

## **Permaculture, zero-tillage and Agro-homeopathy - the trinity of sustainable farming practices**

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Agro-Homeopathy based Organic Botanical HerbAl Garden (AHOBHAG), established about two years ago at the D.E.I. Information Centre, Roorkee, is being maintained by the joint efforts of the staff and students, under the able guidance of our faculty, Mrs. V. Radha Kumari. Presently, this self-sustained ecosystem has an assortment of around seventy herbs and medicinal plants. The project was conceptualized and initiated by Dr. V. Guru Charan, an alumnus of D.E.I., under the practical component of the innovative core courses of D.E.I. on agriculture, social service, environmental science and entrepreneurship. A majority of students belonging to rural areas and farming background motivated us to initiate this endeavour. The remarkable enthusiasm and curiosity shown by the students and staff since this initiative was undertaken, has encouraged us to further extend it to include other state-of-the-art techniques.

According to the 10<sup>th</sup> Agricultural census, small and marginal farmers account for 86% of all farmers in India. Such farmers can hardly afford expensive agricultural inputs. Moreover, traditional organic farming practices involving manufacturing of organic pesticides and herbicides on farms can be a cumbersome process, which may further dissuade the farmer from adopting such labor intensive farming techniques. In 2016, the Hon'ble Prime Minister of India had set a highly ambitious target of doubling farmers' incomes by 2022. An inter-ministerial committee on "Doubling of Farmers' Income" was set up in April 2016 to recommend strategies to achieve this goal. The techniques discussed herein would particularly be helpful in this endeavour.

A humble effort has been made at our centre campus, to develop a self-sustained herbal forest employing permaculture and agro-homeopathy techniques. The initiative named PeRmaculturE Medical Forest And Garden (PREM FAG) is developed in consonance with the principles of the "trinity"-permaculture, zero-tillage and agro-homeopathy. The above practices form a cost effective, environmentally sustainable and complete system of organic farming.

Permaculture, according to Oxford Learner's Dictionary, is defined as “an approach to life and growing food that copies the way things happen in nature in order to create ways for people to live without damaging the environment”. It can be considered a paradigm of systems thinking, which is being used for growing urban forests and food forests around the globe. The aim is to create systems that are ecologically-sound and economically viable, which provide for their own needs, do not exploit or pollute, and therefore are sustainable in the long term. As an experiment, permaculture techniques have been implemented on a small plot of about 125 sq ft. in our centre, where around twenty different species are growing densely-spaced. The plant species include Akarkara, Aloe Vera, Guru Samkru, Lata Kasturi, Lemon grass, Kala Vaasa, Kalmegh, Safed Vaasa, Shal Parni, Tulsi, etc.

Zero-tillage farming is being practiced here to maximize production and minimize human effort and the damage to soil biota, which is ultimately responsible for fertility of the soil. In zero-tillage farming, there is a strong emphasis on mulching, to reduce weeds and water consumption, and improve the soil quality. Using zero-tillage principle results in negligible disturbance of the soil biota, which preserves the topsoil and the biodiversity. This is a win-win solution as the farm starts generating zero net waste, since all the organic waste is used to form mulch or compost.

Agro-homeopathy is a completely safe and cost effective protocol to treat plants and maintain the ecology of the environment. It is being used very effectively to control pests and unwanted weeds. Recently, live homeopathic nosodes of soil and aphids potentised to 6<sup>th</sup> dilution, have been locally developed at the centre. The homeopathic soil nosode prepared from the local soil is used to aid the growth of the plants. In this regard, we have been fortunate to receive expert guidance from topmost international doctors of agro-homeopathy.

Based on the above concepts, a keyhole garden has also been established at the centre. As the name suggests, it is essentially a raised-bed planter in the shape of a keyhole. It can be built on a small space with a composting bin at its centre. The kitchen waste and water are periodically filled in this bin, which decompose and release vital nutrients to the plants. The aim is to demonstrate the utilization of small urban spaces for growing plants organically with minimum effort. Keyhole garden uses considerably less water compared to a conventional garden and may be sufficient for

fulfilling food requirements of a family. Also the raised bed of the garden facilitates ease of tending to the garden. As the soil is extremely nutritious, it enables plants to grow closely spaced and with higher yields.

Our centre has the rare distinction of being the first in the country to employ all the three protocols of permaculture, agro-homeopathy and zero-tillage simultaneously in establishing a herbal garden, as a proof of concept for the agrarian community at large. It also demonstrates that this concept can be conveniently adapted and adopted anywhere, from large farms to roof-top gardens and kitchen gardens.

Besides, elements of other best practices in organic farming from around the world such as Korean natural farming and biodynamic farming are also being adopted. Korean natural farming takes advantage of indigenous microorganisms such as bacteria, fungi, and protozoa to produce fertile soils that yield high output without the use of pesticides.

Additionally, an organic home-made fertilizer named “weed tea” has been prepared and tried on herbal plants at our centre. The fertilizer “weed tea” is prepared by submerging grass clippings and chopped plants in water for about two weeks. Another method called BD 500 (biodynamic cow horn manure) is basically fermented cow dung. It is the basis for soil fertility and the renewal of degraded soils. It is buried in October/November and lifted after four months. Thus the rare combination of above environmentally sustainable “trinity” could be an effective strategy both for small and marginal farmers to grow crops not only healthy and pest-free, but also cost-effective and chemicals-free. Moreover, these techniques along with the keyhole gardening could be equally useful for the home gardeners.

#### References:

1. DEI-DEP news, Vol.8, No.6, July 2020
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3. [https://agritech.tnau.ac.in/org\\_farm/orgfarm\\_biodynamic\\_prep500.html](https://agritech.tnau.ac.in/org_farm/orgfarm_biodynamic_prep500.html)