

BioPack

Colin Austin 25 April 2013

What is a BioPack

BioPack is an inoculant used to improve soil quality incorporating a combination of a host plant, mycorrhizal fungi, bacteria and minerals. They are simply buried or placed on top of the ground so the soil biology generates fertile soil.



The key to regenerating soil are fungi, particularly the mycorrhizal fungi. Their hyphae are incredibly fine and exude enzymes which can dissolve rocks and lignin, releasing nutrients and helping to structure the soil. But fungi operate at the micro level, and here we need the help of the larger soil biology – particularly worms.

There are really two main types of worms, those like the compost worms that stay in place and eat what is available locally, and those that travel around looking for new sources of food, like the amyntus worms. These travelling worms are particularly beneficial as they make channels through the soil which make spaces for the roots and help to break up the soil. They release slime which helps hold the soil in place. Many varieties of soil biology emit exudates which are important as they bind the very fine clay particles into aggregates which is the feature of good soils.

Worms, (and other macro soil biology) also seem to have an important role in moving things around in the soil. Specifically fungi tend to grow rather slowly outwards from their base, but the worms appear to transport the fungi and their spores throughout the soil.

Mycorrhizal fungi, mulch and cover crops.

The most practical way to introduce mycorrhizal fungi is to inoculate a host plant under controlled conditions, then transplant this to the local area.



Gotu Kola makes an excellent host plant as it's tough, low growing and spreads quickly and is a medicinal herb. The mycorrhizal fungi will spread to adjacent crops.

It can be used as a companion plant when growing vegetables creating a growing mulch.

The picture show a typical small BioPack with Gotu Kola suitable for inoculating a square meter. Other hosts are being evaluated for different climates.



The heart of the BioPack is Guto Kola impregnated with mycorrhizal fungi. Also included is a combination of composting and burrowing worms (amynthus variety) which help spread the fungi and break up the soil. The soil also contains bacteria which is needed to help break down compost for the worms. The picture shows trays of multiple BioPacks. Other hosts plants are expected to be available shortly.



Senna Alata is another good host more suitable for larger areas. It has a strong root system which powers through heavy clay and provides a safe haven for the fungi. It is deep rooted so will bring up nutrients from deep in the ground which the fungi will transfer to nearby plants. The picture shows an area being regenerated with Senna Alata.

Minerals and trace elements are also included as these are needed for the soil biology and ultimately to provide us with healthy food full of minerals, trace elements and phytochemicals. (see www.healthyfoodassociation.com)

Looking after your BioPack

Before you plant out your BioPack there are a few steps you should take. First you must ensure that it is maintained moist. Many people use them in a wicking bed (see www.wickingbed.com) which automatically maintains a constant soil moisture but they can equally well be used in any soil remediation.

Fungi like calcium so I suggest that you add gypsum or dolomite to the soil. They also do not like phosphorous, it can even kill them. Conventional agriculture often uses large amounts of N,P,K fertiliser which certainly blows up the plants very quickly. But we do not necessarily want fast growing plants, for our health we want plants that grow slowly with an abundant supply of mineral and trace elements which help produce the phytochemicals which are our aid to health.

I strongly recommend that you only use the minimum of the classic fertilisers. Colin Campbell has an excellent book Garden Talk which has good section on recognising soil deficiencies.

To plant your BioPack you simply make a small hole in the ground, the same size as the box and plant in the normal way and water in well. But soil biology is made up from living creatures which you must feed, water and care for just like a farmer looks after his cows.

You must keep the soil moist and feed the biology. Compost which contains a significant quantities of green material is the best way of feeding your Biopack. In a wicking bed you can use a compost tube, just form a tube in the ground, for example with a conventional auger, and when needed fill with green or partially composted material. You can water through the compost tube so your plants are fed by a compost tea.

Fungi are easily damaged by working the soil. You should never work over the entire area, just a small strip where you are going to plant. If you want to move your strip let the Gotu Kola grow over the old strip so it becomes inoculated with the fungi then make a new strip.

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