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Permaculture - sustainable design of agriculture

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Permaculture (from English permanent and agriculture) is an already established concept within global trends for organic farming. This is not just a type of agriculture applied under the aegis of general norms and European laws for **BIO** production, as an alternative to conventional agriculture, but is a comprehensive **agricultural culture** that unites ecological and biological principles. It is a collection of methods for **sustainable design** of the land, where sustainable refers to human behavior that ensures appropriate exploitation of natural resources and adds value to nature. Its goal is to create productive systems that satisfy human needs and harmoniously integrate people and land. Ecological processes of plants and animals, their nutrient cycles, and climatic factors are taken into account. Elements in the system are considered together with their interactions, where the products of one element are a resource for another. In a typical permaculture system, work is minimized, waste is turned into resources, productivity and yields are increased, and the environment is restored. Permaculture principles can be applied in any environment and scale — from urban residential complexes to rural houses, from small farms to large regions. The development of this type of agriculture is associated with the preservation

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and restoration of natural resources, the development of rural areas, and the restoration of traditions related to ecological agriculture and an environmentally friendly way of life.

In short, the definition states: a way of designing human-inhabited places to develop according to the laws of nature. The initial idea is young-old - about a hundred years old. The Japanese Masanobu Fukuoka is considered the founder of this movement, who tried to introduce a new approach to rice cultivation by creating a method for natural farming. Natural farming requires neither machines nor chemicals, and minimal weeding is needed. He overturned the traditional notions until then that rice fields had to be flooded to increase their yield. The same result is achieved with mulching, where moisture is retained in depth and, at the same time, weed development is minimized. The last stage of its development dates back to the seventies of the 20th century and is associated with the names of Bill Mollison and David Holmgren, Australians, who decided to offer an alternative to destructive industrial-agrarian methods, as in them they saw the poisoning of land and water, the reduction of biodiversity and the destruction of the surface fertile soil layer. Currently, one of the brightest representatives and advocates of this culture is the Austrian Sepp Holzer, who is considered an agrarian revolutionary. His farm, "Krameterhof"located at 1100-1400 m above sea level in the Austrian Alps above Salzburg and spanning 45 hectares, is considered the largest functioning permaculture farm in Europe. Holzer's permaculture includes landscape design (building terraces, creating raised flat and raised hilly beds, water gardens, lakes, composters, microclimatic zones), agro-forestry (using trees and shrubs in agriculture), a fish farm, cultivation of aquatic plants and animals, fruit growing, mountain pastures, as well as the cultivation of alpine plants and herbs.Permaculture design is always based on 3 core values, or "Permaculture Ethics".

1. **Earth Care** - Care for all living systems.
2. **People Care** - Ensuring access to all resources needed for human existence.
3. **Limit Population and Consumption** - By managing our own needs, we can allocate resources to work on the above principles and values.

These values are supported by several basic principles that are always followed when creating and maintaining any piece of land. **Diversity** is leading, as the elements of each system (farm, garden) are always considered together, not in isolation. Each element is chosen to ensure as many functions as possible. Known to many gardeners around the world, including in Bulgaria, is the triad - corn, beans, and pumpkin. The trio is defined as a guild because each of these plants helps and supports the other two. The corn stalks serve as support for the beans, which wrap around the corn. The beans, on the other hand, extract nitrogen from the air and, through a symbiotic bacterium that thrives in the roots of the beans, transform it into a form that plants can use. This nitrogen-fixing bacterium feeds on special sugars that are released from the roots of the corn. The pumpkin, with its wide leaves, forms a living mulch that covers the ground densely, thus preventing weed growth, while keeping the soil moist and cool. Together, the three sisters produce more food and require less water and fertilization than if planted separately.

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Sequential planting ensures the quality of the soil layer by alternating annual with perennial crops or combining them.

Multi-layered garden design (e.g., pergola, forest garden, vines, groundcover plants) (stacking - arranging one on top of the other).

Planting strategy: - 1st - local species, 2nd - proven exotic, 3rd - unknown exotic - carefully and with much observation.

The edge effect. Ecotones are the most diverse and fertile zone in a system. Two systems merge into a third in the border zone between them, and this third system is more diverse than the first two, for example, the edges of a lake, forest, meadows.

Work with nature. Supporting natural cycles contributes to high yields and less work.

Permaculture in Bulgaria

The practical methods and principles of permaculture are not new to the Bulgarian farmer, because our country has rich traditions in gardening. A very large part of the described examples of permaculture design are practiced, but rather as private, isolated cases, and not as strategies for building large-scale farms. Currently, in our country, such initiatives exist in only two places: in the town of Shipka, where physically two separate households are organized according to the principles of long-term culture (permaculture) ,and in the village of Sinemorets, where Dimitar Ruskov is an example of successfully applying permaculture principles in the territory of Strandzha Nature Park - agriculture in harmony with nature.

Permaship is an initiative of several young people located in the town of Shipka, who, in addition to environmentally friendly land cultivation, organize permaculture courses and plant sales. So far, they have succeeded in creating several projects - Forest Garden, worm farm, solar ovens, chicken tractor, planting guilds, and more... and they continue!

In Sinemorets, Dimitar Ruskov has planned and realized a dream of his, a model garden based on permaculture principles. The design of his farm is thought out and changed according to the needs of the plants and aims not only at species diversity but also at achieving a self-sufficient agricultural system within the defined space. At first glance, the garden looks wild, in the sense of abandoned, and with a distinctly chaotic arrangement, but this is only if your eyes are accustomed to recognizing neatly arranged rape or sunflower fields without a single weed.

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The compost takes a central place, positioned directly in front of the house and enriched daily. It is made like a small island, surrounded by various crops such as garden flowers, peppers, lettuces, Malabar spinach, beans, and herbs, so the resulting fertilizer acts primarily locally, and then is also used for the other garden plantings.

In the main garden, Ruskov has relied on mulching, which is double layered between tomatoes, beans, eggplants, onions, and potatoes. His choice for mulch is organic, with the bottom layer being paper, newspapers, and cardboard, and the top layer being straw and compost. It not only looks good but also has the most benefits. It preserves soil moisture, protects against weeds, and adds organic matter to the soil as it decomposes.

The fig trees, which are also typical for the microclimate of Sinemorets, are present in this garden and their role is fundamental in the tree-garden system. They encircle all the garden plants, the area beneath them is again mulched and occupied by various other garden crops. Thus, the trees create a natural barrier between the plantings and the neighboring properties.

The owner also plans the construction of energy-efficient clay houses, which are completely ecological and will blend with the surrounding environment. The specific properties of the main building material (clay) determine the low energy consumption for heating and cooling the building with sufficient thickness of the main walls. This happens under conditions of maintaining indoor humidity and the house's ability to breathe without losing its temperature. Preventing the appearance of harmful molds, lichens, and mildew, and other harmful substances released as a result of aging. This way, the possibility of allergies in the occupants is excluded. The material's tolerance allows for strengthening some qualities and reducing others, as well as combining them.