Dr. S S Tomar

Officer In charge: Dr. S S Tomar;
Associate Director Research

Office address: Zonal Agricultural Research Station,
A B Road, Morena 476001 (M.P)

Home address: Krishi colony,
A B Road, Morena 476001 (M.P)

Phone: 07532-234426 (O)

Fax: 07532-232287 (O)

Email: adrmorena@rediffmail.com

History:

Morena district is one of the State of Madhya Pradesh. The name, Morena is derived from the mor + raina means the place where peacock is enormously found. The district is part of Chambal Division. The town of Morena is the district and divisional headquarters. The district is mostly farmland, and trains are a popular form of transportation, although they connect only about 15% of the villages within Morena. Morena is famous for its mustard production. Morena is located at 26.30°N 78.00°E. Geographically Morena is an interesting place as Madhya Pradesh touches two neighboring states i.e. Rajasthan and Uttar Pradesh here. Morena touches Dholpur (Rajasthan) in North-West and Pinahat (Agra, U.P) in

North-East. The neighboring districts are Bhind, Gwalior, Shivpuri and Sheopur.

Morena district comprises four sub-divisions: Morena, Ambah, Joura and Sabalgarh. Morena sub-division comprises a lone tehsil and a lone block: Morena. Ambah sub-division comprises two tehsils and blocks: Ambah and Porsa. Joura sub-division comprises Joura tehsil, which is further divided into two blocks: Joura and Pahargarh. Sabalgarh sub-division has two tehsils and blocks: Sabalgarh and Kailaras. Significant towns of this district are Morena, Bamore, Ambah, Porsa, Joura, Sabalgarh, Kailaras, Pahargarh and Jhundpura.

Famous personalities from Morena:

- Ram Prasad Bismil; Indian revolutionary, from the village of Barbai
- Narendra Singh Tomar; Minister of Mines and Steel in Indian government, from Porsa.
- Paan Singh Tomar; Famous Athlete Bhidosa (MORENA)
- Ashok Argal: Mayor of Morena Municipal Coorporation

Places of interest:

Pahargarh Cave Painting, Kakan Math Temple, Jain Temples, Kutwar, Harrisiddhi Devi temple, Padawali, Mitawali : Sabalgarh Fort, Sersaini Fort

Plant Pathology and Biochemistry laboratory have been equipped with various instruments for research work.

Staff:

Technical:

1. Dr. S S Tomar (Principal Scientist, Agronomy & I/C RM Project)
2. Dr. Y P Singh (Principal Scientist, I/C WM Project)
3. Dr. N S Yadav (Sr. Scientist; Biochemistry)
4. Er. S K Tiwari (Sr. Scientist; Engineering)
5. Sh. J C Gupta (Scientist: Plant Pathology)
6. Dr. V K Tiwari (Scientist; I/C Soybean Project)
7. Dr. N K Sharma (TA)
8. Er. S P S Sikarwar (TA)
9. Sh. D Awasthi (TA)- Study leave.
10. Dr. Harvender Singh (RA)

Non-technical:

1. Sh. R N Sharma (FEO)
2. Sh. N S Tomar (FEO)
3. Sh. M S Rawat (FEO)
4. Sh. M.K. Shrivastav (Asstt. Gr. II)
5. Sh. M. K. Sharma (Asstt. Gr.II)
6. Sh. B M Yadav (Chokidar)
7. Sh. Munalal (TSL)
8. Sh. Ram Prakash
9. Sh. Daulatram

Zonal Agricultural Research Station:

All India Coordinated Research Project on Rapeseed & Mustard (ICAR):

Madhya Pradesh is an important Rapeseed-Mustard producing state contributing about 12.3% of National production. The area and production is constantly increasing. Morena district is the major Rapeseed-Mustard growing area which contributes 46% of the state production. In Chambal command area mono crop production is normally practices. Therefore, efforts will be made to enhance cropping intensity by converting mono crop area in to double cropping area which eventually leads to increase crop productivity of Rapeseed and Mustard. Keeping in view, the Intensive Research Project in Pulse and Oilseed in Command area was initiated during 1980, at Morena. This project covered the research and training on Mustard being a major oilseed crop of Chambal Command area. This was one of the 16th such project's for Chambal Command area. All CVT's of mustard were conducted under the umbrella of this project before the creation of the AICRP-R&M on April 01, 1987.

Technical:

1. Dr. S S Tomar (Principal Scientist, Agronomy & I/C RM Project)
2. Dr. N S Yadav (Sr. Scientist; Biochemistry)
3. Sh. J C Gupta (Scientist: Plant Pathology)

Objectives of AICRP-R&M:

A. General :

1. Collection, evaluation & maintenance of germplasm of Rapeseed & Mustard.

2. To evolve/ develop high yielding, disease resistant/ tolerant & early maturing varieties of Rapeseed- Mustard especially of Toria and Mustard with improved quality.

3. To develop suitable and low input technology of crop to best suited under double/ multiple cropping patterns of Chambal command area of Northern Madhya Pradesh.

4. To find out optimum fertilizer dose, spacing, effective methods of weed control and intercropping system in Rapeseed- Mustard.

5. To develop suitable and economic cropping sequences under Toria and Mustard based systems.

6. To find out suitable plant protection measures to overcome the problems of aphids, other insect-pests and diseases and weeds etc.

7. To study the economics of developed technology of these crops and transfer of technology.

B. Specific

1. To evolve high yielding varieties, possessing tolerance to white rust.

2. To evolve high yielding varieties tempered with quality of oil and meal.

3. To work out production technology for different situations.

4. Integrated management – (a) Aphids & Painted bug (b) Disease – White Rust & *Alternaria blight.*

5. Biochemical approaches for improvement in Rapeseed-Mustard quality.

MAJOR ACHIEVEMENT

Crop Improvement:

Varieties developed, release and notified for different farming/cropping systems

Group	Year of Release/Name of release committee)	Registration /Notified vide S.O No and date	Elite character
JT-1 (JMT-689)	1996 (SVRC)	360 (E), 01.05.1997	Early (85-90 days), High seed yield (15-18 q/h), bold seed size, early duration.
JM -1 (JMMWR-93-39)	1999 (SVRC)	425 (E), 08.06.1999	Early (125-130 days), High seed yield (15-20 q/h), Resistant donors to white rust under different genetic backgrounds. Having high oil content (>40%).
JM -2 (JMWR-941-1-2)	2003-04 (SVRC)	IC No. 471177 17-13/2003-SD IV, 26-08-2005	Medium early (135-138 days), High seed yield (15-25 q/h), Resistant to white rust, bold seed size & high oil content (>40%).
JM-3 (JMM 915)	2003-04 (SVRC)	17-13/2003-SD IV, 26-08-2005	Medium early (130-132 days), High seed yield (15-25 q/h), Tolerant to Alternaria blight, bold seed size, high oil content (>40%).

RVM-1	2015 (SVRC)	Applied	Recommended for cultivation in ra well as irrigated conditions. Plant ranges between 141-153 cm and it in 98 – 121 days (early medium). T potential is 1389 – 2019 Kg/ha. Nu siliqua per plant varies from 146-43 dark brown to reddish brown seed test weight ranges between 2.8 – 3. have 40.2-43.1 percent oil in i moderately resistant to *Alternaria* powdery mildew, downy milde *Sclerotinia* stem rot disease and tol mustard aphid.
RVM-2	2012 (CVRC)	No. S.O. 2817 (E) 2013 Dated: 19-09-2013	It gives an average of 20 to 22 (q/h yield under late sown condition. V farmers have obtained 25 to 30 (q/h timely sown condition. Has pote obtain 35 q/ha. Oil content-39.2 to 4 It showed moderately resistant to white rust and similarly, for *Alternaria* leaf & pod blight, Powdery and Downy mildew and *Sclerotinia* stem rot.

Genetic resource management: Under mentioned germplsm were collected and evaluated for their use in breeding programme.

Toria-31
Indian Mustard: 459
254 cross material of toria and 375 cross material where developed which are now in different generations. Subsequently, these will be evaluated for their yield and quality characters.

Donors identified for resistance/quality and other factors

Particulars	Character (s)	Name of donors
B. juncea (i) for white rust resistance Exotic	Tall, profusely branched, very small seeded, long duration (more than 150 days) and low seed yield but highly resistant to prevailing races of white rust.	3
Indigenous	High seed yield, early to medium duration, bold seed size and high oil content	27
(ii) Resistance/ tolerance to A. blight.	High seed yield, early to medium duration, bold seed size and high oil content.	4
Resistance/ tolerance to Downy Mildew	High Seed yield, medium early, bold seed, High Oil Content	2
(iii) Quality –Oil content (iv) (%) and protein content (%) - Oil content - Protein content	High seed yield, early to medium duration, bold seed size and high oil content -do-	Brassica genotypes identified for high oil content (%) - i) Indian mustard (B. juncea) 3 ii) Toria (B. compestris)- 3 iii) Gobhi sarson (B. napus) – 3 Brassica genotypes identified for high protein content (%)- i) Toria – B. compestris- 3 ii) Indian mustard – B. juncea 3 iii) Gobhi sarson- B. napus 3

Granted certificate of registration for two extent varieties of Indian mustard by the PPV & FRA, New Delhi.

Breeder Seed Production: This program is under take as per the directives of the Director Farms, RVSKVV, Gwalior in different crops of rabi and kharif season.

(B) Crop Production

(a) INTEGRATED NUTRIENT MANAGEMET:

1. Nutritional requirement:

TORIA:

Rainfed: 30 N + 20 P_2O_5 + 10 K_2O kg ha^{-1}

Irrigated: 60 N + 30 P_2O_5 + 20 K_2O kg ha^{-1}

MUSTARD:

Rainfed: 40 N + 20 P_2O_5 + 10 K_2O kg ha^{-1}

Irrigated: 80 N + 40 P_2O_5 + 20 K_2O + 40 S kg ha^{-1} + spray of thiourea 0.1% + Seed treatment with Azotobactor + PSB.

(b) INTEGRATED WATER MANAGEMET

Irrigation methods and schedules:

Irrigation Method:

Strip (4 - 6 m width) border irrigation method was recommended for Rapeseed-mustard crop.

Irrigation schedules:

Toria:

One irrigation should be applied at 20-25 days and second one at 50- 55 days after sowing if winter rains not occurred.

Mustard:

Under without pre-irrigated condition (conserved moisture)

crop should be irrigated at 30 - 35 days after sowing (pre-flowering stage of the crop)

Under pre-irrigated conditions, crop should be irrigated at 35 – 40 days after sowing.

On failure of winter rains, second irrigation at siliquae development stage i.e. 60-70 days after sowing.

(c) INTEGRATED WEED MANAGEMET

Weed Control:

I. Pre-planting application of *fluchloralin* @ 1.0 kg ha^{-1} under well moist condition and one hand weeding at 25-30 DAS.

II. Preemergence application of pendimethailine @ 1 kg ha^{-1} under well moist condition and one hand weeding at 25-30 DAS.

III. Soybean oil @ 2 drops/young shoot of *orobanche* was recommended for the control of *orobanche*

(d) CROPPING SYSTEM / **CROP SEQUENCE**

I. For irrigated condition

Toria – Wheat *Toria - Berseem* *Bajra – Mustard*

Urid – Mustard *Soybean (Early) – Mustard*

II. For rainfed conditions:

Cowpea – Mustard; Bajra – Mustard (under available moisture) ; *Mung – Mustard*

(e) OTHER AGRONOMIC MANAGEMENT

1. Seed rate and spacing:

Seed rate: ***Toria*:** 4.5 – 5.0 kg ha^{-1} ***Mustard*:** 5.0 kg ha^{-1}

Spacing: Row to row distances 30 cm and plant to plant 10-12 cm.

Mustard hybrid DMH 1 and PAC 432 were found superior against the check across the zone II and zone III with wider spacing of 45 cm x 15 cm and 100% RDF is recommended for higher hybrid production in both zones (Proceeding of AICRP-R&M p A_2).

2. Sowing period:

***Toria*:** Middle of September

***Mustard*:** Second and third week of October

3. Thinning: Thinning of crop at 15-20 days after sowing was recommended.

(C) Plant Protection

(a) Entomology

1. * For the management of painted bug at seedling stage- seed treatment with Imidaclorprid -70 WS @ 7 g/kg seed was found to be very effective, practically feasible and gave higher seed yield.
2. * At vegetative stage- Endosulfan- 4% dust @ 10 kg/ha proved very effective to control of painted bug followed by irrigation at 25-30 DAS
3. *For the Bio management of mustard aphids-predator, *Coccinella septempunctata* @ 5000 beetles/ha minimize the aphid population and gave higher seed yield. Another Bio agent, *Verticillium lecanii* followed by Neem oil @ 2% also reduced the aphid population below ETL.-
4. * Spraying of Dimethoate-30EC @ 0.03% gave maximum control of Aphid and higher seed yield.

(b) Plant pathology

1. * Timely sowing of mustard crop up to 15th of October escaped from the WR, DM & AB
2. * Seed treatment with Metalaxyl @ 6 g/kg seed found to be very effective against WR.
3. * Seed treatment with Carbendazim @ 1 g/kg seed followed by spraying of Carbendazim @ 0.5 g/l of water at 50 DAS was quite effective against SR.
4. * Three sprays of Ridomil MZ -72 WP @ 2 g/l at 50, 65 and 80 DAS were found to be very effective against WR and AB.

AICRP on Irrigation Water Management (ICAR):

1. Dr. Y P Singh (Principal Scientist, I/C WM Project)
2. Er. S K Tiwari (Sr. Scientist; Engineering

The all India Coordinated Research Project (AICRP) on water management was established in July 1981 This centre is one of the 25 AICRP (wm) centres in India and comes under Gird Agro-climatic Zone, financed by ICAR, New Delhi (75%) and government of MP (25%).

The AICRP on water management, RVSKVV, Zonal Agricultural Research Station, Morena made spectacular progress in optimizing irrigation schedules for location specific crops and cropping sequences in devising water use efficient irrigation methods, in developing techniques of pressurized irrigation methods in close and wide growing diversified crops and most of all among the demonstrating improved water management technologies through "On Farm Trials in Chambal Command Areas".

This project is the pioneering centre in the state to introduce drip irrigation for field, aromatic, medicinal, sugarcane and horticultural crops. Much deal of research work has been done on various aspects of sprinkler, drip and other micro irrigation system for field, vegetable, sugarcane, fruit crops, medicine crops, other high value crops etc.

IAAS project:

1. Dr. Harvender Singh (RA & I/C IAAS project)

New Sub-Centre: All India Coordinated Research Project on Soybean (ICAR)

This project was started on June 2015 with the objective to evolve high seed yield and oil content varieties of soybean which have resistance to Yellow Mosaic Virus and tolerant to drought condition in gird region.

Project In charge:

1. Dr. V K Tiwari (Scientist ; PB)

   email: vkt786@rediffmail.com
2. Vacant (Scientist: Plant Pathology)

   Non-technical:

   Vacant TA/FA [Posts:02]

STAFF QUARTER FACILITIES:

TOTAL NUMBER OF QUARTERS : 21

Residential quarters for staff have been built by the RVSKVV just near by the office of the Commissioner's office building.