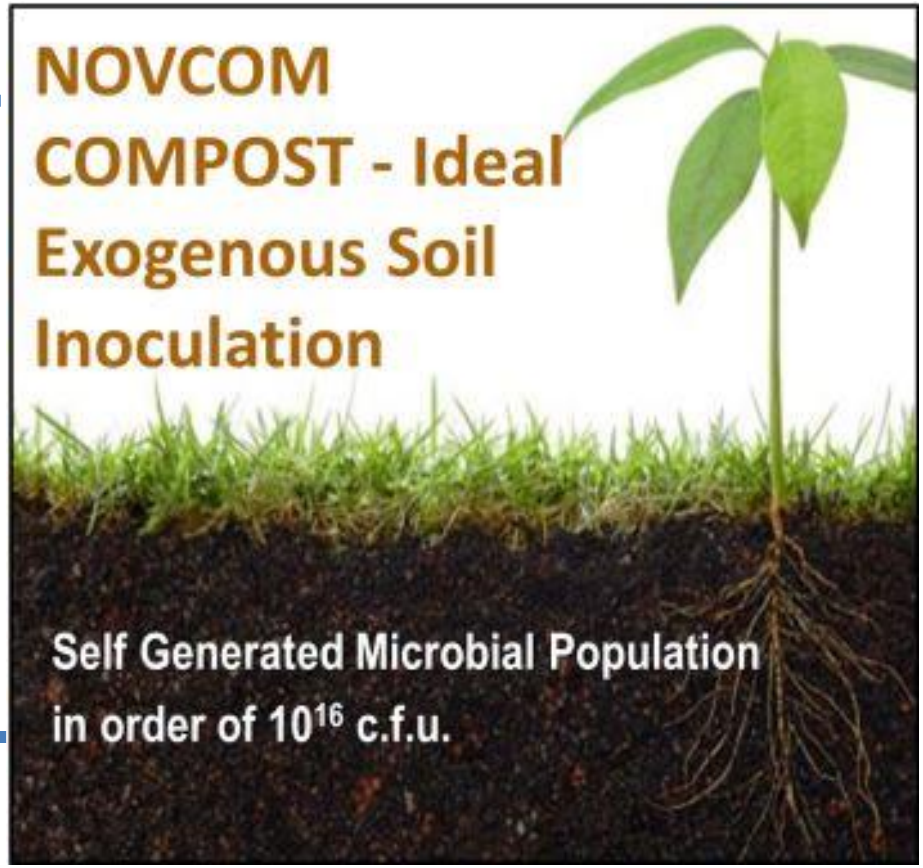
NOVCOM COMPOST

A Integral component of SOIL HEALTH MANAGEMENT for Sustainable Agriculture

Enrich Your Native Soil Microflora with Novcom Compost for Sustained & Higher Crop Goal



Developed by
IORF Technical Team

Need for Soil Health Restoration is becoming a Necessity for Every Agricultural Farm

- On- farm Compost production is the most Effective and Economical way for increasing the Fertilizer- use efficiency in a conventional farm – which can help to **Reduce the Fertilizer Load**

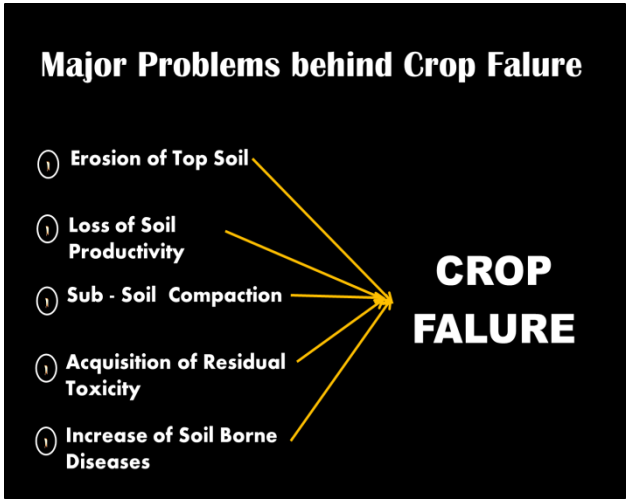
- It is the most effective and economical solution for initiation of the soil- plant- micro flora interactions which is mostly lacking in conventional farms – & this is the **Key Factor for Crop Sustainability**.

- It can help to **Check further Degradation of Soil Productivity especially in Tropical Climate** where rapid breakdown of soil organic carbon occurs post application of chemical fertilizer.

- It can enable reduction of **Residual Toxicity in Soil** by creating an environment for restoration and favourable interactions of native micro flora.

RELEVANCE OF NOVCOM COMPOST

- Sustainable Agriculture is becoming requisite not only for restoration of the depleted soil character but most importantly to restrict the continuous decline of crop productivity.
- And, to meet the objectives without any time lag an effective and sustainable soil management protocol is essential, which can be achieved only through application of good quality, stable and mature compost.
- On-farm Novcom composting is the most effective and economical way for the rejuvenation of native soil microflora – The Most Ignored Soil Component under Chemical/conventional Agriculture – is Actually the **Key Factor for Achieving Crop Sustainability.**
- **Most Importantly the Microbial Rich Novcom Compost helps to contribute towards carbon sequestration - Climate Change Mitigation Potential.**



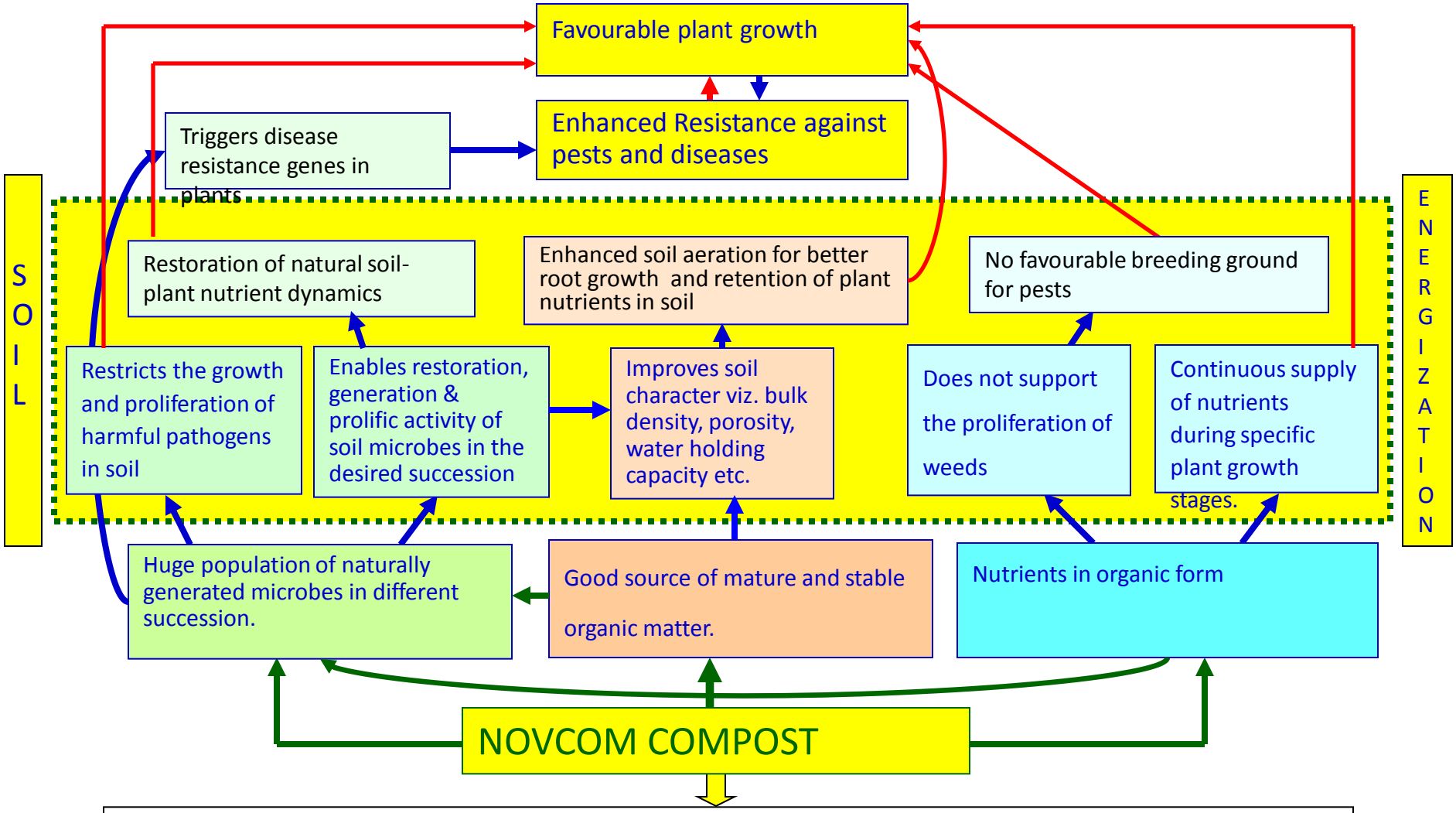
Development of Inhana Rational Farming (IRF) Technology
A Journey Towards Reality

Dr. P. Das Biswas - the Developer of Inhana Rational Farming (IRF) Technology started his journey in 1998 in the quest for a scientific yet an affordable pathway for Sustainable Agriculture. He immersed himself in the ocean of the Indian Philosophy and through a unique blend of this Ancient Indian Wisdom with Modern Science he developed a comprehensive, nature receptive and a truly Scientific Pathway namely– Inhana Rational Farming (IRF) Technology that would provide an effective an affordable solution for Sustainable Agriculture. He also **realized that the Soil Health management would be crucial component in this respect, but a speedy, effective, convenient, complete and economical method for biodegradation that can enable on- far resource recycling would be ideally required.** Thus formed the basis for the development of Novcom Composting Method.

Development of Inhana Rational Farming (IRF) Technology A Journey Towards Reality

IRF Technology showed magical results in tea - one of the most challenging sector in Agriculture in terms of its multiple problems, which remained unanswered in chemical farming. **If the success is to be described in a single sentence then we may say that this Technology (IRF) is the only answer to get rid of the declining soil productivity and increasing food chain toxicity. At the same time this Technology proves that 'Ecological Sustainability Brings Economical Sustainability'.** The Technology has been successfully demonstrated in cereals, pulses and vegetables under the different agro-ecological system and is probably the only Organic Farming Technology in India which can assure Crop Sustainability in the most Economical manner that too without any time lag (*IORF, 2013*).

SOIL ENERGIZATION by NOVCOM COMPOST & Its Effect On Plant System



Life Forms	+	Energy	+	Environment
(Microbes naturally generated within compost)		(Adequate nutrition for microbes in terms of ideal C:N ratio)		(Ideal condition for microbes in terms of stability, maturity & no phytotoxic effect of compost)

NOVCOM COMPOST – *Ideal Exogenous Soil Inoculation for enrichment of Native Soil Microflora*

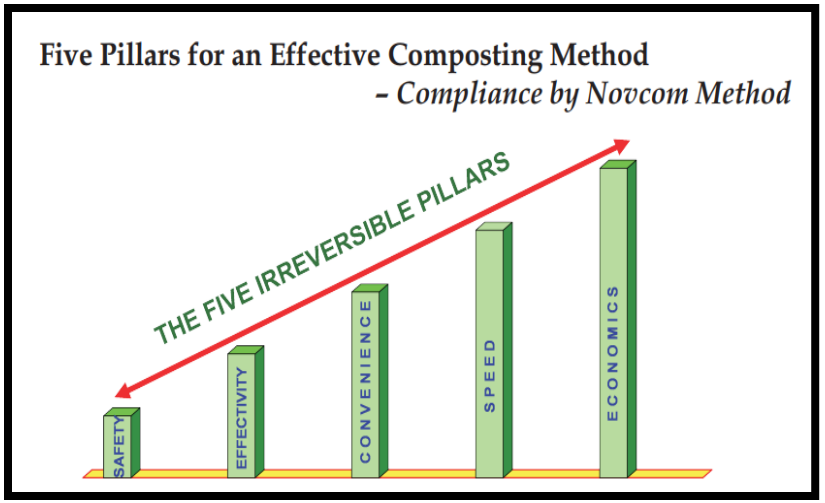
- Ready in 21 days
- No Infrastructure Required
- Upto 200 % N - Appreciation
- Upto 10,000 times higher Native Microflora
- 1/3rd Cost of Vermi-compost Preparation

Microbial Population in the order of 10^{16} C.F.U *per gm moist compost*

WHY NOVCOM COMPOST IS THE BEST CHOICE FOR SUSTAINABLE AGRICULTURE ?

1

Novcom composting method, is the most suitable for large scale on-farm composting as in tea estates due to its process simplicity, speedy biodegradation, high quality end product and low economics.



SAFETY

The high temperature (observed up to 75^0C) generated in an intense, rapid and desired manner during composting process ensures the total destruction of weed seeds and all harmful pathogens. At the same time, performance of various stages of biodegradation in a programmed manner ensures a **safe end product for both human handling and soil environment**

WHY NOVCOM COMPOST IS THE BEST CHOICE FOR SUSTAINABLE AGRICULTURE ?

PROCESS CONVENIENCE

Novcom composting method is a convenient system of biodegradation. It **does not require construction of pits or any specific infrastructure. So it can be adoptED any where and by any person under any socio-economic stature.**

Most importantly, there is no raw material specificity for Novcom Composting. Wide varieties of raw materials from Green matter, obnoxious weeds, poultry litter, Water hyacinths, vegetable market waste, Municipality solid waste, paper mill waste, press mud, pruning litter, crop residues and any other biodegradable raw materials can be used for Novcom compost production.

SPEED

Novcom composting method perhaps ensures the **speediest biodegradation - about 21 days,** which is even shorter in the case of certain raw materials i.e. cow dung, poultry litter etc.

WHY NOVCOM COMPOST IS THE BEST CHOICE FOR SUSTAINABLE AGRICULTURE ?

3

EFFECTIVITY

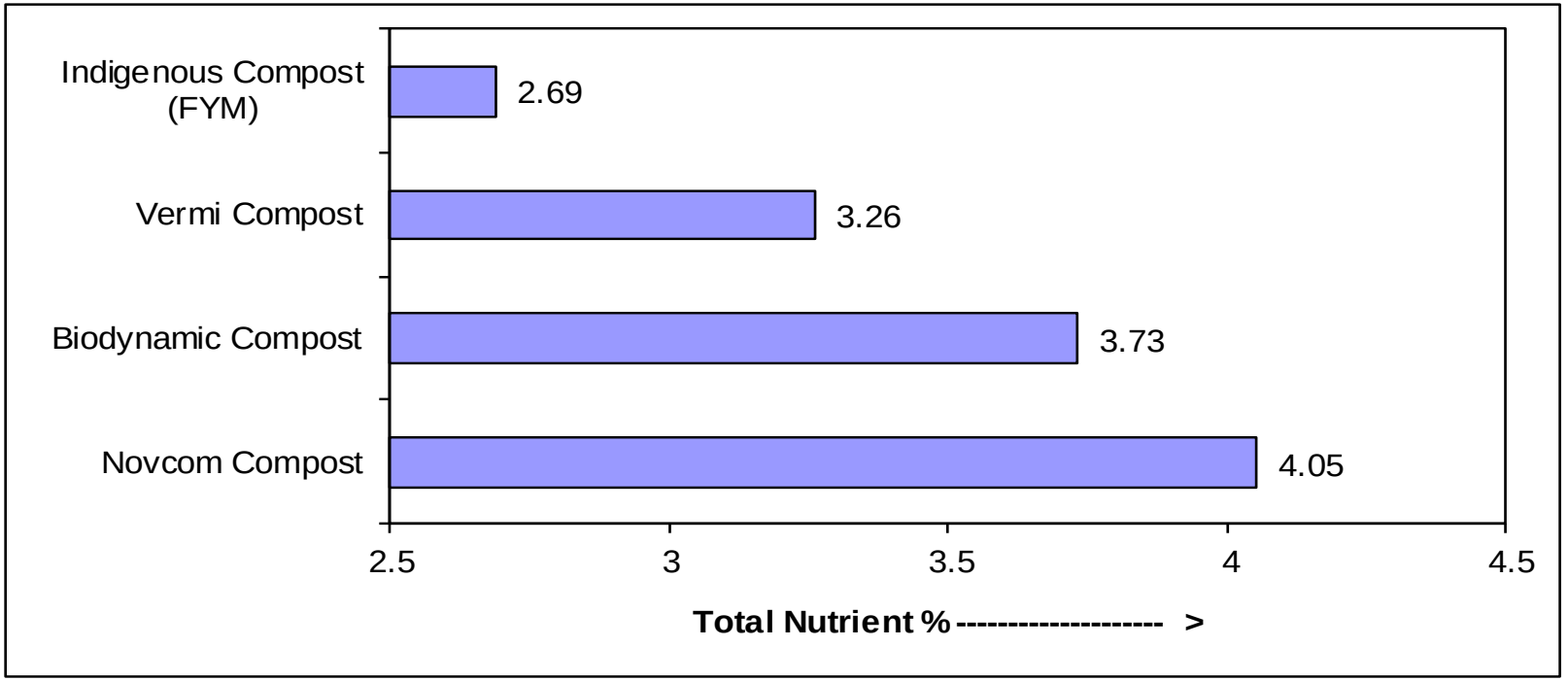
Novcom compost ensures both **ready nutrient supply and enrichment of microbial pollution (1000 to 10,000 times more microbial population then any other compost)** supplied with adequate energy sources; that ensures post soil application effectiveness in terms of sustained crop production as well as soil carbon sequestration.

ECONOMICS

Novcom composting method is an economical process, which does not require any investment on infrastructure, needs minimum labour deployment and does not require any specific raw material. The technology cost is also very low.

Post soil application effectivity of Novcom compost is well documented by several research workers in different agricultural and horticultural crops including the FAO Project

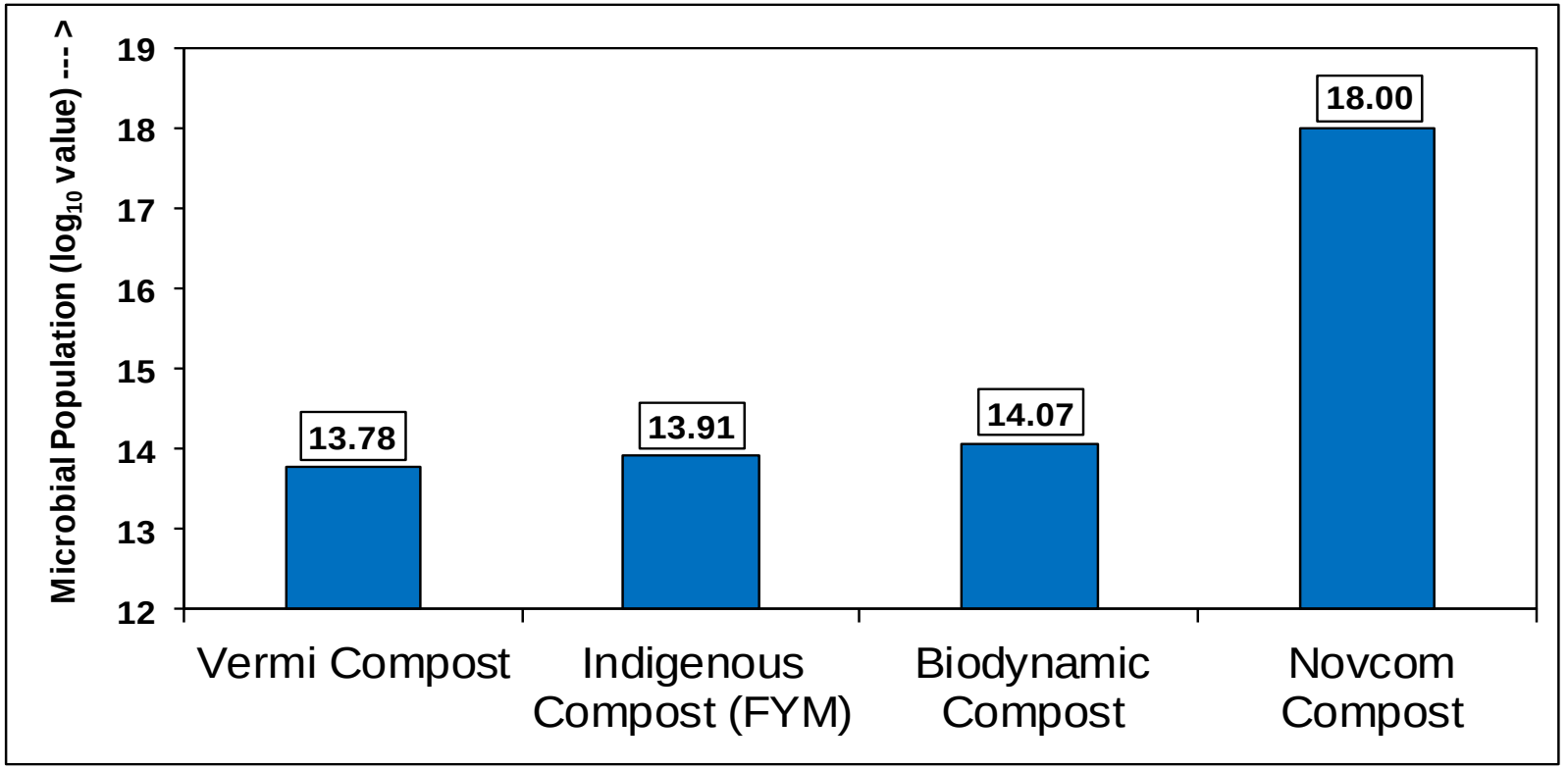
Comparative Study of Total nutrient content in Different Compost



Total Nutrient Content in Novcom compost is 50.6, 24.2 and 8.6 percent higher than that of Indigenous, Vermi and Biodynamic compost respectively.

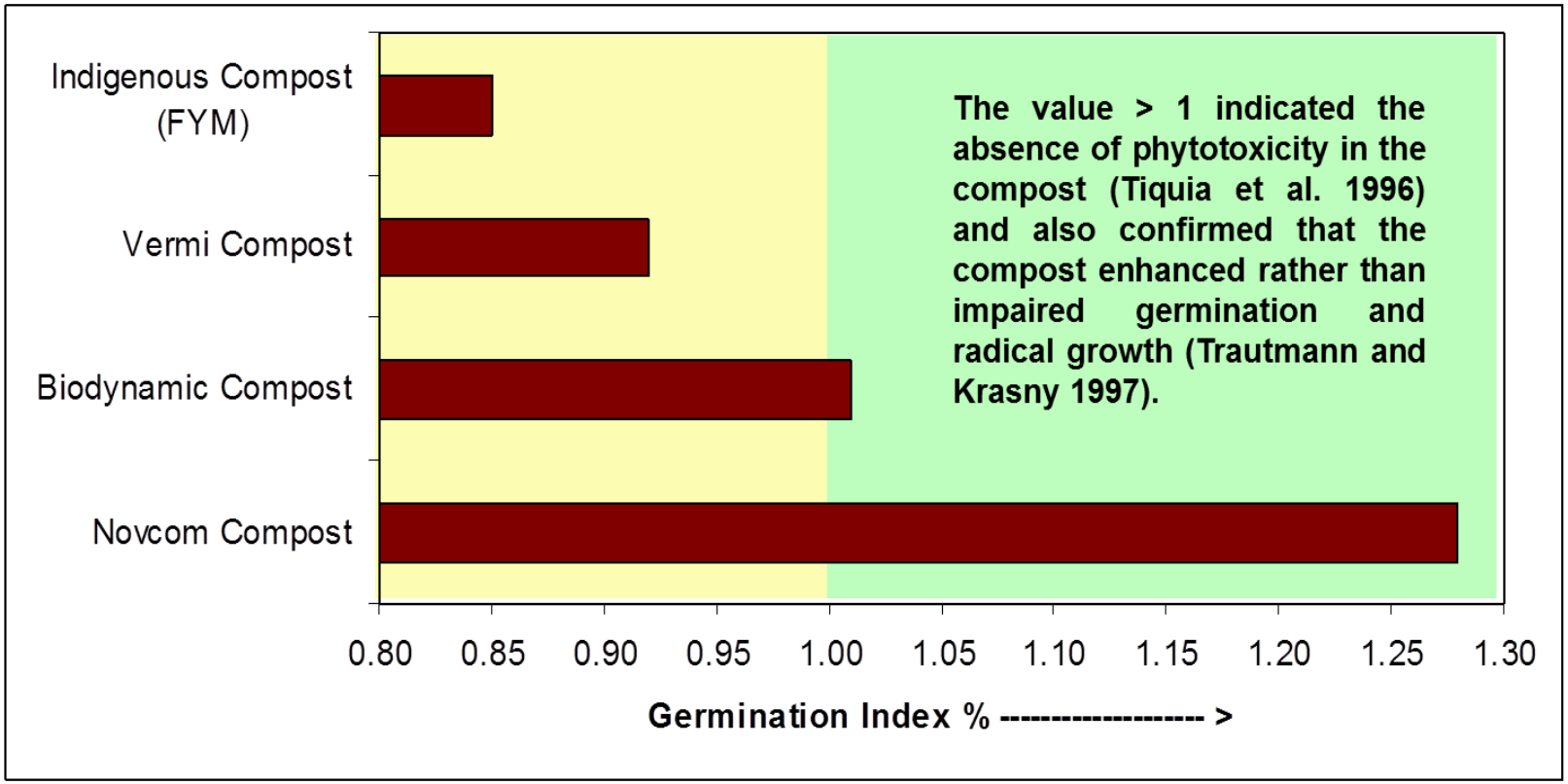
The Higher Nutrient Concentration in Novcom compost is due to its Process Efficiency

Presence of Microbial Population in Compost – THE KEY COMPONENT OF SOIL REJUVENATION



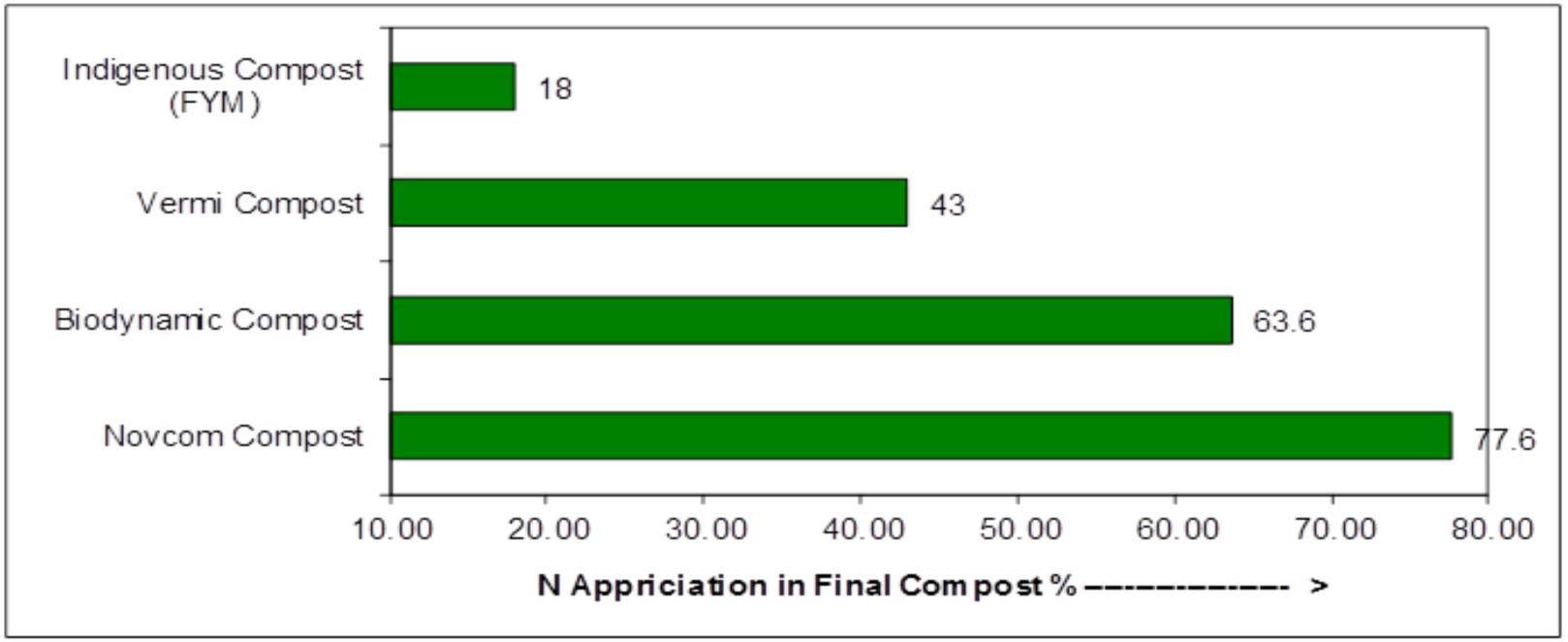
Total microbial population in Novcom compost is at least 10,000 times higher than any other compost prepared under the different composting processes. **This Enormously huge population is due to high Energy Flow within Novcom composting process– the most Potent Source for Soil Microbial Rejuvenation.**

Germination Index – Indicator of Compost Quality



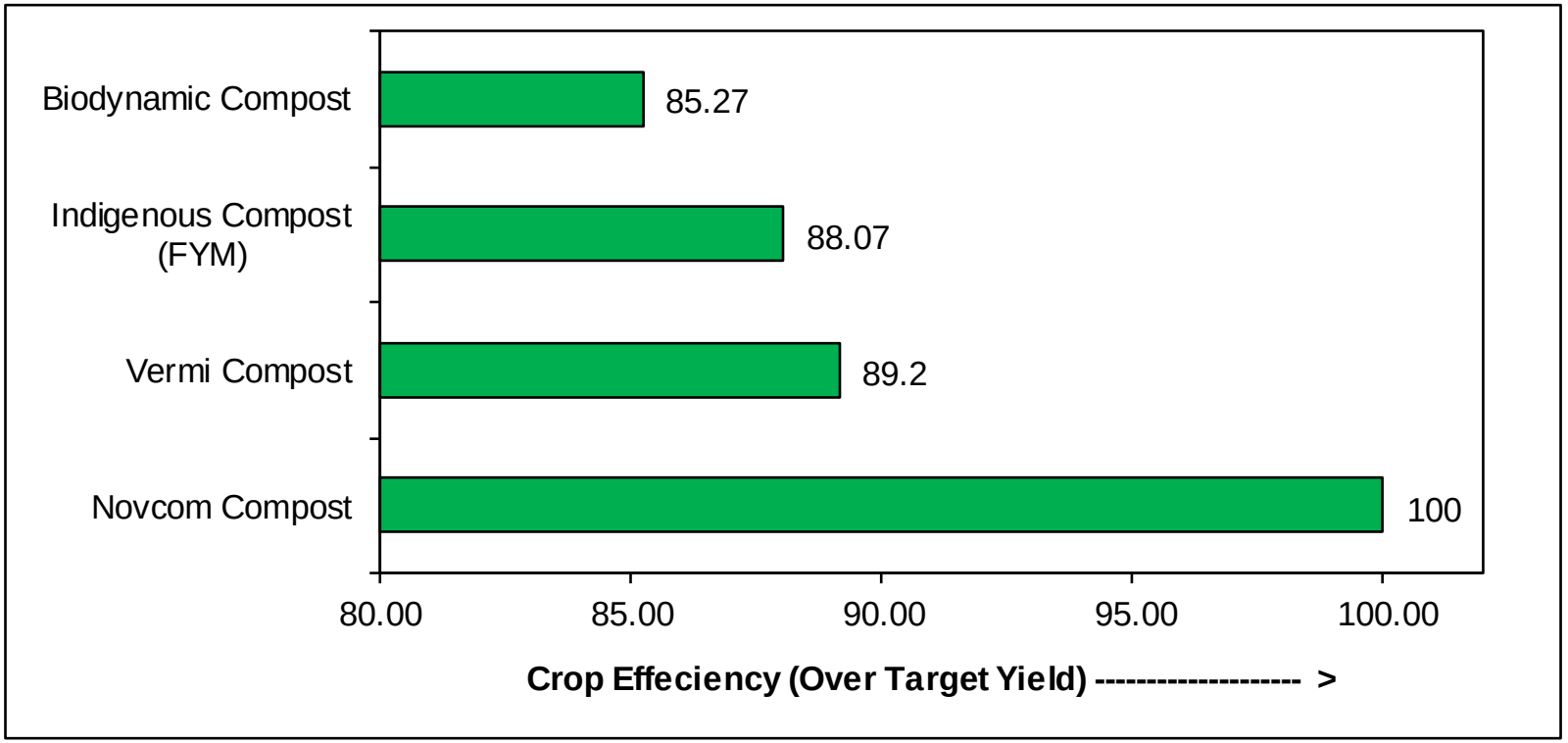
The Qualitative difference of mature Novcom compost from the others was clearly exhibited by the difference in Germination Index – The hidden potential within a compost towards crop Support.

Appreciation of N Value – Strongest Indicator of the Efficiency of Any Composting Process



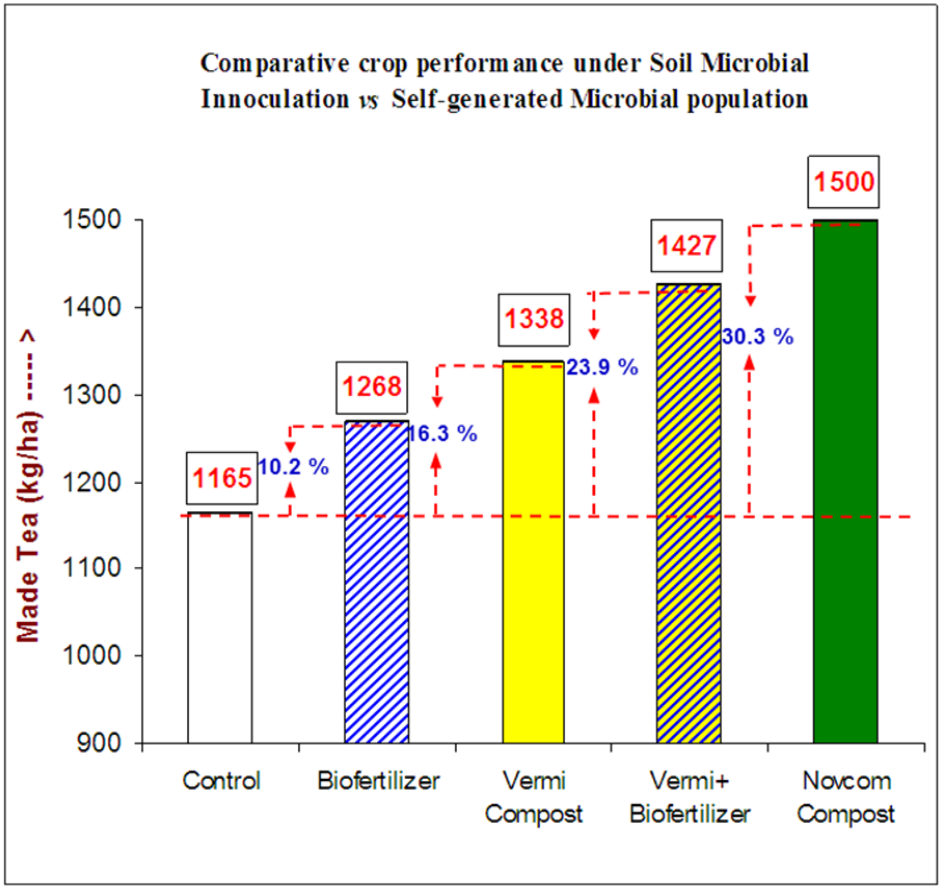
Initiated with same N value in raw material, N Appreciation was highest in Novcom compost

CROP EFFICIENCY – Validation of Post Soil Application Effectivity



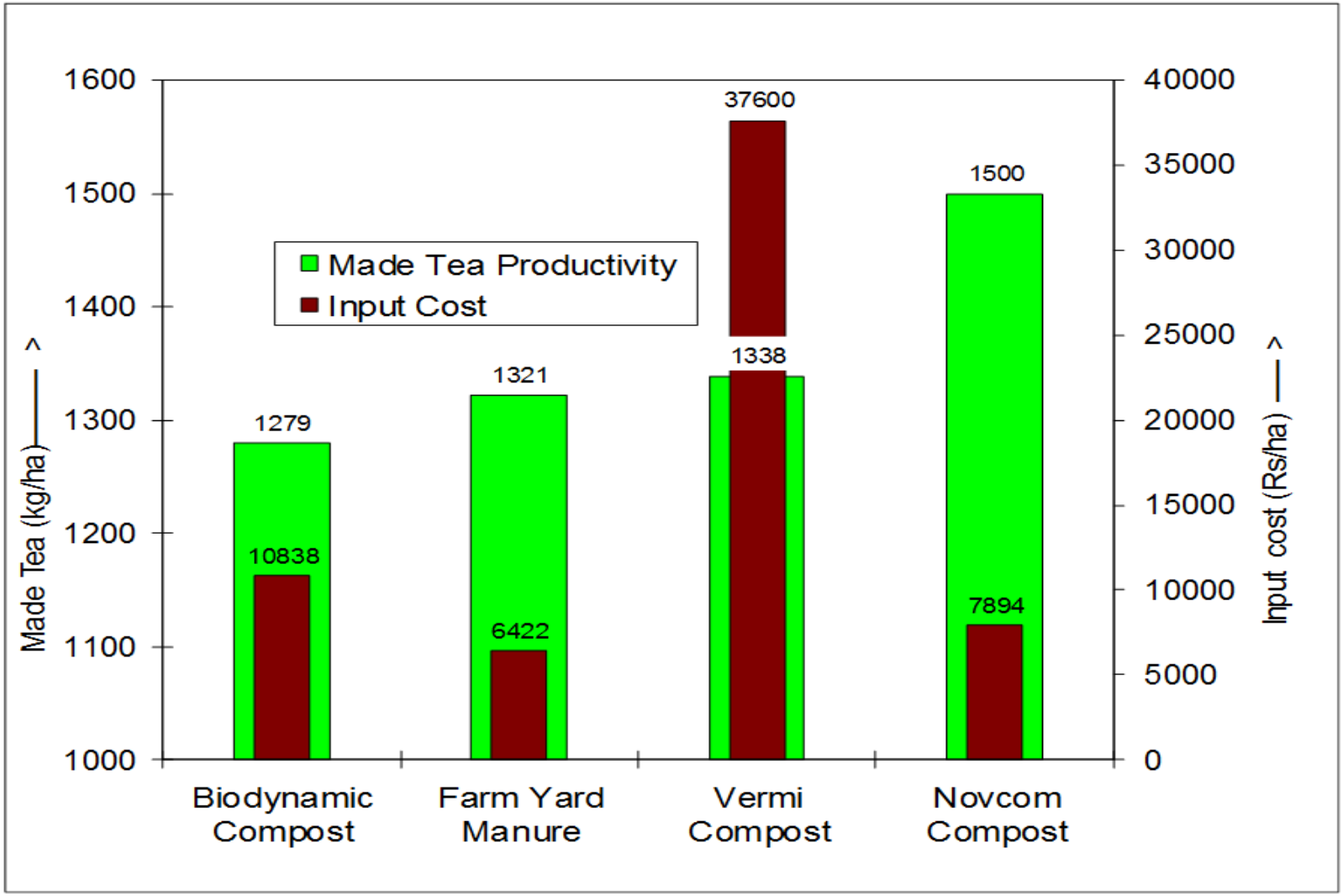
With application of different compost (same dose on N basis), highest crop response was achieved in case of Novcom compost – Superiority in terms of Post Soil Application Effectivity is Well Established.

Organic Soil Management : Self generated or Microbial Inoculated

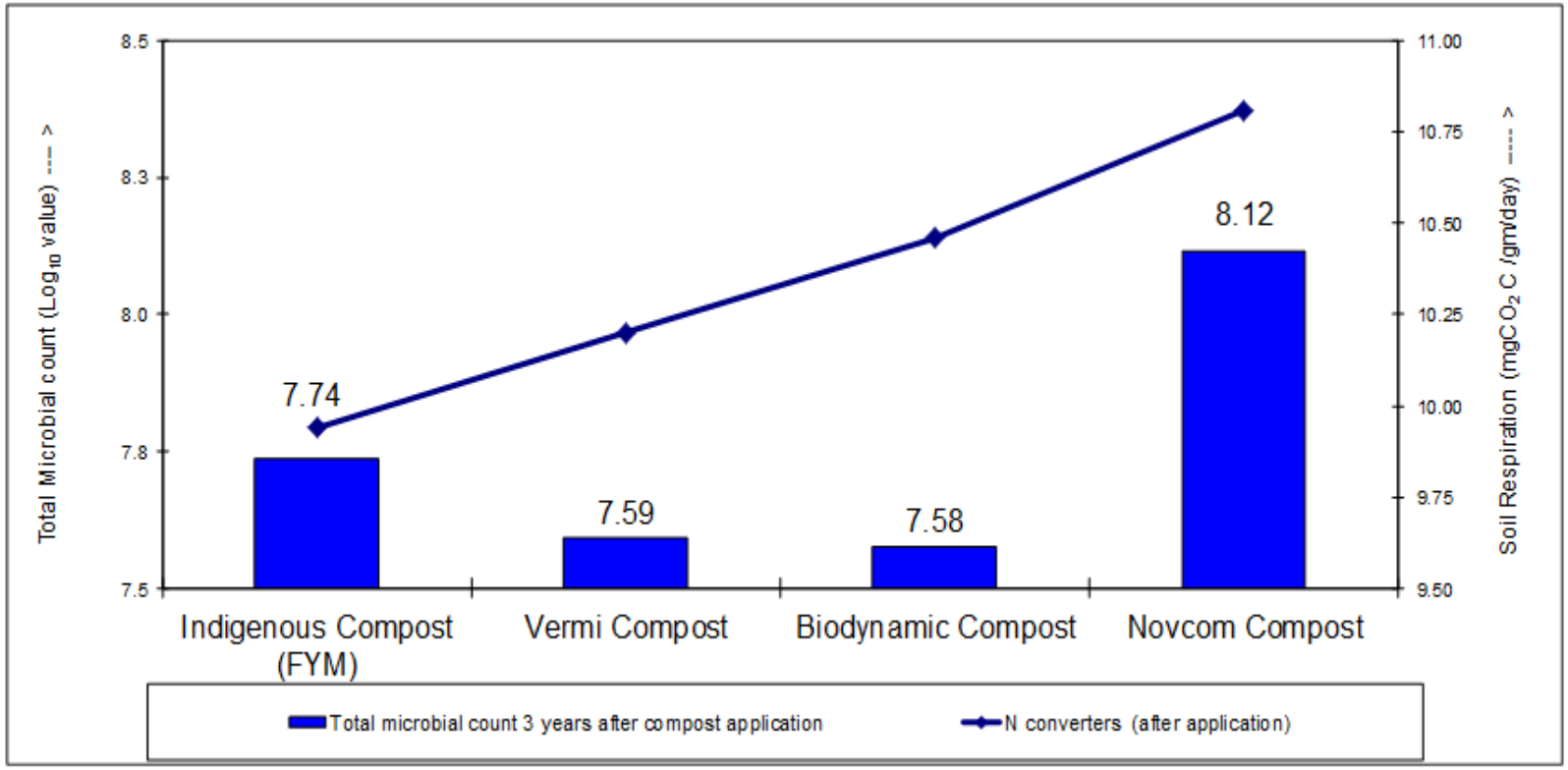


Comparative crop performance under organic soil inputs with limited microbial population, bio-fertilizer, bio-fertilizer combination & Self generated high microbial population.

Comparative analysis of Cost of Production vis-à-vis Crop Performance under different Organic Soil Inputs

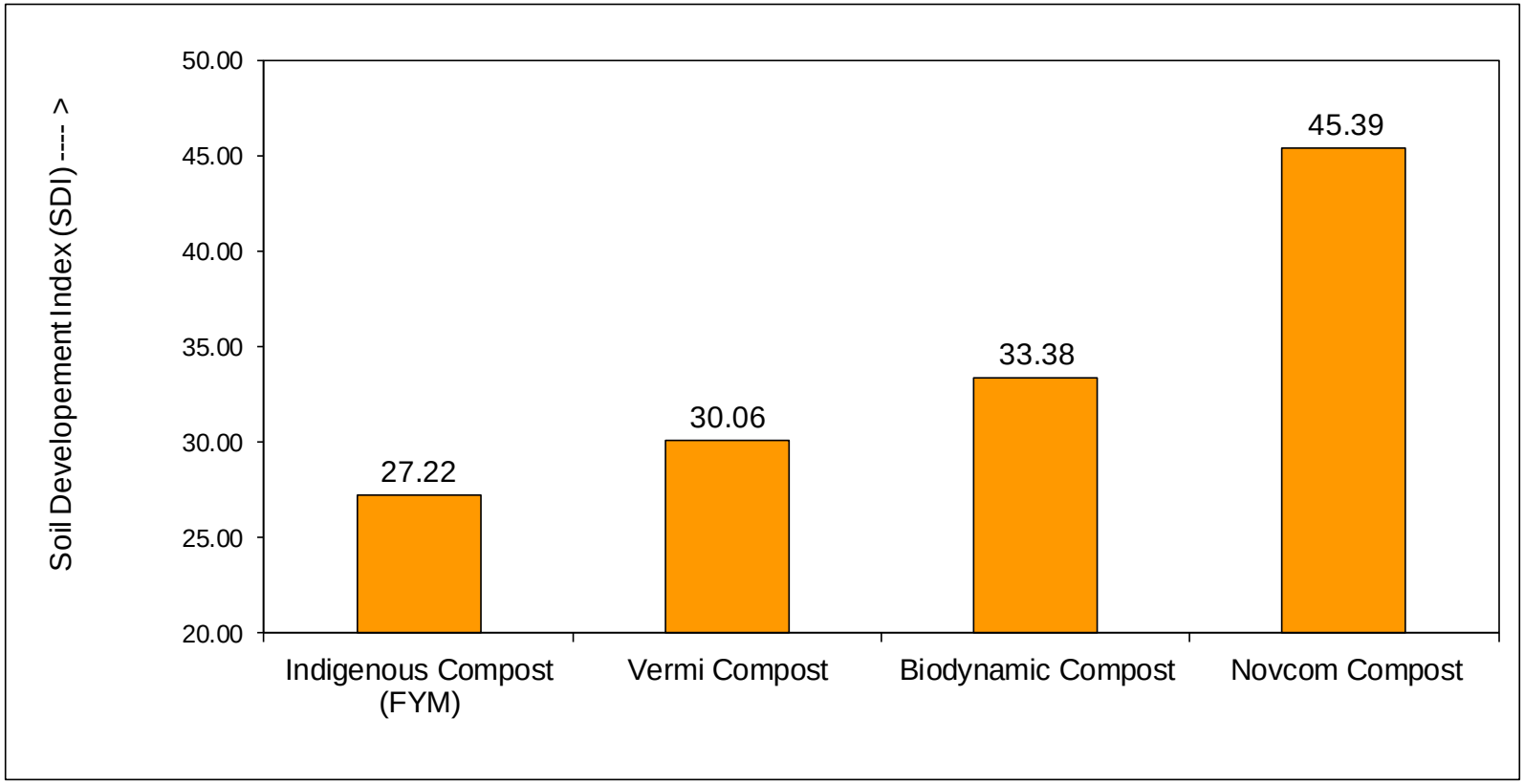


Improvement of Soil Microbial Population under 3 years Continuous Application of different Compost.



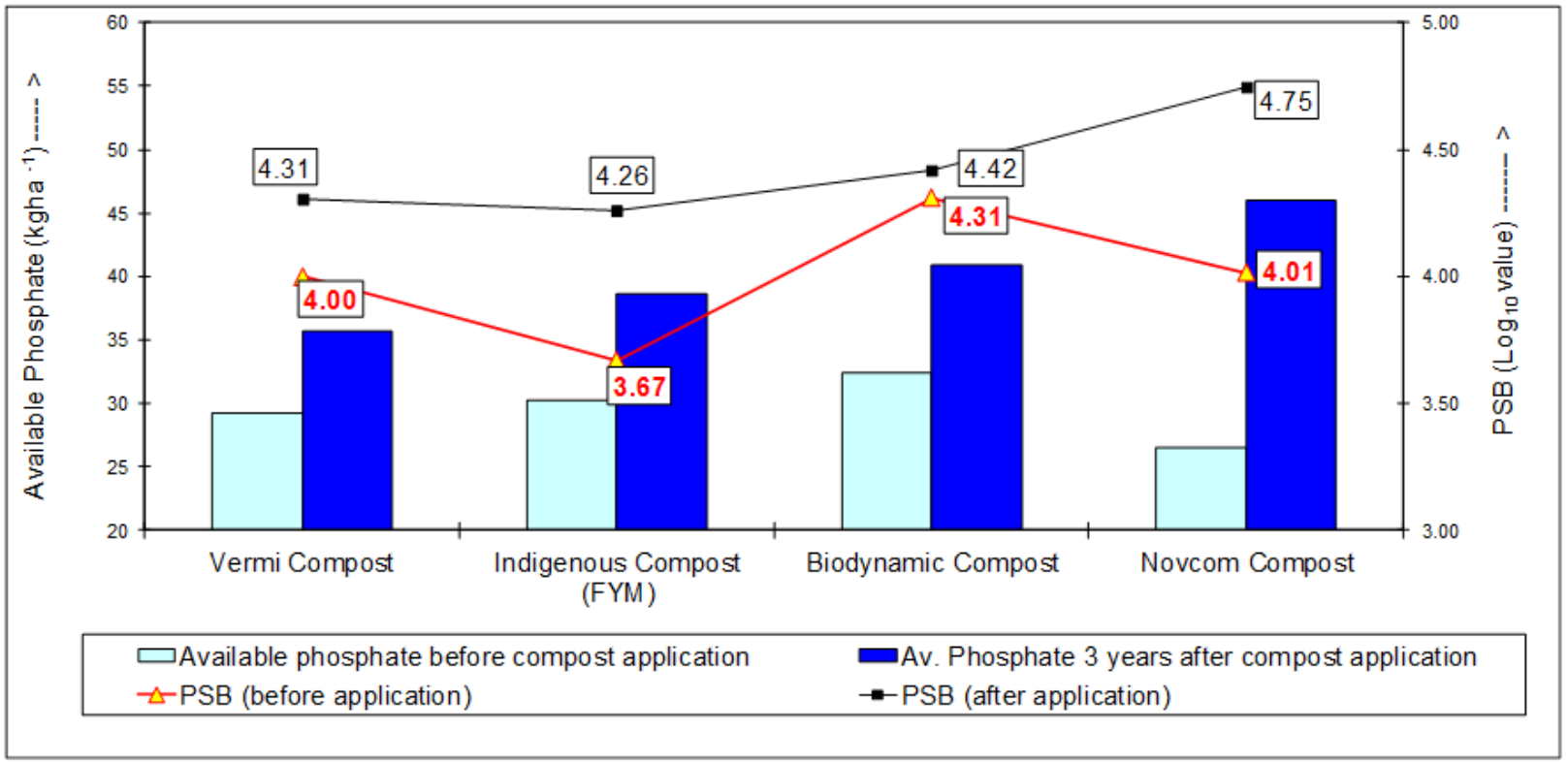
Total microbial count represents its population in soil, where as Soil Respiration indicates the dynamics and the activity of that microbial pool in the soil.

Soil Quality Development under 3 years Continuous Application of different Compost.



Highest Soil Quality Development under application of Novcom compost was corroborated with the highest crop response under Novcom compost application

Improvement of Soil Phosphate Dynamics under 3 years Continuous Application of different Compost.



Higher Phosphate availability depends upon the extent of Rejuvenation of Phosphate Solubilizing Bacteria in the soil upon compost application

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Table 3 : Convenience factor of different composting methods at Maud T.E., Assam.

Parameters	Vermi compost	Biodynamic Compost	Indigenous Compost	Novcom compost
Requirement of infrastructure	Yes	Partly Yes	No	No
Biodegradation period	60 to 75 days	80 to 90 days	80 to 90 days	21 to 30 days
Selectivity of raw materials	Yes	No	No	No
Monitoring requirement.	Yes	Minimum	No	Minimum
Simplicity in composting process	Complex	Moderate	Simple	Simple
Sensitivity to external factors	Yes	No	No	No

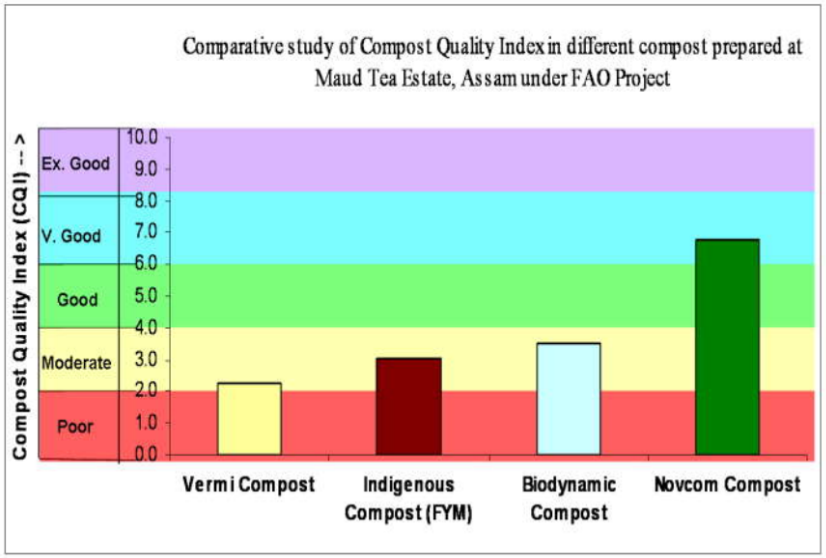

Fig. 4 : Quality rating of different types of compost as per Compost Quality Index (CQI).

Comparative Study of Convenience Factor of Different Composting Methods :

The degree of convenience associated with NOVCOM composting method was judged through different parameters viz. process simplicity, infrastructural requirement, raw material selectivity, biodegradation period, necessity/ frequency of monitoring required, and the sensitivity to external factors in comparison to the other composting methods

Findings From FAO-CFC-TBI Project (2009 - 2011)

10B

Parameter	Vermi compost	Biodynamic compost	Indigenous (FYM) compost	Novcom compost
Raw material Specificity	Yes	No	No	No
Biodegradation Period	60 - 75	80 - 90	80 - 90	21 - 30
Recovery Percent	67.0	61.0	57.0	69.4
Total nutrient (N+P+K) content (%)	3.26	3.73	2.69	4.05
N enrichment (% increase over initial value in raw material)	142.88	172.1	107.41	207.75
Total Microbial Count (c.f.u / gm moist sample)	67×10^{16}	43×10^{12}	21×10^{12}	17×10^{12}
Compost Quality Index (CQI)	2.82	3.59	2.24	7.28
Crop efficiency (%) (w.r.t. target yield of 1500 kg made tea/ ha)	89	85	88	100

32 PARAMETERS Quality Study of different types of Compost /1

Sl. No.	Parameter	Analytical Value			
		Vermi compost	Biodynamic compost	Indigenous compost	Novcom compost
Physical Parameters					
1.	Moisture percent (%)	54.34^{a3}	48.54^{b}	46.46^{b}	56.73^{a}
2.	Bulk density (g/cc)	0.70^{a}	0.63^{b}	0.67^{b}	0.47^{c}
3.	Porosity (%)	55.80^{b}	52.43^{c}	54.23^{bc}	67.01^{a}
4.	WHC[1] (%)	157.51^{b}	165.45^{b}	173.64^{b}	206.36^{a}
Physicochemical Parameters					
5.	pH_{water} (1 : 5)	6.56^{d}	7.23^{b}	7.03^{c}	7.61^{a}
6.	EC (1 :5) dS/m	1.56^{b}	1.68^{b}	1.54^{b}	2.21^{a}
7.	Total Ash Content (%)	54.14^{b}	52.64^{b}	57.34^{a}	49.71^{c}
8.	Total Volatile Solids (%)	45.86^{bc}	47.37^{b}	42.66^{c}	50.29^{a}
9.	Organic carbon (%)	25.48^{b}	26.31^{b}	23.70^{b}	27.94^{a}
10.	CEC (cmol(p+)kg^{-1})	140.03^{c}	215.89^{b}	174.03^{b}	267.07^{a}
11.	CMI[2]	2.12^{b}	2.00^{c}	2.42^{a}	1.78^{c}
12.	Sorption capacity index	5.50^{c}	8.21^{a}	7.34^{b}	9.56^{a}
Fertility Parameters					
13.	Total nitrogen (%)	1.74^{b}	1.78^{b}	1.68^{b}	2.19^{a}
14.	Total phosphorus (%)	0.65^{b}	0.77^{a}	0.45^{b}	0.72^{ab}
15.	Total potassium (%)	0.87^{b}	1.18^{a}	0.56^{b}	1.14^{a}
16.	C/N ratio	14.6 : 1^{a}	14.8 : 1^{a}	14.1 : 1^{a}	12.8 : 1^{b}

[1]WHC : Water holding capacity; [2]CMI : Compost mineralization index; [3]*Duncan test ($p < 0.05$)*

32 PARAMETERS Quality Study of different types of Compost /2

Sl. No.	Parameter	Value			
		Vermi compost	Biodynamic compost	Indigenous compost	Novcom compost
Ready Nutrient Supplying Potential					
17.	Water soluble carbon (%)	0.250^{b3}	0.328^{b}	0.312^{b}	0.390^{a}
18.	Water soluble inorganic N(%)	0.087^{b}	0.106^{b}	0.086^{b}	0.125^{a}
19.	Water soluble organic N (%)	0.050^{b}	0.062^{b}	0.054^{b}	0.074^{a}
20.	Organic C/N ratio	5.00^{c}	5.29^{b}	5.78^{a}	5.29^{b}
21.	Humification ratio	0.010^{b}	0.012^{b}	0.013^{b}	0.014^{a}
Microbial Parameters (per gm moist soil)					
22.	Total bacterial count[3]	13.78^{b}	13.97^{b}	13.82^{b}	17.81^{a}
23.	Total fungal count[3]	11.53^{d}	13.24^{b}	13.06^{c}	17.32^{a}
24.	Total actinomycetes[3] count	11.15^{d}	12.85^{b}	12.54^{c}	17.15^{a}
25.	MBC[4] (%)	0.45^{d}	1.02^{b}	0.87^{c}	1.24^{a}
Stability Parameters					
26.	CO_2 evolution rate ($mgCO_2$-C/g OM/day)	1.43^{c}	1.89^{b}	1.81^{b}	2.16^{a}
Maturity & Phytotoxicity Parameters					
27.	NH_4^+ - Nitrogen (%)	0.025^{b}	0.028^{a}	0.024^{b}	0.023^{b}
28.	NO_3^- - Nitrogen (%)	0.062^{b}	0.078^{b}	0.062^{b}	0.102^{a}
29.	Nitrification Index	0.40^{a}	0.36^{a}	0.39^{a}	0.22^{b}
30.	Seedling emergence (% of control)	94.66^{c}	102.56^{b}	89.69^{d}	111.72^{a}
31.	Root elongation (% of control)	97.14^{c}	98.47^{ab}	94.23^{d}	114.16^{a}
32.	Germination index (phytotoxicity bioassay)	0.92^{c}	1.01^{b}	0.85^{d}	1.28^{a}

[3]Count in MPN method, [4]MBC : Microbial biomass carbon; [3]*Duncan test ($p < 0.05$)*

"Demonstration of Resource Recycling from Farmers Field to Organic Tea Estates"

What is NOVCOM SOLUTION ?

Novcom Solution has been developed by Dr. P. Das Biswas, Founder Director of Inhana Organic Research Foundation, (a R&D organization based in Kolkata, India) and pioneer of Sustainable Tea Cultivation in India. The solution contains biologically activated and potentized extract of Cynadon dactylon., Sida cordifolia L. and Ocimum bascilicum.

- Novcom solution does not contain any microbial culture or any chemical catalytic agents. It only provides the necessary energy component to create a favourable environment for rapid, intense and prolific generation of microbes during composting, that too in a programmed manner.
- Novcom solution is made in customized manner considering the raw materials for getting quality compost. Novcom method only follows the natural steps of biodegradation and just intensify each step and their succession. Unlike the facilitation of any particular step or addition of any converters or conversion mechanism of complex components of the organic material being followed in all other methods.
- Only Novcom solution is made in the customized manner according to the composting of each organic raw materials. Therefore Novcom is effective to biodegrade of all organic waste.

Process flowchart for Novcom solution under the ELEMENT ENERGY ACTIVATION (E.E.A) PRINCIPLE.

Selection of specific plants (Specific days and time)

Radiant energy from the Basic Life Force (solar energy) is stored in plants. As the specific energies are stored in specific parts of the different plants, selection of the plants or more precisely selection of specific plant parts is most important. Not only that, specific days and times are also important as the energy-storage potential of the plants varies with various star occurrence. So astronomical parameters are important to extract maximum stored energy.

Alcoholic Extraction (Specific plant parts in specific time and procedure)

Specific plant parts, viz. roots, stem, leaf, root hair, leaf vein are taken for extraction as early as possible from the collection time, before the living parts become inert and stored radiant energy is dissipated. Since the energy components are extremely subtle and abstract in nature and simultaneously they need a medium (matter) and after / during extraction, they should be transferred to a medium which is less gross and the same time has higher surface tension. Alcohol is used for the extraction process because it has the potential to isolate the bound energy in gross form and stored within it.

Energization (Isolation of energy components)

Energization is the process through which energy components are isolated from its gross form and stabilize in alcoholic medium. Both extraction and energization process operates simultaneously as the extracted gross components should be immediately transferred to a medium from which these can be liberated easily. The total energization procedure continues for several days up to 21 days to extract maximum stored energy to this medium. Still only a part of the stored energy can be isolated from its plant source.

Potentization (Release of bound energy in order of 10^3 to 10^4 times)

Potentization is the process through which the extracted bind energy is activated to perform in a desired order when applied in plants. In this process, specific energy is transformed to its nearly original source or more specifically as it was transformed to differential energy from the Basic Life Force. This form is Lifetrons, which are much subtler than electron, proton or atom. The bind energy manifests when it is separated from the binding agents. In this process the medium used is pure filtered water free from heavy particles. The potentization is done in the order of 10^3 to 10^4 times according to the specific energy components and the objectives of the specific role. Potentized energy components are actually in the binding form but are separated from other differential energy and posses a huge liberating potential than its previous stage.

Combination of the potentized and energized extracts

Combination of this potentised and energized extract is done according to the specific objectivity of the solutions.

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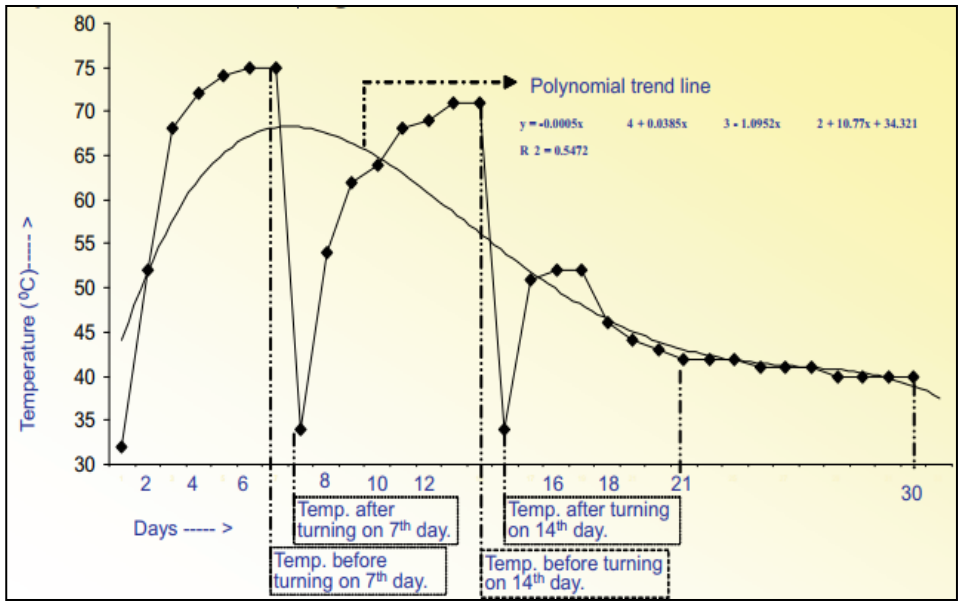
Novcom solution is developed under the element energy activation principle. Radiant solar energy is stored in plants and the bound stored energy components are extracted from energy-rich plant parts using a specific extraction procedure and subsequently potentized in the order of 10^3 to 10^4. The process flowchart of Novcom Solution under the Element Energy Activation (EEA) principle described the development of the solution in brief.

How Novcom composting method works ?

Novcom Composting Method advocates six steps of bio-degradation

- High Temperature of 65-70^0 C to pasteurize and kill pathogens.
- Production of Thermophilic Bacteria & Actinomycetes
- Preventing the proliferation of mineralizing bacteria and loss of valuable substances and preparation of the field for fungi.
- Temperature falls. Manure worms & crustaceans chew up org. matter.
- Break up of organic matter and multiplication of fungi.
- Break up of cellulose and lignin fiber into simpler form.



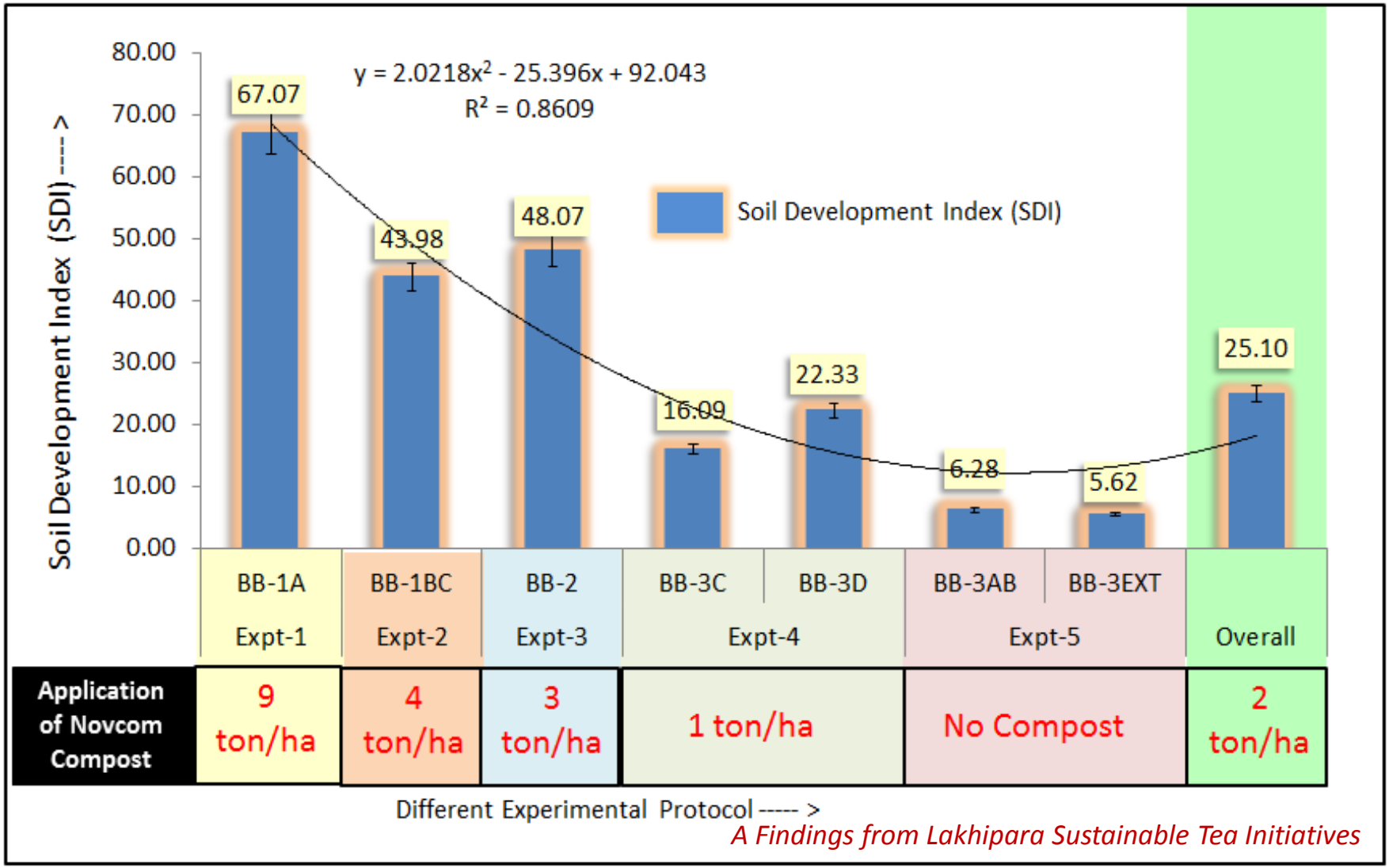
Variation of temperature in the Novcom compost heap during biodegradation.

In the Novcom composting process the high temperature of 65-70°C pasteurizes and kills pathogens. At the same time thermophilic bacteria and actinomycetes are produced while proliferation of mineralizing bacteria is prevented and thereby loss of valuable substances is restricted.

Interpretation of Mechanism through E.E.A. Principle:

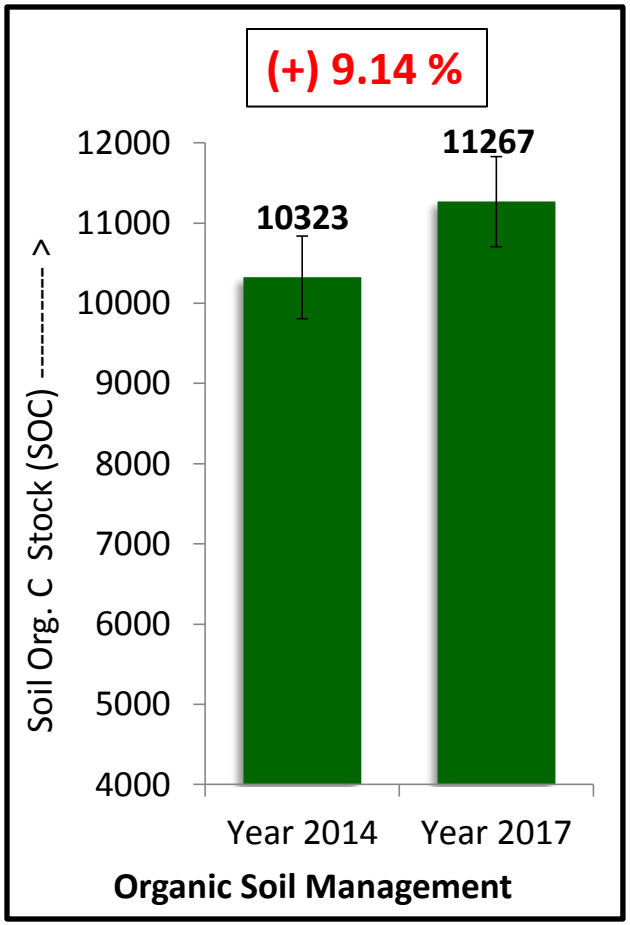
- It is known that all animate and inanimate objects of the earth is composed of **five elements (Earth, Water, Fire, Air & Space)**. In the first stage of degradation process the elements are broken to their respective individual identity.
- Then the temperature rises up to 65-70^{0}C by activating the fire element with the help of **Apana Prana**. In this stage the unfriendly bacteria, fungi or the seeds of unwanted plants are destroyed and thermophillic bacteria start growing up.
- After a span of time, the actinomycetes group come and breaks the degraded material into the smaller particles. This function is facilitated by the Space element utilizing **Vyana Prana.**
- The process continues at various levels with the help of **Fire element** and finally the stage of lignin degradation comes.
- In the complete process **Air element** plays a very important role by providing the oxygen for respiration of the numerous micro-organisms engaged at the different stage of conversion process.
- The entire process is rapid, intense and programmed; hence it finishes within 3 weeks only.

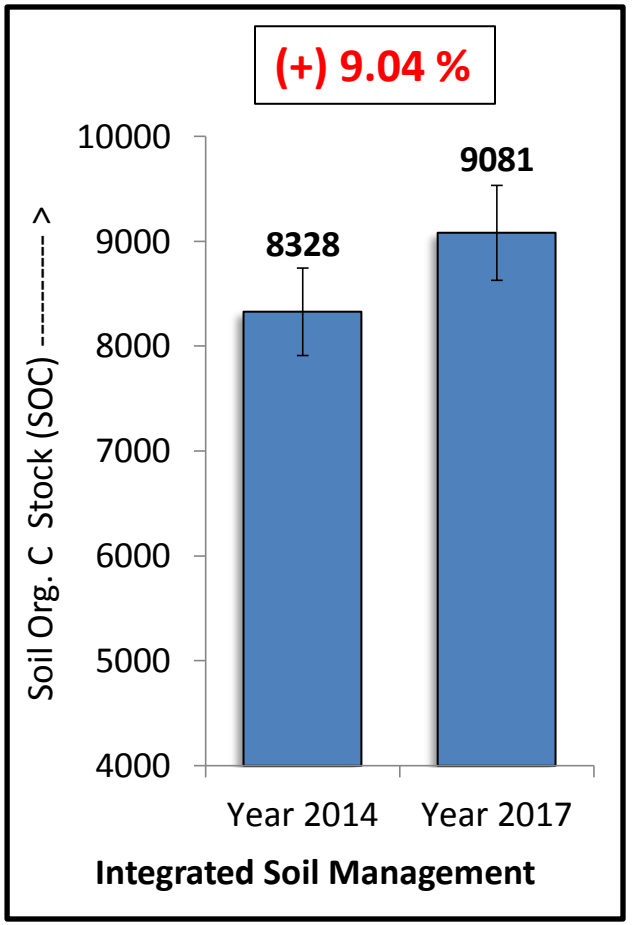
Soil Quality Development with Application of Novcom Compost

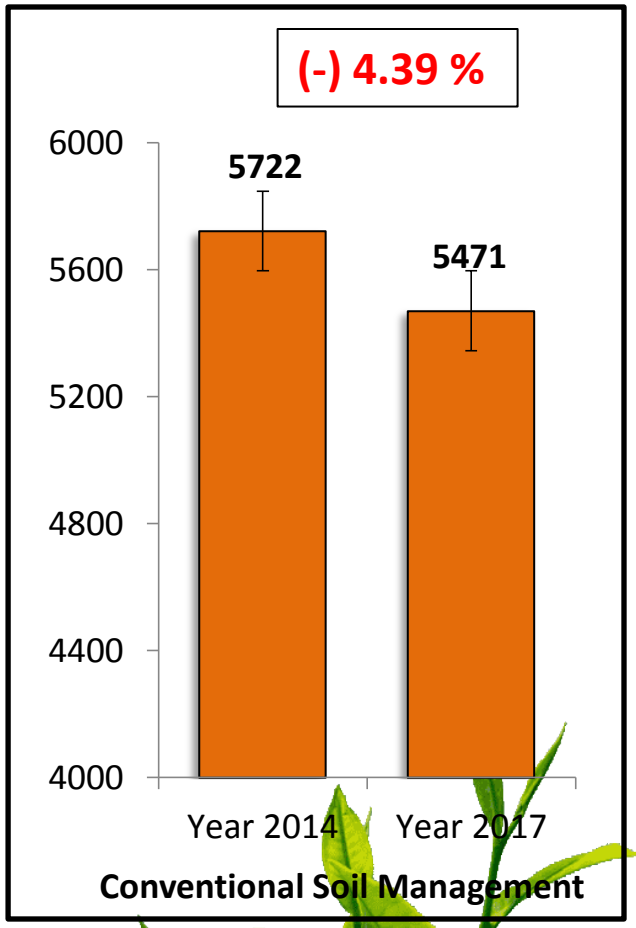


Comparative study of Soil Development Index (SDI) with Novcom compost application in the project area.

Soil Organic Carbon Stock with Application of Novcom Compost



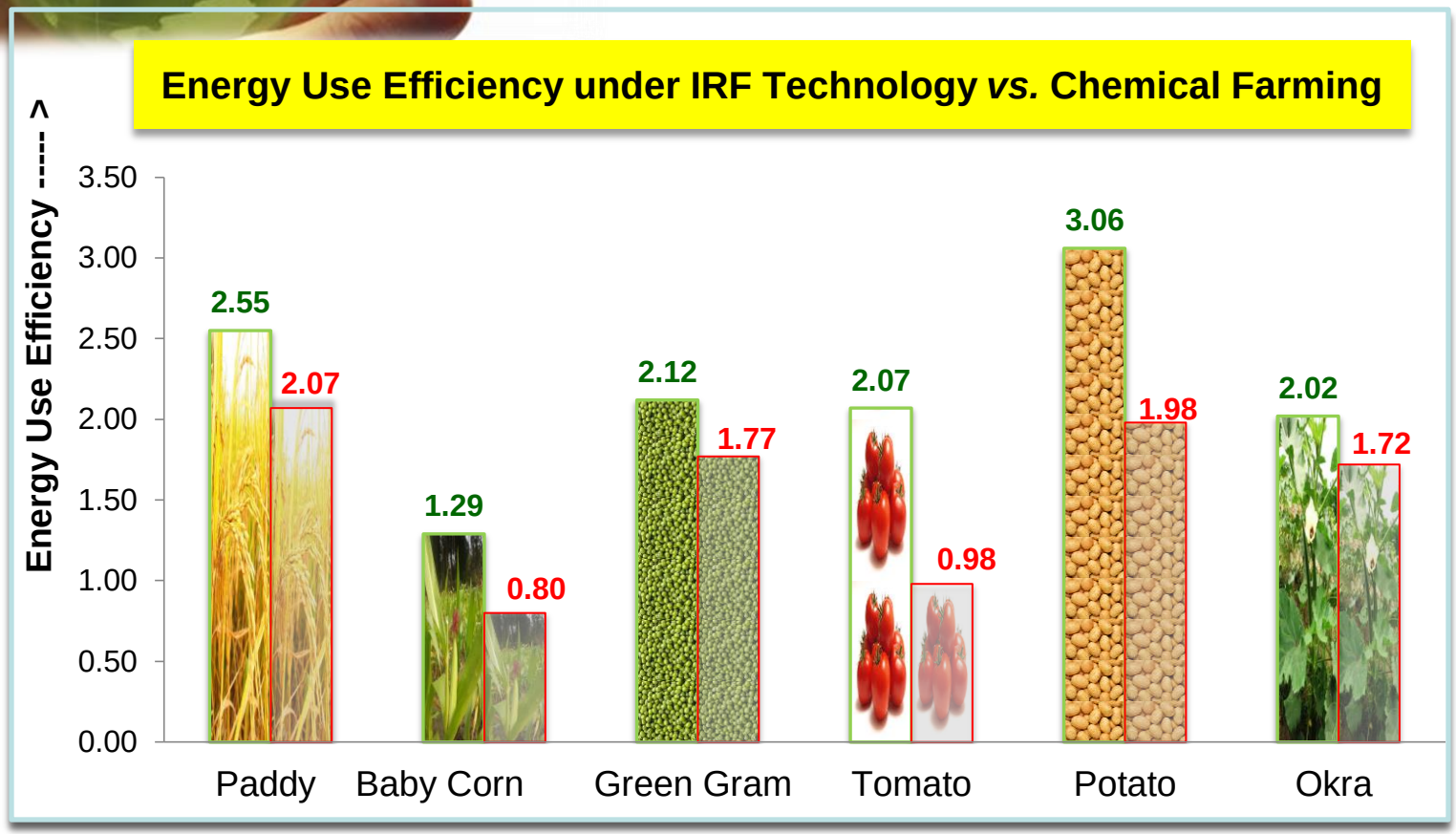




A Findings from Lakhipara Sustainable Tea Initiatives

The Dual Approach of Soil Health Management through Novcom Compost along with Plant Health Management can enable . . .

Up to 71 % lower Energy Usage with 40 to 60 % increase in Renewable Energy inputs.



Novcom – Its potential towards Efficient Carbon Foot Print Management

1/3rd Biodegradation Time – *Less GHG Emission Potential*

Minimum involvement of Mechanization – *Low Energy Intensive Method.*

Higher N Appreciation – *Lower Energy Consumption to Sustain Productivity*

Higher Microbial Population – *Faster Soil Rejuvenation Leads to Higher GHG Trapping Potential.*

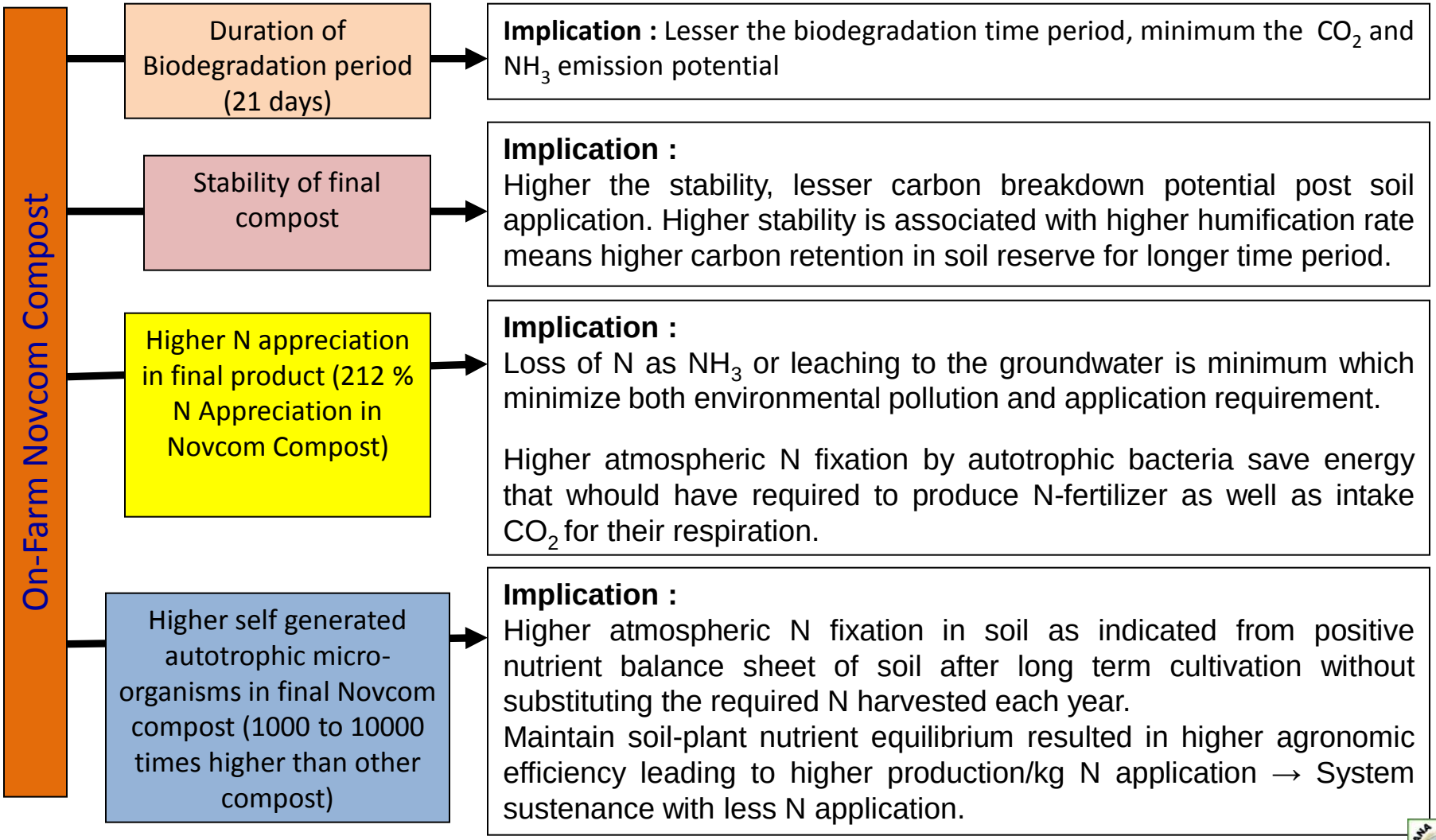
Stable, Mature compost with High Org. C – *Higher potential of C Sequestration*

All roads leads to Lower GHG Emission/ Efficient Management of the Carbon Foot Print

& All these points are conclusively attended by:

NOVCOM COMPOSTING METHOD

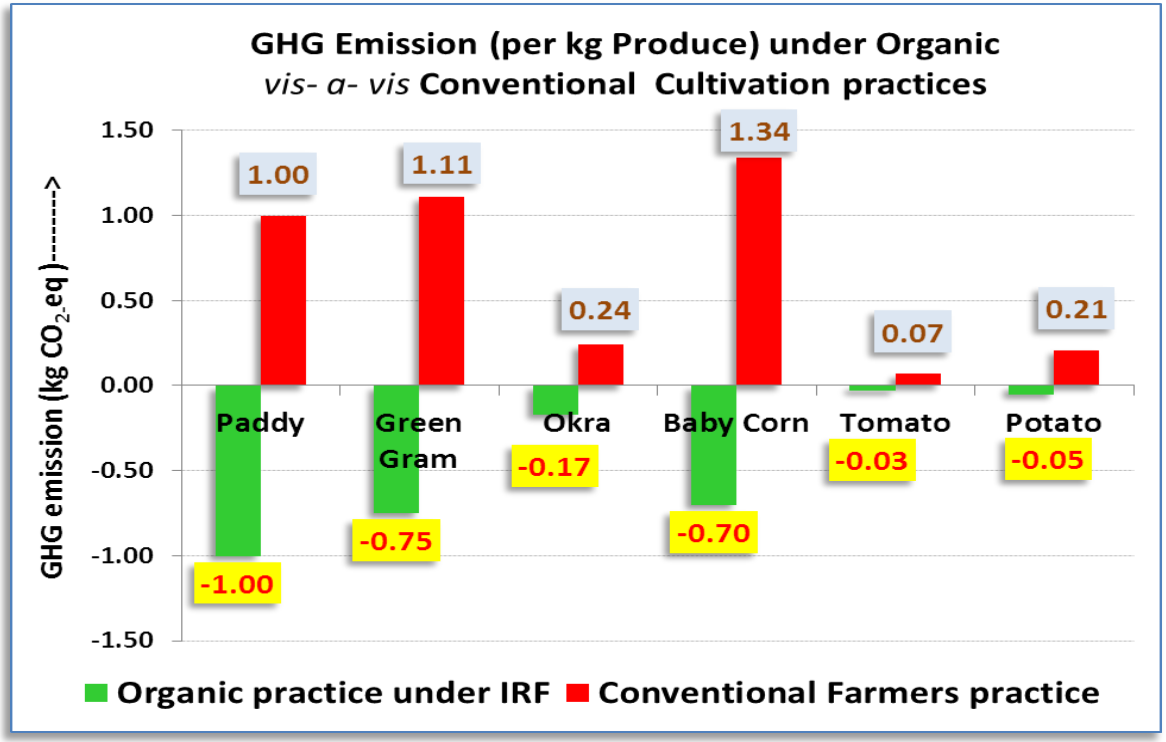
Quality of On-Farm Composting Method – Impact on GHG Emission, C-retention and C-cycle.



(Sourced from Inhana Publicatio

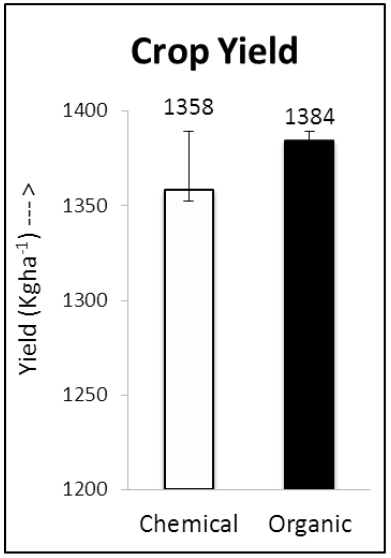
The Potential of Novcom Compost towards reduction of agricultural GHG's is un-debated

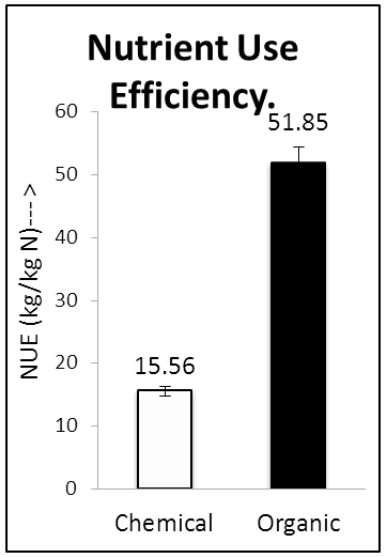
(-) 0.03 to (-) 1.0 kgCO_2 eq./kg produce reflects both **GHG Mitigation & Adaptation Aspects when Soil Health Management through NOVCOM COMPOST is undertaken in combination with Plant Health Management under IRF Technology**

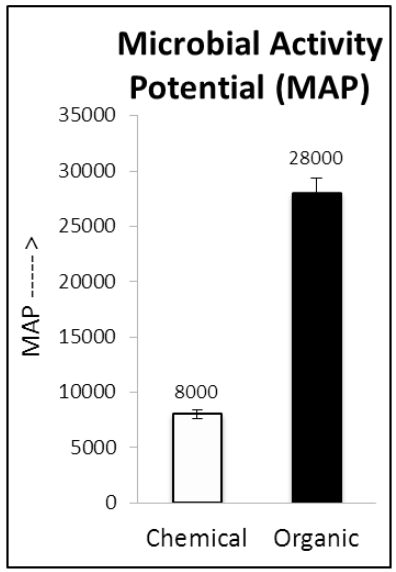


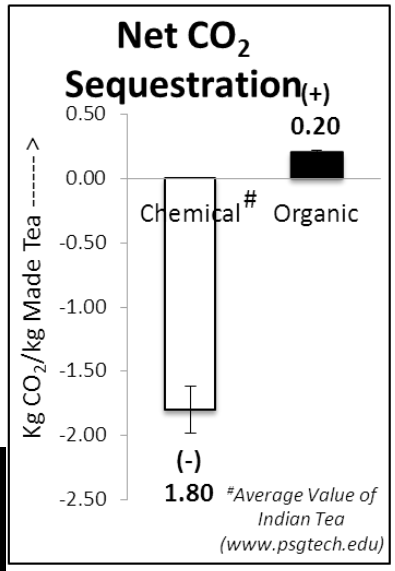
A new study by University of Oregon also suggests that ***organic farming*** *may not be always sustainable;* ***can produce even more greenhouse gases*** *when done on large scale than its conventional counterpart; primarily due to crop losses*

THE JOURNEY SO FAR . . .









Successful Organic Conversion of about 3.0 million kg Tea for the last 15 years.

Where > 40% Yield Loss under organic conversion is common in Indian Tea . . .

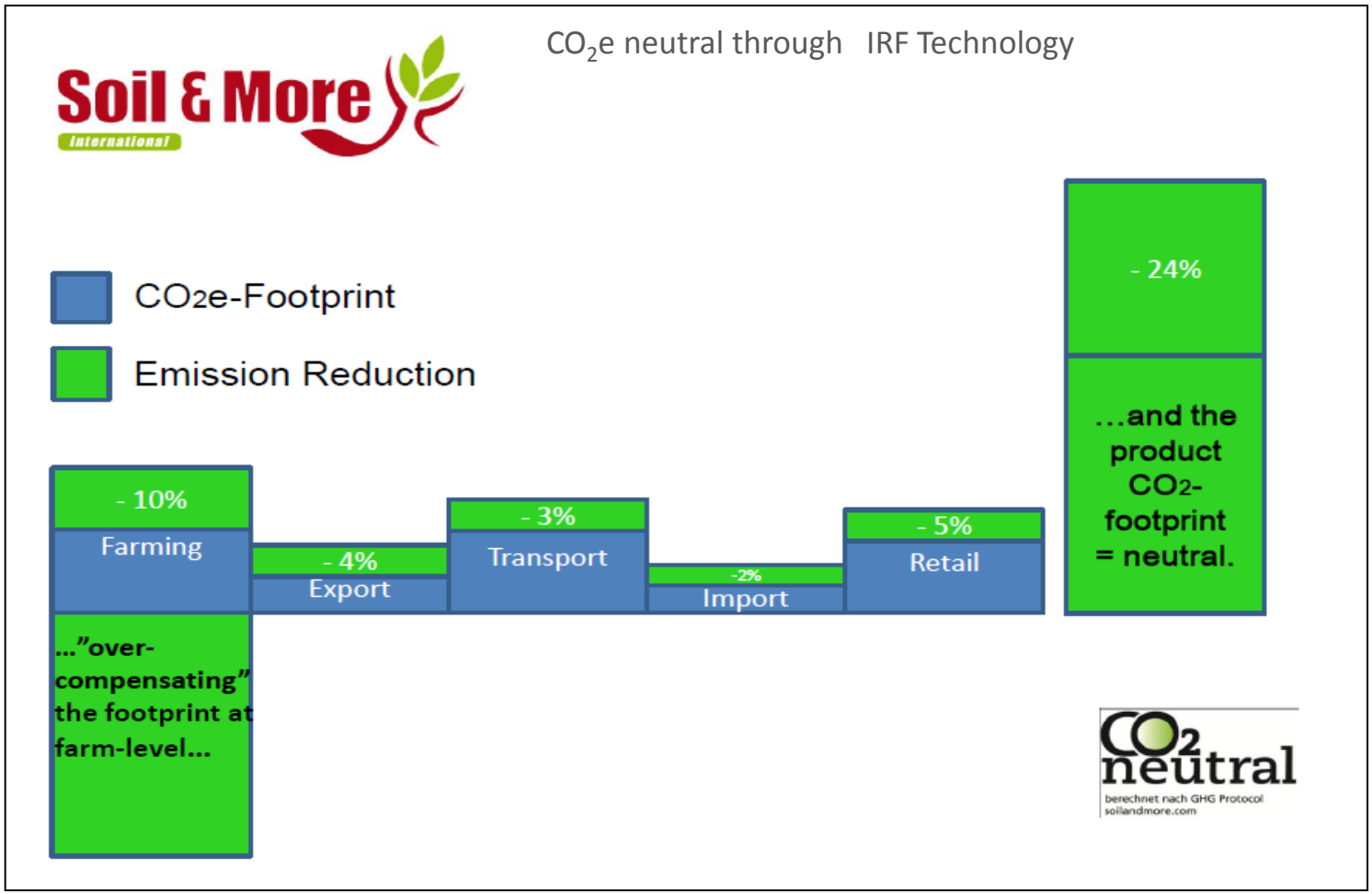
West Jalinga T. E., Assam, India became **World's 1st Carbon Neutral Tea Estate** following adoption of **Inhana Rational Farming Technology**

A 10 year's average under chemical and post organic conversion showed **increase in crop productivity despite application of 1/5th dose of N** as done under chemical.

- **71 % lower Energy** Requirement
- **36 %** Higher **Carbon Sequestration**
- **21 % Lower Cost** than Conventional

Technology that practically demonstrates large scale Ecologically & Economically Sustainable Organic farming

THE JOURNEY SO FAR . . .



Net carbon footprint of **(-) 0.4 kgCO_2e/kg tea** in W. Jalinga Tea Estate.

Evaluation of the Effectivity of different Package of Practice in Mature Tea under FAO-CFC-TH Project (2008-13)

Rank	Package of Practice	Yield (kg/ha)	Over Target (1220 kg/ha)	Cost / ha (Rs.)	Cost/kg (Made tea) (Rs.)	Soil Development Index (SDI)
1.	IRF Technology for soil and plant management **(IRF)**	1374	113.3 %	13,796/-	10.04/-	97.9
2.	Vermi Compost & Bio-fertilizer combination for soil management + Bio-pesticide for plant management **(VMI)**	1299	103.5 %	66,257/-	51.01/-	79.7
3.	Vermi Compost for soil management + Bio-pesticide for plant management **(VMIP)**	1235	98.9 %	46,832/-	37.92/-	63.47
4.	Vermi compost for soil management + Conventional organic Pest Management **(VCO)**	1158	92.8 %	40,184/-	34.70/-	72.9
5.	Convention organic soil and plant management (CO)	1109	89.2 %	12,954/-	11.68/-	80.5
6.	Biodynamic Farming soil and plant management **(BD)**	1075	87.4 %	14,914/-	13.87/-	63.12
7.	**Bio-fertilizer and Bio-pesticide for soil & pest management (MI)**	1065	86.2 %	28,657/-	26.91/-	53.39

Comparative study of crop cultivation under IRF Organic and Chemical Farming (compiled from different organic project done during 2008 - 20)

Crop	Yield ($Kgha^{-1}$)	NUE[1]	EUE[2]	Soil Health Indices		
				FI[3]	MAP[4]	SQI[5]
Experimental Stations (hot moist sub-humid ecological sub region with deep loamy to clayey alluvium-derived soils, medium to high AWC and LGP 210-240 days)						
Paddy (Oryza sativa)[#] [Variety : Gobindobhog]	3194* (2977)	11.8 (24.8**)	2.55* (2.07)	24.1 (23.6)	15.40** (11.20)	0.54* (0.47)
Baby Corn (Zea mays) [Variety : HM 4]	1700** (1333)	8.1* (6.7)	1.29* (0.80)	20.2 (20.7)	13.43* (10.12)	0.46* (0.41)
Green Gram (Vigna radiata) [Variety : PDM 84-139]	933* (819)	6.95 (8.19*)	2.12* (1.77)	26.5 (26.2)	18.12* (16.24)	0.59 (0.56)
Tomato (Lycopersicon esculentum) [Variety : Rituraj]	35000** (31000)	129.6* (110.7)	2.07** (0.98)	25.9 (26.3)	20.13* (17.22)	0.64* (0.58)
Farmers Field						
Paddy (Oryza sativa)[##] [Variety : IET4786]	6098** (4707)	25.5* (19.6)	3.06** (1.98)	23.2* (21.8)	16.04** (13.21)	0.57 (0.54)
Potato (Solanum tuberosum) [Variety : Jyoti]	30000* (27750)	111.1** (79.2)	4.56** (2.07)	28.7 (29.4)	22.04* (19.06)	0.63 (0.59)
Okra (Abelmoschus esculentus) [Variety : hybrid Shakti (F1)]	7793* (6860)	36.59* (27.55)	2.02* (1.72)	23.4 (23.9)	14.43* (10.27)	0.51** (0.43)
Green Gram (Vigna radiata) [Variety : PDM 84-139]	699* (665)	3.28* (2.67)	2.05* (1.74)	26.5 (25.8)	14.56 (12.34)	0.48 (0.45)

Note : Figure in the parenthesis represents data from chemical farming;

T – test (* significant at P<0.05 and ** significant at P<0.01); [#]Rain fed; [##]Irrigated; [1]NUE : Nutrient Use Efficiency (kg/kg produce); [2]EUE : Energy Use Efficiency; [3]FI : Fertility Index; [4]MAP : Microbial Activity Potential; [5]SQI : Soil Quality Index (Bera et al, 2015)

THANK YOU

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