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Need for focusing on VRR of Rapeseed-Mustard under NMEO-OS

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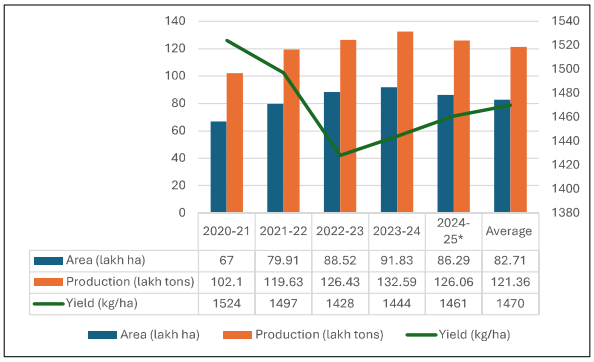
Abstract

Attending Atma Nirbharta in Edible Oils is one of the prime concerns of the National Mission on Edible Oils-Oilseeds (NMEO-OS) to check the rising edible oil imports, balancing edible oils requirement and domestic availability. Rapeseed-Mustard is one of the important sources of edible oil in the country which has made a significant contribution to domestic edible oil availability over the last few decades. Mustard crop, an indigenous oilseed grown in Rabi season, can play an important role in achieving self-sufficiency in domestic output of edible oils and there is a need to increase acreage, promote use of high-yielding seed varieties and provide assured prices to farmers to boost yield and production as emphasized under NMEO-OS. Rapeseed-mustard crop has good production potential, where the cultivation is supported with new varieties, technology and knowledge inputs. GOI has given maximum focus on Rapeseed-Mustard and has fixed to increase its area by 9.57%, production by 63%, productivity by 50% and oil production by 56% under NMEO-OS by 2030-31. Thus, Rapeseed-Mustard crop is to contribute 32% of the total oilseeds production target of NMEO-OS.

Keywords: *NMEO, VRR, oilseeds,rapeseed-mustard*

Introduction

The productivity of Rapeseed-Mustard (R&M) in India is the lowest among the major rapeseed- mustard growing countries. As against the World average of 2072 kg/ha, highest productivity of 3306 kg/ha of United Kingdom followed by Germany (3303 kg/ha), France (3183 kg /ha), the Indian average yield was only 1461 kg/ha during 2024-25. The R&M is cultivated in 26 states of the country, over an average area of 82.71 lakh ha (2020-21 to 2024-25), average production of 121.36 lakh MT and average yield of 1470 kg/ha (Fig. 1). The area under R&M in the country is continuously increasing and ranged from 67.00 lakh ha to 91.83 lakh ha during the last five years with production increase from 102.10 lakh tons to 132.59 lakh tons with productivity ranging from 1428 kg/ha to 1524 kg/ha.(Sharma et. al. 2025) In India, rapeseed-mustard is predominantly cultivated in Rajasthan, Uttar Pradesh, Madhya Pradesh, Haryana, Gujarat, West Bengal, Jharkhand, Assam, Bihar and Punjab (Fig 2). The Cluster Front Line Demonstrations (CFLDs) conducted by KVKs of Rajasthan under NMEO-OS resulted in a significant yield increase of 22.36% over farmers practices, with an average yield of 17.61 q/ha and a net return of Rs



	2020-21	2021-22	2022-23	2023-24	2024-25*	Average
Area (lakh ha)	67	79.91	88.52	91.83	86.29	82.71
Production (lakh tons)	102.1	119.63	126.43	132.59	126.06	121.36
Yield (kg/ha)	1524	1497	1428	1444	1461	1470

Fig 1: APY of Rapeseed-Mustard during last 5 Yrs (2020-21 to 2024-25)

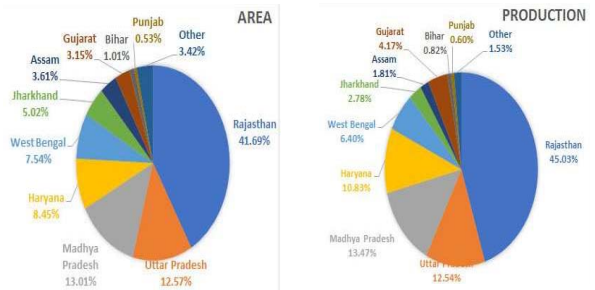


Fig 2: Contribution Major states in Rapeseed-Mustard in India during 2020-21 to 2024-25

68,816.81/ha. The AICRP results recorded that the whole package technology demonstrations of rapeseed-mustard increased the average productivity by 81-137% under rainfed condition and by 87-105% under irrigated conditions over the farmers' practice.

Importance of R&M under NMEO-OS

Target of NMEO-OS

- NMEO-OS gives primary focus on three crops namely Rapeseed-Mustard, Groundnut and Soybean (89% of the oilseeds area and 95% of edible oil production.
- Addressing the existing significantly high yield gap (~60%) in Mustard crops.
- Increasing primary oilseed production to 69.7 million tonnes by 2030-31 from 39 million tonnes in 2022-23 and yield increase from 1428 kg/ha in 2022-23 to 2142 kg/ha by 2030-31.
- Increasing domestic edible oil production to 25.45 million tonnes and meet around 72% of our projected domestic requirement together with NMEO-OS (oilseeds) & NMEO-OP (Oil Palm).
- Expand oilseed cultivation by an additional 40 lakh hectares.

R&M target of NMEO-OS	Over 2022-23	Target by 2030-31
Increase area by	9.57%	88.52 lakh ha to 97.00 lakh ha
Production increased by	63%	126.43 lakh tons to 207.00 lakh tons
Increase productivity by	50%	1428 kg/ha to 2142 kg/ha
Increase oil production by	56%	41.0 lakh tons to 64.2 lakh tons

Targeted contribution of R&M by 2030-31

The major contribution to domestic edible oil production comes from Rapeseed & Mustard oil (45%), groundnut oil (25%) and soybean oil (25%). The minor edible oilseeds (sesame, sunflower, safflower, and niger) contribute about 5% of the total domestic oil production. Rajasthan and Madhya Pradesh have the highest production of oilseeds, about 21.42% of the national production, followed by Gujarat (17.24%) and Maharashtra (15.83%). Together, these four states contribute to 75.63% of the total oilseeds production in the country. Similarly, Rajasthan, Haryana, Madhya Pradesh, Uttar Pradesh, and West Bengal collectively contribute 87.9% of India's total R&M production. It can be noted from Table 1 that R&M must contribute 29-30% of the total oilseeds area target under NMEO-OS by 2030-31 with minimum area expansion of 8.2 lakh ha (non-traditional 1.00 lakh ha & traditional 7.2 lakh ha). By 2030-31 Mustard area target is 9.7 million ha from current area of 8.9 million ha (2024-25).

The total oilseeds production by 2030-31 is projected to 69.71 million tons as against the 3rd advance estimates of 2024-25 (42.6 million tons) which is 63% higher than current production. R&M crop is to contribute 32% of the total oilseeds production target under NMEO-OS by 2030-31. In the last decade, rapeseed-mustard exhibited positive yield growth rates of 3.2%. During last 5 years yield of R&M varies from 1444 to 1524 kg/ha at national level. The yield of the crop further needs to be enhanced to 2142 kg/ha by 2030-31.

Table 1: Projected contribution of area, production and Edible oil production of Rapeseed-Mustard
(Area: Million ha, Production: Million tons, Oil: Million tons)

Parameters	2024-25*	NMEO-OS Target/contribution					
		2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
Oilseeds area	30.26	29.70	30.40	31.00	31.70	32.30	33.00
Rapeseed-Mustard area	8.62	9.00	9.10	9.30	9.40	9.50	9.70
Contribution (%)	28.48	30.3	29.3	30.0	29.6	29.4	29.3
Oilseeds Production	42.60	42.70	45.90	50.10	55.50	62.20	69.71
Rapeseed-Mustard Production	12.60	13.90	14.70	15.80	17.20	18.80	20.70
Contribution (%)	29.57	32.5	32.0	31.5	31.0	30.2	29.6
Edible Oils (Primary sources)	9.40	9.90	10.60	11.60	12.80	14.30	15.99
Rapeseed-Mustardoil production	4.16	4.32	4.57	4.90	5.32	5.84	6.42
Contribution (%)	44.25	43.6	43.1	42.2	41.5	40.8	40.1

Source: NMEO-OS documents, *3rd adv estimates, DA&FW

However, the contribution of R&M in total edible oil production from primary sources is to be maintained at 40-43% by increasing only 0.82 million ha. This is the most challenging and thus indicates the importance of this crop in edible oil basket of the country. The projected edible oils production from primary sources is 15.99 million tons and from R&M it is 6.42 million tons by 2030-31.

Horizontal and vertical expansion strategies

NITI Aayog report 2024 (Pathways and strategy for accelerating growth in edible oil towards goal of Atmanirbharta) suggested to adopt horizontal and vertical expansion strategies of oilseeds including mustard on cluster basis and the mission support the same. (Neelam et. al. 2024)

Vertical expansion (High Area-High yield clusters): Rajasthan, Madhya Pradesh, and Haryana are in the high area-high yield quadrant for mustard should prioritize vertical expansion strategies focused on maximizing yield from existing cultivating area at par with global yield.

Horizontal expansion (Low Area-High Yield clusters): Uttar Pradesh, Gujarat, Punjab, and Telangana, represent opportunities for horizontal expansion to increase their oilseed footprint. Horizontal expansion strategy aims to strategically increase the area dedicated to cultivating edible oil crops. This strategy seeks to bring more land under cultivation for specific oilseeds.

Vertical & Horizontal expansion (Low Area-Low Yield clusters): States including Bihar, West Bengal, Jharkhand, Assam, Chhattisgarh, Manipur, Arunachal Pradesh, Nagaland, Maharashtra, Meghalaya, Odisha, Tripura, Andhra Pradesh, Karnataka, Mizoram, and Tamil Nadu, may require alternative agricultural strategies to increase yield and cultivation area. These states require a comprehensive approach combining both horizontal and vertical expansion strategies.

Support of NMEO-OS to stakeholders

A total of 368 districts of 13 states have been identified for increasing yield of Rapeseed Mustard under the mission. It has been emphasised to conduct 600 Value Chain Clusters of oilseeds over 10 lakh ha of which mustard area will be 3.16 lakh ha in 10 states. Currently 35 seed hubs have been established for 9 oilseed crops in 16 states and 31 districts with a total capacity of 20,000 quintals of certified seeds annually. Under the NMEO-OS, 65 new seed hubs will be established to increase the availability of quality seeds of which 16 for R&M (existing 8 seed hubs) through ICAR/SAU/KVKs/Central Agencies/FPO. Assistance will also be provided for 50 Specialized Seed Storage units. India needs 20 million tonnes of R&M production to meet its growing demand as against current production of 10-13 million tonnes. Under irrigated conditions seed yield of 20 q/ha can easily be achieved having yield advantage of 33% over Farmer's practices. NMEO-OS is supporting for

- Breeder seed, Foundation seed and Certified seed production and distribution.
- Promotion of high yielding & high oil content newly released varieties (< 5 yrs).
- Cultivation of R&M in Rice/Potato fallow areas in identified states.
- Conducting FLDs / CFLDs / Block demonstrations.
- Developing value chain clusters of 500 ha each in potential districts/blocks.
- Crop diversification in Punjab, Uttar Pradesh, Assam, Tripura.
- Post-harvest infrastructure support.

Mismatches in breeder seed production and indent

The Seed Replacement Rate (SRR) of R&M is above the threshold level (33% for self-pollinated crops) and varietal replacement rate (VRR) is also satisfactory but not for newly released varieties. NMEO-OS has emphasized to promote less than 5 years old varieties of Oilseeds including R&M under the seed production, distribution and seed rolling plan of states and central agencies. As per target of NMEO-OS the Certified Seed (CS) requirement of R&M at 50% SRR is projected at 2.25 lakh quintals in 2025-26 with consistent increase to 4.85 lakh quintals by 2030-31. The Foundation Seed (FS) as well as Breeder Seed (BS) requirement would be 2250 quintals and 22.50 quintals by 2025-26 and 2420 quintals (FS) and 24.20 quintals (BS) by 2030-31 respectively. (NMEO-OS document. DA&FW, Govt. of India, 2024)

Target of NMEO-OS	2025-26	2030-31
Target area (lakh ha)	90.00	97.00
Seed rate (5kg/ha) @100% SRR (lakh qtls)	4.50	4.85
CS requirement @ 50% SRR (lakh qtls)	2.25	2.42
FS requirement (quintals)	2250	2420
BS requirement (quintals)	22.50	24.20

Table 2: BS production & Indent of R&M in last 5 yrs.

Year	BS production (q)	BS Indent (q)	% indented	Surplus BS (q)	% surplus
Rabi 2021	239.48	164.53	68.7	74.95	31.2
Rabi 2022	223.95	69.94	31.2	154.03	68.7
Rabi 2023	254.66	89.03	34.9	165.63	65.0
Rabi 2024	281.00	145.44	51.7	135.56	48.2
Rabi 2025	424.09	90.61	21.3	333.48	78.3
Average	**284.63**	**111.91**	**41.5**	**172.73**	**58.2**

As per seed net portal data of DA&FW, it is well established fact that total Breeder seed production by ICAR/SAUs/AICCRP centres are always higher by many folds than the requirement and indents placed by states and central agencies. During the last 5 years, the average BS production was 284.63 quintals of which the indent was for only 41.5% of the production leaving surplus production of 58.2% (Table 2). The surplus breeder seeds were further allocated to NSC for its multiplication. These mismatches in the Breeder seed production and indent by states and central agencies which seems to be wastage of resources and manpower.

Status of < 5 yrs old varieties

As per seed net portal during *rabi* 2025, BS indent was placed for 93 varieties of Rapeseed & Mustard of which 38 are less than 5 years old (Annexure 1)**.** BS indent for Brown sarson, Gobi sarson and Taramira are low owing to less area under cultivation. The total production of BS during *rabi* 2025 was 424.09 quintals but indent by various states & central agencies was only 98.47 quintals out of which 90.61 quintals was allocated to 16 states and 7 central agencies by Oilseeds division of DA&FW. However, the indent for below 5 years old varieties is only 33.75 quintals i.e. 37.2% of total indent. (Table 3). BS indent for < 5 yrs old varieties was 76.6 % in case of Toria followed by rapeseed i.e 31.8% of the indent. However, the BS of new varieties of brown sarson, Gobi sarson and Taramira are very low i.e. 0-9% only.

Table 3: BS production & Indent of R&M in Rabi 2025.

Crop Name	BS production (q)	Indent (q)	Allocation (q)	<5 yrs (q)	< 5 yrs (%)	Total varieties (no)	Varieties <5yrs (no)
Brown Sarson	1.55	1.44	1.44	0	0	2	0
Gobi Sarson	5.15	1.27	1.27	0.12	9.44	5	2
Taramira	2.15	0.40	0.40	0.20	0.50	3	1
Toria	66.54	16.37	12.49	9.57	76.6	17	5
Rapeseed	348.70	78.99	75.01	23.86	31.8	66	30
Total R&M	424.09	98.47	90.61	33.75	37.2	93	38

Source: Breeder Seed allocation rabi 2025, DA&FW

BS indents by States & Central agencies

Rajasthan being the top Mustard producing state is placing BS indent of only 1.35 Q having 59.2% varieties less than 5 years old. Uttar Pradesh is contributing nearly 16 % of total Mustard production in the country but BS indent of <5 years is only 42.1% (Table 4) Similarly, Madhya Pradesh contribution is above 13% of total Mustard production in the country but BS indent of <5 years is only 6.8%. Haryana is also a major Mustard production state (10% contribution) but total indent of BS is very less only 0.12 quintals. West Bengal is an emerging state of Mustard in recent years and giving indent of 2.85 quintals unfortunately with only 15.4 % varieties are below 5 years old.

Among the Central seed producing agencies, NSAI is giving maximum indent of Breeder seeds (10.09 q) followed by NSC (5.70 q) having less than 5 years old varieties of 52.1 and 57.8 % respectively. BBSSL and KVSSL showed 70-80 % indent of < 5 years varieties while IFFDC, KRIBCO and HIL maintained 50% indent for less than 5 years old varieties in their seed chain. The total allocation of BS by various agencies was 19.53 quintals out of which 10.54 quintals are below 5 years old *i.e.* 54 % of total allocation as against states allocation of only 32.65%.

Conclusion

The vertical and horizontal expansion strategies of R&M as suggested by NITI Aayog are well placed under NMEO-OS coupled with initiatives like the expansion of

Table 4: Status of BS allocation vs new varieties of Rapeseed & Mustard (Rabi 2025)

Major states/Agencies	Production contribution (%)	Breeder Seeds (Q)		
		Allocation (q)	<5 yrs varieties (q)	% of allocation
A. Major states				
Rajasthan	43	1.35	0.80	59.2
Uttar Pradesh	16	10.98	4.63	42.1
Madhya Pradesh	13	18.73	1.28	6.8
Haryana	10	0.12	0.10	83.3
West Bengal	6	2.85	0.44	15.4
Other states	12	37.05	15.96	43.0
Total-A	100	71.08	23.21	32.65
B. Central Agencies				
BBSSL (Bharatia Beej Sahakari Samity Ltd)		0.54	0.44	81.4
KVSSL (Krishi Vikas Sahakari Samity Ltd)		0.81	0.56	69.1
NSC (National Seeds Corporation)		5.70	3.30	57.8
HIL (Hindustan India Limited)		1.80	1.00	55.5
NSAI (National Seeds Association of India)		10.09	5.26	52.1
Other agencies		0.59	0.12	20.3
Total-B		19.53	10.54	54.0
Total A+B		90.61	33.75	37.24

Source: Seed Net Portal, DA&FW

fallow land cultivation, improved farming practices, ensuring seed quality and traceability, market linkages with effective storage strategies, value addition through processing, refining techniques, holds significant promise for maximizing the impact of the *Atmanirbharta* strategy and fostering a resilient domestic edible oil production system. Enough varieties of < 5 years old are available for its inclusion in seed rolling plan by States & Agencies. Total Breeder seed production by ICAR/SAUs/AICCRP centres are always higher by many folds than the requirement and indents placed by States and central agencies. Increased indent & availability of certified seed, adequate SRR (50%) with high VRR (70%) with < 5 yrs. old varieties are some of the contributing factors for enhanced yield from 1461 kg/ha (2024-25) to 2142 kg/ha by 2030-31. The significant contributor of R&M growing especially in Madhya Pradesh, West Bengal, and Haryana must give BS indent for more quantity as well as for less than 5 yrs old varieties. States like MP and West Bengal should also push new varieties of R&M in their seed rolling plan. The states are placing only 32.65% indent of BS for <5 yrs old varieties and central agencies by 54% which must be increased to 50-60% under NMEO-OS.

GOI has launched NMEO-Oil Palm which is directly linked with private Oil palm processing companies/cooperatives. But under NMEO-OS it is missing. There is need for conducting Block demonstrations, Value Chain Clusters and establishment of oilseeds seed hub by Central nodal agencies/seed companies/Associations/Cooperatives to promote newly released varieties and to achieve the set target of R&M under NMEO-OS.

Annexure 1

Rapeseed-Mustard varieties under Breeder Seed indent by States/Agencies during Rabi 2025

Varieties	>5 yrs.	Varieties	< 5 yrs
		Brown Sarson	
Shalimar Sarson-2 (KBS-49)	2019	-	-
Gobi Sarson			
GSC 7 (GSC 101)	2015	JAMMU GOBHI SARSON 123	2022
Him Sarson-1	2009	HIM PALAM GOBHI SARSON 1	2021
GSL-1	1987	-	-
		Taramira	
JWALA TARA (RTM-1355)	2017	KRISHNA TARA (RTM-1624)	2022

JOBNER TARA (RTM-1351)	2017	Azad Chetna (TKM 14-2)	2021
		Toria	
RSPT-6 (TCN 13-9)	2019	Raj Vijay Toria 2 (RMT 08-2)	2021
TAPESHWARI (TK 06-1)	2018	AAU TS 38	2021
Pant Hill Toria-1 (PT-2006-4)	2017	Jeuti (JT 90-1)	2020
Pant Toria-508 (PTE-2008-2)	2017	Raj Vijay Toria 3 (RVT 3)	2020
TL 17	2016		
Sushree	2015		
Uttara (PT-2002-25)	2010		
TH-68	1991		
BHAWANI (TK-8401)	1986		
PT-303	1985		
Agrani (B-54)	1982		
T-9	1975		
		Rapeseed	
RH 761	2019	RH 1975	2024
PC J03 – 401	2019	PDZ 14	2024
RH 715	2018	PDZ 15	2024
CS 60	2018	DRMR 2018-19	2024
PDZ 1	2018	LES 43	2024
PYS 2007-10	2017	RH 1706	2023
PRB 2008-5	2017	ANDM 14-09	2023
CS-58	2017	Pant Pili Sarson-2 (PYS-2016-8)	2023
GDM 5	2016	RH 1424	2023
Raj Vijay Mustard 1	2016	PUSA BOLD	2023
RGN 298	2015	CS 61	2023
GDM-4	2015	CS 64	2023
JMWR 08-3	2013	ROHINI WRR 2	2023
RH 0406	2013	LES 60	2023
RH 0749	2013	OUAT KALINGA MUSTARD 1	2023
DRMRIJ 31	2013	RH 1706	2023
NPJ 124	2012	JM 13-5	2022
NPJ 113	2011	TBM 143	2022
EJ-17	2011	PDZ 33	2021
NPJ 112	2010	RCH 1	2021
NRCDR 601	2010	DRMR 2017-15	2021
RYSK 05-02	2010	PHR 126	2021
Chhattisgarh Sarson	2010	BBM 1	2021
NRCYS 05-02	2009	DRMRIC 16-38	2021
NRCHB 101	2009	TAM 108-1	2021
YSH 0401	2009	YSWB 2011-10-1	2020
RH 9304	2003	YSWB 2014-2	2020
SEJ 2	2003	DRMR 150-35	2020
RK 9501	2001	DRMR 1165-40	2020
SEJ -2	1998	LES 54	2020
GUJARAT MUSTARD-2	1997		
LAXMI (RH-8812)	1997		
BOI-902	1994		
YSB 19-7C	1991		
NDR-8501	1990		
RH -30	1985		
B-9	1982		
Total 55 varieties		Total 38 varieties	

Reference

A.K. Sharma, Vinod kumar, R.K. Yogi and V. V. Singh 2025. Best Management Practices for of Rapeseed-mustard Re for Madhya Pradesh, ICAR-IIRMR, Bharatpur, pp:44

National Mission on edible oil-oilseeds (NMEO-OS operational guidelines (2024-25 TO 2030-2031), Oilseeds Division Department of Agriculture & Farmers Welfare Ministry of Agriculture & Farmers Welfare Government of India Krishi Bhawan, New Delhi (https://nmeo.dac.gov.in/nmeodoc/NMEO-OSGUIEDELINES1.pdf)

SeedNet India Portal, "National Initiatives for information on quality Seed", Department of Agriculture and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Government of India (https://seednet.gov.in/)

Neelam Patel, Harshika Choudhary and Sambuddha Goswami 2024. NITI Aayog (2024). Pathways and Strategy for Accelerating Growth in Edible Oil towards Goal of Atmanirbharta (https://www.niti.gov.in/sites/default/files/2024-08/Pathways_and_Strategy_for_Accelerating_Growth_in_Edible_Oil_towards_Goal_of_Atmanirbharta_August%2028_Final_compressed.pdf)