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Constraints and farmer-led solutions in adopting pomegranate recommendations from Mahatma Phule Krishi Vidyapeeth

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Abstract

This study investigates the knowledge and adoption of pomegranate recommendations released by Mahatma Phule Krishi Vidyapeeth, Rahuri, among farmers in Nashik district, Maharashtra - a region leading in pomegranate area and production. Employing an ex-post facto research design, data were collected from 120 respondents across 12 randomly selected villages in Satana, Deola and Malegaon tahsils for the year 2024-2025. Results reveal that according to their medium to high level of adoption, the majority of the farmers have adopted released varieties of the university likewise Bhagwa, Phule Bhagwa. The findings highlight the need to invent many more recommendations of pomegranate and other fruit also to be helpful for the farmers to enhance the adoption of sustainable practices. This research provides actionable insights for policymakers and stakeholders to strengthen pomegranate cultivation, improve farmer livelihoods, and promote sustainable agriculture in Maharashtra.

Keywords: pomegranate cultivation, adoption, constraints, suggestions, recommendations, MPKV Rahuri

Introduction

Pomegranate (*Punica granatum*) is an important fruit crop of arid and semi-arid regions of India, belonging to the family Lythraceae (Mincuzzi & Ippolito, 2023) ^[8]. It is a non-climacteric fruit and one of the drought-resistant horticultural crops, which has proved to be the best profitable crop under dryland conditions. Pomegranate is one of the most popular table fruits. Fresh fruits are used for table purposes as well as in the creation of processed products such as juice, syrup, squash, jelly, anardana rub, juice concentrates, carbonated cold drinks, anardana tablets, acids, and so on. It has enormous medicinal and nutritional value and is one of the richest sources of antioxidants. The fruit is mainly used for dessert purposes and also processed for making juices, syrup, jelly, and anardana.

Area and Production of Pomegranate in Maharashtra (2024-2025)

Table 1: The area, production, and productivity of pomegranate in Maharashtra

Districts	Area (in MT)	Production (in MT)	Productivity (in MT)
Nashik	26.056	442.050	16.96
Sangli	9.151	146.418	16
Smbhajinagar	4.900	58.800	12
Ahilyanagar	31.950	343.032	10.73
Solapur	48.130	331.639	6.89

Pomegranate is truly an ancient cultural icon of the Old World. Whether in an Arabian Night storyteller, the Spanish Alhambra palace garden, or stories of Shirin Farhad of Persia, there runs a common thread of romance and beauty of this tree of life. Greek goddess Nike and goddess Tanit of Phoenicia, both revered around the Mediterranean, are holding pomegranate fruit as a symbol of fertility and prosperity in their hands. It is customary to consume pomegranate on Jewish New Year as Jewish tradition teaches that the pomegranate is a symbol of righteousness.

A large number of varieties are cultivated in different parts of India. Among them, Bhagwa is the predominant ruling variety owing to its dark red arils and attractive red color rind. Other important varieties of pomegranate are Ganesh, G-137, Mridula, Dholka, and Phule Arakta. Earlier, Ganesh variety with big-sized fruits was preferred, but presently soft-seeded, red rind and aril color varieties with a high percent of juice are preferred, such as Bhagwa and Mridula. The external variables that determine the shelf life of pomegranates are temperature, relative humidity, and the type of gases in the environment. These variables can be efficiently utilized to extend the post-harvest life by reducing respiration and losses resulting from fungal and physiological degradation (Dhumal *et al.*, 2022)^[4].

Pomegranate is an important fruit crop grown in the dry regions of India. In India, pomegranate is cultivated extensively with an area of 2,53,000 ha and production of 29,15,000 Metric Tons (DAC & FW, 2018). It has attracted many growers, especially those in Karnataka and Maharashtra, for its wider adaptability and profitability. Karnataka is one of the progressive states of India with great potential for the development of fruit crops.

The pomegranate needs critical care at the production level, enhancing the need for consultancy services for production. Maharashtra stands first in the country in respect of area and production of pomegranate. At present, 1,75,000 hectares are under pomegranate crops with 18,00,000 tonnes production, 6.0 million tonne per ha productivity, and 66.21% total share in production (Anonymous, 2017)^[5].

Recommendations Released by MPKV Rahuri

MPKV Rahuri emphasizes the use of high-yielding, disease-resistant pomegranate varieties. These varieties are selected based on their adaptability to local conditions, resistance to common pests and diseases, and higher protein content. Varieties such as Bhagwa, Phule Anardana, and Phule Arakta are recommended for their superior performance in Maharashtra's agro-climatic conditions.

Methodology

The present study entitled "Knowledge and adoption of Mahatma Phule Krishi Vidyapeeth released recommendations on pomegranate cultivation" was undertaken. The study adopted an ex-post facto research design. Nashik district in Maharashtra, which leads in both pomegranate productivity and production, was purposively chosen for the investigation. Among the district's twelve tahsils, Malegaon, Satana, and Deola were identified as having the highest area and production of pomegranate, and consequently, they were selected for the study.

Using a random selection process, four villages were chosen from each of the three tahsils, resulting in a total of 12 villages for the study. From each selected village, twelve respondents were chosen, making a total sample size of 120 respondents. The present investigation was based on primary data. The data on various aspects of the study were collected from personal interviews with the help of specially designed schedules. The data pertain to the year 2024-2025.

Result and Discussion

Constraints Faced During Adoption of Pomegranate Recommendations Released by Mahatma Phule Krishi Vidyapeeth Rahuri.

Table 2: Constraints Faced by Pomegranate Growers

Sr. No.	Constraints	F (N=120)	P (%)	Rank
1	High input cost of fertilizers, pesticides, and herbicides	70	58.33	I
2	High labor cost due to labor-intensive practices	66	55.00	II
3	Technical complexity and lack of knowledge of recommendations	54	45.00	III
4	High cost of packing material, transportation by truck	47	39.17	IV
5	Major attack of oily spot disease on pomegranate	44	36.67	V
6	Lack of awareness about post-harvest management practices	40	33.33	VI

Gaikar (2023)^[1] revealed that payment security from marketing agencies while selling pomegranate at farm level is ranked first by small producers (72.22%). Medium producers give first rank to price fluctuation of fruit in the market (52.00%), and large producers rank first the high commissions of market intermediaries outside the APMC.

Patil (2024)^[4] noted that major problems in the marketing of pomegranates include lack of information about distant markets, high transport cost, labor shortage for grading and packing, as well as defects in the market like high commission charges, deductions, and price fluctuations.

Analysis of the data shows that the majority (58.33%) of respondents faced constraints related to high input costs of fertilizers, pesticides, and herbicides, followed by 55.00% reporting high labor cost due to labor-intensive practices. Technical complexity of pomegranate recommendations was a constraint for 45.00% of respondents. Other challenges include high cost of packing material and transportation (46.56%), lack of storage facilities (39.17%), and major attacks of oily spot disease (36.67%).

These findings highlight the major economic, technical, and environmental challenges encountered by pomegranate farmers. Addressing these issues requires integrated policy interventions, targeted extension services, and promotion of resilient and sustainable farming practices.

Suggestions Expressed by Pomegranate Growers

Table 3: Suggestions Made by Respondents to Overcome Constraints

Sr. No.	Suggestions	F (N=120)	P (%)	Rank
1	Fertilizers, pesticides & herbicides should be available at reasonable rate	89	74.17	I
2	Farm mechanization should be promoted by government to overcome labor problem	85	70.83	II
3	Recommendations should be in simple language	64	53.33	III
4	Availability of cooperative transport facilities	57	47.50	IV
5	Oily spot disease resistant varieties of pomegranate should be developed by agricultural universities	46	38.33	V
6	Agricultural University recommended post-harvest management practices	40	33.33	VI

Observed that most respondents suggested eliminating middlemen (81.66%), standardizing prices (70.00%), providing access to market information (41.66%), forming

cooperatives for collective marketing (21.16%), and spending time in market research (19.16%) noted that most growers suggested providing skill-based training (68.00%), developing bacterial blight-resistant varieties (57.77%), and providing high-quality planting material and low-cost fertilizers (56.00%).

These recommendations highlight the need for policy-level interventions, infrastructure improvements, capacity-building initiatives, and better access to resources for pomegranate farmers. A multifaceted approach can help reduce input costs, protect against environmental hazards, enhance technological adoption, and improve access to financial resources and sustainable inputs.

Conclusion

The study underscores the multifaceted challenges confronting Maharashtra's pomegranate farmers, including prohibitive input costs, climate vulnerabilities, labor inefficiencies, and gaps in technical knowledge. Farmers advocate for systemic reforms, including: high input cost of fertilizers, pesticides and herbicides; high labor cost due to labor-intensive practices; technical complexity and lack of knowledge of recommendations; high cost of packing material and transportation by truck; major attack of oily spot disease; and lack of awareness about post-harvest management practices.

Bridging these gaps can bolster farm profitability, resilience, and ecological sustainability, ensuring Maharashtra's horticultural sector remains competitive amid climatic and market uncertainties. This research provides crucial insights into enhancing pomegranate production, contributing to broader efforts in ensuring food security and promoting sustainable agriculture. By recognizing the challenges and implementing the proposed solutions, stakeholders can collaborate to improve both the agricultural sector and the socio-economic environment. Addressing the identified constraints and incorporating farmers' recommendations can lead to a more sustainable and productive future for pomegranate farming, benefiting both farmers and society at large.

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