



## PROMOTION OF ORGANICS & BIOFERTILIZERS IN CROP PRODUCTION

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## ORGANIC MANURES

- Manure from plant & animal origin
- Contains 0.5% N, 0.2 %  $P_2O_5$ , 0.5%  $K_2O$  in Rural Compost
- On an average contains 6 ppm B, 12 PPM Mn, 10 ppm Zn.
- Quality of Compost is important

## GENERAL CRITERIA FOR A GOOD QUALITY ORGANIC MANURE/ COMPOST

Criteria	Good Quality	Poor Quality
Color	Brown in black	varies
Odour (Smell)	No foul odour (has earthy or humus like odour)	Foul Odour
pH	6.5 to 7.5	Below 6 or above 8
C:N ratio	20:1 or less	> 20 : 1
Moisture	15.0 – 25.0 %	> 30%
Temperature	30 to 40°	> 45°C
Humus	6-8 %	< 4%
Nitrogen	> 1.0 %	< 1.0%
Plant Growth	Good	Poor

## STANDARD FOR ORGANIC MANURES

	City Compost	Vermi Compost	Pressmud
Moisture, per cent by weight	15.0 – 25.0	15.0 – 25.0	15.0
Min. Total N (%)	0.5	1.0	1.80
Min. Total $P_2O_5$ (%)	0.5	1.0	2.00
Min. Total $K_2O$	1.0	1.0	1.40
pH	6.5-7.5		7.0 – 8.0
C : N Ratio	20:1 or less		
Conductivity (ds /m)	4.0		
Pathogens	NIL	NIL	NIL

## HEAVY METAL CONTENT (MG/ KG)

	Urban Compost	Vermi Compost	Pressmud
Arsenic	10	10	10
Chromium	50	50	50
Mercury	0.15	0.15	0.15
Nickel	50	50	50
Lead	100	100	100
Copper	300	--	300
Zinc	1000	--	1000

\* 1000 mg per kg Zn will add 1 kg Zn per tonne of Compost, 5t Compost will add 5 Kg Zn/ ha. Such Zn are organically bound & will be gradually available.

## BIO FERTILIZERS

- ➔ Bureau of Indian Standard (BIS) have developed quality standards for Rhizobium, Azotobacter Azospirillum & PSB.
- ➔ No Standards are available for BGA, Azolen, VAM, Azotobacter

### RHIZOBIUM STANDARD

Base	Carrier based or liquid based
Viable Cell Count (CFU)	Minimum $10^7$ cells/g of carrier material or $10^7$ cell/ml of liquid.
Contamination level	No contamination of $10^5$ dilution
pH	6.5 – 7.5
Particle size in case of carrier based material	All Material shall pass through 0.15 – 0.212 mm IS Sieve.
Moisture percent by weight, maximum	30-40% (Carrier based material)
Efficiency Character	Should Show effective nodulation on all the legume species (Crops) listed on the packet.

### AZOTOBACTER STANDARD

Base	Carrier based or liquid based
Viable Cell Count (CFU)	Minimum $10^7$ cells/g of carrier material or $10^7$ cell/ml of liquid.
Contamination level	No contamination of $10^5$ dilution
pH	6.5 – 7.5
Particle size in case of carrier based material	All Material shall pass through 0.15 – 0.212 mm IS Sieve.
Moisture percent by weight, maximum	30-40% (Carrier based material)
Efficiency Character	The strain should be capable of fixing at least 10 mg of N per g of sucrose consumed.

### AZOSPIRILLUM STANDARD

Base	Carrier based or liquid based
Viable Cell Count (CFU)	Minimum, $10^7$ cells/g of carrier material or $10^7$ cells/ml of liquid material
Contamination level	No contamination of $10^5$ dilution
pH	6.5 – 7.5
Particle size in case of carrier based material	All Material shall pass through 0.15 – 0.212 mm IS Sieve.
Moisture percent by weight, maximum in case of carrier based material	30-40%
Efficiency Character	Formation of white pellicle in semi-solid Nitrogen –free bromothymol blue media

### PHOSPHATE SOLUBLISING BIOFERTILIZER (PSB) STANDARD

Base	Carrier based or liquid based
Viable Cell Count (CFU)**	Minimum $10^7$ cells/g of carrier material or $10^7$ cells/ml of liquid material
Contamination level	No contamination of $10^5$ dilution
pH	6.5 – 7.5
Particle size in case of carrier based material	All Material shall pass through 0.15 – 0.212 mm IS Sieve.
Moisture percent by weight, maximum in case of carrier based material	30-40%
Efficiency Character	The strain should have minimum 30% phosphate solubilizing capacity, when tested spectrophotometrically. In terms of zone formation, minimum 5 mm solubilization zone in prescribed media having at least 3

Bio-fertilizers are not included in FCO and as such no penal action can be taken for supplying sub-standard biofertilizers.

Government does not control the prices of Organic Manures & Bio-fertilizers.

Import of Organic manures & biofertilizers is banned. However, export is considered on case to case basis by DGFT (Directorate General of Foreign Trade) on the basis of recommendation of the Ministry of Agriculture.

Import of biofertilizers is restricted to avoid Competition with indigenous unit and also to avoid entry of pathogens through bio-fertilizer. However DGFT can allow imports.

#### PROSPECTS OF USE OF ORGANIC MANURES

##### ● Positive Aspects

- ➔ To improve soil organic carbon, biological fertility, aggregation, water and nutrient retention capacity, chelation.
- ➔ Available as a house hold wastes.
- ➔ Farmers have knowledge of its use.
- ➔ Cheap source of plant food.
- ➔ Improves quality of produce.
- ➔ Have high residual value
- ➔ Multi nutrient source.

#### PROSPECTS OF USE OF ORGANIC MANURES

##### ● Negative Aspects

- ➔ Used as fuel also.
- ➔ Quality is not given importance.
- ➔ Not much fortification is done.
- ➔ Un-decomposed one is harmful.
- ➔ Can be used as a supplementary source of plant nutrients.
- ➔ Availability is around 3 t/ha against recommendation of 10 t/ha.
- ➔ Difficult to handle.

#### PROSPECTS OF USE OF BIOFERTILIZERS

##### ● Positive Aspects

- ➔ Cheap source to augment plant nutrient supply.
- ➔ Easy to treat seeds.
- ➔ Effect of Rhizobial inoculation is established.
- ➔ Work well under low fertilizer use.
- ➔ Work well in combination with organics.

#### PROSPECTS OF USE OF BIOFERTILIZERS

##### ● Negative Aspects

- ➔ Bio-fertilizers other than Rhizobia have limited use so far.
- ➔ Manufacture is difficult.
- ➔ Not available in Blocks/ Panchayats/ Villages.
- ➔ Only limited quantity is available to farmers.
- ➔ Outside agencies often supply spurious materials which affect farmers considerably.
- ➔ Not much residual value.

#### HOW TO MAKE THINGS MOVE ? ▶

- Training of farmers on quality composting.
- Farmer participating demonstrations on Use of quality composts.
- Awareness creation among farmers quality Vs quantity.
- Crop demonstrations on vegetables, pulses, oilseeds, cereals on use of quality manures + bio fertilizers depending on crop removal.
- Emphasis on residue management.
- Soil health cards – Soil Testing, identifying critical issues – soil acidity, phosphorus, boron etc.
- Developing indicators to determine maturity of composts.

#### CONSTRAINTS IN PROMOTION OF ORGANIC MANURES&BIOFERTILIZER

- No policy on soil test based nutrient use.
- Soil Testing network in the State- very poor.
- State Govt. should promote vermi composting , leaf composting, phospho composting, crop residue management through farmers groups, WIG, SHGs in KVKs/ ATMs.
- SAUs, ZRS, KVKs need to be encouraged for bio-fertilizer production. State Govt. should decide on targets well in advance and ensure that it reaches the farmers in time.
- Mass Media support is meagre in this field.
- Absence of a Sound & scientific Agricultural policy in the State.
- No quality control lab for organics/ Bio-fertilizers.

#### SUGGESTION FOR EXTENSION FUNCTIONARIES

- USE YOUR CONSCIENCE WHILE WORKING IN RURAL AREAS WITH RURAL HOUSEHOLDS.
- PROMOTE DIFFERENT PROVEN TECHNOLOGIES FOR RESOURCE POOR & RESOURCE RICH FARMERS.
- SHARE ONLY THAT PART OF YOUR KNOWLEDGE WHICH CAN MAKE A DENT ON THE RURAL LIVELIHOOD UNDER A SPECIFIC SITUATION.
- DEVELOP A CLOSE LINKAGE WITH THE PEOPLE AND DO NOT IMPOSE ANY THING WHICH IS NOT TIME – TESTED.

THANK YOU