

## 2. Seedlings inoculation procedure

- For 1000 seedlings, add 100 g of KEFRIFIX to 20 litres of water.
- Mix the solution thoroughly and stir regularly to avoid Biofertilizer (KEFRIFIX) settling
- Use the mixture to water the seedlings at the base.
- Water the seedlings to wash the bacteria down to the root system.
- Maintain the inoculated seedlings in the nursery for at least two weeks before transplanting.

## Precaution

- Ensure use of the right Bio-fertilizer for the right leguminous plant.
- Store the inoculant in a cool place. Any opened inoculant should not be stored.

## To buy KEFRIFIX

KEFRIFIX is currently only available at KEFRI Biotechnology laboratory at Central Highlands Eco-region Programme - Muguga and is produced on order

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**Kenya Forestry Research Institute (KEFRI)**



**Bio-fertilizer for enhanced  
growth and productivity of  
leguminous plants**

## Introduction

Leguminous trees are planted widely in Kenya for; fodder, green manure, fuelwood and soil conservation. The growth and productivity of these plants can be enhanced by promoting their biological nitrogen fixing ability through inoculation. Nitrogen is the most limiting element in most agricultural production. Leguminous plants can increase soil fertility through biological nitrogen fixation to correct soil nutrients imbalances and save almost 40% of Africa's foreign exchange spent on chemical fertilizer.

## What is biological nitrogen fixation?



Biological nitrogen fixation is the process through which atmospheric nitrogen ( $N_2$ ) is converted by bacteria in association with leguminous plants to a form that can be readily utilized by plants. This process can be adapted and utilized in production of bio-fertilizer for inoculation of leguminous plants.

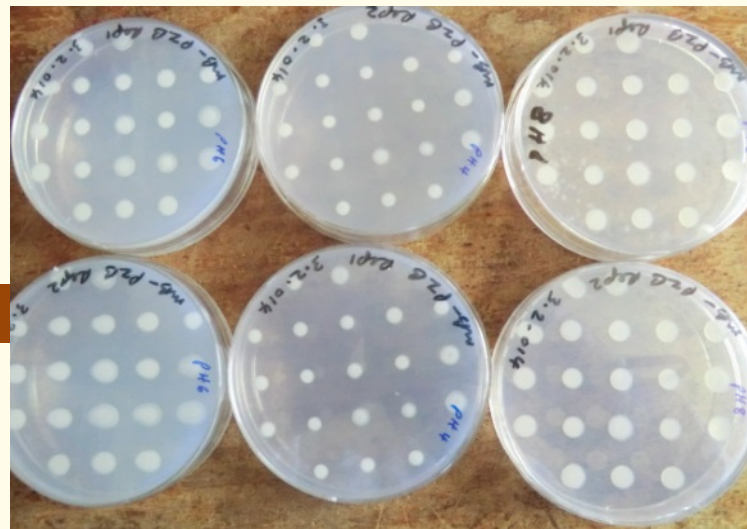
## What is inoculation?

Inoculation is the process through which a given leguminous plant is provided with compatible and effective group of bacteria known as rhizobia. These bacteria enter the plant roots to form nodules in which nitrogen is fixed.

## Production of bio-fertilizer (KEFRIFIX)



Nitrogen fixing bacteria from different soil sources are screened and tested on different leguminous plants to identify and select the most compatible and effective strains for particular plants. Superior bacteria strains are selected through DNA finger printing for production of inoculum (KEFRIFIX-biofertilizer).



leguminous tree species such as *Calliandra calothyrsus*, *Leucaena leucocephala*, and agricultural crops such as the common beans.

## Methods of inoculation

### 1. Seed coating procedure

- Clean the seeds by washing to remove any detergents, fungicides, herbicides, insecticides and excessive acid or alkaline fertilizer residues.
- Prepare 15% sucrose solution/slurry (e.g. 15 g of ordinary sugar in 100 ml of water). Sucrose can be replaced by methylcellulose or gum Arabic.
- Immerse seeds (between  $\frac{1}{4}$  to 15 kg depending on the seed size) in the slurry, mix and drain the slurry.
- Pour 100 g of the inoculant (KEFRIFIX) on the seeds and mix thoroughly to uniformly coat each seed.
- Leave the seeds to air-dry under a shade for about 30 minutes (avoid direct sun light) and sow the seeds directly in wet soil.