



Energy for Peace & Prosperity

**SAARC
ENERGY
CENTRE**

**Online Capacity Building of SAARC Professionals on
Commercial Scale Biogas Plants
August 23-27, 2021**



Residue management and value addition

- a game changer in improving financial viability of Biogas plants

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Chandan Gadgil

Hon Advisor Bio-energy, BAIF, Pune

and

President

Sankalp Medi Education Society, Pune

chandangadgil@gmail.com

Contents

- ☐ Need for change in outlook towards Residue management.
- ☐ The current utilization of residue for small and commercial plants.
- ☐ How to create Opportunities to Improve financial viability of any Biogas project.
- ☐ What is Bioprom ?
- ☐ Why is Bioprom so unique?
- ☐ Field trials and Validation of the product.
- ☐ Financial impact of Bioprom on biogas projects .
- ☐ Challenges and policy suggestions
- ☐ About BAIF, Pune –

Learning objectives

- ☐ Why Residue capture and value add is the need of the hour.
- ☐ How to create opportunity via value added product from residue.
- ☐ Improving financial viability and robustness of Biogas projects
- ☐ About Bioprom - Experience sharing on producing and field application of Bioprom.

The Need: Soil Health and Agriculture Productivity is showing a downward trend.

- Soil health is deteriorating fast due to the high use of chemical fertilizers
- Micro flora is reducing from the soil.
- Moisture retention capacity is being lost
- Agricultural productivity reducing, Soils becoming lifeless
- Over use of Chemical fertilizers and pesticides leading to downstream pollution and health issues.
- Forex outflow and subsidies on phosphatic fertilizers, are a big burden.
- Dire need for Substitute products to reduce/replace chemical fertilizers.
- The Future of Climate change mitigation will significantly lean on soil carbon.
- Changing the mindset to add residue capturing and value addition as important.



SLURRY NOT BEING CAPTURED PROPERLY

Residue management for small biogas units - BAIF Slurry Filter_{pat pending}



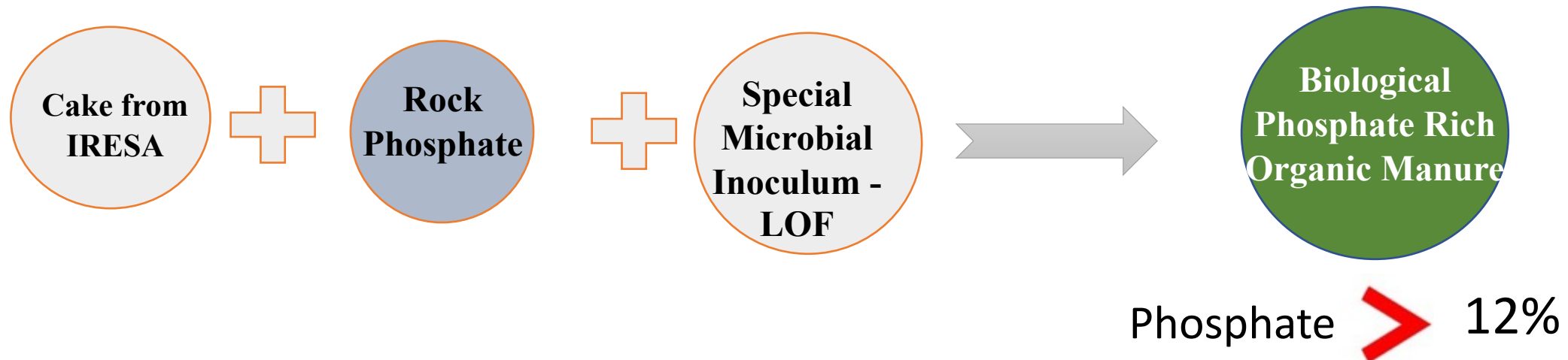
The Opportunity : Create a Better Financial viability through value added products

- Making a Paradigm shift – Convert Residue from a Bi-product to Product.
- Financial viability can be improved significantly by value addition
- BAIF, has developed a very good option for value addition to residue- “**Bioprom**” . Its Biological phosphate rich organic Manure.
- It has a potential to replace or reduce Chemical phosphatic fertilizers.
- Huge market opportunity to be tapped.
- A high phosphate source for Organic Farmers.
- **Institutional Bioprom Unit** - It can be produced at an Institutional level (e.g. sugar, dairy) from LARGE Biogas plants
- **Cluster Bioprom Unit** - 100 IRESA¹ farmers in a cluster can have 1 Bioprom unit.

*IRESA¹— A 2m³ /day Family size Biogas plant together with BAIF Slurry filter (BSF) pat pending
-Integrated Renewable Energy and Sustainable Agriculture.*

What is BIOPROM ? –

- BIOPROM is Biological Phosphate Rich Organic Manure.
- It is produced by mixing Biogas Residue, Rock phosphate and a Bio -inoculum LOF (*pat-pending*) ,
- LOF (*pat-pending*) is Bio inoculum developed by **BAIF** . It is a consortia of soil and plant beneficial microbes.



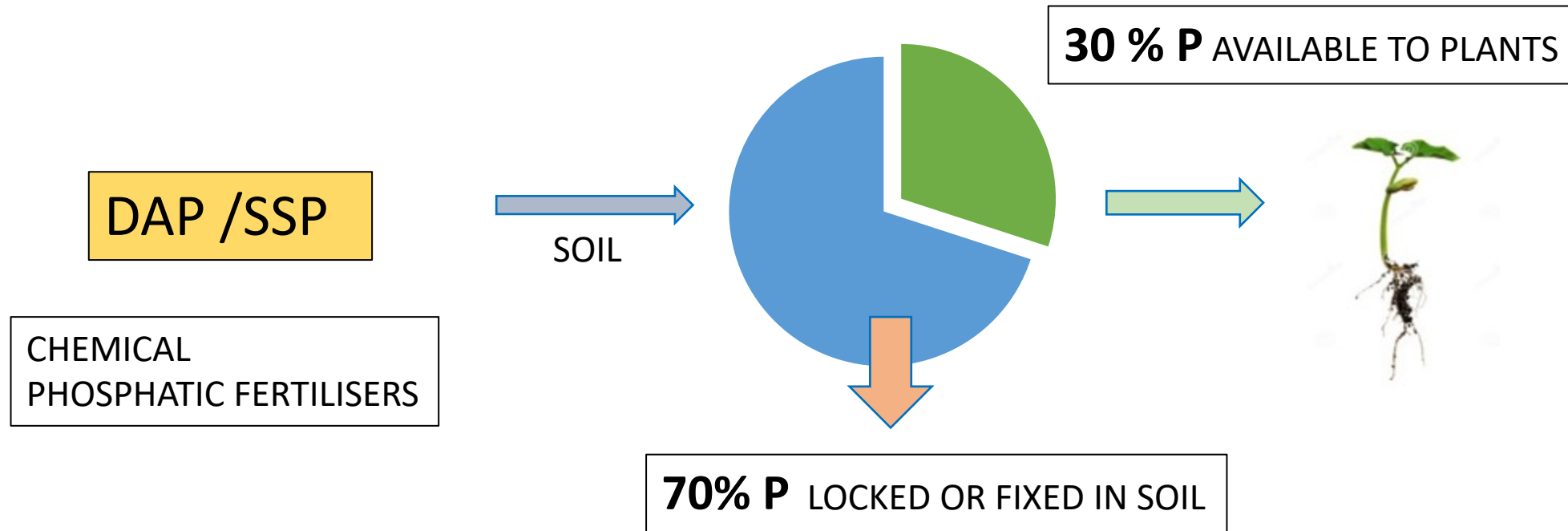
WHY BIOPROM ? PRODUCT UNIQUENESS

Bioprom is a 3 in one product.

1. BIOPROM can reduce or replace Chemical Phosphatic Fertilisers.
2. Its almost like a Biofertilizer .
3. Its organic.

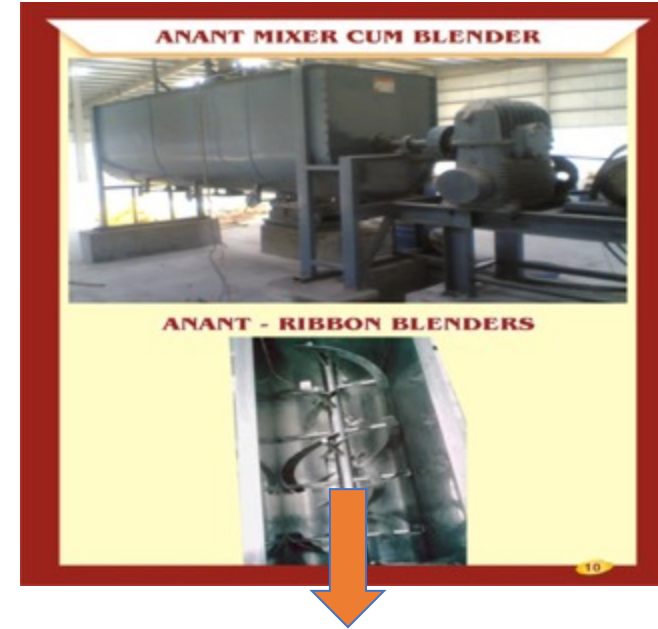
Less fixing of Phosphate in Soil through Bioprom

TYPICAL ISSUE WITH CHEMICAL PHOSPHATIC FERTILISER



Bioprom Production – Simple steps

Slurry
Separator



LOF Bio Inoculum and
fortification, Blending
and mixing

No need for
Windrows,
aero tillers and
large land
requirement

PROM BAGS



screening
operations

Slurry liquid application –Can value add.



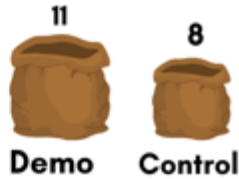
PRODUCT FIELD DEMONSTRATION AND VALIDATION

RESULTS AND SUMMARY – FARMER FIELD TRIAL



Name of crop : Gram
Total no. of demonstration plots : 3
Name of cluster – **Ramtek**

Average yield (q/ha)



% increase: 37.50



Name of crop : Onion
Total no. of demonstration plots : 5
Name of cluster – **Igatpuri**

Average yield (q/ha)



% increase: 17.64



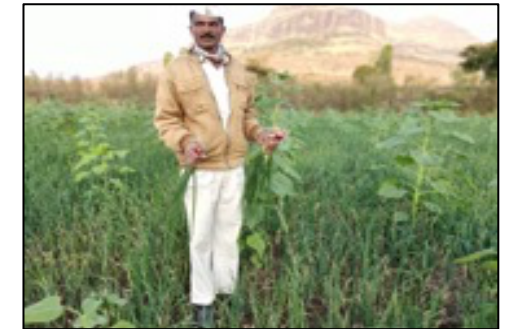
Name of crop : Wheat
Total no. of demonstration plots: 4
Name of cluster – **Katol**

Average yield (q/ha)



% increase: 30.33

- ☐ **Crops:** Wheat, Gram, Onion
- ☐ **No of farmer plots:** 35
- ☐ Significant increase in yield of all the crops at all locations due to BIOPROM and LOF application
- ☐ Average increase in net income of farmers
- ☐ Scope for replacement of SSP or DAP with PROM



INTERIM RESULTS AND SUMMARY – AGRI UNIVERSITY ON ONION and GRAM

Table 1: Effect of Biological Phosphate Rich Organic Manure (BioPROM) on Yield of Onion

Tr. No.	Treatment details	Bulb yield (t ha ⁻¹)
T ₁	Absolute control	16.61
T ₂	GRDF (100:50:50 N, P ₂ O ₅ & K ₂ O + 20 t ha ⁻¹ FYM)	35.22
T ₃	100% P through BioPROM and N and K as per recommendation	36.77
T ₄	75% P through BioPROM and 25% P through chemical fertilizer and N and K as per recommendation	33.89
T ₅	60% P through BioPROM and N and K as per recommendation	33.49
T ₆	GRDF (100 kg N, 50 kg K ₂ O through chemical fertilizer and 50 kg P ₂ O ₅ through BioPROM + 20 t ha ⁻¹ FYM)	37.41
T ₇	RDF (100:50:50 N, P ₂ O ₅ & K ₂ O ha ⁻¹)	32.60
SE ±		1.05
CD at 5%		3.23

Effect of Biological Phosphate Rich Organic Manure (Bio PROM) yield of Gram

Tr. No.	Treatments	Seed yield (q/ha)	Straw yield (q/ha)
1.	Absolute control	24.49	51.75
2.	GRDF (25:50:30 kg N, P ₂ O ₅ & K ₂ O + 5 t FYM ha ⁻¹)	34.67	61.70
3.	100 % P through Bio PROM and N and K as per recommendation	32.19	58.31
4.	75 % P through Bio PROM and 25 % through chemical fertilizer and N and K as per recommendation	31.88	58.61
5.	60 % P through Bio PROM and N and K as per recommendation	31.04	56.74
6.	GRDF (25 kg N and 30 kg K ₂ O through chemical fertilizers, 50 kg P ₂ O ₅ through Bio PROM + 5 t FYM ha ⁻¹)	35.58	62.66
7.	RDF (25:50:30 N, P ₂ O ₅ & K ₂ O kg ha ⁻¹)	30.62	55.80
SEm±		0.90	1.59
CD (5%)		2.78	4.91

About BAIF Development Research Foundation, Pune

BAIF is a grass root NGO working in the area of livestock, rural development , sustainable agriculture, enabling lives , since 1967

Some of the achievements of BAIF:

- Over 50 lakh families availing Animal Husbandry services in 100,000 villages.
- 20 lakh elite cows and buffaloes contributing Rs. 7500 crores through milk per annum.
- BAIF has 4000 Cattle development centres across 15 States in India.
- Watershed development covering 4 lakh ha and 2.2 lakh families enhanced the crop yields by Rs. 700 crores per annum. Wadi programme benefitting 2 lakh families, enhanced the production by Rs. 570 crores per annum.
- 2600 SHGs covering 27,500 women are actively engaged in socio-economic development.

BAIF experience in IRESA and Bioprom enterprise

- 1000 IRESA PLANTS Successfully commissioned
- 6 Bioprom UNITS successfully deployed
- 3 NEW Bioprom UNITS being added shortly.
- Special Bio-inoculum (LOF)_{pat pending} successfully developed for Bioprom production.
- Field trials conducted comparing Bioprom with Chemical phosphatic fertilizers , at the Govt University and at farmers level, on multiple crops.

CHALLENGES AHEAD

- Awareness creation
- Market Development
- Low cost Funding for setting up projects.

POLICY INITIATIVES

- Create a level playing field with Chemical Phosphatic Fertilizers
- Initiate a national programme to create awareness.
- Incentivizing setting up Slurry filters in small plants
- Value add Projects like Bioprom should be supported.
- Make 5% offtake mandatory for Fertilizer companies

Bioprom - ITS RELEVANCE TO SAARC NATIONS

- Most of the SAARC nations import SIGNIFICANT Phosphatic fertilizer¹
 - ✓ Bioprom projects can reduce this dependance significantly.
- Total subsidy¹ given on P & K fertilizer FOR INDIA in FY 2019-20 was \$3.5 Billion.
 - ✓ Use of Bioprom can reduce import, forex and subsidy on Phosphatic fertilizers.
- LPG imports² for INDIA in 2019-20 is about 13 million tons at a cost of \$6.7Billion,
 - ✓ Biogas from IRESA can reduce LPG import, forex and subsidy
- 300³ million bovine animals in India.
 - ✓ COW DUNG availability in India is significant. Enough raw material

¹ Annual report 2019- 20 of Department of Fertilizers, Government of India

² INDIAN PETROLEUM & NATURAL GAS STATISTICS 2018-19, Ministry of Petroleum and Natural Gas Economics & Statistics Division

³ DAHD –Department of Animal Husbandry.



WIN –WIN AT 4 KEY LEVELS

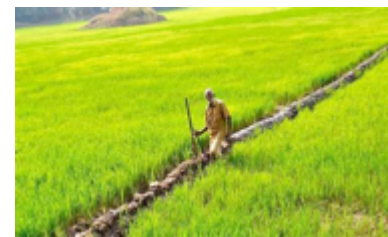
FOR FARMERS
REPLACING/REDUCING
CHEM PHOSPHATIC
FERTILISER



SOIL –
PRODUCTIVITY
IMPROVEMENT



NATION –
SELF
DEPENDANT



GLOBAL –
UN SDG GOALS





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Thank you

