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Storage of microbial inoculants by indigenous technology know how (ITK)

G. ROOPA DEVI[1], S. SHANKAR AND G.P. BRAHMAPRAKASH[1]

Members of the Research Forum

Associated Authors:
[1]Department of Agricultural Microbiology, University of Agricultural Sciences, G.K.V.K., BENGALURU (KARNATKA) INDIA

Author for correspondence :
S. SHANKAR
Department of Agricultural Microbiology, University of Agricultural Sciences, G.K.V.K., BENGALURU (KARNATKA) INDIA

ABSTRACT : The experiment was conducted to store the microbial inoculants such as *Bradyrhizobium japonicum* and *Bacillus megaterium* in the pitcher technology by using lignite and talc as carrier material. Survivability of these microbial inoculants were monitored up to 120 days. More survival at the end of the 120 days observed in inoculants stored in earthen pot covered with wet sand and least in earthen pot stored at 38^{0}C. Significant decline in population count was observed from 0th day to 120 days of storage in inoculant stored in earthen pot maintained at 38^{o}C and less decline in population observed in case of earthen pot covered in wet sand. Survival of *Bacillus megaterium* in lignite stored in earthen pot covered with wet sand contained higher viable cells compared to other treatments at the end of storage period. Higher decline in population per cent was observed in inoculants stored earthen pot at 38^{o}C followed by carriers stored at room temperature. The decline per cent was minimum in carrier stored in earthen pot covered with wet sand followed by saw dust.

KEY WORDS : Microbiol inoculants, Indigenous technology, Storage, ITK

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Microbial inoculants are carrier based preparations containing beneficial micro-organism in viable state, intended for seed and soil application to enhance plant growth and soil fertility. These are integrated components of organic farming and sustainable agriculture. Microbial inoculants are environment friendly, low cost agricultural inputs playing a significant role in improving nutrient availability to the crop plants, the success of inoculation depends on the quality of the inoculants used (Hegde and Dwivedi, 1994).

RESEARCH METHODS

Loop full of *Bradyrhizobium japonicum* and *Bacillus megaterium* from pure culture were aseptically transferred to each 250 ml conical flask containing 100 ml Yeast extract mannitol broth (YEMB) and Nutrient broth (NB) and incubated on a mechanical shaker for 6 and 3 days, respectively. These were used as mother culture for preparation of inoculants, after obtaining maximum growth, cultures were maintained on media for further work at 4^{o}C in a refrigerator.

Inoculant preparation:

Liming of lignite was done by mixing calcium carbonate ($CaCO_3$) with lignite at the rate of 250 g / kg of lignite to raise the pH to neutrality. After sieving and liming, lignite was pre-packed into 20 grams packets in poly propylene covers and sterilized at 121^{0}C, for 30 minutes. Broth cultures of *Bradyrhizobium japonicum* and *Bacillus megaterium* were injected to these packets separately using a sterile syringe at the rate of 10 ml per packet and sealed with the help of electronic sealer, mixed uniformly by hand. Same procedure followed for talc carrier except liming.

Establishment of pitcher (earthen pot) technology:

Experiment was taken up to test the survival of different microbial inoculants in earthen pots (pitcher) up to 120 days and to assess feasibility of locally available materials in enhancing the shelf life of selected microbial inoculants. Pitcher technology is an indigenous method to store microbial inoculants. Pitcher technology is nothing but use of earthen pots for storage of microbial inoculants. Different microbial inoculants in two carrier materials were placed in these pots.