

Natural Farming Practices for Sustainable Banana Cultivation in Andhra Pradesh

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Introduction

Banana is one of the most important fruit crops in Andhra Pradesh and plays a vital role in the livelihoods of thousands of farming families across the state. It is cultivated extensively in districts such as West Godavari, East Godavari, Krishna, Guntur, Kadapa, Anantapur, and Chittoor, where favourable agro-climatic conditions support year-round production. Fertile alluvial soils in the Godavari and Krishna river basins, coupled with assured irrigation from canal systems and bore wells, have enabled Andhra Pradesh to emerge as one of India's leading banana-producing states. The tropical climate, with warm temperatures and moderate rainfall, further provides ideal conditions for rapid growth and high productivity of banana crops. However, in recent years, banana cultivation in the state has become increasingly input-intensive. Heavy reliance on chemical fertilizers, pesticides, and growth regulators has resulted in several long-term challenges. Continuous chemical use has weakened soil structure, reduced organic matter content, and disturbed beneficial soil microorganisms. As a result, farmers are experiencing declining soil fertility, increased susceptibility of crops to pests and diseases such as Panama wilt and Sigatoka leaf spot, and rising costs of cultivation. Environmental issues such as contamination of soil and water resources, along with health concerns for farmers and consumers, have also become major areas of concern.

Against this backdrop, natural farming has emerged as a promising and sustainable alternative for banana cultivation in Andhra Pradesh. Popularly promoted through the state-led Community Managed Natural Farming (APCNF) programme, this approach encourages farmers to move away from chemical-dependent agriculture and adopt practices that work in harmony with nature. Natural farming emphasizes the revival of soil life, recycling of on-farm biomass, and use of locally available natural inputs such as cow-based formulations and plant extracts. By strengthening biological processes in the soil, natural farming improves nutrient availability and enhances the natural resilience of banana plants. Farmers adopting natural farming in banana cultivation have reported stable yields, improved fruit quality, reduced pest and disease pressure, and significantly lower input costs. More importantly, these practices contribute to long-term soil fertility and climate resilience, ensuring sustainable banana production while safeguarding the environment and farmer livelihoods in Andhra Pradesh.

Living Soil: The Foundation of Natural Banana Farming

Healthy soil is the foundation of sustainable banana cultivation, and in natural farming systems practiced in Andhra Pradesh, soil is treated as a living entity rather than an inert medium. Instead of depending on chemical fertilizers, farmers focus on improving soil organic matter and stimulating biological activity through the regular application of well-decomposed farmyard manure, compost, vermicompost, and other on-farm inputs. Recycling banana residues such as dried leaves, pseudostems, and crop wastes back into the field further enriches the soil, feeding beneficial microorganisms, improving soil structure and aeration, and supporting strong root development for efficient nutrient uptake. Mulching plays a crucial role under the state's hot and

often dry climatic conditions, with banana trash, paddy straw, sugarcane trash, and locally available green biomass spread around the plant base to conserve moisture, suppress weeds, and moderate soil temperature during peak summer months. As the mulch decomposes, it enhances earthworm activity and microbial populations, improves nutrient cycling, and boosts soil fertility, enabling banana plants to develop healthier root systems, tolerate moisture stress better, and maintain steady growth reinforcing the importance of living soil in natural banana farming systems.

Use of Green Manures and Intercropping Systems

Andhra Pradesh farmers traditionally practice intercropping, and this fits perfectly with natural banana cultivation. Leguminous crops such as cowpea, green gram, black gram, horse gram, and sunhemp are grown between banana rows to fix atmospheric nitrogen and add organic biomass to the soil. In canal-irrigated areas of West and East Godavari districts, farmers successfully grow green manure crops like *Sesbania* before banana planting. In upland regions, banana is often intercropped with turmeric, ginger, colocasia, or vegetables, which improves land use efficiency and provides additional income. These cropping systems enhance soil fertility, reduce weed pressure, and increase farm biodiversity.

Natural Inputs and Microbial Formulations

A unique strength of natural farming in Andhra Pradesh is the large-scale adoption of cow-based bio-inputs under the Community Managed Natural Farming (APCNF) programme. These natural formulations are prepared using locally available materials such as desi cow dung, cow urine, jaggery, pulse flour, and a small quantity of native soil. Inputs like Jeevamrit, Ghana Jeevamrit and Beejamrit serve as powerful microbial inoculants, while botanical extracts prepared from neem and other locally available plants act as natural protectants. These preparations are easy to make on the farm, low-cost, and well-suited to the agro-climatic conditions of the state, enabling farmers to reduce their dependence on expensive chemical inputs. When applied to banana fields, these cow-based formulations introduce and multiply beneficial microorganisms in the soil, which play a crucial role in nutrient solubilization and recycling. Regular soil drenching with Jeevamrit and application of Ghana Jeevamrit enhance microbial activity around the root zone, improving the availability of nitrogen, phosphorus, potassium, and micronutrients. Foliar sprays strengthen plant vigor, promote healthy leaf development, and reinforce pseudostems, allowing the plants to support heavier bunches. Farmers practicing natural farming in bananas have reported improved tolerance to drought, pest pressure, and nutrient stress, along with a significant reduction in chemical fertilizer use, leading to healthier crops and more sustainable production systems.

Eco-Friendly Pest and Disease Management

Pests such as banana weevil, aphids, and thrips, along with diseases like Panama wilt and Sigatoka leaf spot, pose serious challenges to banana cultivation in Andhra Pradesh. In conventional systems, farmers often rely heavily on chemical pesticides, which can disrupt ecological balance and lead to pest resistance over time. Natural farming, in contrast, emphasizes prevention through healthy soils, strong plants, and balanced farm ecosystems. When banana plants receive adequate nutrition from biologically active soils, they develop stronger natural defenses, making them less vulnerable to pest and disease attacks. Eco-friendly pest management practices form an integral part of natural banana farming. Neem-based formulations, garlic–chilli–ginger extracts, and fermented plant decoctions are widely used to repel pests and suppress their populations without harming beneficial organisms. Pheromone traps and light traps are installed to monitor

insect activity and reduce adult pest populations, particularly banana weevils. Field sanitation practices such as removing diseased or infested plants, maintaining proper spacing, and ensuring good drainage further limit the spread of pathogens. Over time, banana fields managed under natural farming systems exhibit improved ecological stability, lower pest pressure, and enhanced resistance to diseases, reducing the need for chemical interventions and supporting sustainable production.

Improved Fruit Quality and Farmer Livelihoods

Bananas grown under natural farming systems are valued for their superior taste, longer shelf life, and chemical-free quality, as the balanced and gradual nutrient supply from organic sources ensures uniform bunch development, proper finger filling, and improved fruit texture. Compared to chemically grown bananas, naturally cultivated fruits exhibit better keeping quality and reduced post-harvest losses, making them well suited for local transport and marketing. With increasing awareness of food safety and environmental sustainability, consumers in both rural and urban markets are showing a clear preference for naturally grown bananas, which often fetch premium prices. At the farm level, natural farming significantly lowers input costs by reducing dependence on chemical fertilizers and pesticides, thereby improving net returns even when yields remain stable. Continuous enhancement of soil health supports long-term productivity and lowers production risks, while the use of locally available resources and shared community knowledge restores farmers' confidence and self-reliance. This reduced dependence on external inputs strengthens farmer networks, encourages collective learning, and contributes to sustainable livelihoods in the banana-growing regions of Andhra Pradesh.

Conclusion:

Natural farming offers a practical and sustainable solution for banana cultivation in Andhra Pradesh. By focusing on living soils, efficient water use, biodiversity, and locally available resources, farmers can produce healthy bananas while conserving natural resources. As climate change and rising cultivation costs challenge conventional farming systems, natural farming provides a resilient pathway that benefits farmers, consumers, and the environment alike. Adopting natural farming practices in banana cultivation is not just an agricultural choice, it is a commitment to sustainable livelihoods, healthy ecosystems, and a greener future for Andhra Pradesh.



Intercropping of banana with sunhemp and turmeric