

Boost Your Farm's Productivity with Multilayer farming

Anju Prakash

Research Scholar, Department of Plant Pathology, College of Agriculture Pune-411005

What happens when a country's population keeps rising without enough resources to support it? In India, this is not just a question but a growing reality. This increase has led to a rising demand for food, making it crucial to adopt sustainable agricultural practices. One effective solution to this growing concern is Multilayer farming or multi-tier farming. Multilayer farming is, growing crop species at different heights utilising both vertical and horizontal dimensions in the same land at the same period of time. This farming practice is unlike the traditional farming practices where farmers practiced monoculture which led to a decline in yield and decrease in returns at the incidence of a disease-pest attack or sudden drop in market demand. In this system, farmers are not depended on one crop, they are able to grow wide variety of crops including vegetables, fruits, spices, flowers and medicinal plants within the same land area.

As per the National Sample Survey Office's Situation Assessment Survey (2019), small and marginal farmers contribute to around 89.4% in India. It was shown in studies that most farmers of India have less than 5 acres of land. Fragmented land holding's will always be an obstacle to agricultural growth. Due to increased urbanisation, the available cultivable land is also diminishing at an alarming rate. Multilayer farming is a successful strategy to be adopted in these areas as it utilises the available land intensively and maximises farmer's net returns. According to a report by *Navbharat Times*, 800 tribal farmers across 20 villages has been practicing multilayer farming and the implementation of this method has enabled farmers in Mandla district of Madhya Pradesh to earn up to eight times more income by cultivating five crops simultaneously at lower costs. This innovation technique has played a crucial role in doubling farmers earnings. Particularly advantageous for small and marginal farmers with limited land as it maximizes production with a short timeframe.

This system works on the principle that planting two crops with different growth durations ensures that their peak nutrient and light

requirements occur at different times, minimizing competition. Harvesting the early maturing crops creates favourable conditions for the late maturing crop, allowing it better access to nutrients, light and space. Layers can be added or removed depending upon the fertility of the soil, irrigation facilities, land area and several other factors. The crops should be planted in each layer in such a way that the top layer comprises of tall perennial trees which require greater sunlight and can provide adequate shade to the lower tiers. The second layer can be composed of fruit trees like banana, papaya, avocado, followed by the third layer that contains shade loving trees such as cocoa. Spice crops such as cardamom can be grown at the soil layer and ginger, turmeric at the lowest layers. In this way the land is utilized efficiently, the fertility of the soil is maintained and requires lesser manpower. In areas with water shortages farmers can incorporate rainfed crops or crops that require lesser water. This method enables farmers to harvest yields equivalent to 4 to 5 crops within a single field while using the same amount of fertilizer and irrigation typically required for just one crop. By efficient water distribution, irrigating one crop benefits others as well, leading to a significant 70% reduction in water usage. As a result, farmers can cultivate multiple crops simultaneously on the same land, boosting agricultural productivity.

As reported by Kapil Dixit in the *Times of India* on May 22 2018, a group of 12 women led by Momi Dey, in Narwal Patti village, Kaushambi, Allahabad, successfully implemented multi-layer organic farming, yielding a variety of vegetables and fruits within three months. Using vermi-compost as fertilizer, they cultivated crops like ginger, spinach, bottle gourd, papaya, and more on 0.15 acres of land. This innovative technique, which utilizes vertical, horizontal, and underground spaces is expected to generate an annual income of Rs. 2.5-3 lakhs. Inspired by agricultural expert Akash Chaurasia, Dey is now training other farmers in the region. Experts emphasize that multilayer farming not only boosts income but also enhances soil fertility and ensures year-round crop production.

Benefits of multilayer farming

- Multi-layer farming allows you to grow more food in less space, making it ideal for limited backyard areas.
- By alternating different crops each year, it helps prevent soil depletion, reducing the need for constant additions of amendments.
- This practice also enhances your food variety and helps protect plants from pests and diseases. Since different crops are planted together, pests and diseases have a harder time targeting all the plants at once. For example, planting garlic near roses can help deter aphids and other pests that tend to target roses. The garlic's smell masks the scent of the roses, making it harder for pests to find them. Marigolds can be planted with beans as they help protect beans and other plants from root-knot nematodes, which can cause root rot and stunted growth. Marigold roots exude a substance that repels nematodes, preventing soil-borne diseases.
- Another benefit of multi-layer farming is the ability to control crop yields. If there is an abundance of tomatoes in one season but a shortage of another crop, you can plant a second round of tomatoes to stagger the harvest. This maximizes your yield and

ensures a steady supply throughout the growing season.

- By growing multiple crops together, you can increase overall yields by up to 30% compared to conventional methods. This is because plants with different root systems and nutrient needs complement each other, improving the overall productivity of the soil.

Two-thirds of the population are depended on agriculture sector directly or indirectly. Agriculture productivity is struggling to enhance due to lack of natural resources, climate change and lack of awareness among farmers about newer technologies. This system yields more productivity, improves crop diversity, provides year-round yield, regular employment, minimizes environmental impact and makes land resilient to climate change. By adopting this system, farmers can enhance their profits per unit area, improving overall farm efficiency. This integrated farming approach maximizes the use of water, fertilizers, and soil, ensuring optimal yield from every unit of land. It is necessary to spread this technology to farmers so that this system is widely adopted to bring about higher production and economic growth by maintaining ecological balance. To survive in today's condition, farmers will have to take up multilayer farming system as it can enhance their agricultural efficiency and strengthen their economic stability.
