

# Fertilizer – compost – soil

## Before composting, clarify the use – and replace peat

Dr. Uli Johannes König,  
Forschungsring eV,  
Darmstadt,  
www.forschungsring.de



Everyone probably knows the experience: you throw away a pile of organic waste carelessly, and when you “accidentally” find it again after a while, it has become black humus. Waste became the “gold” of the gardener and farmer! We take this miracle for granted - but do we consciously use the opportunities it presents for agriculture and gardening?

### Composting: Ideal and reality

If we look at the practice of our organic farming - and Demeter often doesn't make a big difference - we find a relationship to compost and manure that is characteristic of today's times: the latter is often used as a "nutrient carrier" for fertilization without any further fertilizer care. In addition, the company produces waste that is composted with very varying degrees of success and is often more likely to be used

The diversity of Fertilizer – compost – soil

Create the impression of large-scale disposal rather than targeted use to promote plant growth. And finally there are the cultivated soils, which are usually purchased because the risk of producing them yourself is seen as too great and the economic conditions often speak in favor of purchased substrates. Here is a quote from a Demeter gardener fifteen years ago: “If my young seed plant costs 25 cents because I have to laboriously produce my own soil and I only get 28 cents for the finished lettuce from the wholesaler, it just doesn't work .”

Is it possible to raise young plants, for example? So today, for example, only in specialized companies that buy in their operating resources? This input-output situation that actually exists today is contrasted with the ideal image of the closed business organism that, as far as possible, produces its own resources: new, fertile and healthy ones are created from the various raw materials from the nursery or farm Soil that is at least as suitable for growing young plants as the commercially available ones, and ideally even of better quality. Is this now utopia? Unfortunately, for larger companies the answer to this question often has to be yes, but smaller companies also show that it is possible - often under different economic conditions. How can I approach this ideal image again in practice?

at least with regard to compost and soil? I have to start collecting experience again about how my waste or raw material fertilizer becomes valuable “gold”. In the past, the gardener was also the compost master; Today he has to learn it again. And in this regard, I can start with fertilization: am I already handling my farm fertilizer with sufficient awareness? How do I store it? Dumped somewhere - or placed on a straight, homogeneous windrow, protected from rain, wind and sun? And my waste compost, is it rotting away or is it just drying out, overgrown with weeds or do I care for it regularly so that it doesn't get too wet or dry? Do I even know what I want with him when he's done? Simply disposed of in the field as a necessary evil in the form of fertilizer, it is too valuable, as it has the opportunity to bring it into the business in a differentiated way as a fruitful, life-giving gift.

### Compost for what? Decide consciously!

So it's good to be clear beforehand about the different substances I need in my business: fertilizer for heavy or weak eaters, compost to increase soil fertility, compost soil for horticultural cultivation or over-spread on the potting herbs Compost tea applications (Image 1). Depending on what goal I want within



If I am driven by this, I will prepare the compost differently.

To do this, you have to get to know the composting process in detail. A classic distinction is made between four phases into which rotting is divided: the warming phase, the hot phase, the cooling phase and the ripening phase (Figure 2). In the first three phases, microbial decomposition of the organic matter takes place. The result is a dark, humus-rich soil. Since from the outside the rotting appears to be finished - no further heating occurs when the heap is turned over - you think you have stable, ripe compost in front of you.

But that is far from the truth! Now the fourth phase of composting begins, which gives the process a completely new direction: the humus building phase or ripening phase. While the first phases are carried out using suitable methods such as: B. intensive implementation needs to be accelerated, this last phase requires sufficient time. Now the compost fauna is developing: the beetles



and insect world and the all-important earthworm. Only these compost animals are able to build up a permanent humus as a basis for long-term soil life (see Bockemühl: About life in the compost heap).

By the way, modern compost soils, which are marketed by composting plants pure or as an additive to organic substrates, have not gone through this process of maturation. It is therefore advisable to allow such soil to rot and mature on your own farm if you have to or want to use it.

to provide at least a few months of education. There will be no way around compromises for price and capacity reasons.

compost plant  
Sassen nursery: Composts for various purposes

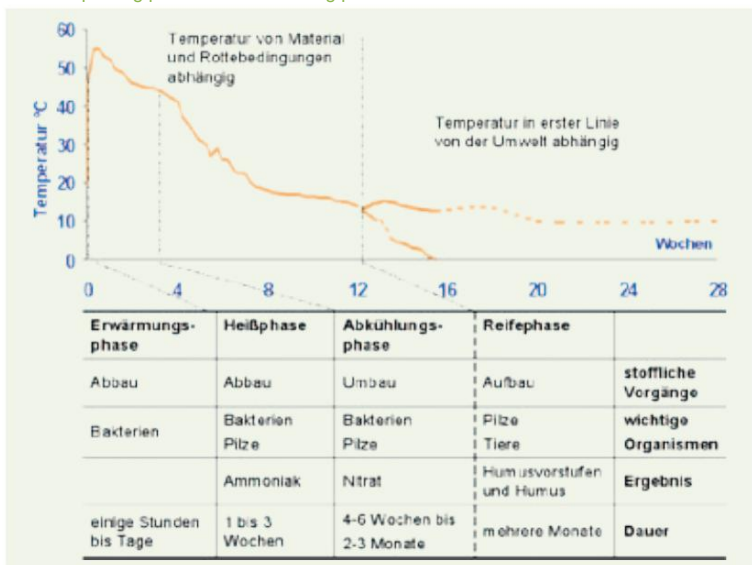
### Compost differently

Once you have gained experience and perhaps your inner relationship with composting has grown, you will begin to develop different qualities.

There is the *all-round compost*, in which you put everything that is left over from the company in terms of organic waste: the various manure from the smaller stables, the sweepings from the farm, the feed and so on Processing waste, sod and soil, etc.

Experience shows that with such a heterogeneous starting material, the compost must be mixed intensively (e.g. with a turner), especially at the beginning. Later, peace should return here too. Recently, an increasing number of companies have been using the CMC compost process, which has been accelerated through intensive implementation. This procedure also only leads through the first

The composting process and its rotting phases.



# ur research

through three stages of composting, accelerated and with a great expenditure of energy and work. Experiments by the Dottenfelderhof show that this can also be achieved with a moderate use of technology (a report on the experiences made here will follow in the May issue).

*Low-nutrient composts* for "diluting" nutrient-rich composts are obtained from slowly rotting deciduous species such as oak, beech, plane trees, etc. Of course, this compost must be able to mature for a long time (at least one to two years). This also applies to other leaf composts. Birch leaf compost is said to have a particularly balancing, healing effect on plant growth. Coniferous and oak leaf composts, on the other hand, are suitable for acid-loving ericaceous plants. Walnut leaves even have herbicidal effects and are therefore only suitable for substrates to a limited extent.

## Meaning of animal Dung

A key reason for producing your own substrates is the possibility of adding animal manure to the compost. This has not yet been possible in the commercial substrate sector, apart from horn fertilizer. Now what is so special about animal dung?

and especially on cattle dung? This substance has e.g. through the digestive process. B. in the cow, a higher form of organization is obtained compared to the purely plant-based compost substance. The animal's sentient consciousness leads to a souling through the flow of substances from food intake to excretion, without ultimately depriving the manure of the forces for its own development, as is the case with humans. This is why Rudolf Steiner also speaks in the "Agricultural Course" about the animal's "ego system," which is still present in the manure and which benefits the soil and thus also the plants during fertilization. What is meant is also shown in the fact that long-term humus build-up in agricultural soils is only possible with manure fertilization (Ochsenmaier 2013).

In this context, I would like to point out that in biodynamics, MK Schwarz has given us an excellent opportunity with the so-called birch pit preparation to be able to add this special animal dung quality to vegetable composts (König, Leben-dige Erde 3 /2012, 44 to 45). As initial tests at the research ring showed, consistent use of fertilizer water can, for example, B. a green waste compost is similar in terms of its qualitative properties to a stable manure compost.

be hert. This was tested using copper chloride crystallization on the compost extract and the root morphology. A detailed investigation report is in preparation.

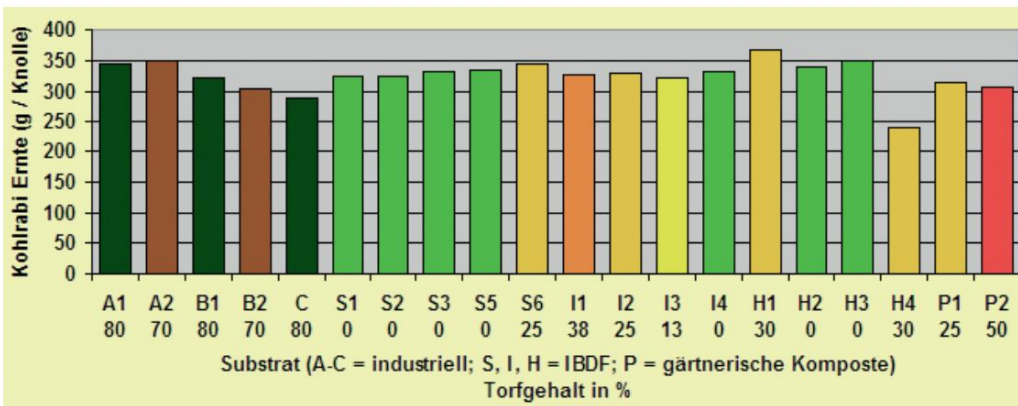
## Experiments show:

### Peat replacement is possible

Another incentive to produce your own soil for growing young plants is the desire to reduce the usually very high peat content of commercially available substrates. On the one hand, it is about the ecological aspect of counteracting peat mining and thus the destruction of moors or moorland landscapes. However, one should not forget that the vast majority of the peat (Ochsenmaier 2013) is used to generate energy, not for horticulture. The far more important aspect, however, lies in the qualitative question of the effect of the peat on the young, developing plant. Peat is preserved, mummified life and therefore does not provide an environment to provide the vital forces necessary for plant growth. Peat also closes itself off from the cosmos rather than opening the plant to its surroundings and cosmic forces. But that is exactly the goal of biodynamic cultivation!

In addition to replacing peat with high-quality compost, especially low-nutrient leaf compost, fermented wood fiber is a good option. It is advantageous to carry out this "fermentation process" yourself in the company. For this purpose, eco-certified wood fiber is used (e.g. B. from Klasmann-Deilmann or Kleeschulte) and adds 10 to 20 percent by volume of mature compost. Depending on the N content of the compost, you can add up to

It can also be done without or with little peat, like an experiment  
 Research ring/IBDF shows:  
 Comparative test of substrates with different  
 Peat content:  
 Average weight of  
 Kohlrabi tubers (peat content in % in the bottom line)





both photos: U. König

Add 500 g N per cubic meter of horn meal. The pile is left to lie for two to three months. During this time it can be implemented two to three times in order to achieve the most even implementation possible. This fermented wood fiber can now be added to your own soil as required; How much does everyone have to try out in practice? At the time, we had easily achieved 50% peat replacement in our experiments, and in many cases up to 100% (König 2004). (Fig.3).

The substrates were tested in a size 32 earth press pot, manufactured with the Unger-Perfekt. The young plants were then further cultivated in the test field. Only the yield was measured, as the practical opinion was that without peat no plants capable of growth would be produced. Three groups of soils were compared: the first group were commercial substrates from leading substrate producers, the second group were various proprietary mixtures of composts made from renewable raw materials as well as fermented wood fiber and varying peat contents, the third group was practical soils from biodynamic

Garden centers that are used there to grow young plants. For all substrates it can be said that there was no greater difference between the non-commercial and commercial substrates than the differences within the commercial substrates themselves. (See also the graphic Fig. 4)

### Buy soil, but which one?

Finally, let's take a look at the substrates that can be purchased. The market is large and not always transparent when it comes to quality. On the one hand, the compost qualities vary greatly between different manufacturers. Also, only a few use biodynamic preparations. Only the Klasmann-Deilmann company guarantees the use of the products for all organic substrates. Fermented wood fiber is also used in organic substrates. Flo-ragard also uses biodynamically prepared compost in some substrates, but not in all. You have to ask carefully here. In addition, two other companies offer biodynamic special substrates: the company "Die Torffrau" offers herb and potting soil

the base of oak bark compost and the company Gramoflor a potting substrate using biodynamic spelled husks.

For larger order quantities, manufacturers also offer the option of producing your own mixtures with lower peat contents.

However, the small buyer is dependent on the bagged goods, which as a standard should have a peat content of between 50 and 70%, depending on the substrate. Of course, there are other suppliers of substrates, but they neither contain the biodynamic preparations nor are their additives transparent enough. It should be carefully checked whether, for example: B. the bark humus used was not obtained with urea, which is prohibited for organic

Handling compost in biodynamic operations and producing your own growing soil remains a challenge. There is still great potential for development that needs to be seized. The author would therefore like to encourage the reader to report on their own experiences in dealing with compost and their own young plant soil. |

exemplary fertilizer storage on the Rengoldshäuser Rotteplatte (left)...  
...or how it shouldn't be (right)

### Sources

König UJ (2004): Peat replacement in organic cultivation soils II. IBDF publication series Volume 18: • Oltmanns, M. (2013): Research ring materials • Raupp, J., Oltmanns, M. 2006: Reduction of nutrient losses during manure rotting by influencing the Rotting conditions. IBDF series of publications, vol. 19