Indian Farming 75 (10): 11-13; October 2025

Spring-summer mungbean for sustainable intensification: A pathway to higher yields and incomes

Uma Sah*, Rekha Rani, Hemant Kumar, C. P. Nath, Anup Chandra, Sujyanand, G. K. Vikas Maurya and Vikrant Singh

ICAR-Indian Institute of Pulses Research, Kanpur, Uttar Pradesh 208 024

Mungbean (Vigna radiata L.) *is a nutritionally rich pulse crop, valued for its protein, dietary fiber, vitamins, minerals, and bioactive compounds, making it a functional food for human health. Beyond its nutritional importance, mungbean serves as a short-duration crop that fits well into the cropping calendar, enabling sustainable intensification and diversification of Indian agriculture. This study reports the adoption and impact of high-yielding, disease-resistant mungbean varieties (IPM 410-3* Shikha *and IPM 205-7* Virat*) in spring-summer cultivation under the Farmer FIRST Programme and Model Pulse Village programmes in Kanpur Dehat and Hamirpur districts of Uttar Pradesh. Demonstrations with improved agronomic practices, including line sowing, seed treatment, and integrated insect-pest management, showed significantly higher yields (12.20–16.72 q/ha) compared to traditional practices (9.75–11.14 q/ha), resulting in additional farmer income of ₹1,02,354–1,06,869. The integration of short-duration mungbean into fallow or traditional cropping systems enhanced land use efficiency, crop intensification, soil health through nitrogen fixation, and profitability. These interventions highlight the potential of improved mungbean technologies to strengthen farmer livelihoods, promote sustainable intensification, and serve as a model for scaling up in similar agro-climatic zones.*

Keywords: Crop diversification, Disease-resistant variety, Farmer FIRST Programme, High-yielding varieties, Income enhancement, Model Pulse Village

MUNGBEAN *(Vigna radiata* L.*)* is a versatile pulse crop widely cultivated across India due to its high nutritional value, short duration, and adaptability to multiple cropping systems. It is a valuable source of protein, dietary fiber, vitamins, minerals, and bioactive compounds, which contribute to human health and nutrition. Beyond its dietary importance, mungbean plays a crucial role in crop diversification, sustainable intensification, and soil fertility improvement through nitrogen fixation. Spring and summer mungbean cultivation provides a strategic opportunity to utilize fallow land after *rabi* harvest, enhancing income and productivity for farmers while maintaining ecological balance. Recent advancements in breeding and crop management by ICAR-Indian Institute of Pulses Research (ICAR-IIPR), Kanpur, have led to the development of high-yielding, disease-resistant varieties such as IPM 410-3 *(Shikha)* and IPM 205-7 *(Virat)*, specifically suited for north and central India. The dissemination of these varieties, combined with improved agronomic practices and integrated pest management, offers farmers an effective pathway to achieve higher yields, income, and sustainable intensification in traditional cropping systems.

Nutritional and agricultural significance of mungbean

Mungbean is an important pulse consumed all over India. It has been known to be a good source of quality protein, dietary fiber, minerals, vitamins, and significant amounts of bioactive compounds, including polyphenols, polysaccharides, and peptides, therefore, becoming a popular functional food in promoting good health. Apart from the nutritional aspect, mungbean plays a unique role in diversifying and intensification of Indian agriculture. The crop is versatile and fits well across the seasons which have led to significant area expansion under mungbean cultivation in the recent years. Spring/summer mungbean is an important crop cultivated by the farmers for additional income. Being a short-duration crop, it fits well within the cropping

Mungbean demonstrations in Hamirpur district

Mungbean demonstrations in Kanpur Dehat district

window between the *rabi* (winter) harvest and the *kharif* (monsoon) sowing. Besides generating additional yield and income, it plays an important role in improving soil health through nitrogen fixation.

Development of improved mungbean varieties

Advancements in pulse research have led to the development of short-duration, disease-resistant mungbean varieties suitable for different agro-climatic zones of India. These efforts have promoted the cultivation of mungbean during the summer/spring season in north and central India. ICAR-Indian Institute of Pulses Research (ICAR-IIPR), Kanpur has made a substantial contribution to the development of several high-yielding, disease-resistant mungbean varieties for different production niches across the country. The mungbean varieties developed by the institute accounted for more than 60% of the total breeder seed indent for mungbean varieties in the country during *kharif* 2024. IPM 410-3 (*Shikha*) and IPM 205-7 (*Virat*) are two very popular high-yielding, disease-resistant varieties developed by ICAR-IIPR, Kanpur in 2016 for cultivation in the North West Plain Zone and Central Zones of India during the summer/spring season. The variety IPM 205-7 *(Virat)* matures in 52–56 days and has a potential yield of 10–11 q/ha, while IPM 410-3 *(Shikha)* matures in 65–70 days with a potential yield of 11–12 q/ha.

Dissemination of improved technology through Farmer FIRST

The ICAR-IIPR, Kanpur institute is continuously making efforts to disseminate improved pulse production technologies, including mungbean, to reach farmers through on-farm interventions under ongoing projects such as the Farmer FIRST Programme and Model Pulse Village, among others, in the adopted villages. Some success cases of short-duration mungbean varieties (IPM 410-3 and IPM 205-7) in project villages are shared in this article.

Introduction of high-yielding varieties in project villages

Prevalence of non-descript mungbean varieties and limited uptake of plant protection technologies were the major challenges, restricting farmers from realizing the full yield potential of spring mungbean cultivation in the project villages of Kanpur Dehat and Hamirpur districts.

To address these challenges, high-yielding and disease-resistant mungbean variety *(Shikha)* was successfully introduced for the first time in Kanauta Danda and Gimuha Danda project villages of Kurara block, Hamirpur district of Uttar Pradesh during 2022–23 under the Farmer FIRST Programee (FFP). A total of 3.2 ha was brought under summer mungbean cultivation in partnership with nine farmers. The mungbean was introduced to intensify cropping systems such as sorghum–chickpea–fallow, sesamum–chickpea–fallow, fallow–wheat–fallow, fallow–mustard/rapeseed–mungbean, and fallow–field pea–mungbean. Besides improved varieties, farmers were trained on improved mungbean cultivation practices, including line sowing, seed treatment, and timely use of recommended insecticides. Sowing of mungbean was carried out by the farmers during the second fortnight of March to the first fortnight of April 2023, following pre-sowing irrigation. The first irrigation was applied 20–25 days after sowing, followed by irrigation at 10–15 day intervals as per crop requirement. Farmers recorded an average yield of 16.72 q/ha from demonstration plots compared to 10.53 q/ha from control plots, earning additional income of ₹1,02,354/ha from summer mungbean cultivation.

Continued demonstrations and expansion

In continuation to the attempts made, demonstrations on summer mungbean (var. *Shikha)* were organized on 12.8 ha in partnership of 18 farmers of Hamirpur district of Uttar Pradesh during 2023–24 under FFP. Sowing was done during second fortnight of March to first fortnight of April 2024. The previously mentioned package and practices was followed by the partner farmers. The partner farmers received 12.12 q/ha yield from demonstrations plots compared to control plots (that translated the gross income of ₹103,748/ha. In the same year i.e. spring 2024, mungbean viz. IPM 207-5 *(Virat)* and IPM 410-3 *(Shikha)* were successfully introduced on 75 ha in partnership of 148 farmers of Kandhi, Kandhi Ki Madaiya, Ingwara and Korawa project villages under Model Pulse Village project. Besides improved varieties, insect-pest management is

Mungbean demonstrations in Kanpur Dehat district

a crucial component of spring mungbean cultivation, however limited availability of spraying machines deterred farmers from following the recommended spray schedule. To address this challenge, partner farmers were also supported by providing spraying machines (100 nos.) under SCSP project. These efforts led to proper insect-pest management in mungbean crop. The enthusiasm of partner farmers and the technology backup under Model Pulse village project led to higher productivity levels of the spring mungbean crop in the project villages. The farmers fetched average yield of 12.20 q/ha from demonstrations plots against 9.75 q/ha from control plots, leading to higher income from demonstrations plots (₹104,864.60 q/ha) as compared to control plots (₹ 83,440.5 q/ha). In this line, during the year 2025, attempt made to increase the income of partner farmers from summer mungbean (var. *Shikha* and *Virat)* cultivation in project villages of Kanpur Dehat district, demonstrations on summer mungbean were organized on 12 ha in partnership of 15 farmers of project villages of Kanpur dehat under Model Pulse Village project. The partner farmers received 14.84 q/ha yield from the demonstration's plots in compare to control plots (11.14 q/ha) of the region and earned ₹106,869/ha as a gross income.

Impact of improved mungbean cultivation practices

The efforts made in the project villages of Kanpur Dehat and Hamirpur districts showed that adopting improved varieties, timely sowing, seed treatment, and insect-pest control measures led to higher yields and returns from mungbean cultivation compared to traditional methods. These demonstrations also highlighted the potential of short-duration summer mungbean in income enhancement by intensifying traditional cropping systems. The outcomes serve as a strong motivation for farmers in nearby villages to adopt improved spring/summer mungbean production technologies for additional income and higher yields.

SUMMARY

Spring-summer mungbean is a short-duration, high-protein pulse that supports both nutrition and agricultural intensification in India. ICAR-IIPR, Kanpur, has developed high-yielding, disease-resistant varieties such as IPM 410-3 *(Shikha)* and IPM 205-7 *(Virat)*, suitable for diverse agro-climatic zones. Through Farmer FIRST and Model Pulse Village projects, these varieties were successfully introduced in Kanpur Dehat and Hamirpur districts, along with training on line sowing, seed treatment, irrigation, and pest management. Demonstration plots consistently outperformed control plots, yielding 12–16.7 q/ha and generating additional income of ₹1–1.06 lakh/ha. Adoption of improved varieties and practices enhances cropping system intensification, income, and farmer motivation for sustainable mungbean cultivation.

*Corresponding author email: umasah@gmail.com

Model Pulse Village

THE **Model Pulse Village (MPV)** project, sanctioned by the Department of Agriculture and Farmers' Welfare, Ministry of Agriculture and Farmers' Welfare, Government of India, is designed to develop villages capable of sustaining and enhancing pulse production through a holistic approach integrating social, economic, technological, institutional, and skill development components.

Each MPV functions as a **community-oriented, self-sustaining model** that demonstrates best practices in pulse cultivation, seed production, and technology dissemination. Implemented in clusters of villages, these projects involve **collaboration among government agencies, research institutions, and farmers,** focusing on major pulse crops such as **chickpea, pigeon pea, mungbean, urdbean, lentil, and field pea.**

Key Objectives

- ***Enhance productivity:*** Double pulse yields by overcoming constraints like low productivity, pests, and diseases.
- ***Promote sustainability:*** Encourage climate-smart, resource-efficient, and region-specific pulse cultivation practices.
- ***Improve livelihoods:*** Boost farmers' income through access to quality seeds, improved technologies, and better markets.
- ***Strengthen self-reliance:*** Reduce pulse imports by increasing domestic production and ensuring national self-sufficiency.