

## How to produce Biocyclic Humus Soil – a short guideline

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The discovery of **Biocyclic Humus Soil** and its amazing proprieties at [Biocyclic Park](#) in Kalamata/Greece has been quite recent, although in old times farmers were not unaware of the characteristics of “old compost”. The first research on this topic has started at the University of Athens.<sup>1</sup>

A precondition for gaining a material which has the characteristics of humus soil is to produce high quality compost exclusively from plant materials. It is essential to initiate right from the beginning a controlled process in order to avoid losses in nutrients during the first phase of thermal aerobic fermentation and to reduce emission of gases and leachate. By monitoring temperature and CO<sub>2</sub> content of the windrows both, frequency of turning the material and water added can be determined exactly. The result at the end of the process is a nutrient and structure stabilized compost. Once having produced a high-quality fully ripe plant-based compost which is characterized by a high water retention capacity and a balanced composition of nutrients (C:N ratio), the material can be used in agriculture. Due to the fact, that the compost, even if it is ripe, still has some components which are water-soluble, it is usually mixed up with soil in order to avoid burnings at the root system, especially if used for seedlings or young plants. This is something which will be different when the compost has become humus soil. Have a look to the following table in order to understand the differences between common compost and humus soil.

Characteristics	Ripe Compost	Humus soil (min. 10 years)
<b>Smell</b>	Like forest soil	Almost no smell
<b>Volume</b>	Declines while using it	Remains almost unchanged over years
<b>Nitrogen content</b>	1.2-2.0%	More than 2.5%
<b>C:N ratio</b>	12-20	8-12
<b>Specific weight</b>	600-700g per litre	700-800g per litre
<b>Water solubility of nutrients</b>	A considerable portion of nutrients can be washed out by irrigation water or rain	No nutrients washed out by irrigation water or rain
<b>Sensitiveness</b>	May be used only in small amounts when used for seedlings	No restriction, may be used in every stage of development from seed to fruiting period without mixing with other materials
<b>Plant growth</b>	Vigorous	Extremely vigorous with unusual but not unnatural shape
<b>Plant health</b>	Good health, better than without compost	Extremely healthy, almost no fungicides necessary
<b>Stress resistance</b>	Resistant against draught	Resistant against draught, heat and even slight frost
<b>Yield</b>	Good and stable yields if applied every year	Very good yields, much higher than expected, increasing year by year if grown in pure humus soil without other soil added.

<sup>1</sup> <http://www.biocyclic-vegan.org/wp-content/uploads/2019/01/biocyclic-lydiaGGI40.pdf>

The reason for the change of characteristics seems to be the structure of the carbon molecules which account for up to 80% of the organic matter in humus soil. There is strong evidence that the post maturing stabilization process of compost ends up with a different carbon structure than observed in common ripe compost. While in compost clay-humus complexes are responsible for the retention of water, air and nutrients in the soil thus improving soil fertility by physical means, in humus soil carbon itself (instead of clay) forms stable complexes by building amorph grid structures that seem to be responsible for the retention of nutrients. The density of these grids seems to be so high, that water molecules cannot easily penetrate these structures, whereas smaller molecules like acids can. In other words, humus soil is a substrate without water-soluble nutrients. This is exactly what the plant forces to activate its natural nutrient absorption mechanisms which are fully adapted to an environment where there are no water-soluble nutrients available, as it is the case in natural woodland or other natural ecosystems. Thus, the plant actively absorbs only those nutrients which correspond to the needs of the specific stage of development in order to be nourished permanently close to the optimum. These plants do not depend any more on water-soluble fertilizers.

The transition of organic carbon into a pre-crystalline grid structure seems to be a process which takes several years. Probably only the first part of this process is induced and enhanced by microbial activity. There are indications that at the end of the process the formation of carbon grids is supported by other than biological degradation factors. These factors have recently become subject to scientific research. There are estimations that they cannot be influenced by the same means that accelerate biological processes during the early stages of ripening. At present we only know, that the factor time is essential. As a rule, we recommend calculating a stabilization period of at least 4 to 6 years.

Based on our own experiences we suggest for professional composters or for those who produce their own compost to take apart one tenth of annually produced quantity and to treat the material extensively in the same manner as if it would be still unripe compost. This means, it should be placed in windrows in order to be turned once or twice a year and to control humidity by irrigating (if too dry) or covering (if there is too much rain). It has been proven very practical to plant these windrows, initially with squashes like pumpkins, melons etc., later also with more sensitive cultures like salads, rocket, spinach, beets, tomatoes etc. By doing so, one can use the surface of the windrows as a productive area. Therefore, we suggest collecting the material from the compost plant and to set it up in windrows either directly on the fields or at field margins, so that the humus soil obtained later is already where you need it without causing further transport costs. The material should never get completely dry and should be kept as long as possible under a plant coverage. Soil analyses should be done every year in order to monitor the development of the above-mentioned characteristics. We recommend keeping records of all measures taken so that the material can be certified by CERES, a German certification body specialized on process documentation of biocyclic humus soil production. Certified biocyclic humus soil can be labelled accordingly and be used without restrictions by all operations following the Biocyclic Vegan Standard.

For further information please see [www.biocyclic-vegan.org](http://www.biocyclic-vegan.org) and the video [“What is Humus Soil?”](#).