

Growth Medium With Composted Cow Manure

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INTRODUCTION

Approximately 5000 years ago the people in Scandinavia started to grow crops. When crops are harvested it implies that the soil is robbed of its vegetation which would turn into mold and nutrients for the crops to come. This makes it necessary to replace the removed organic matter with other organic matter, and if this is not done we shall disturb the ecological balance of nature.

Back in the nineteenth century nearly all organic matter was brought back to the soil in the form of cattle manure. In the twentieth century industrialization began and fertilizers made their entry in agriculture and later on also in gardens. The humus content of the top soil, however, does not last forever. Fortunately, many have started to realize this and think it is a good idea to use nature's own biological reserves to maintain the humus content.

For a long time sphagnum has been the backbone of growth media because it is available in relatively large quantities in Scandinavia and the Baltic area. Luckily weed seeds and pathogenic organisms are rare in sphagnum. To a great extent sphagnum suppliers are producing the mixtures according to the growers' wishes and the special requirements of the cultures, whether it is about admixture of manure or granulated clay, leca, grodan, perlite, etc. The important thing is that the plants are healthy and get a good start. Therefore, the microbiological activity of the growth medium is of utmost importance to the plant. A large content of antagonists is necessary for the suppression of root pathogens. In nature there are a great many possibilities to maintain the natural balance of microbiological organisms in the topsoil by admixture of organic matter, e.g., cattle manure and other forms of compost.

THE HISTORY OF SIMONSTORP'S COMPOSTED COW MANURE

It all started approximately 30 years ago on the experimental farm Simonstorp in Blendtarp, Sweden. On the farm, owned by the Rausing brothers, there were a large number of cows who received litter in the form of sphagnum instead of straw to stand on. Overtime a large compost heap was built up which, after some years, was used with good results in the beds on the farm; this made the Rausing brothers think about its potential. The company, Tetra Pak, assigned a research worker, Lennart Ohlsson, to develop the product for commercial use. The knowledge behind Simonstorp's composted cow manure is not new, it is the result of our development work that we are marketing today under the name of Simonstorp's composted cow manure which is a pure natural product.

Production takes 3 years to produce, and the first step is the procurement of a proper liquid manure from stocks subjected to veterinary inspection, where cows are removed from the cowsheds if they become ill. In this way no medicine residues will get into the liquid manure which would negatively influence the development of bacteria during the composting process. For the same reason no cleaning chemicals are used in the cow sheds. In the production process 60% liquid manure and 40%

pure unsorted harrow peat are forcibly mixed and stack composted for 3 years. The compost is turned over several times a year in order to be aerated and oxidized according to requirement. This oxidation process means that the microlife is vigorously stimulated, and the ammonium nitrogen is converted into nitrate. This oxidation process is essential to make the compost odourless. During the composting the temperature must never exceed 45°C, as the microbial life will then die from lack of oxygen. The microorganisms expend a great deal of oxygen in order to reproduce, and at the same time oxygen is necessary to decompose and mineralize the compost.

THE SIMONSTORP GROWTH MEDIUM HAS A HIGH MICROBIAL ACTIVITY

After 2 years in the open air the compost is placed in an open shed where it stays for a whole year before it is finally ready for use. Then the compost is completely odourless and has a high natural content of *Trichoderma harzianum* and other useful microorganisms as well as naturally produced organic nutrients in large quantities. The number of useful microorganisms can easily reach 8 to 13 billion per gram of compost.

The pure composted cow manure is a microbiologically active medium which means that we get an opportunity to exploit its natural biological abatement of pathogenic microorganism, and also the nutrients from dead microbes are released to the plants. The nutrients are long-acting and do not get washed out but stay in the pots/beds until the plants assimilate it.

Incidentally, Simonstorp's products are approved for ecological plant production.

AVOID PLANT PATHOGENIC FUNGUS ATTACKS

The best growth results are obtained where sphagnum mixtures with a good structure are enriched with 20% by volume of composted cow manure and 60 kg Bara RHP approved lime-deficient granulated clay m⁻³ in the fraction 0.2 to 2.0 mm. Bara granulated clay has a very high content of silicon. Silicon is accumulated in the cell wall and in this way it slightly delays the growth of the plants. The granulated clay increases the water-holding capacity of the growth medium and this eliminates the sharp wilting point. Because of the ion exchange capacity of the clay colloids, cations (positive ions) will be absorbed to the clay granulates. The granulated clay is also a good habitat for microorganisms due to its porous surface.

Naturally, any substrate must in the future be adapted to modern greenhouse production and be consumer orientated. The high microbial activity of the composted cow manure favours the decomposition and the setting free of nutrients and gives the growth medium a high content of naturally occurring *T. harzianum*. According to analyses made by the Danish Growers Associations' laboratory *T. harzianum* propagates vigorously, and this means that root pathogens will find it more difficult to establish.

When using composted cow manure in the soil mixtures it is necessary to alter the irrigation. You have to irrigate somewhat less as the growth medium has a better absorption capacity and thus becomes more hydrous, which means that the soil has a more uniform drying before irrigation.