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Boosting Mustard Productivity and Profitability through Improved Technologies: A Success Story from West Champaran, Bihar

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INTRODUCTION

West Champaran district comes under North West Alluvial Plain Zone. The soils of the area under demonstrations are sandy loam soil and more fertile because it flows down from Himalayan foothills. This makes agriculture is the most important profession of the people. The major existing faming systems are Rice-Wheat and Sugarcane under the command area of Krishi Vigyan Kendra, Narkatiyaganj. West Champaran district has a humid sub-tropical climate with large variation in between summer and winter temperature. Mustard is an important commodity for human diet after cereal crops and sugarcane is taken by the farmers as cash crop in district West Champaran. The average productivity of mustard crop is low due to the use of poor-quality seeds and improper cultivation practices. Limited access to irrigation, leaving crops vulnerable to weather fluctuations and inadequate knowledge of pest and disease management, leading to frequent crop losses. Shri Baccha Singh was an ordinary farmer and he came in contact with the activities of Krishi Vigyan Kendra, Narkatiyaganj and with improved technological knowhow, KVK technocrats also selected him for cluster frontline demonstrations (CFLD) on mustard crop after identification of technological gaps.

Plan, Implement and Support/KVK Intervention(s): Identification in the knowledge gaps in seed selection, nutrient management and plant protection measures by the KVK Narkatiyaganj team. The KVK technocrats designed a comprehensive mustard cultivation training module. KVK Narkatiyaganj distributed high-yielding mustard variety (DRMR 150-35) seeds, Sulphur, Mancozeb + Carbendazim and Imidacloprid 17.8 SL for plant protection measures to the selected farmer. KVK experts provided training sessions and demonstrations on soil testing, balanced nutrient application, integrated pest and disease management and continuous technical guidance provided throughout the crop cycle on do and don't guide. Observations and data were recorded and analyzed.

Details of Practices followed by the farmer: With the guidance and support of the KVK, the farmer adopted several improved and scientific practices that transformed his mustard farming. The mustard HYV DRMR 130-35 (@ 5 Kg/ha) with full package of practices viz. proper tillage, proper seed rate and sowing method, balanced dose of fertilizer/bio-fertilizer (60:40:40:10:N:P:K:S kg/ha, proper irrigation, weed management and improved plant protection measures i.e. seed treatment with Mancozeb + Carbendazim @ 2 g/kg seed and also control of Alternaria blight and aphid control with Imidacloprid 17.8 SL @ 1 ml/2 liter of water were comprised under the cluster frontline demonstration. Timely and need based application of nutrients, irrigation and pest management practices. The farmer harvested the crop when 80% of pods turned yellow-brown to avoid shattering and properly dried and cleaned mustard seeds to maintain quality for storage and sale.

Results/ Output: As a result of adopting improved cultivation practices under the guidance of the KVK, Mr. Bachcha Singh achieved remarkable improvements in both yield and income from mustard farming. Before KVK intervention the average yield was approximately 11.5 quintals per hectare using traditional practices with using old age, local mixed varieties but after KVK intervention the yield enhanced to 16.3 quintals per hectare using improved varieties, scientific nutrient management and plant protection measures. The insect-pests and disease infestation minimized with the use of plant protection strategies during technology assessed period. His yield increased by 41.74 percent as compared to traditional practices. The economic gain per unit area in terms of gross returns, net returns and BCR are recorded Rs 61870, Rs 38,813 and 2.68 respectively. This technology improves pod yield significantly under irrigated condition. Enhanced oil content and seed quality fetched a better price in local markets. Reduced input costs through efficient use of fertilizers and timely pest control.

Impact/ Outcome: (economical/ social/ etc.)

The maximum yield and net returns under varietal replacement of mustard with plant protection strategies is quite encouraging to partner farmer as well as neighboring farmers of cluster villages. The partner farmer and neighboring farmers were fully convinced with the technology transferred. The farmer is enthusiastic to adopt the scientific package of practices for oilseed production. Mustard cluster frontline demonstrations has significantly improve farmers' socioeconomic status by increasing their income through increased mustard yield due to the adoption of improved technologies and practices showcased in the demonstrations, leading to higher profitability and better financial stability, this is achieved by enhancing their knowledge, skills, and access to new varieties and pest management strategies, ultimately contributing to a better quality of life. Mr. Bachcha Singh is very happy on improvement of their income, livelihood and set-forth example for others.

Economic Information

Enterprise	Gross Income (annual)	Net income	Cost-Benefit ratio	Economic Impact of technology/intervention (cost saving/ higher yield/etc.)
Farmers Practice	39,680	19758	2.00	1. Use of scientific methods of mustard cultivation reduced the technology gap to a considerable extent thus leading to increased productivity and higher income. 2. Farmers convinced about technology and appreciated. 3. Encouraged the farmers to act their farm work in a more systematic and specific manner. 4. Partner Farmer's reduced the plant protection input costs and providing various environmental benefits and also establish set-forth for others.
Improved Practice	61,870	38813	2.68	

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Lesson learned and Future plans: Adoption of improved varieties, seed treatment, and balanced fertilization significantly increased productivity and profitability. The farmer has realized that proper sowing time, irrigation during key growth stages, and early pest management play a major role in ensuring high yields. Moreover, the regular support from KVK experts boosted the farmer's confidence and helped overcome traditional barriers to innovation.

In his future endeavours the farmer plans to increase mustard cultivation area by utilizing more of his land with scientific methods. Instead of going for a solo crop, he wants to integrate mustard with pulses or vegetables in a rotation system to maintain soil health and maximize profits year-round.Moreover, exploring small-scale oil extraction unit will definitely add value and increase earnings.

Supporting Images

CFLD demonstration of Mustard cv. DRMR 150-35 at field of Shri Bachcha Singh