

# Biofertilizer for crop enhancement and environmental protection

## Applications

The current technology is a one-time application of the liquid consortium, which is a combination of an anaerobic and an aerobic consortium, which can be applied during seed sowing. Requires no additional fertilizer application throughout the growth period. This ensures that the soil is ready for next round of cultivation with minimum loss of fertility. This consortia provide measures to decrease hydrocarbon, oil and pesticide contamination of soil, and has applications in the field of:

- Organic farming
- Hydroponics
- Lands with oil spillage



Field Trials of NB1+BN7 on Vigna radiata

## Inventor

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## Categories of this invention

- Lifesciences (Agriculture, Environment)
- Research Tools (Isolation and Purification)
- Synthetic Biology (Bacterial)

## Intellectual Property

Microbial combination for environmental protection and agricultural sustenance. Applicant Dr. Shaon Ray Chaudhuri, Indian Patent Granted -347939; NBA Approval

## Problem Addressed

There is a need for enhancing yield of crop to sustain the increasing population. Also, the available land for cultivation is declining over the years. This results in indiscriminate use of fertilizer for enhancing the yield of crop, which in turn results in the majority of the unutilized fertilizers (>70%) leaching into the environment damaging it further. Therefore, bio-fertilizers is to be viewed as the future of fertilizers, as they have the ability to solve the problems of salinity of the soil, chemical-run offs from the agricultural fields.

## Technology

This technology relates to a microbial consortium based liquid fertilizer comprising a combination of an aerobic and an anaerobic bacterium. The mixed consortium NB1+BN7 removes and sequesters nitrate from waste water and biomass, wherein the consortium can be used as a source of carbon, phosphate and nitrate for plant growth promotion. The microbial consortium used in the experimental studies are

- BN7 labeled aerobic consortium comprises 20% *Pseudomonas* sp., 31% *Azoarcus* sp., 46% uncultured bacterium and 36% *Bacillus*.
- NB1 labeled anaerobic consortium comprises 44% *Pseudomonas* sp., 37% *E.coli* and 19% uncultured bacterium.
- BN7+NB1 mixed consortium of the present invention containing BN7 labeled aerobic consortium and NB1 labeled anaerobic consortium in 1:1 ratio.

Based on the field trials conducted using mixed consortia NB1+BN7 on the *Vigna radiata* plants showed greater yield in terms of weight of pod, and number of pods per plant (Chart 1,2). Also, this consortium on experiments with rice crop shows significant grain elongation compared to chemical fertilizers. It is efficient in ramie fiber cultivation as well. Furthermore, this consortium can also effectively reduce inherent soil hydrocarbons as well as hydrocarbons derived from Metacil and Servo lubricant.



Vigna radiata Sprouting

Hardening

Early flowering

Chart 1: Total Grain Yield Field Trial - Site 1

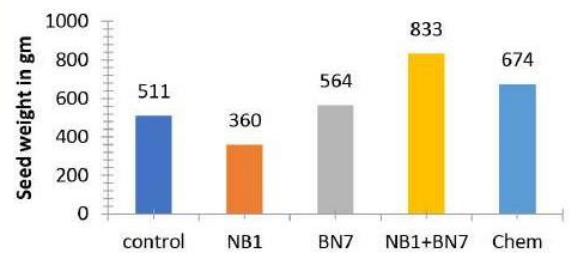
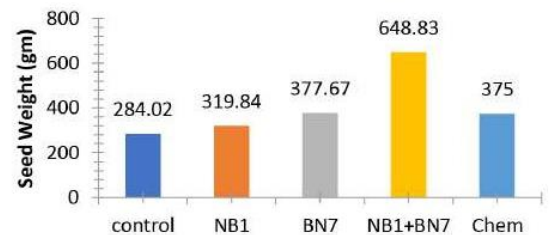
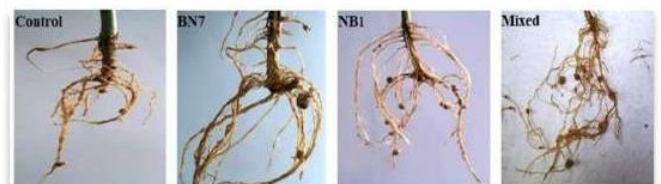


Chart 2: Total Grain Yield Field Trial - Site 2



## Advantages

- Unlike conventional biofertilizers in the market which compromise the yield, this biofertilizer enhances yield while maintaining quality of the produce.
- The price of the bulk production can be affordable in comparison to the organic fertilizers.
- One time application during sowing which maintains the soil fertility



Average No. & Pattern of Root Nodules

in