

Harmony in cultivation

Expanding the reach of natural farming practices

Harish M N¹, A A Raut¹, S R K Singh^{1*} and Sanjana Shrivastava¹

¹ICAR-Agricultural Technology Application Research Institute, Jabalpur, Madhya Pradesh 482 004

In recent decades, the indiscriminate use of natural resources in Indian agriculture has resulted in environmental, social, and economic challenges for the planet Earth. Natural farming has emerged as a beacon of hope in modern agriculture, offering a sustainable alternative to conventional farming practices. In recent years, the importance of natural farming has garnered widespread attention due to its potential to address pressing challenges. At its core, natural farming emphasizes working in tandem with nature's rhythms rather than against them. By harnessing the inherent resilience and complexity of natural ecosystems, this approach seeks to nurture healthy soils, enhance biodiversity, and promote the well-being of farmers and communities. Recognizing the significance of natural farming, ICAR initiated a nationwide project titled 'Out-scaling of Natural Farming through KVKs, in 2022. In ATARI Zone-IX, the project is being implemented across 48 KVKs in Madhya Pradesh and Chhattisgarh to promote and expand the adoption of natural farming practices via Krishi Vigyan Kendras. Within this initiative, the crucial components focused are promoting natural farming practices, capacity building for farmers, demonstrations and trials, scaling up, and knowledge sharing and documentation of natural farming practices.

Keywords: Capacity building, Chhattisgarh, Demonstrations, Krishi Vigyan Kendra, Madhya Pradesh

As the world population continues to grow rapidly, the demand for food is increasing accordingly. To meet this rising demand sustainably, it is imperative to transition towards sustainable agriculture practices. The excessive use of chemicals and fertilizers has led to the rapid deterioration of soil fertility, posing significant environmental risks. Synthetic fertilizers and pesticides are not only polluting the environment but also contributing to soil degradation. Natural farming offers a sustainable and resilient approach to agriculture, aligning with principles of ecological balance and biodiversity conservation. In natural farming, practices such as ploughing and tilling of soil are eliminated, and synthetic fertilizers are replaced with natural alternatives. Farm-made pesticides derived from natural sources are utilized to control pests and diseases, promoting healthier ecosystems and soil fertility. Natural farming represents a chemical-free agricultural system deeply rooted in Indian tradition, enriched with modern ecological insights, resource recycling, and on-farm resource optimization. It embodies an agro-ecology-based diversified farming system that seamlessly integrates crops, trees, and livestock with functional

biodiversity. Central to natural farming is the on-farm recycling of biomass, emphasizing practices such as biomass mulching, the use of on-farm cow dung-urine formulations, and the maintenance of soil aeration. An essential aspect of natural farming is the exclusion of all synthetic chemical inputs, promoting sustainable and environmentally friendly agricultural practices.

Adoption of natural farming

ICAR is spearheading a nationwide initiative titled 'Out-scaling Natural Farming through Krishi Vigyan Kendras' across 425 districts in India. Natural farming is practiced in several states, with prominent adoption observed in Andhra Pradesh, Chhattisgarh, Kerala, Gujarat, Himachal Pradesh, Jharkhand, Odisha, Madhya Pradesh, Rajasthan, Uttar Pradesh, and Tamil Nadu. Currently, approximately 6.5 lakh hectares of land are covered under natural farming in India. This approach aims to reduce dependency on purchased inputs, offering a cost-effective farming solution with potential for enhancing employment and rural development. Total 48 KVKs were allotted for implementing the natural farming during the 2022-23, 16 KVKs were allotted

from Chhattisgarh state while 32 KVKs from Madhya Pradesh. Natural farming prioritizes the restoration of soil health, maintenance of biodiversity, ensuring animal welfare, efficient utilization of natural and local resources, and promoting ecological fairness.

Key practices essential for the adoption of natural farming includes avoidance of external inputs, utilization of local seeds, emphasizing the use of indigenous varieties, application of on-farm produced microbial formulations (such as bijamrita) for seed treatment, incorporation of on-farm made microbial inoculants (such as jivamrita) to enrich the soil, implementation of cover crops and mulching using green and dry organic matter to recycle nutrients and create a conducive microclimate for beneficial microbial activity in the soil, adoption of mixed cropping practices, promotion of farm diversity through the integration of trees, pest management through utilization of local on-farm made botanical concoctions (like neemastra, agniastra, neem ark, dashparni ark, etc.), integration of livestock (particularly native breeds) for the utilization of cow dung and cow urine as essential inputs for various practices and emphasis on water and moisture conservation techniques.

Objectives

The objectives of the project 'Out-scaling of Natural Farming through Krishi Vigyan Kendra' are promoting the widespread adoption of natural farming practices across India, eliminating or minimizing the use of chemical fertilizers and pesticides in agriculture, encouraging the utilization of locally available resources for nutrient management and pest control, enhancing the economic viability of farming by reducing production costs and increasing farmers' net incomes, improving agricultural productivity and overall farm profitability, building resilience to climate change and environmental degradation in agriculture, popularizing integrated farming approaches that incorporate sustainable agriculture and animal husbandry practices, facilitating knowledge dissemination and capacity building among farmers to adopt natural farming techniques effectively, collaborating with stakeholders including farmers, agricultural experts, and policymakers to promote sustainable agriculture practices, and contributing to environmental sustainability by reducing greenhouse gas emissions and preserving natural resources.

Major components of natural farming

- Beejamrit, an ancient and sustainable agricultural technique, is utilized for treating seeds, seedlings, or any planting material. This fermented microbial solution is rich in plant-beneficial microbes and is applied as a seed treatment to protect young roots from fungal infections. By colonizing the roots and leaves of germinating seeds, the beneficial microbes in beejamrit contribute to the healthy growth of plants, promoting their vigour and resilience.
- Jivamrit, serves as a biostimulant by stimulating the activity of microorganisms in the soil and enhancing

the activity of phyllospheric microorganisms when applied to foliage. It functions as a primer for microbial activity, initiating and supporting the growth of beneficial microbial communities in the soil and on plant surfaces. Additionally, Jivamrit contributes to the proliferation of native earthworm populations, further enriching the soil ecosystem and promoting soil health.

- Mulching is the practice of covering the soil surface with a layer of material, which can include live crops or straw (dead plant biomass). This technique serves multiple purposes, including the conservation of moisture by reducing evaporation, moderation of soil temperature around plant roots, prevention of soil erosion by wind or water, reduction of runoff during rainfall events, and suppression of weed growth by blocking sunlight and hindering weed seed germination. Residue mulching also saves seeds from birds, insects, and animals. Overall, mulching is a valuable practice for promoting soil health, water conservation, and weed management.
- Whapasa refers to the mixture of 50% air and 50% water vapour present in the pore spaces between soil particles. This microclimate within the soil is crucial for soil organisms and plant roots, as it provides the primary source of moisture and some nutrients. It plays a vital role in increasing water availability within the soil, thereby enhancing water-use efficiency for plants. Additionally, it contributes to building resilience against drought conditions by maintaining adequate moisture levels in the root zone. Overall, Whapasa is essential for supporting soil health and promoting optimal plant growth and productivity.
- Plant protection involves the application of biological concoctions through spraying, aimed at preventing pest, disease, and weed problems while simultaneously enhancing soil fertility and plant health. Various formulations are utilized for plant protection measures, including Neemastra, Brahmastra, Agniastra, Dashaparni Ark, or Kashaya. These concoctions are composed of natural ingredients and are applied to plants to deter pests and diseases, thereby reducing reliance on synthetic pesticides and herbicides. Additionally, they contribute to improving soil health and fertility, fostering a balanced and sustainable agricultural ecosystem.

Initiatives/Programmes to create mass awareness cum capacity building of personnel involved in natural farming

- National Workshop on Natural Farming organized at RVSKVV, Gwalior on Dec 3, 2022.
- Regional Workshop on Natural Farming organized by KVK Burhanpur, Madhya Pradesh on 27-28 March 2023.
- Regional Workshop on 'Chemical Free Natural Farming in the Present Context: Challenges and Prospects' held on 9-10 October 2022 at KVK Satna.
- National Conference on 'Next Generation

Agriculture Organic and Natural Farming Pathways: Extension Strategies & Approaches' held on January 28-30, 2024 at ICAR-ATARI, Jabalpur.

Overall, initiatives and programs focused on creating mass awareness and building the capacity of personnel play a vital role in promoting the adoption of natural farming. By empowering farmers with knowledge and skills and engaging stakeholders across the agricultural sector, these initiatives contribute to the widespread adoption of sustainable farming practices and the achievement of broader goals related to food security, environmental sustainability, and rural development.

Success stories of farmers in natural farming

India is leading the way by adopting natural farming practices, guided by Krishi Vigyan Kendras (KVKs) and inspired by the promise of healthy soils and bountiful harvests, these farmers are witnessing firsthand the economic and ecological benefits of natural farming. In the quest for sustainable agriculture, progressive farmers across various parts of Madhya Pradesh and Chhattisgarh are embracing natural farming practices and witnessing remarkable transformations in their agricultural landscapes. Here, we delve into some inspiring success stories that showcase the power and potential of natural farming in fostering resilient, eco-

Success Story

From soil to success: Journey with natural farming

Mohan Gangaram Patel, a farmer from Lohari village, Khandwa, Madhya Pradesh, has achieved success in natural farming with the support of Krishi Vigyan Kendra. Despite his limited education and landholding, he embraced KVK's assistance, transitioning to natural farming practices. With guidance, he focused on cultivating Chickpea Var. RVG 204 over 0.40 hectares, showcasing the effectiveness of natural techniques like seed treatment with beejamrit and manual weeding. This shift led to a notable increase in yield from 16.25 to 21.25 quintals per hectare, significantly boosting income. Mohan's success underscores the benefits of jeevamrit and amritpani application, reducing dependency on costly inputs. While facing challenges like labour availability, his story highlights the viability of natural farming. Recommending the replication of such models among other farmers, it suggests exploring high-value crops and establishing markets for naturally produced goods, fostering sustainability and economic growth.



Success Story

Leading the green revolution in Burhanpur with natural farming

In the district of Burhanpur, Madhya Pradesh, farmer Prabhakar Sitaram Chaudhary has emerged as a torchbearer of sustainable agriculture, showcasing the process of natural farming. Engaging with the Krishi Vigyan Kendra during 2022-2023, he embarked on a journey that not only transformed his yields but also revolutionized his approach to farming. A medium landholding farmer with a three-hectare plot, two indigenous cows, and a high school education, he implemented innovative interventions such as jivamrut, bijamrut, nimastra, bramhasra, and dashparni ark at regular intervals.

Under the natural farming paradigm, he cultivated gram (RVG-203) on 0.4 hectares, achieving a commendable production of 14.1 q/ha. The KVK played a pivotal role, providing training, capacity building, and essential inputs for the demonstrations. A careful comparison between natural farming and conventional farming practices revealed remarkable success. While natural farming incurred a lower cost of cultivation at ₹37,950, this resulted in a higher net income of ₹25,590 and a better benefit-cost ratio of 1.67, signifying the economic viability of natural farming. The success story extends beyond financial metrics. Prabhakar attests to the reduction in fertilizer and insecticide costs, praising the environmental and economic benefits of natural farming. Despite facing challenges related to manual labour for input preparation and application, he recognizes the potential for further expansion of natural farming in his fields. The story culminates with a vision for the future as Chaudhary plans to extend the adoption of natural farming to other crops, making him a beacon of sustainable agriculture in the region.

Through scientific practices and institutional support, Prabhakar Sitaram Chaudhary has not only transformed his farming techniques but has also sown the seeds of a greener, more sustainable future for agriculture in Burhanpur.



Restoring soil health in Chhattisgarh

Deepak Kumar, a farmer from Chhattisgarh's Bhatapara district, embarked on a transformative journey into natural farming during 2022-2023. Guided by the Krishi Vigyan Kendra (KVK) in Baloda Bazar (Balod), Deepak implemented a comprehensive set of farming practices on his two hectare landholding. His interventions included the application of various natural inputs like beejamrit, ghanjeewamrit, jeewamrit, mulching, and plant protection methods using neemashtra, agniashtra, brahmashtra, and mixed leaf extracts. Focusing particularly on Chickpea variety RVG-202, covering 0.40 hectares, Deepak achieved a production yield of 4.76 quintals.

Deepak's venture into natural farming not only resulted in a healthy crop but also reflected positively on the economic performance of his farm. The adoption of these practices led to a lower cost of cultivation compared to conventional farming methods, reducing operational expenses significantly. Despite a slightly lower yield, the net income increased notably, alongside a favourable benefit-cost ratio.

His success highlights the viability and sustainability of natural farming practices, bringing economic benefits while contributing to soil health and organic matter improvement. With a commitment to continue natural farming with the support of KVK, Deepak's experience stands as an inspiring model for fellow farmers seeking cost-effective and environmentally friendly agricultural solutions.



friendly, and prosperous farming communities.

SUMMARY

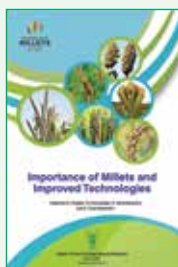
Natural farming emerges as a promising and sustainable agricultural approach with multifaceted benefits. Through its emphasis on organic inputs, minimal chemical usage, and holistic ecosystem management, natural farming not only enhances soil health and fertility but also promotes biodiversity and reduces environmental degradation. The success stories presented underscore the viability of natural farming, with higher yields, lower costs, and improved profitability compared to conventional farming practices. These success stories exemplify the transformative potential of natural farming in revitalizing agricultural

systems by rejuvenating soil health, increasing crop yields, and empowering farming communities. As we navigate the challenges of climate change, resource depletion, and food insecurity, the adoption of natural farming practices offers a pathway towards a more sustainable and resilient future for agriculture. Through the guidance and support of Krishi Vigyan Kendras/ ATARIs, farmers across India are embracing sustainable agricultural practices and reaping the rewards. By celebrating these successes and sharing their lessons, we can inspire more farmers to embrace the principles of natural farming and contribute to building a healthier, more vibrant planet for generations to come.

*Corresponding author email: srksingh.icar@gmail.com



Importance of Millets and Improved Technologies



“Importance of Millets and Improved Technologies” This book is an excellent compilation of knowledge of importance of Millets and improved production technologies which is essential to create awareness among the end users for their promotion. Millets are being utilized for various purposes such as food, feed, fodder and more recently, as bio-fuel.

For this information, importance of different millet crops in our livelihood and their technological advancement has been compiled in this monogram. This will be of immense value to the researchers, academicians, end-users and policymakers alike to promote millets farming.

TECHNICAL ASPECTS

Pages: v + 183; Price: ₹ 700.00, US\$ 90.00; Postage: ₹50

ISBN No.: 978-81-7164-272-4

For obtaining copies, please contact:

Business Unit

ICAR- Directorate of Knowledge Management in Agriculture

Krishi Anusandhan Bhawan – I, Pusa, New Delhi 110012

Tel: 011-25843657; email: bmicar@icar.org.in, businessuniticar@gmail.com

website: www.icar.gov.in