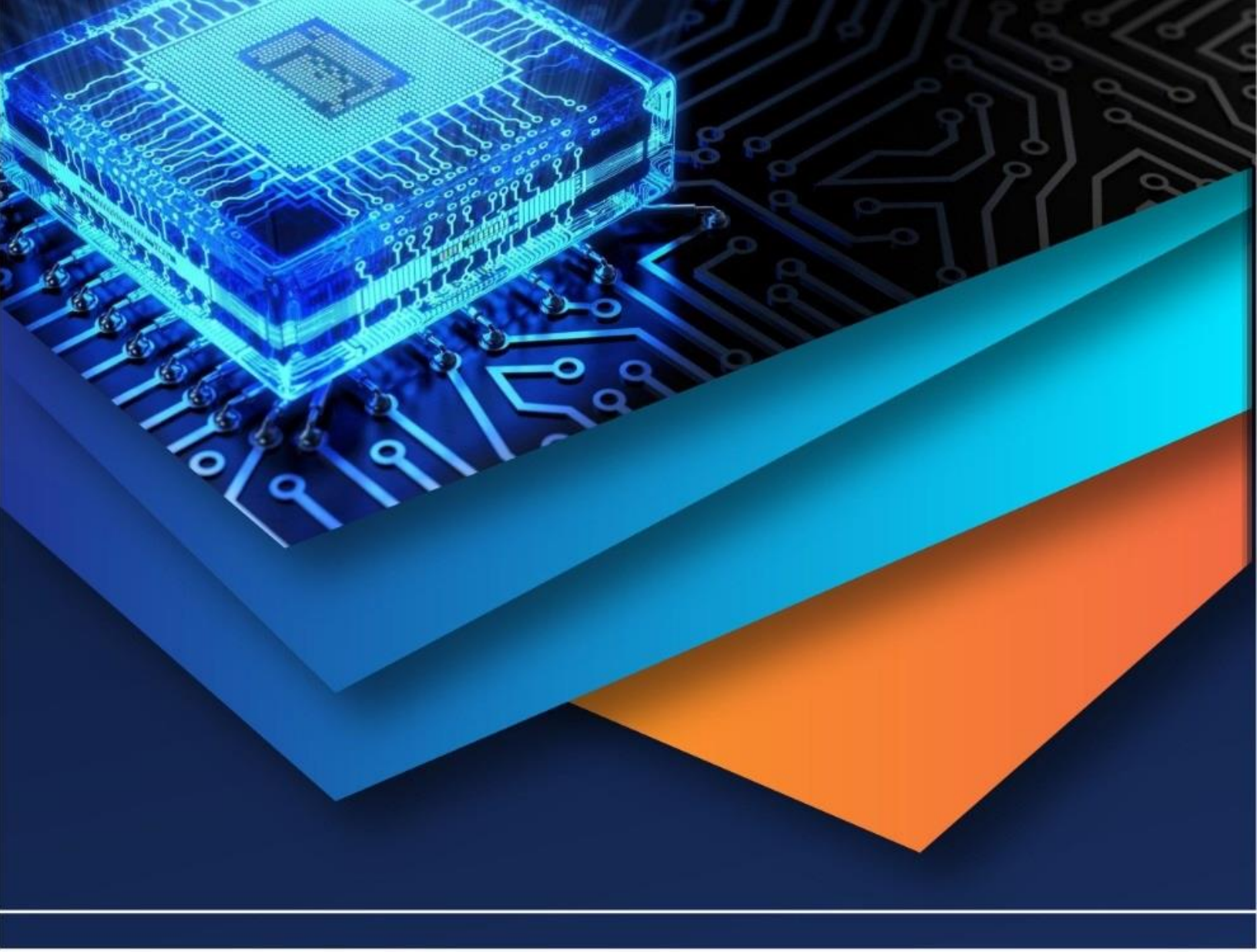
V. CONCLUSIONS

The "Minerals Rich Organic Manure (MROM)" is manufactured from the biodegradable agricultural waste, Cow Dung, Gomutra (Cow Urine), the waste obtained from saturated filters of Bunkerman CO2/TVOC Removal Systems and other important minerals like Rock Phosphate, Zeolite, Bentonite, Gypsum, Kaolin, Carbon, Silica etc, available in nature. The emphasis has been on the significance of sustaining agricultural productivity and microbial diversity in the rhizosphere In this manner, the nitrogen, phosphorus, potassium and total nutrient of the soil, improve greatly with use of MROM in farming. Four types of "Minerals Rich Organic Manures (MROM-1 to MROM-4)" have been manufactured by making use of the waste obtained from saturated filters of Bunkerman CO2/TVOC Removal Systems, the biodegradable agricultural waste, Cow Dung, Gomutra (Cow Urine) and other important minerals like Rock Phosphate, Zeolite, Bentonite, Gypsum, Kaolin, Carbon, Silica etc, available in nature.

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