

BIOFERTILIZER MANUFACTURING PLANTS

Biofertilizers :

Biofertilizers, unlike synthetic fertilizers, are of natural (microbial) origin, have a wide range of applicability, & leave no toxic or non-biodegradable residues. They are thus gradually replacing synthetic fertilizers in several applications.

Biofertilizers are manufactured by fermentation of a complex heterogeneous medium using commercially viable microbial cultures.

The production plant consists of two sections, the manufacturing section & the culture laboratory.

The manufacturing section consists of fermentors, blenders, conveyors, storage tanks, piping & instrumentation, & bag/pouch filling equipments. The culture laboratory is equipped with standard testing & culture propagation equipments, the main ones being autoclaves, laminar flow work benches, microscopes, rotary shakers, etc. In addition, utilities equipments such as boilers, cooling towers, air compressors, water softeners & purifiers, pumps & vacuum pumps are also deployed.

Biofertilizers are growing in demand, with the increasing awareness amongst farmers about the ill-effects of synthetic fertilizers. Government agencies such as National Biofertilizers Development Centre (NBDC), Biotech Consortium India Ltd. (BCIL), etc. have taken up the promotion of these products, through measures such as subsidies to entrepreneurs for setting up of such plants, subsidies to farmers for using biofertilizers, etc.

Napro's role in biofertilizers :

We at Napro undertake complete projects on a turnkey basis for setting up of biofertilizer manufacturing plants. We have developed special biofertilizer culture cultivation systems, which have proved to be successful at all the installations where the same have been supplied.

Our scope of supply, work & services are normally as follows :

1. Supply of equipments for process & laboratory :
 - a. Haffkine type culture vessels with instruments & accessories
 - b. Temperature controlled water bath arrangement for culture vessels
 - c. Compressed air generation & distribution system for culture vessels
 - d. Autoclave for culture vessels
 - e. Autoclave for carrier (lignite)
 - f. Mechanical powder mixer (blender)
 - g. Orbital shaker for seed culture development
 - h. Laminar air flow (LAF) work bench
 - i. Phase contrast microscope
 - j. Weighing balance



- k. Pouch sealing machine
2. Installation & commissioning of all the above equipments
3. Technical know-how for operating the plant :
 - a. Write-up of manufacturing process
 - b. Recommendation for purchasing mother culture(s)
 - c. Demonstration of working of the plant
 - d. Training of plant personnel in process operations

Civil construction, plumbing work, electrical work etc. will be excluded from our scope. Further, obtaining required manufacturing licences, pollution clearance & other clearances will not be in our scope.

Salient Features of the system offered :



The biofertilizer culture cultivation system offered is multipurpose & can be used for cultivation of any of the biofertilizer cultures such as Rhizobium, Azotobacter, Azospirillum, Blue-green algae, etc. They can also be used for cultivation of any other cultures, which can grow under gentle agitation (bubble agitation) without liberating excessive heat of fermentation.

An alternative method of manufacture of biofertilizers is by using large volume fermentors. However, the manufacture of biofertilizers using culture vessels is our own **proprietary design** for small & medium scale manufacturing operations.

Some of the advantages of this system over conventional fermentors for small & medium scale operations are as follows:

No.	Culture vessels	Fermentors
1.	Lower capital cost	Higher capital cost
2.	Lower electricity consumption	Higher electricity consumption
3.	Staggered output is obtained in tune with downstream equipments, which is convenient	Lumpsum output is obtained which is inconvenience since the product can get spoilt if not blended & packed immediately
4.	Simple to operate – even unskilled labour can operate the system	Operation is more complicated – skilled & trained workers & maintenance technicians are required
5.	Expensive accessories are not required	Expensive accessories such as boiler, water chiller, generator/inverter, etc. are required
6.	Complicated & expensive instruments are not required	Fermentors need sophisticated process control instruments & automation for proper operation
7.	More suitable for small & medium scale operations (upto 300 MT/annum)	More suitable for large scale operations (over 300 MT/annum)

Manufactured in India by :-

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