



ANNUAL RESEARCH REPORT

(2024-25)

Nimbkar Agricultural Research Institute
Lonand Road, Phaltan, Maharashtra



Report of the President

I have the pleasure of presenting to you the NARI annual research report for 2024-25. Some significant events of this year were as follows:

1. We are proud to announce that our Director and Hon. Secretary Dr. Anil K. Rajvanshi was chosen for [Visionary Leadership Award 2025](#) in the Environment category by Frost and Sullivan Institute in U.S. In the past, awardees have been Desmond Tutu, Ratan Tata, Azim Premji, Kumar Mangalam Birla, among others.
2. We are also proud to announce that one of our trustees Ms. Madhura Rajvanshi was selected for [Fulbright Distinguished Teacher Award](#) and was given a scholarship to attend the training program in [Rochester University, U.S.A.](#) from August to December 2024.
3. We are very proud to announce that our distinguished Governing Council member, [Professor P. Balaram](#) was awarded [Ernesto Scoffone Prize, 2024](#) by Italian Peptide Society for his lifetime achievement work in peptide science.
4. Dr. Anil Rajvanshi, the Director of NARI, gave prestigious lectures to many organizations. Specifically, they were:
 - (a) He [gave a talk on 25 May 2024 in the Silicon Valley, U.S.A.](#) on his journey from IIT, Kanpur to USA and back to rural India and his work at NARI. The talk was jointly organized by IIT Kanpur Silicon Valley Chapter, U.S. based IIT Kanpur Foundation and Indians for Collective Action (ICA). The talk was initiated by [Dr. Abhay Bhushan](#) the first batch IIT Kanpur alumnus and Internet Hall of Fame Awardee.
 - (b) Dr. Rajvanshi was invited as the [chief guest for 7th convocation of IIT Palakkad on 20 July 2024](#) where he gave the [convocation address](#) to about 1000 students.

- (c) Dr. Anil Rajvanshi was the [Chief Guest at the Foundation Day Celebration of Bureau of Indian Standards \(BIS\)](#) in Pune on 6th January 2025.
- (d) Dr. Rajvanshi was the Chief Guest on 17th January 2025 at the Foundation Day of Asset Management Society of India, Manipal (via Zoom) and gave his lecture.
- (e) Dr. Anil Rajvanshi was invited as the Chief Guest for the 7th IEEE International Conference on Emerging Smart Computing and Informatics held at [AISSMS College of Engineering](#), Pune on 5th March 2025. [He gave a talk on What AI can and cannot do.](#)
5. The Institute received the SIRO certificate from DST, Govt. of India for further 3 years 2024-27.
6. We set up two systems for producing clean water for rural schools in Nandal and Adarki villages. Around 400 students are now getting clean drinking water. The technology is based on NARI's pioneering work in Solar energy and consists of rainwater harvesting and its purification by Solar Energy. [A nice story on this technology was carried in Better India.](#)
7. Dr. Anil K. Rajvanshi [was felicitated in D. Y. Patil College of Engineering](#), Akurdi in a function to release the book "100 Great IITians in the Service of the Country". He is [one of the IITians mentioned in the book.](#)
8. AHD-NARI received a prestigious grant of Rs.77.99 lakh for 3 years from the Sir Dorabjee Tata Trust, Mumbai for the project "Climate change mitigation initiative managed and led by women farmers" to be carried out among tribal communities in the southern Aravali hills region of southern Rajasthan and northern Gujarat. This innovative and ambitious project will establish women led community based genetic improvement programs of local goat breeds and at the end, draw up a blueprint for such programs to be submitted to the relevant

state governments and the Government of India Department of Animal Husbandry.

9. On 13 July 2024, Dr. Chanda Nimbkar, Director, AHD-NARI was interviewed in a function in Pune organized by the Marathi Weekly Sadhana, Mukhtangan Mitra (organization working for the rehabilitation of alcohol and drug addicts) and the Maharashtra Foundation, U.S.A. The recording of the interview is available on <https://www.youtube.com/watch?v=K5RihctFvEc>
10. Dr. Chanda Nimbkar was invited by the Food and Agriculture Organization of the United Nations as an invited expert scientist to the regional capacity building workshop of the National Coordinators for the Management of Animal Genetic Resources (AnGR) in the Southeast Asian region, held at Putrajaya, Malaysia. This meeting was organized to facilitate nations to prepare their national reports for inclusion of the information in the Third report on the 'State of the World's Animal Genetic Resources for Food and Agriculture (SOW-ANGR3)'.
11. We are sorry to inform you that we have lost two well-wishers of the Institute.
 - (a) [Shri. S. B. Patel](#) a well-known Civil engineer; and a former founder trustee of the Institute passed away in Mumbai on 20 December 2024. He was 92 years of age.
 - (b) Shri. Madhur Bajaj, Former Vice-Chairman of Bajaj Auto passed away in Mumbai on 11 April 2025. He was 73 years old. A nice [obituary on him was written by Dr. Anil K. Rajvanshi](#) who was a close friend of Madhur Bhai.
12. We have initiated a program of solar electrification of the Institute. Thus a 20 kW Solar PV Unit is being installed at the head office.



Dr. Nandini Nimbkar
President

September 2025

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Agricultural Research

Soil Testing

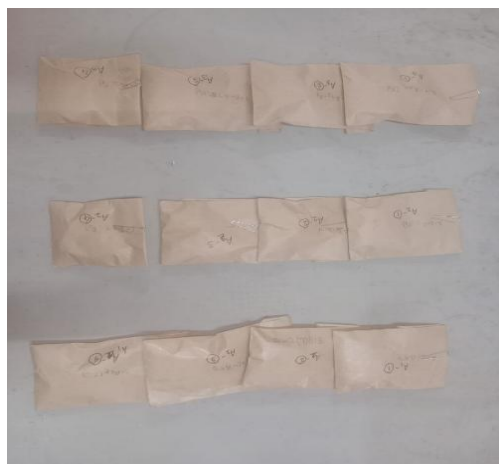
Project titled “Testing the Effect of Sugar as a Substitute for the Basal Dose of Chemical Fertilizer (Rabi 2024–25),” was conducted at NARI’s Tambmal farm. The objective of this project is to assess whether varying concentrations of sugar can serve as an alternative to traditional chemical fertilizers by enhancing soil microbial activity, thereby supporting soil fertility and crop productivity.

As part of this study, baseline microbial analysis was conducted on two designated plots to determine the initial microbial load in the soil. Sugar was then applied to the plots in different concentrations. After five weeks, once seed germination was observed, microbial testing was repeated to evaluate any changes in the microbial population. The aim of this comparative analysis is to determine whether sugar treatments influence soil microbial flora in a way that could potentially support sustainable agricultural practices by reducing dependence on chemical fertilizers.

Work Description / Activities Performed

Project - Testing the effect of sugar as a substitute for the basal dose of chemical fertilizers (Rabi 2024-25) to be conducted at NARI, Tambmal farm.

Field Work: Collected soil samples for CFU testing from NARI’s agricultural fields. The soil was dug to a depth of 25-30 cm, four soil samples were collected from each plot and kept in plastic/paper bags. The soil samples were stored in a refrigerator at 4C till analysis.



Laboratory Work:

- The soil was sieved before using for testing. 1 g soil was weighed out and mixed with Distilled Water. From each plot two soil samples were taken. **Serial dilution** and



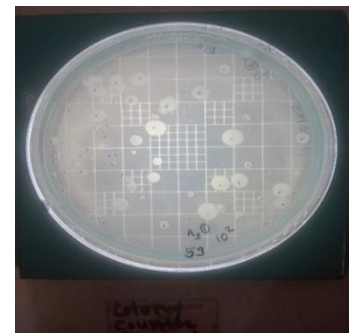
spread plate techniques were used to check the Microbial count in soil samples.

Sample	Initial CFU/g Count	CFU/g count after Sugar treatment
A1-1	5.6×10^3	4.1×10^5
A1-2	7.3×10^4	4.6×10^5
A2-1	6.3×10^3	5.9×10^4
A2-2	2.3×10^3	8.2×10^4
A3-1	3.3×10^4	6.5×10^4
A3-2	8.0×10^4	9.7×10^4
A4-1	9.7×10^4	5.3×10^6
A4-2	1.8×10^8	5.7×10^4
A5-1	2.1×10^4	7.2×10^4
A5-2	8.9×10^5	6.1×10^4
A6-1	5.9×10^5	3.8×10^4
A6-2	9.6×10^4	5.6×10^4
A7-1	3.3×10^4	6.0×10^4
A7-2	4.1×10^4	3.4×10^4

- CFU
24 to 48

A8-1	6.2×10^5	1.0×10^7
A8-2	5.2×10^4	6.6×10^7

count – After
hours of
incubation, the



Result table

number of colonies growing on the media plates were counted with the help of a colony counter.

- **Outcome and Conclusion**

The aim of this trial was to assess whether sugar application could stimulate microbial activity in the soil, potentially serving as an alternative or supplement to chemical fertilizers. **Microbial population testing (CFU count)** was performed on soil samples collected before and after sugar application. The results were inconclusive as there was considerable variation in the counts of soil samples collected from the same plot.

Soil Organic carbon Testing-

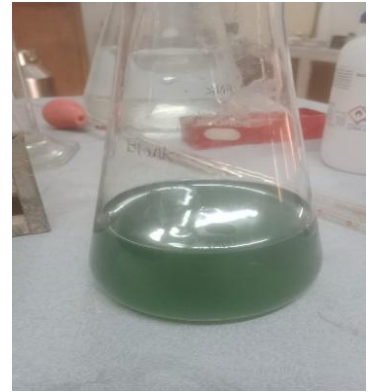
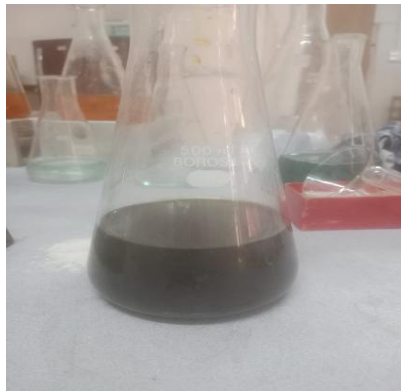
The primary objective of soil organic carbon (SOC) testing is to evaluate the organic matter content in soil, which is a key indicator of soil health, fertility, and overall productivity. Organic carbon plays a critical role in maintaining soil structure, enhancing water retention, supporting microbial activity, and facilitating nutrient cycling.

Soil organic carbon level of all the plots at Tambmal farm of NARI were tested by Walkley and Black titration method.

- **Soil Sample-** Air-dried soil samples were sieved and 0.5 g was weighed out for the test.
- For Titration 10mL Potassium dichromate and 20mL concentrated Sulphuric acid was added to the soil sample and kept for 30 min.



- After 30 min 200mL of distilled water was added to the soil mixture to stop the oxidation reaction. This was followed by addition of 10ml Orthophosphoric acid.
- Then 5-6 drops of Diphenylamine indicator were added turning the colour of the mixture black. This mixture was titrated with 0.5N Ferrous Ammonium Sulphate till its colour changed from black to violet or blue and finally to blue-green.

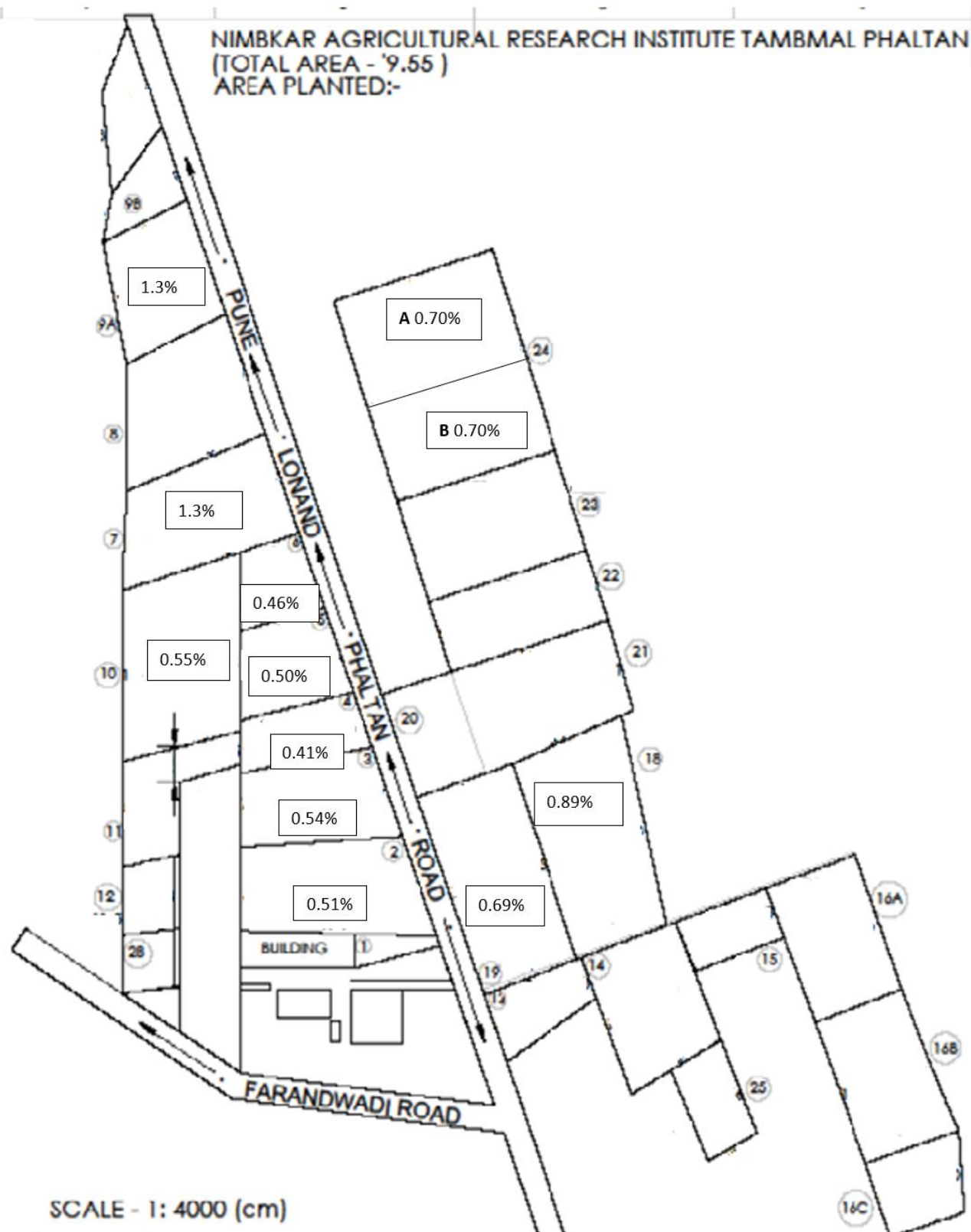


Bhu-parikshak Device-



IIT, Kanpur has developed a device called 'Bhu-parikshak' which is claimed to have been designed for rapid and convenient assessment of soil nutrient content. They were kind enough to send this device to us for testing.

Results- Soil Organic carbon range (Percentage %)



Outcomes and Conclusions-

During the Rabi season of 2024–25, an intern Ms. Trushali Bhalerao was involved in a research trial at the Tambmal farm of the **Nimbkar Agricultural Research Institute (NARI)**. The aim of the trial was to evaluate the **effect of sugar as a substitute for the basal dose of chemical fertilizers in safflower and sorghum**

Outcomes-

Ms. Bhalerao was an M.Sc. in Microbiology. However, she had no practical experience regarding laboratory and field work required in agricultural research. The organic carbon analysis of soil samples was carried out by her successfully. However, the estimation of Colony Forming Units (CFUs) of microbes in soil samples by her left much to be desired as even the results of the same soil sample analysed repeatedly gave widely varying results.

Shortcomings –

1. Although the Bhu-Parikshak soil nutrient testing device from IIT Kanpur was made available, we were unable to operate it effectively due to unresolved issues with the associated mobile application software. Despite timely communication with the development team and receiving technical support, the problem remained unresolved during the reporting period. As a result, soil nutrient testing using this advanced tool could not be carried out as planned.
2. As mentioned above the results of microbial analysis showed wide variation even for a given soil sample and was probably due to the inexperience of the person carrying out the analysis.

Conclusions-

The work carried out highlighted the importance of continued research into the effect of soil amendments on microbial communities to achieve sustainability in agriculture.

Highlights of Other Agricultural Research

Overall the crop growth was satisfactory during the past year. Preliminary results of trials on sweet sorghum and safflower indicated that sugar could substitute for the basal dose of chemical fertilizers resulting in considerable saving to a farmer.

With the availability of irrigation sunflower appears to be the most promising oilseed crop for the rabi (winter) season as it gives highest oil yield per unit area in the shortest length of time.

None of the germplasm evaluated gave better performance than the presently cultivated sweet sorghum cultivars Madhura-1, 2 and 3.

A dehydrated, sterile bacterial culture developed by the Appropriate Rural Technology Institute (ARTI) appears to be promising as a replacement of conventional chemical fertilizer containing N, P, K.

Scientists : Nandini Nimbkar, Sharad Choudhari

Technical assistants : Anita Gholap, Sarika Pawar, Maruti Shirke

Details of the trials conducted were :

Trial 1 : Testing the effect of sugars as a substitute for the basal dose of chemical fertilizers.

Dr. A. D. Karve, the former director of NARI had theorized from his experimental observations that roots exude antibiotics into the soil to kill the bacteria, which are then digested and absorbed by the plants. He also found that applying sugar to the soil caused the bacteria to proliferate, so if applied to the soil prior to seeding, crop yields higher than those of the control resulted. His trials conducted in plastic bags indicated 25 to 45 Kg sugar per ha applied one week prior to seed sowing to be the optimum dose. Therefore, to test this hypothesis field trials were conducted on safflower and sweet sorghum with sugar dosages of 10, 20, 30, 40, 50 and 60 Kg per ha along with an untreated control and a treatment with a recommended basal dose of fertilizers.

Attempt was made to count the colony-forming units (CFU) of bacteria in the soil. However considerable variation was observed in samples drawn from the same plot. Therefore, these data have not been included.

Sweet sorghum : The germination count a week after sowing in all the treatments was significantly higher than that for the untreated control. The plant height 15 days after sowing was significantly higher in the treatments of 10, 20, 30, 50 and 60 Kg sugar ha⁻¹ compared to the untreated control and recommended fertilizer treatments. The differences between the treatments in plant height 40 days after sowing and stem diameter were non-significant. All the treatments gave significantly higher fresh biomass weight than the treatment of 20 Kg sugar ha⁻¹. Similarly all the treatments gave significantly higher seed yield compared to the treatments to which 10 or 20 Kg sugar ha⁻¹ was applied.

Safflower : The germination count a week after sowing was significantly highest in plots to which either the recommended dose of chemical fertilizers or 10, 20, 40 or 50 Kg ha⁻¹ sugar was applied. The differences between the treatments for plant height, number of capitula plant⁻¹

and capitulum diameter were non-significant. The significantly highest seed yield was obtained in either plots to which the recommended basal dose of chemical fertilizers or 10, 20, 40 or 50 Kg sugar ha⁻¹ was applied.

Therefore, no firm conclusions can be drawn from the trials carried out to test the effect of sugars as a substitute for the basal dose of chemical fertilizers as to the sugar dosage to be used. However, since sugar is considerably cheaper than the chemical fertilizers they can be easily replaced with basal dose of 40 Kg sugar ha⁻¹ applied a week before sowing in safflower and sweet sorghum crops.

Trial 1 :

	Basic information
Operation	Date
Removing soil sample for CFU count	16-12-2024, 17-12-24
Basal fertilizer dose application	19-12-2024
Sowing	27-12-2024
Irrigation	19-12-2024, 28-12-24, 24-1-25, 18-2-25, 6-3-25, 12-3-25, 13-3-25
Thinning	Sorghum 6-1-2025
	Safflower 9-1-2025, 15-1-25
Weeding	Safflower 10-1-2025, 11-1-25
	Sorghum 6-2-2025, 7-2-25, 8-2-25
Spraying (Dimethoate)	10-1-2025, 15-1-25, 29-1-25, 10-2-25
Top dressing	24-1-2025
Covering by nylon net for bird protection(safflower)	21-3-2025, 22-3-25
Harvesting of sweet sorghum (5 plants)	31-3-2025, 2-4-25
Threshing of sweet sorghum	12-4-2025
Petal collection (safflower)	10-4-2025, 11-4-25
Harvesting of safflower(5 plants)	17-4-2025
Threshing of safflower	29-4-2025

Sweet sorghum variety used: Madhura-3

Safflower variety used : NARI -6

Recommended dose of chemical fertilizers:100:50: 50 Kg/ha N:

P:K

All observations were recorded from 5 plants/plot

Sweet Sorghum trial

Design of experiment: Randomized Complete Block Design
 No of replications: Three
 Treatments: Eight
 Net plot size: 13.5 sqm

Sr. No.	Treatment	Germination count/ plot on 4-01-2025	Plant height (cm) on 11-01-2025	Plant height (cm) on 6-03-2025	Stem diameter (cm)	5 plant fresh biomass wt. (g)	5 plant panicle wt. (g)	5 plant seed yield (g)
1	Recommended basal dose of chemical fertilizers	176.00	15.33	198.67	2.10	2181.67	418.33	273.00
2	10 Kg Sugar/ha	173.33	16.47	204.00	1.94	2081.67	386.67	240.00
3	20 Kg Sugar/ha	182.33	16.07	197.33	1.89	1881.67	360.67	216.00
4	30 Kg Sugar/ha	169.67	16.67	205.33	2.02	2145.00	464.67	305.33
5	40 Kg Sugar/ha	169.00	15.33	193.33	1.71	2293.33	478.33	315.00
6	50 Kg Sugar/ha	169.67	17.27	196.67	1.88	2318.33	456.67	287.00
7	60 Kg Sugar/ha	174.00	16.40	193.33	2.11	2048.33	440.00	280.67
8	Untreated control (No basal dose of chemical fertilizers)	165.33	15.13	199.33	1.95	2031.67	446.67	277.33
	General Mean	172.42	16.08	198.5	1.95	2122.71	431.5	274.29
	C.D. (0.05)	14.43	1.49	N.S.	N.S	432.21	86.76	44.05
	SEM ±	4.77	0.49	8.59	0.18	142.81	28.67	14.56
	C.V. %	4.79	5.29	7.5	15.75	11.65	11.51	9.19

Safflower trial

Design: Randomized Complete Block Design

Replications: 3

Treatments: 8

Gross plot size: 13.5 sqm

Sr. no.	Treatment	Germination count/ plot on 6-01-2025	Plant height (cm) on 15-01-2025	Plant height (cm) on 27-03-2025	Number of capitula/ plant	Average capitulum diameter (cm)	Seed yield/ plot (g)	Seed yield (kg/ha)
1	Recommended basal dose of chemical fertilizers	115	8.7	98.7	24.2	2.5	122	90.6
2	10 Kg Sugar/ha	122	9.0	98.3	18.1	2.4	101	74.8
3	20 Kg Sugar/ha	113	8.1	93.7	22.9	2.4	106	78.8
4	30 Kg Sugar/ha	106	9.0	95.3	21.6	2.3	88	65.4
5	40 Kg Sugar/ha	108	9.7	96.7	20.9	2.2	109	80.5
6	50 Kg Sugar/ha	111	9.3	95.0	17.9	2.4	93	68.9
7	60 Kg Sugar/ha	104	9.0	94.7	18.9	2.4	70	51.9
8	Untreated control (No basal dose of chemical fertilizers)	105	8.7	86.7	18.4	2.4	47	34.8
	General Mean	110.50	9.0	94.87	20.18	2.34	92.08	68.2
	C.D. (0.05)	15.87	N.S	N.S	N.S	N.S	32.06	23.7
	SEM ±	5.24	0.9	4.65	2.31	0.11	10.59	7.8
	C.V. %	8.22	16.7	8.5	19.85	8.5	19.93	19.93

Trial 2 : Comparison of five rabi oilseed crops.

Research had been carried out on safflower (*Carthamus tinctorius*) at NARI for about 50 years (1968-2018). However, in recent times we have noticed severe yield reduction due to pests such as aphid and diseases such as wilt. Therefore, it was decided to compare it with some other rabi oilseed crops to find out which crop yields the highest amount of oil from a given area under conditions at Phaltan.

Unfortunately, soybean crop could not be included in the trial because of very low plant population due to severe attack of cutworm (*Agrotis ipsilon*). Among the remaining crops significantly highest initial plant stand was recorded by mustard, while the significantly highest final plant stand was recorded by safflower. Significantly highest seed yield of about 24 q ha⁻¹ was recorded by sunflower, which also gave the highest oil yield of nearly 5 q ha⁻¹. Therefore, sunflower appears to be the most promising oilseed crop for rabi as it gave the highest oil yield per hectare with a relatively short crop duration. Groundnut had the highest oil content in its seed of nearly 28%, however due to its poor population it could not reach its potential seed yield. Also it had the longest crop duration. Of course one of the major shortcomings in this trial was non-inclusion of soybean which is one of the most popular crops in our area especially in kharif. Also we may not have used the varieties of different crops which have been recommended for this region as being most suitable due to non-availability of seeds locally of crops such as sunflower.

Trial 2 :

Basic information		
Operation	Date	
Date of sowing and basal fertilizer dose application	04/12/2024	
Date of sowing and top dressing	21/12/2024	
Dates of irrigation	5/12/2024 , 21/12/24, 23/1/25 , 4/2/25, 18/2/25, 7/2/25, 5/3/25	
Date of thinning	16/12/2024	
Dates of weeding	17/12/2024, 6/1/25, 11/1/25, 31/1/25, 1/2/25,	
Dates of spraying (Dimethoate & (Chlorpyrifos 50% + Cypermethrin 5% EC)	30/12/2024, 14/1/25, 26/2/25	
Date of covering by nylon net for bird protection (safflower & sunflower)	26/2/2025	
Date of petal collection (safflower)	17/3/2025	
Crop	Date of harvesting	Date of threshing
Mustard	05-03-2025	10-03-2025
Safflower	18-03-2025	05-04-2025
Sunflower	10-03-2025	12-03-2025
Sesame	07-04-2025	15-04-2025
Ground nut	28-05-2025	04-06-2025

Trial 2 :

Sr. No .	Oil seed crop	Initial plant stand/plot	Final plant stand/plot	Plant height (cm)	Seed yield/plot (Kg)	Seed yield (kg/ha)	Oil content (%)	Oil yield (Kg/ha)	Crop duration (days)
1	Mustard	310	173	140	2.45	1133.18	16.23	183.92	91
2	Safflower	233	227	91.7	1.17	543.36	15.47	84.06	104
3	Sunflower	154	147	195	5.23	2422.84	21.47	520.18	96
4	Sesame	161	140	124	1.46	674.69	25.08	169.21	124
5	Groundnut	24	25	67.2	2.03	942.13	27.77	261.63	175
6	Soybean	84	-	-	-	-	-	-	-
	General Mean	161.11	142.33	123.57	2.47	1143.52	-	-	-
	C.D (0.05)	64.89	31.32	25.59	1.07	495.37	-	-	-
	SEM +	20.58	9.59	7.83	0.33	152.78	-	-	-
	C.V. %	22.12	11.67	10.98	22.96	22.96	-	-	-

Design of experiment : Randomised Complete Block Design

No. of replications: Three

No. of treatments : Six

Varieties :

Mustard : F₁ hybrid Mannat-RE-444

Safflower : NARI-6

Sunflower : F₁ hybrid FB- Bhaskar

Sesame : Swathi

Groundnut: Pioneer - Poor germination

Soybean : Phule Sangam - Poor stand due to cutworm attack

Gross plot size: 21.6 sqm

Trial 3 : Evaluation of sweet sorghum germplasm in summer season.

Total of eight germplasm entries were evaluated in 2025 summer season along with the three checks (Madhura-1, 2 and 3).

Overall Madhura-1 (hybrid) showed the best performance as it had a good final plant stand, stem diameter, biomass yield, stripping % and panicle weight as well as early maturity. It was followed by NARI-235, Madhura-2 and Madhura-3. NARI-235 was superior in terms of final plant stand, stem diameter. stripping %, stripped stalk yield and panicle weight. However, it exhibited the significantly highest stem borer damage. Similarly the entry NARI-LC-7-29-1 had the significantly highest shootfly damage.

Both Madhura-2 and Madhura-3 had good stem diameter, panicle weight and stripping percentage. Madhura-2 also gave good final plant stand and biomass yield. Madhura-3 was also early maturing and had high stripped stalk yield.

Trial 3 : Basic information

Operation	Date
Sowing & basal fertilizer dose (50:50:50 kg/ha N:P:K) application	17/2/2025
Top dressing (50 kg/ha N)	7/3/2025
Irrigation	17/2/2025, 7/3/25, 26/3/25, 15/5/25
Thinning	5/3/2025
Spraying (Dimethoate)	21/3/2025
Weeding	24/3/2025
Sampling of 5 plants	4/7/2025
Harvesting	Panicles were damaged due to heavy rain in May

Net plot size : 4.5 sqm.

Replications : Three

Trial 3:

Sr.no	Entry	Final plant stand 000s/ha	Days to 50% flowering	Plant height (cm)	Stem diameter (cm)	5 plant fresh biomass wt.(kg)	Stripping (%)	5 plant stripped stalk wt. (kg)	Juice extraction (%)	5 plant juice wt. (g)	Juice brix	5 plant panicle weight (g)	Shoofly damage (%)	Stem borer damage (%)
		1	2	3	4	5	6	7	8	9	10	11	12	13
1	NARI-LC-7-38	30.37	84	312.67	2.0	3.35	54.32	1.99	32.26	0.59	15.50	55.00	27.3	30.26
2	NARI-SS-260	51.85	88	336.33	1.5	2.98	65.87	1.97	36.71	1.90	12.07	35.00	26.6	25.80
3	NARI-LC-7-29-1	25.93	84	296.00	1.6	3.40	71.80	2.37	35.73	0.84	15.67	56.67	48.9	27.41
4	NARI-203	93.33	84	233.00	1.7	2.83	62.06	1.75	32.62	0.57	15.73	61.67	19.7	12.49
5	NARI-LC-4-46	51.11	83	270.00	1.6	3.18	58.64	1.94	31.64	0.62	15.57	56.67	24.6	16.98
6	NARI-235	80.74	81	273.67	1.7	3.05	68.26	2.23	27.71	0.62	14.40	43.33	28.2	35.58
7	NARI-SS-228	68.15	78	243.67	1.9	2.51	70.95	1.82	36.02	0.64	16.93	30.00	15.6	12.59
8	NARI-SS-48	73.33	78	260.00	1.6	2.60	67.90	1.74	37.18	0.68	14.73	56.67	19.6	19.20
9	Madhura-1©	79.26	78	277.00	1.7	3.31	64.64	2.04	32.63	0.66	15.60	75.00	20.3	24.23
10	Madhura-2©	84.44	83	267.33	2.1	4.03	67.92	2.75	33.92	0.95	15.80	73.33	27.2	17.52
11	Madhura-3©	17.04	77	240.67	1.7	2.15	67.84	1.52	34.94	0.50	15.37	51.67	20.0	32.59
	General Mean	59.60	81.67	273.67	1.74	3.03	66.59	2.01	33.76	0.67	15.22	54.09	25.25	23.15
	C.D. (0.05)	18.51	1.64	26.99	0.41	0.97	11.75	0.65	N .S	0.31	2.64	37.55	23.54	21.33
	SEM ±	6.27	0.56	9.13	0.14	0.33	3.98	0.22	3.74	0.11	0.89	12.70	7.96	7.22
	C.V. %	18.20	1.18	5.78	13.75	18.66	10.34	19.05	20.23	27.02	10.17	40.65	54.62	53.99

Note: seed yield could not be recorded as panicles were damaged due to heavy rainfall

Trial 4 : Testing of ARTI organic fertilizer on daikon radish (*Raphanus sativus*).

Based on the fact that root exudates kill microorganisms Dr. A. D. Karve, the former director of NARI had established that in nature, plants kill, digest and consume microorganisms in the soil in order to obtain their N and mineral elements. Since the microorganisms are the active ingredient in all composts, they can substitute for the chemical fertilizers. Based on these findings Appropriate Rural Technology Institute (ARTI) developed a dehydrated, sterile bacterial culture that can be stored, transported and applied to crops.

A field trial was conducted of this organic fertilizer on daikon radish during summer 2025. The trial unfortunately suffered from a severe attack of wilt. However, significantly highest fresh weight of radish root was recorded from the treatment of 3 g organic fertilizer dose per sq.m. and it was on par with the chemical fertilizer control. Therefore, potentially this organic fertilizer at 30 Kg/ha dose can replace 300 Kg/ha of conventional chemical fertilizer containing N:P:K at 15:15:15 proportion.

Trial 4 :**Basic information**

Variety F₁ Hybrid Mino Early (Imported); Mayhco
 Date of sowing 01-04-2025
 Design of experiment : Randomised Complete Block design (RCBD)
 No of replications: Three
 Time of organic fertilizer application= Basal dose at the time of sowing
 Chemical fertilizer given 300 kg/ha(30g /sq.m)of 15:15:15(N:P:K) at the time of sowing
 Dates of weeding : 8-4-2025,28-4-2025
 Dates of irrigation 9,15,21-4-2025
 Date of spraying (Dimethoate) : 24-4-25
 Date of harvesting : 5-5-25

Observations were recorded on 5 plants /plot.

Mean table

Sr. No.	Treatment	Number of plants /plot	Length of radish root (cm)	Diameter of radish root (cm)	Fresh weight of radish root (g)	Wilted plants /plot	% wilting
1	Untreated control	74.0	14.65	1.4	8.7	49	57.98
2	Chemical fertilizer control	86.0	16.01	1.6	14.5	54.3	62.01
3	Organic fertilizer (1 g / sq.m)	64.7	14.30	1.4	10.5	33.3	50.91
4	Organic fertilizer (2 g / sq.m)	70.7	14.81	1.6	14.8	40.7	54.47
5	Organic fertilizer (3 g / sq.m)	66.0	16.07	1.6	18.1	37.7	53.07
6	Organic fertilizer (4 g / sq.m)	60.0	13.56	1.5	10.1	28.7	48.54
	General Mean	70.22	14.90	1.51	12.78	40.69	54.50
	C.D. (0.05)	N.S.	N.S.	N.S.	7.05	N.S.	N.S.
	SEM ±	12.26	1.25	0.16	2.24	10.87	9.78
	C.V. %	30.25	14.56	17.89	30.32	46.37	31.09

Testing of DWT System developed

The Nimbkar Agricultural Research Institute (NARI) undertook a research and development project aimed at scaling up the existing drinking water technology (DWT) system to provide potable water to rural schools. DWT combines Rainwater Harvesting (RWH) with Solar Water Purification (SWP).

Testing was carried out to assess the potability of water. The specific parameters checked during testing included bacteriological quality (MPN of coliform bacteria) as well as physicochemical parameters such as Total Dissolved Solids (TDS), pH, turbidity, taste, and odour. To assess the efficiency of the water purification system, water samples were collected from various location points (Storage tank, filtered water tank, SWP unit) for bacteriological analysis. Most Probable Number (MPN) method was employed to evaluate bacteriological contamination, specifically the presence of coliform bacteria.

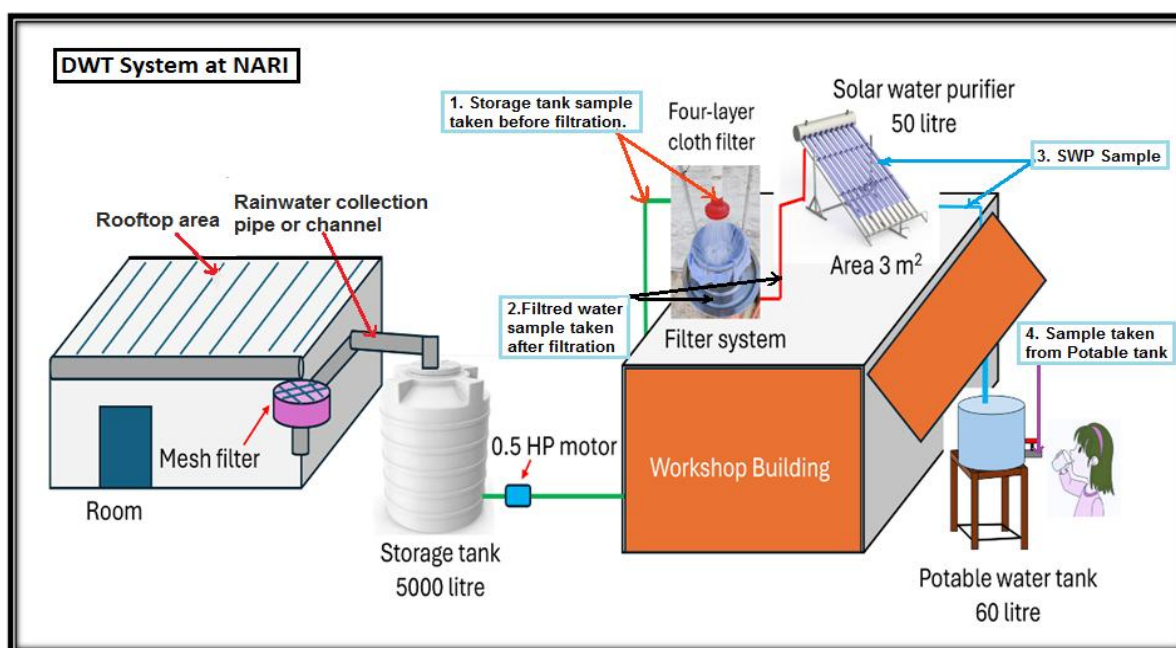


Fig 1: DWT system at NARI Showing sample collection points for water testing.

- 1. Storage Tank:** Typically exhibits the highest microbial load (1600-900) due to potential contamination.

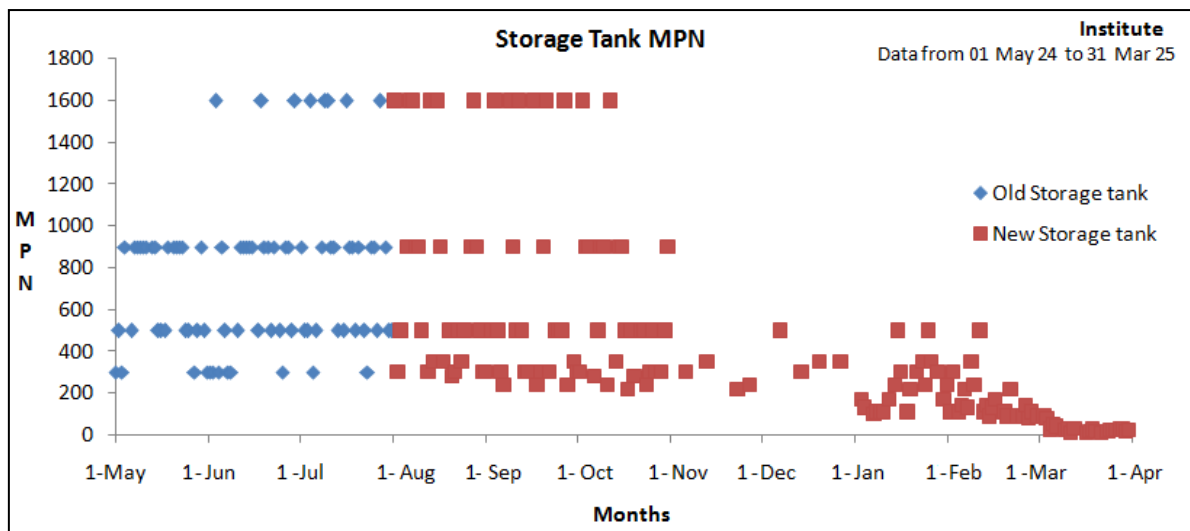


Fig 2: Storage Tank MPN data (before filtration and SWP)

- 2. Filtered Water:** Shows a reduction (500-200) in microbial contamination, though some pathogens may remain.

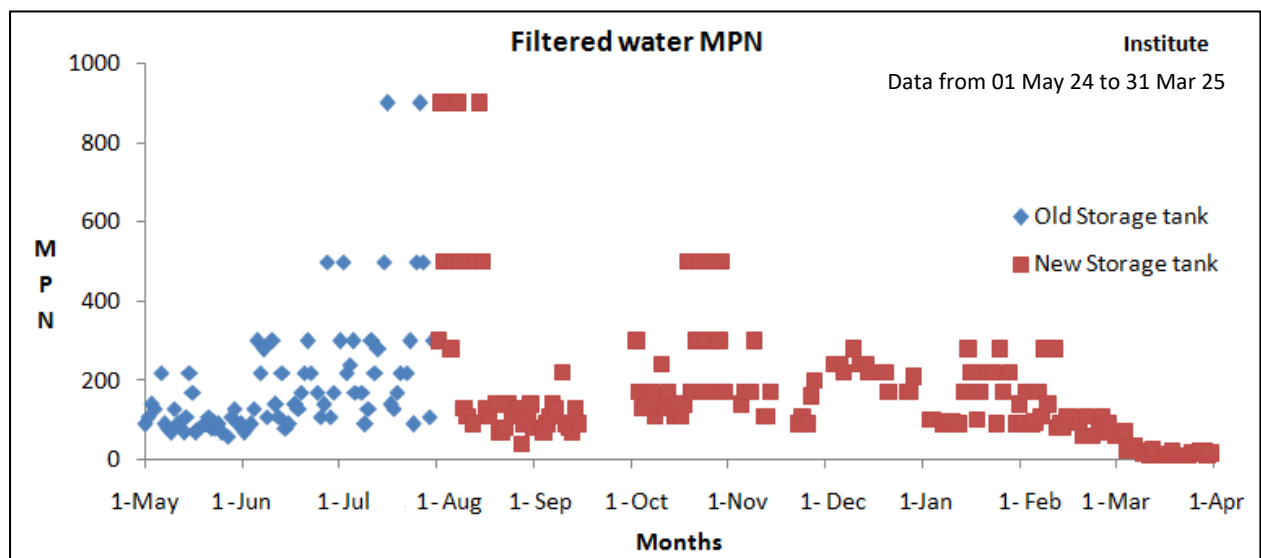


Fig 3: Filtered Water Tank MPN results (after first filtration)

- 3. Solar-Purified Water:** Demonstrates the lowest or zero microbial loads, indicating effective purification.

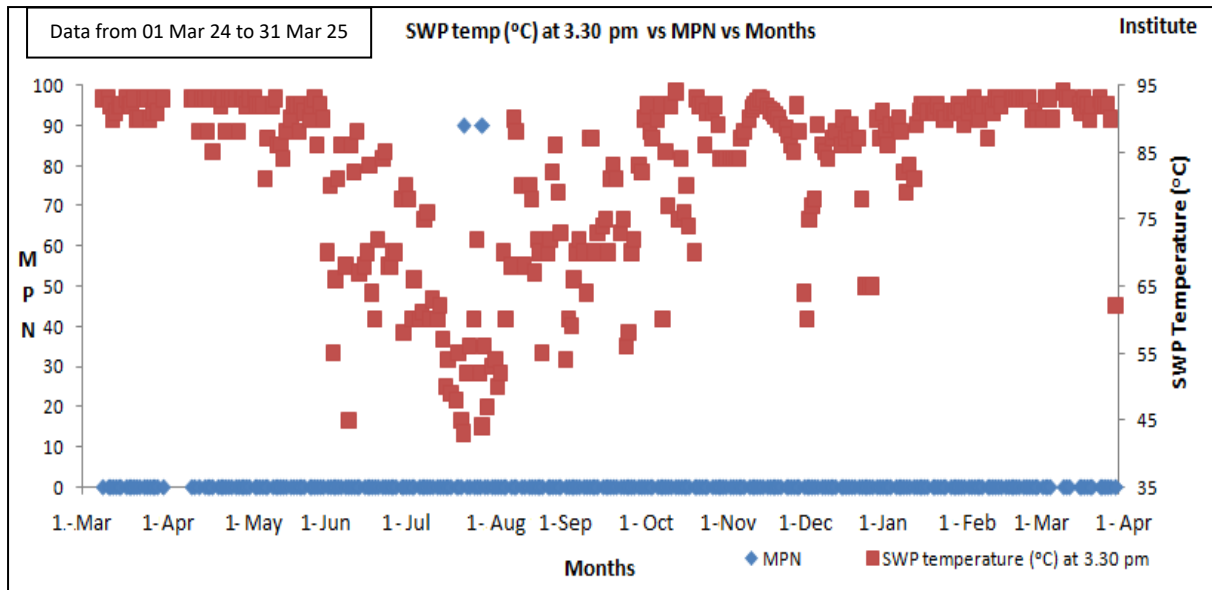


Fig. 4: Months vs. MPN and temperature of water in SWP at 3.30 pm

Solar water purification (SWP) is a simple and effective method that utilizes solar energy to purify biologically contaminated water, making it safe for drinking. When the water temperature exceeds 45°C for a specific length of time (3 hrs) the pathogens in it are inactivated.

As the water temperature in the SWP system generally reached around 60°C at 1:30 PM, effectively inactivating the coliforms present, we conducted dual batch experiments to increase the output of clean drinking water. This involved processing two batches of water in a single day, effectively doubling the system's production. The experiments demonstrated that the SWP unit's output can be successfully doubled throughout the year, except during the rainy months of June, July, August and September. During this period, reduced solar radiation limits the system's efficiency, making it more practical to purify only a single batch of water.

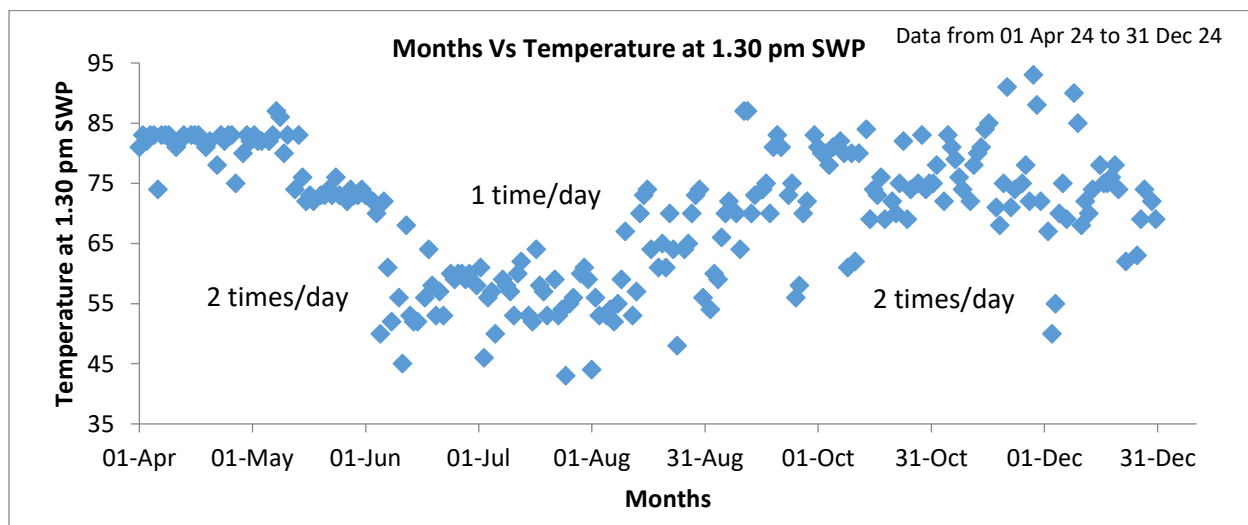


Fig 5: Months vs. Temperature of water in SWP at 1.30 pm

Drinking Water Sample parameters checked in Institute laboratory and External laboratory

S. No.	Test Name	Institute lab (NARI) Results	External Lab (TUV) Results	Unit	Limit as per IS10500:2012
1	Detection of E.coli	Absent	Absent	Per 100 ml	Absent
2	Coliform count	Absent	Absent	Per 100 ml	Absent
3	Odor	Agreeable	Agreeable	-	Agreeable
4	pH	7.6	7.01	-	6.5-8.5
5	Taste	Agreeable	Agreeable	-	Agreeable
6	Turbidity	Above 90% Transmittance(<1 NTU)	< 1 (NTU)	NTU	Max 1
7	Total Dissolved Solids	22	25	mg/l	Max 500
8	Colour	Not done	<1	Hazen	Max 5
9	calcium		3.42	mg/l	Max 75
10	Total Hardness		12.01	mg/l	Max 200
11	Magnesium		0.48	mg/l	Max 30
12	Chloride		3.40	mg/l	Max 250
13	Sulphate		<LOQ	mg/l	Max 200
14	Nitrate		5.44	mg/l	Max 45
15	Fluoride		<LOQ	mg/l	Max 1
16	Iron		<LOQ	mg/l	Max 1
17	Manganese		0.02	mg/l	Max 0.1
18	Heavy Metals (Pb, As, Cu, Zn)		<LOQ	mg/l	(Pb, As: Max 0.01 Cu: Max 0.05, Zn: Max 5)

LOQ – Limit of Quantification

All tested parameters comply with the drinking water standards (IS 10500), ensuring the water is safe for consumption. External laboratory – TUV India Private Limited (NABL accredited laboratory in Pune)

Drinking Water Technology (DWT) Installed in Schools

Our project aims to provide clean drinking water to rural school children in areas facing water scarcity. After conducting a survey of schools in the Phaltan taluka, we selected two schools:

1. Adarki Madhyamik Vidyalaya, Adarki
2. Sant Dnyaneshwar Maharaj Madhyamik Vidyalaya, Nandal



Dig 6: DWT installed at Adarki High School



Dig 7: DWT installed at Nandal High School

To ensure the DWT system functions effectively, specific parameters checked during testing included bacteriological quality (MPN for coliform bacteria) as well as physicochemical parameters such as Total Dissolved Solids (TDS), pH, turbidity, taste, and odour. Initially, water samples were tested twice a week to closely monitor the system's performance. Since the system consistently delivered water with zero coliform count during this period, the testing frequency was later adjusted to three times a month to ensure continued efficiency and safety.

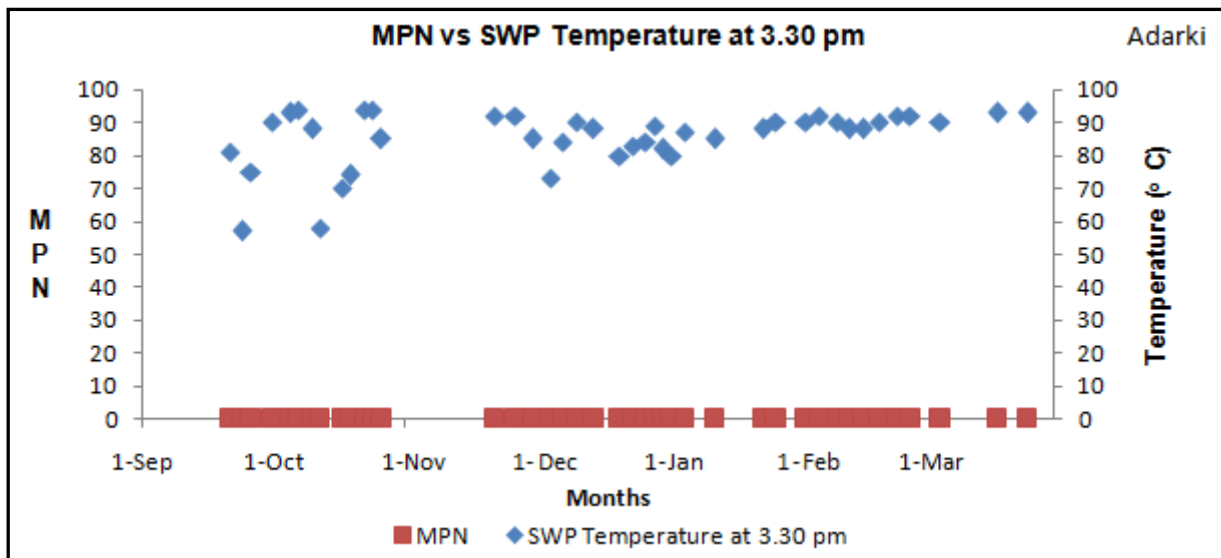


Fig 8: Adarki School Potable tank MPN and SWP temperature at 3.30 pm (**42 samples**)

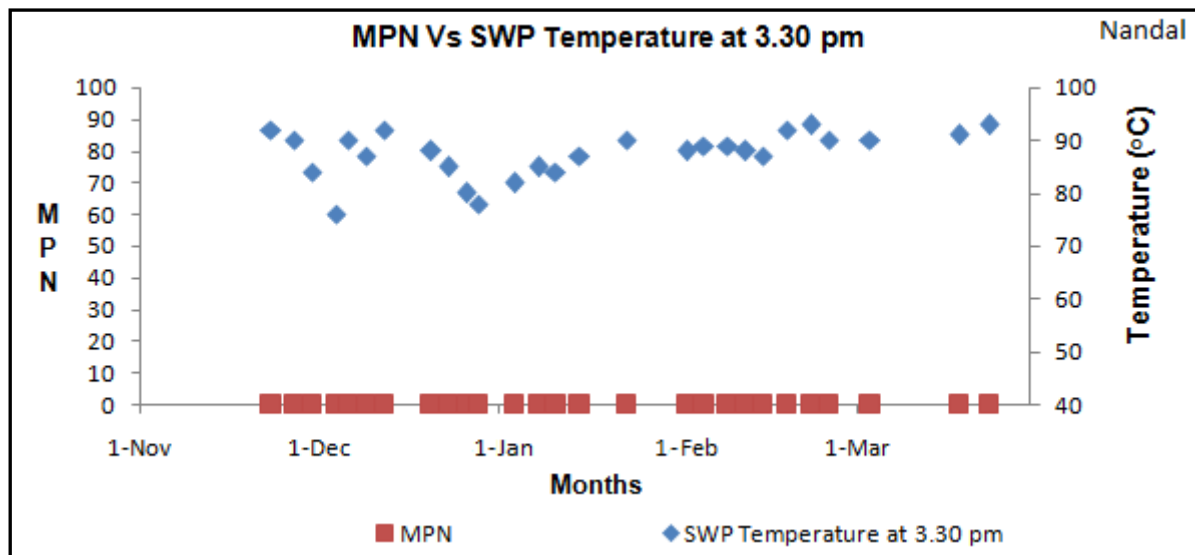


Fig 9: Nandal School Potable tank MPN and SWP temperature at 3.30 pm (**31 samples**)

We have prepared two learning manuals on the DWT system for students. The first manual provides a step-by-step guide on how to operate and maintain the DWT system. The second manual offers a detailed explanation of the Rainwater Harvesting (RWH) process and the SWP technology involved.

Training sessions were organized for both school students and teachers on the operation and maintenance of the DWT unit.

SUMMARY SHEET OF WEATHER DATA. 2024-25

Month	Air Temperature		Rainfall	Rainy days	Pan evaporation mm/day	Wind direction	Relative humidity(%)		Nature of sky Octa grade (0-8)	
	Max	Min					Max	Min	Morning	Evening
April	41.28	23.90	34.25	0	7.30	NW	70	30.18	0.50	1.90
May	40.66	23.56	41.40	0	7.12	NW	86	35.74	0.55	2.10
June	34.45	23.73	304.10	16	4.12	NW	99	60.27	2.73	4.97
July	30.40	23.37	109.25	19	2.51	NW	100	76.55	5.13	6.35
Aug	31.94	22.68	97.4	19	2.70	NW	99.7	70.29	4.35	5.06
Sept	32.75	20.28	82.3	11	3.96	NW	91	61.37	4.03	4.23
Oct	34.85	18.63	126.50	10	3.39	SE	97.26	52.81	2.74	3.29
Nov	34.07	14.73	0.00	0	3.14	SE	98.00	40.43	0.50	1.03
Dec	34.32	14.35	0.00	0	2.58	NW	97.19	45.19	0.61	1.32
Jan	35.60	12.76	0.00	0	3.23	SE	97	36.61	0.06	0.35
Feb	38.91	14.8	0.00	0	4.82	SE	90	33.07	0	0.04
March	41.91	17.62	0.00	0	6.39	SW	78	31	0	0.32
Mean	35.93	19.20	795.20	75.00	4.27	NW	91.99	47.79	1.77	2.58

Visitors during the year (HO)

Date	Name of visitor	Organization	Purpose of visit
2/9/2024	Ananth Krishna, Founder, Bibhishan Bagal, Research analyst	Shekru Foundation	To learn about NARI activities
30/1/2025	Dr. Jeyabal Appavu Technical Lead-Innovative Crop Solution	Fertis India Pvt. Ltd., Hyderabad	To learn about NARI sweet sorghum research
15/3/2025	Srikanth Vadikicharla CEO and Founder	Envilive Pvt. Ltd., Hyderabad	To learn about NARI sweet sorghum research

Visits by groups

Date	No. of persons in group	Type of group	Place
4/9/2024	23 students	B.Sc. (Agri.) students for RAWE project	College of Agriculture, Phaltan
14/10/2024	Prof. Avinash Kamble + 2 teachers with 10 students	Biotechnology (Semester-3)	Savitribai Phule University, Dept. of Botany, Pune
3/2/2025	17 students	B.Sc. (Agri.) Semester-8 students for RAWE program	College of Agriculture, Phaltan
6/2/2025	7 students	RAWE program	Lokmangal College of Agriculture, Wadala, Dist. Solapur



Animal Husbandry Research

Animal Husbandry Division, 1 April 2024 to 31 March 2025

Highlights of the year

- a. AHD-NARI received a prestigious grant of Rs.77.99 lakh for 3 years from the Sir Dorabji Tata Trust, Mumbai for the project “Climate change mitigation initiative managed and led by women farmers” to be carried out among tribal communities in the southern Aravali hills region of southern Rajasthan and northern Gujarat. This innovative and ambitious project will establish women led community based genetic improvement programs of local goat breeds and at the end, draw up a blueprint for such programs to be submitted to the relevant state governments and the Government of India Department of Animal Husbandry. Dr. Chanda Nimbkar, the Director of AHD-NARI and Dr. Pradip Ghalsasi, the Associate Director of AHD-NARI will be involved in the project work. This is the first time that AHD-NARI has received a grant from one of the Tata Trusts and it is because of the credibility established by it in the area of community-based small ruminant genetic improvement over the last twenty years and of course because of the credibility of NARI in agricultural research for 56 years.
- b. On 13 July 2024, Dr. Chanda Nimbkar, Director, AHD-NARI was interviewed on stage in a function in Pune organized by the Marathi Weekly Sadhana, Mukhtangan Mitra (organization working for the rehabilitation of alcohol and drug addicts) and the Maharashtra Foundation, U.S.A. Sadhana is known as a progressive, socialist, idealistic weekly which publishes analytical and critical writing on political, social and cultural topics and has been published continuously for the last 77 years since 1948. A prominent agro-industrialist from Maharashtra, Mr. Vilas Shinde and a well-known agriculturist Mr. Vishwasrao Patil were interviewed along with her by the reputable journalist Mr. Nishikant Bhalerao. The recording of the interview is available on <https://www.youtube.com/watch?v=K5RihctFvEc>
- c. We conducted an impact assessment survey of the Osmanabadi goat field unit under the ICAR-All India Coordinated Research Project on goat improvement which was established in 2009 at AHD-NARI. Thirty-one out of 121 current goat keepers were surveyed, with equal representation from each category of goat ownership (i.e. 1-2, 3-5, 6-10, 11-20 and >20 goats). The surveyed goat keepers owned 505 goats in total including kids.
The conclusions of the study were that:
 - the income earned by goat-keepers participating in the Osmanabadi Field Unit has increased as a result of the reduction in sickness and mortality of goats, improved goat management, better sale prices received due to better quality of goats and the goat-keepers being better informed about the weights of their goats.

Efforts are being made now to make goat-keepers more and more independent in sourcing vaccines, administering first-aid treatments and goat weighing.

- d. Dr. Chanda Nimbkar was invited by the Food and Agriculture Organization of the United Nations as an invited expert scientist to the regional capacity building workshop of the National Coordinators for the Management of Animal Genetic Resources (AnGR) in the Southeast Asian region, held at Putrajaya, Malaysia. This meeting was organized to facilitate nations to prepare their national reports for inclusion of the information in the Third report on the 'State of the World's Animal Genetic Resources for Food and Agriculture (SOW-ANGR3)'. There were national AnGR coordinators present from Sri Lanka, Nepal, Pakistan, Thailand, Philippines, Vietnam and also Mongolia and some countries from the South Pacific such as Vanuatu and Cook Island. The FAO-AnGR coordinator Dr. Paul Boettcher also participated in the meeting.

Dr. Nimbkar gave a presentation on the third day of the meeting on community-based breeding programs such as the ICAR-AICRP Goat Improvement and Project Mesha implemented by the Aga Khan Foundation for which Dr. Nimbkar was a consultant in goat genetic improvement.



- e. We keep receiving appreciation of our NARI Suwarna sheep breed by sheep owners in Maharashtra, Karnataka, Telangana and Andhra Pradesh. During 2024-25, Mr. Ashok a retired government officer from Ayodha, Dist. Mabubabad, Telangana purchased 2 NARI Suwarna rams and 5 female lambs. This is a distance of 1400 km from Phaltan. He intends to crossbreed the local sheep he has, with NARI Suwarna rams. He says, "There is no other institute/organization in India which is providing sheep with the genetic potential of twinning." There are no local sheep breeds in Telangana which have the characteristic of twinning. Reddy,



Mr. Ashok Reddy, Telangana and NARI Suwarna female lambs purchased by him

Details of Research and Development Projects

Project I. Osmanabadi Goat Field Unit of the ICAR-All India Coordinated Research Project on Goat Improvement

Funding agency: Indian Council of Agricultural Research (ICAR), Government of India, New Delhi, administered by the Central Institute for Research on Goats, Makhdoom, Via Mathura, U.P.

Scientists: Dr. Chanda Nimbkar, Dr. Pradip Ghalsasi,

Technical staff: Mr. Navnath Patange, Mr. Sagar Shinde, Mr. M. P. Sonwalkar (up to 8 November 2024),

Ms. Minakshi Ghorpade (in Dhakale, Tal. Baramati, Dist. Pune),

Mr. Mithu Garje (Sakat and Gandhanwadi, Tal. Jamkhed and Patoda, Dist. A'Nagar and Beed respectively- up to 28 February 2025),

Mrs. Prajakta Lahane (Sakat and Gandhanwadi, Tal. Jamkhed and Patoda, Dist. A'Nagar and Beed respectively)

The Osmanabadi goat field unit of the ICAR-AICRP Goat Improvement was started in June 2009 at the Nimbkar Agricultural Research Institute, Animal Husbandry Division in Phaltan, Dist. Satara, Maharashtra. The Osmanabadi goat is a popular local goat and also a recognized goat breed. According to the 20th Livestock Census (2019), out of total 10.6 million goats in Maharashtra, there are 15.2 lakh (1.52 million) Osmanabadi and 3.8 lakh (0.38 million) graded Osmanabadi goats. Of these, 13.2 lakh and 3.4 lakh respectively are female goats.

The Osmanabadi goat field unit has carried out performance recording of goats belonging to village goat keepers in Ahmednagar, Beed, Dharaashiv (Osmanabad), Pune, Satara and Solapur districts. Authentic data on about 600 Osmanabadi goats is collected each year in different regions of Western and Central Maharashtra. An SQL based comprehensive

data base has been developed and established for all data of the Osmanabadi Field Unit since 2009 and these data are now easily available for analysis and interpretation. The data integrity is also being protected.

Vaccination, deworming, timely advice and guidance and treatment of sick goats are the services provided to registered goat keepers and in many cases, to goat keepers from outside the field unit also. Outstanding true-to-type twin-born and fast-growing bucks born to does with a high milk yield have been selected and purchased by the field unit and after reaching maturity, they have been provided to villagers for breeding.

The total number of superior, selected Osmanabadi bucks purchased from the field since 2009 is 113, 31 of which were sired by selected breeding bucks provided by the Osmanabadi Field Unit. Seventy-seven superior bucks were purchased from areas outside the project to increase diversity and minimize inbreeding. **Eight Osmanabadi bucks were purchased during the period 1 April 2024 to 31 March 2025** out of which, four were sired by the superior Osmanabadi bucks disseminated by the Osmanabadi Field Unit.



6.5 months old buck SM2646 weighing 38 kg, sired by AHD's buck P1047 selected and purchased) for further breeding from a buck keeper Mr. Gautam Sul (Morochi, Dist. Solapur)

In addition, semen of these bucks has been frozen and since 2012, more than 60,000 frozen semen straws of selected Osmanabadi breed bucks have been provided to *pashu sakhis* and AI technicians for genetic improvement of Osmanabadi and upgrading of local goats. In addition, 20,000 Osmanabadi buck straws were provided to the Govt. of Karnataka.

The least squares mean 3, 6, 9 and 12-months weights of Osmanabadi kids under the Field Unit are 11.4 kg, 16.0 kg, 18.5 kg and 20.2 kg respectively. These can be compared to the least squares means reported by Mandakmale (2002) on analysis of field data collected from 1995 to 1998 (7.7 kg, 14.1 kg, 14.5 kg and 18.6 kg at 3, 6, 9 and 12 months age). These average weights reflect the good genetic quality of the animals due to the continuous introduction of superior, unrelated breeding bucks as well as the high standards of feeding and management because of the efforts taken by NARI over the last 16 years.

The least squares mean 90-day milk yield was close to 110 litres and top 50% of the recorded does had a 90-day milk yield of 136 litres. Out of 239 milk records collected in 2024-25, 55 does had a test-day yield of 1 to 1.5 litres, 25 gave 1.5 to 2 litres while 12 does gave >2 litres milk per day.

During 2024-25, in 487 kiddings, 790 kids were born making the average litter size per kidding 1.62. Many does have two kiddings in a calendar year and so the average litter size per doe kidded per year is 1.81.

Eight multiplier flocks have been established which have 155 adult does in total. They have all been supplied selected Osmanabadi breeding bucks.



Dr. P.M. Ghalsasi in a goat keeper's flock in Gosaviwadi, Tal. Mann, Dist. Satara

ManForm

Dashboard

Add Details

Manage Herd

Sale/Purchase

Other

Export Data

Reports

Data Tables

Report Data

Date Range

21-09-2025

to

21-09-2025

☐ Allive Goats Only

☐ Male Goats Only

☐ Female Goats Only

Age Group

3 Months

6 Months

1 Years

85 (Min)

175 (Min)

265 (Min)

95 (Max)

185 (Max)

275 (Max)

Owner ID

Location

Sakat

Use Case

199

Report

☐ Record with Status Only (For Village Visit)

Birth	Purchase	Sale	Death	NonCooperate	Fetal Tests	Morbidity	Health Measures	Village Visit	Report	Village Visit Query	Heart Rate	Respiration Rate	Rectal Temperature
AccGoatID	Village	Owner code	Last Name	First Name	Father's Name	Goat Code	DOB	Sex	Dam Tag	Last Date Weighed	Last Weig (KG)		
370239	Sakat	AhijaSa128	Pulawale	Rukmini	Anun	33570	06-04-2022	F					
370242	Sakat	AhijaSa128	Pulawale	Rukmini	Anun	33569	06-03-2025	M		33571			
370243	Sakat	AhijaSa128	Pulawale	Rukmini	Anun	33568	06-03-2025	F		33571			
370238	Sakat	AhijaSa129	Varat	Gorakh	Abaji	33566	06-04-2023	F					
370222	Sakat	AhijaSa129	Varat	Gorakh	Abaji	33565	01-04-2025	F		33119			
370221	Sakat	AhijaSa129	Varat	Gorakh	Abaji	33564	01-04-2025	M		32930			
370220	Sakat	AhijaSa129	Varat	Gorakh	Abaji	33563	01-04-2025	M		32930			
370223	Sakat	AhijaSa139	More	Suraj	Balasahab	33556	01-04-2025	M		33265	06-04-2025	5.4	
370228	Sakat	AhijaSa139	More	Suraj	Balasahab	33555	01-04-2025	M		33268	06-04-2025	4.2	
370227	Sakat	AhijaSa139	More	Suraj	Balasahab	33554	01-04-2025	M		33268	06-04-2025	4.0	
370230	Sakat	AhijaSa139	More	Suraj	Balasahab	33553	01-04-2025	F		33272	06-04-2025	3.7	
370229	Sakat	AhijaSa139	More	Suraj	Balasahab	33552	01-04-2025	M		33272			
370226	Sakat	AhijaSa139	More	Suraj	Balasahab	33551	01-04-2025	M		33266	06-04-2025	2.9	
370225	Sakat	AhijaSa139	More	Suraj	Balasahab	33550	01-04-2025	M		33266	06-04-2025	3.1	
370225	Sakat	AhijaSa139	More	Suraj	Balasahab	33549	01-04-2025	M		33266	06-04-2025	3.7	
370224	Sakat	AhijaSa139	More	Suraj	Balasahab	33548	01-04-2025	M		33266	06-04-2025	4.2	
370232	Sakat	AhijaSa140	Adisul	Ganesh	Ashru	33548	01-04-2025	F		33285	06-04-2025	4.1	
370231	Sakat	AhijaSa140	Adisul	Ganesh	Ashru	33547	01-04-2025	M		33285	06-04-2025	4.7	



Mr. Navnath Patange doing data entry in the database we established specially for the Osmanabadi Field Unit. This is unique among the 30 units under the project.

Salient Achievements during 2024-25

- A new village Boratwadi was added in the Mann cluster. This was an addition of 213 goats belonging to 11 goat keepers. Here, the goat keepers are cooperative, the goats are good quality and goat management is excellent.



Osmanabadi goat field unit in-charge Dr. Chanda Nimbkar at a goat keeper's house in Boratwadi, Tal. Mann, Dist. Satara holding discussions to answer goat keepers' questions and allay their doubts



Osmanabadi unit in-charge Dr. Chanda Nimbkar and extension worker (Sagar Shinde, first from the right in the photo) at Mr. Raju Shembade's flock in Boratwadi

- During 2024-25, 2740 Osmanabadi frozen semen doses of 19 selected Osmanabadi bucks were provided to Mann Deshi Foundation and local AI technicians.



A '*sheli sakhi*' from Mannndeshi Foundation artificially inseminating a doe at a goat keeper's house using buck frozen semen produced at AHD-NARI

- Using some of the amount allotted for capital under the scheduled caste sub-plan, we constructed a shelter measuring 10' x 10' for the goats of Smt. Sitabai Dadaso Rite, a woman goat keeper in Rajale village. She is a childless widow, lives alone and has no support. Her goats used to be tied in the open earlier. She takes them for grazing every day. Now they are protected from the rain. A shed was also built for Shri Sakharam Ghodeswar in Sakat village, Tal. Jamkhed, Dist. Ahilyanagar.
- AHD-NARI distributed nine hand-held weighing scales to scheduled caste goat keepers in four different cluster in Osmanabadi goat field unit. This will help goat keepers in weighing their goat kids on their own and obtain better sale prices. This will also help the project in obtaining birth weights of kids.

Project II. Increasing profitability of sheep production by genetic improvement using the *FecB* (Booroola) mutation and improved management in conjunction with the Project for Dissemination of *FecB* carrier sheep to Karnataka, Telangana and Andhra Pradesh.

Scientists: Dr. Chanda Nimbkar, Dr. Pradip Ghalsasi

Technical staff: Mr. Anil Chavan, Mr. Dattatray Mulik, Mr. Dilip Bhandare and Mr. Sagar Shinde

This successful breeding programme has continued to be self-sustaining since 2012, by generating income mainly from the sale of breeding rams and ewes and secondarily from the sale of surplus lambs and cull sheep.

A. Breeding programme

A new strain of Deccani sheep has been developed, called 'NARI Suwarna' which gives about 40-50% higher lamb production due to a 50% higher litter size compared to local Deccani sheep. The growth rate, mothering ability and conformation of the new breed were improved by the introduction of the Madgyal and Awassi breeds and continuous selection is being carried out to improve these traits further. The breed has

been disseminated to shepherds in Maharashtra, Karnataka, Telangana and Andhra Pradesh and they are profiting from its use. **Total 983 breeding rams and 1554 breeding ewes have been supplied.** Out of these, 34 rams and 56 ewes were supplied during 2024-25. These rams and ewes were purchased by sheep keepers from Karnataka, Maharashtra and Telangana.

All ewes are bred by artificial insemination (AI) in order to use a large number of breeding rams to maintain diversity and control inbreeding and maintain accurate pedigree records. Each of the three AI programs in 2024-25 went on for one month, roughly covering two oestrus cycles. Ewes were inseminated in natural oestrus detected by vasectomised teaser rams. All ewes were inseminated cervically once, about 5-6 hours after oestrus detection. Ewes were inseminated with fresh, diluted semen of the allotted rams. The overall conception rate of 81.4% indicates the high standard of practices used for the AI program and the good condition of ewes and rams. Genetic analysis was used to estimate breeding values.



Drs. Ghalsasi and Nimbkar inspecting and selecting lambs at Lundy farm, Rajale

Dissemination of NARI Suwarna Sheep for Breeding in different States of India (2004- 2024)

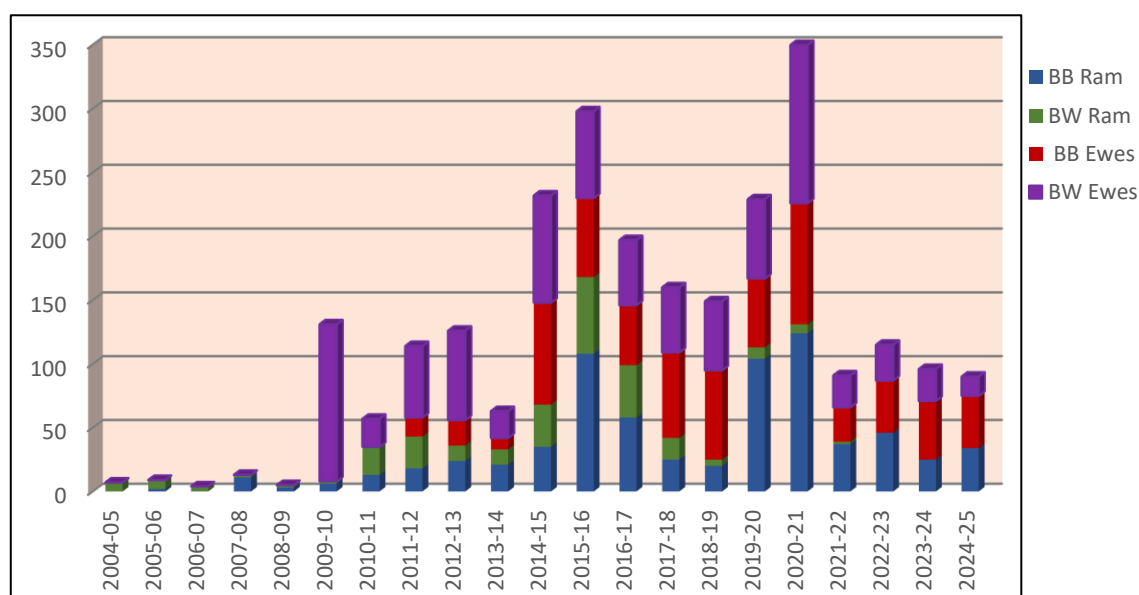


Table 1. Results of three AI programs carried out at NARI's Lundy farm, Rajale in January-February 2024, April-May 2024 and July-August 2024

Particulars	Ewe's <i>FecB</i> genotype			
	<i>FecB</i> ^{BB}	<i>FecB</i> ^{B+}	<i>FecB</i> ⁺⁺	Overall
Ewes inseminated artificially (AI)	85	133	8	226
Ewes conceived (first and second AI)	70	112	8	190
Conception rate to first AI (%)	80.0	81.2	100.0	81.4
Pregnant ewes died/sold	0	2	0	1
Ewes aborted	10	10	1	21
Ewes lambled with at least one live lamb	56	94	7	157
Ewes lambled with all lambs stillborn (perhaps due to dystocia) or died soon	4	6	0	10
Total live lambs born	75	142	10	227
Live lambs born per ewe lambled with at least one live lamb	1.34	1.51	1.43	1.45
Live lambs born per ewe conceived	1.07	1.27	1.25	1.19

The conception rate to artificial insemination of 81.4% was greater than last year. However, the number of live lambs born per ewe lambled decreased from 1.59 to 1.34 for homozygous ewes and from 1.62 to 1.51 for heterozygous ewes. Thus the overall number of lambs born per ewe lambled is 1.45 which is less than 1.58 last year. The number of lambs born per ewe conceived decreased from 1.50 to 1.07 for homozygous ewes and from 1.43 to 1.27 for heterozygous ewes. This is partly because abortions increased from 5.5% during 2023-24 to 11% this year. This situation is partly also attributable to some *FecB* carrier ewes lambing during the night when no supervisor was present and the lambs died because no assistance was given to the ewe. We have now given a mobile phone to the watchman at the sheep farm so that he can call the supervisor in case of a difficult lambing. We gave antibiotic treatment to all the ewes which will hopefully reduce the incidence of abortions. Surprisingly, 3 out of 7 non-carrier ewes had twin lambs.

We wish to place on record our sincere thanks to Mr. Prithviraj Dilip Chavan of Kavthe, Tal. Wai, Dist. Satara for lending us his Avishan ram of *FecB*^{BB} genotype for breeding in our flock. Avishan is a *FecB* carrier breed developed by the ICAR-Central Sheep and Wool Research Institute, Avikanagar and has 50% Patanwadi, 37.5% Malpura and 12.5% Garole proportion. Breeding with Avishan will introduce genetic variability into the NARI Suwarna flock.



NARI Suwarna ewes with their twin lambs

A. Genotyping of sheep DNA at the *FecB* locus

Table 2. *FecB* genotypes of AHD-NARI's sheep tested at the AHD laboratory during 2024-25.

Breed	Number of animals genotyped	<i>FecB</i> ^{BB}	<i>FecB</i> ^{B+}	<i>FecB</i> ⁺⁺
NARI Suwarna lambs	224	123	99	2

*There were three discrepancies found between genotypes of parents and progeny.

The *FecB* genotyping protocol is now **fine-tuned and cost-effective** and **100%** results were obtained at the first go in all the genotyping tests conducted this year also.

Table 3. *FecB* genotypes of blood samples received from outside NARI

Source of samples	Breed	Number of animals genotyped	<i>FecB</i> ^{BB}	<i>FecB</i> ^{B+}	<i>FecB</i> ⁺⁺
Mr. Prithviraj Chavan, Sumbran Goat farm, Wai	Avishan	3	3	-	-
King Saud University, Saudi Arabia	Najdi	4 4	20	21	3

We would like to thank Mrs. Padmaja Ghalsasi, our retired Technical Officer, who was most gracious and helpful to come from Pune and carry out all the genotyping. We are extremely grateful to her.

We acknowledge the valuable help and guidance of Mrs. Sheetal Ranade who is our consultant and adviser for the *FecB* DNA test.

Project III. Setting up a State of the Art A.I. Centre for sheep and goats under the National Livestock Mission Scheme under the component of ‘Interventions towards productivity enhancement’.

(This project was originally sanctioned under the Central Sector Scheme – Integrated Development of Small Ruminants and Rabbits).

The project was submitted to the Government of India, Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries under Central Sector Scheme – Integrated Development of Small Ruminants and Rabbits on 21 August 2010 through Commissioner, Animal Husbandry Maharashtra State. The proposal was approved for 100% Central Government assistance by the Government of India, Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries vide their administrative approval letter No. 48- 51/2010-TS/Sheep dated 24 November 2010.

The total project amount was received in five installments from October 2011 to August 2016. An audited utilization certificate of the last installment was submitted to the Deputy Commissioner, Satara District, Animal Husbandry, Maharashtra State on 28 April 2017.

1. **Date of commissioning of the semen freezing lab:** 2 January 2012
2. Production and utilization of buck frozen semen doses during the period January 2012 to 31 March 2025.

We established a standard protocol for freezing of buck semen and started producing frozen semen straws since June 2012. These straws are regularly supplied to State Governments and private customers and excellent conception rates of average 50% are being achieved.

Table 4. Number of buck frozen semen straws produced and used (2012 to March 2025)

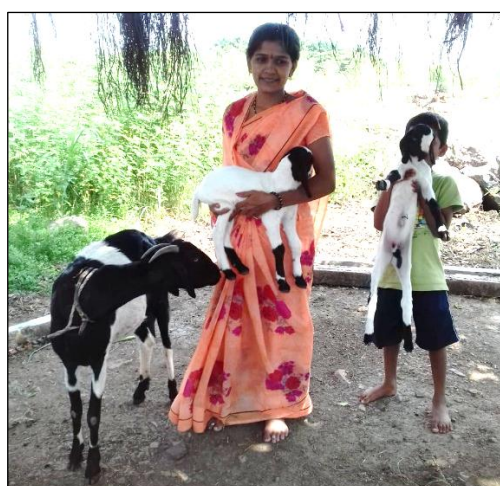
Type of buck semen doses	Breed of buck					Total
	Boer	Osmanabadi	Damascus cross	Alpine and Saanen X Beetal	Beetal	
Frozen	46,853	61,647	7,658	1477	440	1,18,075
Supplied	39,319	59,598	6,545	1453	343	1,07,258
Used for AI of NARI and MGS RDI Farm and local goat keepers' goats and given free to AI technicians for trial	5,139	913	441	24	5	6,522
In storage	2,395	1,136	672	0	92	4,203

- 2,786 goat does belonging to farmers from surrounding villages and 3,760 goat does of the Institute have so far been artificially inseminated using these frozen semen straws.

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Table 5. Number of buck frozen semen straws produced and supplied during the year 1 April 2024 to 31 March 2025.

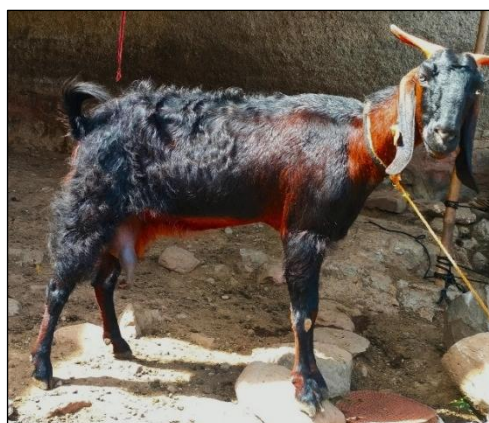
Type of buck semen doses	Breed of buck			
	Boer	Osmanabad i	Damascu scross	Total
Frozen	561	1,595	162	2,318
Supplied	1,922	2,739	795	5,456
Used for AI of NARI and MGSARDI Farm and local goat keepers' goats brought to NARI	25	20	19	46
In storage	2,395	1,136	672	4,203



Boer cross kids born after A.I.



Osmanabadi kids from A.I.



Damascus cross doe born after A.I.

- Goat keepers from nearby villages bring their goats in oestrus to the AHD-NARI farm for cervical AI. AI technicians who used to carry out AI of only cows and buffaloes belonging to farmers, have started to take buck frozen semen from NARI and carry out AI of does at the farmers' door. During the year 2024-25, (1 October 2023 to 31 October 2024) 36 goat does belonging to local goat keepers were inseminated, out of which 25 could be followed up and 20 kidded. Thus the conception rate to A.I. was 80 %. This is a high conception rate and reflects the high semen quality as well as the skill of our farm supervisors/inseminators. Conception rate results for the last 13 years (2012-24) are given in Table 6.



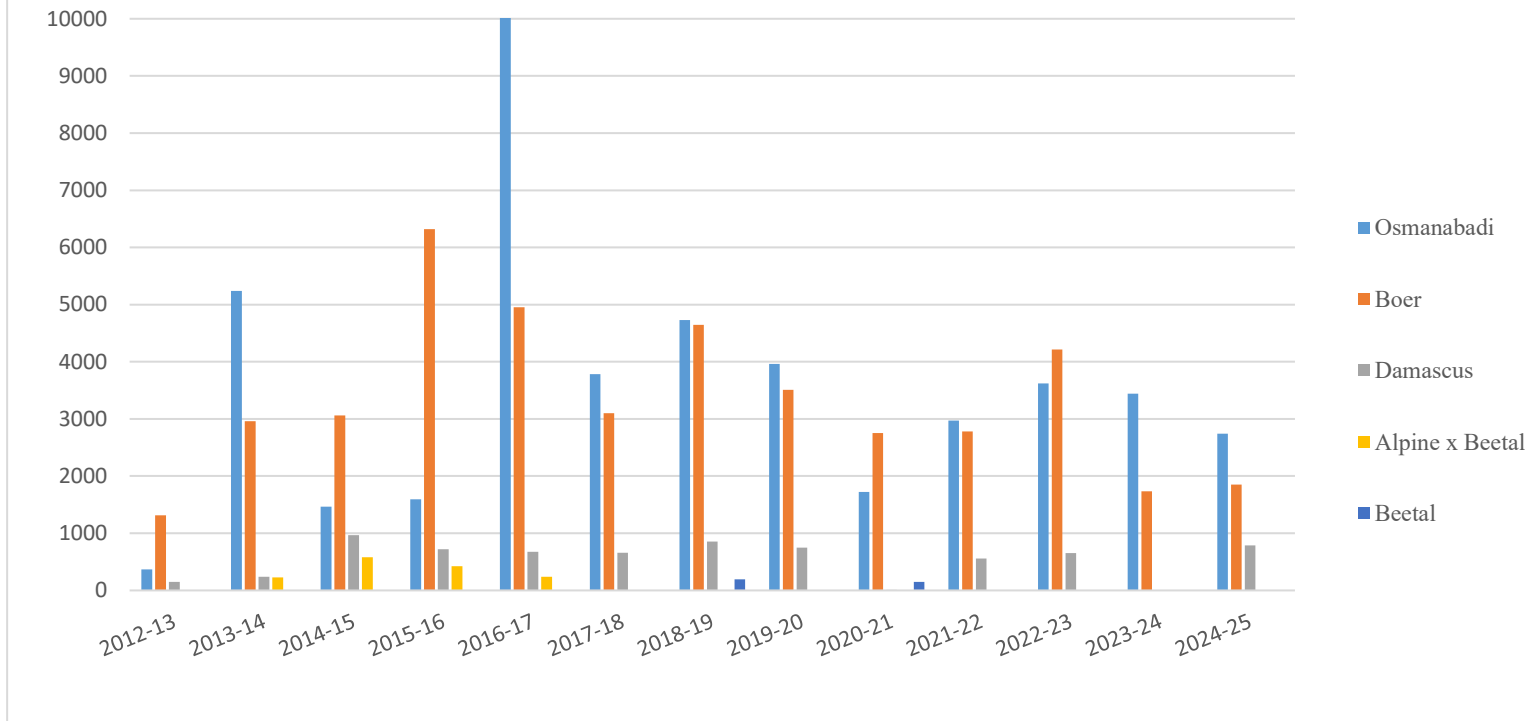
Artificial insemination of local goat keeper's goat at AHD farm, Wadjal

Table 6. Results of AI of farmers' goats using frozen buck semen on NARI farms

Farm / Field	No. of goats inseminated	No. of goats monitored	No. of does conceived	Conception rate (%)
NARI Farms (Oct. 2023-Oct. 2024)	36	25	20	80%
NARI farms (2012-Oct. 2024)	1,500	1,156	594	51.4%

**Nimbkar Agricultural Research Institute, Animal Husbandry Division
Maharashtra Goat and Sheep Research and Development Institute**

Superior buck frozen semen straws supplied from 2012 to 2024



1. 2016-17: 20,000 Osmanabadi semen straws supplied to Government of Karnataka.
2. 2020-21: Straw procurement reduced due to the Covid19 pandemic

Training courses in goat and sheep production and management and artificial insemination (AI) conducted by NARI-AHD

Table 7. Training courses and classification of participants (2007- March 2025)

Topic of training	No. of training courses	No. of participants			Total
		Vets	Para-vets and pashu/sheli sakhis	Farmers	
Goat Artificial insemination (AI)	73	306	210	251	767
Goat and sheep production and management	16	57	52	87	196
Goat and sheep management including AI	22	138	79	3	220
Goat and sheep first-aid including AI	10	0	81	156	237
Total	121	501	422	497	1420

We wish to place on record our gratitude to Mr. K.M. Chavan, our former employee who still carries out the role of the main trainer during our training courses now.

Project IV. Research in veterinary parasitology with special reference to sheep and goats.

Funding agency: Internally funded

Scientists: Dr. Chanda Nimbkar, Dr. Pradip Ghalsasi

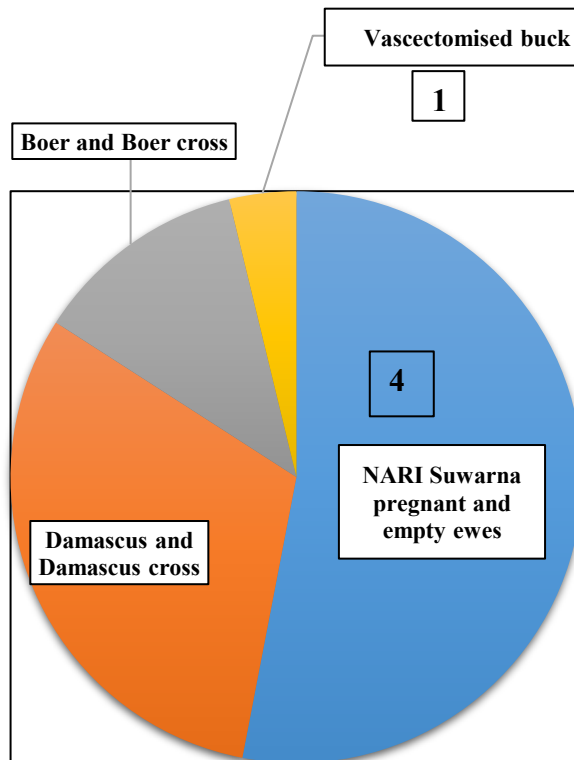
Technical staff: Ms. Shraddha Khot, Mr. Dilip Bhandare, Mr. Datta Mulik, Mr. Sagar Shinde, Mr. Anil Chavan.

We monitored fecal worm egg counts (FEC) and FAMACHA scores of our sheep and goat flocks to assess the gastro-intestinal nematode (GIN) worm burden under natural infection. We have been studying internal parasite burdens and parasite epidemiology in sheep and goats for more than 23 years. During the last 14 years, we have also included FAMACHA score monitoring as a part of our sustainable GIN control strategy. FAMACHA chart is an anemia guide which indicates the seriousness of the burden of infection with blood sucking parasites. It can be effectively used especially when laboratory facilities are not available. Anemia in sheep and goats is mainly caused by the parasite *Haemonchus contortus* which is the predominant species in our area. The anthelmintic *Closantel* is a selective drug used against *H. contortus* only. We often use it. We tested its efficacy by measuring the FEC of drenched sheep on days 14, 28 and 42 after drenching. It was found to be fully effective up to day 42.

AHD maintains sheep and goats on three farms - Wadjal, Dhuldeo and Lundy farm (Rajale).

Dhuldeo Farm
Breed and numbers of animals
(April 2024 to March 2025)

Animals on 31 March




Information about farm:

Goats are stall-fed.



Ewes are grazing.



Rainfall during the year - 675 mm 

FAMACHA Score: 2 to 2.5

Body condition score: 2.5 to 3

During the year FEC of all animals was measured four times and found as below:

All flock was drenched with Closantel only once during the year

1) Goats -

FEC average: 320 epg

FEC range: 0-1200 epg

(3 goats out of 26 with FEC >1000 epg. were individually drenched with Closantel in May 2024.)

2) Kids-

FEC average: 140

FEC range: 0- 800

(2 kids out of 10 were individually drenched with Fentas plus for tapeworm infection in May 2024.)

3) NARI Suwarna inseminated ewes (1 group) -

FEC average: 2242 epg

FEC range: 0-5300 epg

(Ewes were mass drenched with Closantel in May and ewes with FEC >1000 epg. were individually drenched with Closantel in October 2024.)

4) Vasectomised rams- 4

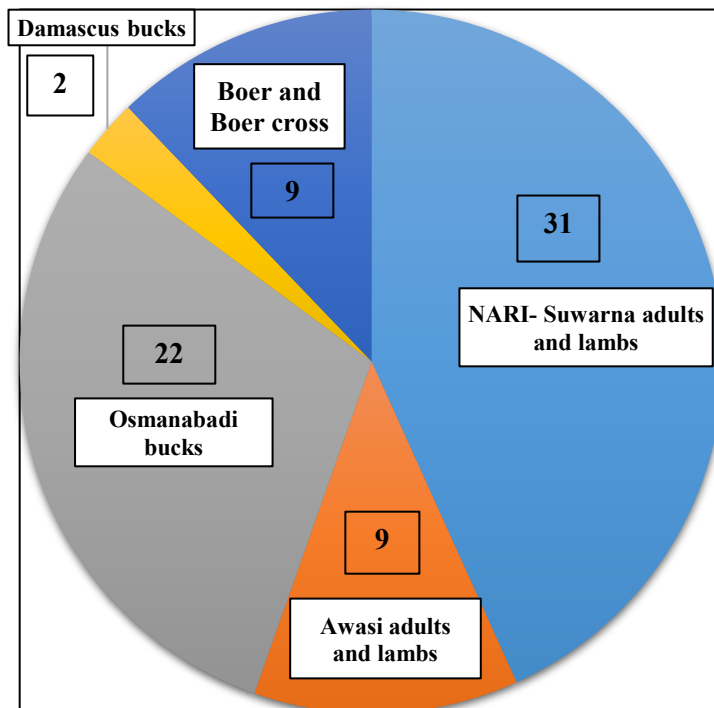
FEC Average: 2450 epg

FEC range: 1000-8500 epg

(All were drenched with Closantel only once during the year in May 2024.)

Wadjal Farm
Breed and numbers of animals
(April 2024 to March 2025)

Animals on 31 March 2025



Information about farm:

All animals are stallfed.



Rainfall during the year - 732mm



FAMACHA score : 2 to 2.5

Body condition score : 2.5 to 3

During the FEC of all animals was measured four times and below are the observations.

1) Osmanabadi and Boer & Boer cross Bucks- 26

FEC average: 2092

FEC range: 1000-7600

(12 bucks needed to be drenched individually with Closantel and 1 buck drenched with Albendazole in July and December respectively)

2) Boer goats: 2

FEC average: 1700

FEC range: 1500-200

3) Awassi adults- 7

FEC average: 1100

FEC range: 1100epg

(Two ewes were drenched with Closantel in July and December)

4) Awassi Lamb- 1

FEC average: 0

FEC range: 0

5) NARI Suwarna adult males and female - 21

FEC average: 1800 epg

FEC range: 1000-2600

(Only 4 lambs out of 21 Tapeworm

Infection seen so drenched with Fentas Plus.)

6) NARI Suwarna male lambs- 16

FEC average: 33.3

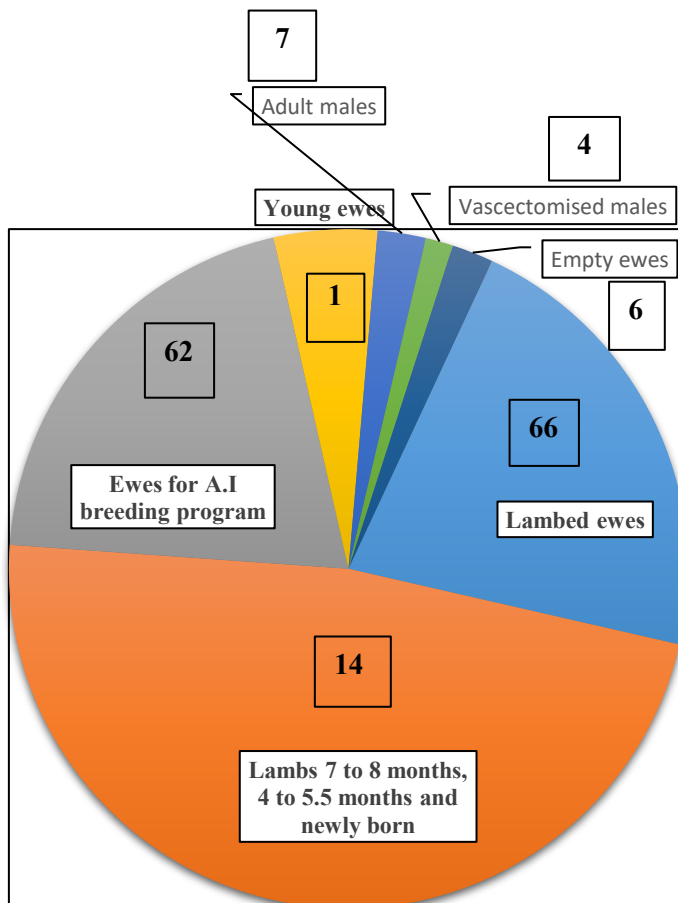
FEC range: 0- 300

(Only 7 lambs out of 18 Tapeworm

Infection seen so drenched with Fentas Plus.)

Lundy Farm
Breed and numbers of animals
(April 2024 to March 2025)

Animals on 31 March 2025



Information about farm:



All sheep are grazed.

Rainfall during the year- 808 mm

FAMACHA Score: 2 to 3

Body Condition Score: 2 to 3

During the year, FEC was measured three times and the observation found as below.

1) Empty ewes (2 groups) -

FEC average: 3633 epg

FEC range: 0-8600 epg

(FEC >1000 epg. were individually drenched with Closantel in October.)

2) 4 to 5 months pregnant ewes (2 groups)

FEC average: 2740 epg

FEC range: 200-4200epg

(Both groups of ewes were mass drenched with Closantel in April and June

3) Lambed ewes (15 days to 1 month after lambing)- (2 groups)

FEC average: 7400 epg

FEC range: 0-11500 epg

(One group of ewes was individually drenched with Closantel in June and one group of ewes was individually drenched with Albendazole in October)

4) Lambed ewes (2 to 3 months after lambing)- (3 group)

FEC range: 3550 epg

FEC range: 0-8300 epg

All flock was drenched with Closantel in June. One group was individually (FEC >1000 epg.) drenched with Albendazole in October and One group ewes was individually (FEC >1000 epg.) drenched with Closantel in April.)

5) 6 to 7 months old female lambs -

FEC average: 0 epg FEC range: 0 epg

(18 lambs out of 21 were drenched with Fentas Plus for tapeworm infection in October.)

We check the FAMACHA scores of all animals every month at the time of weighing of animals and ensure that no animal has a FAMACHA score above 3. If it is above 3, we have to take correctional measures such as giving iron injections.

- Those lambled and pregnant ewes with FAMACHA score of 2.5 to 3 as well as high FEC were drenched individually and also given an iron injection.
- We observed in this year, population of *Trichostrongylus* is increased compared to last year so after drenching with narrow spectrum anthelmintic we needed to drench with broad spectrum anthelmintic also.
- The immediate and sustained activity of Closantel which is long acting and narrow spectrum was tested at day 14, 28, 42 post-drench and found Closantel was fully effective up to 42 days.
- To ensure that the feeding is going on correctly, all the animals were **weighed every fortnight**. When there was weight loss, the feeding was altered. This year to the management gave incentives to the workers of those farms where animals in all the groups gained weight during a particular month. And almost all 3 farms got incentives which means our management is improving day by day.
- Ecto-parasite infection was observed in sheep and goats during rainy season. Amitraz was used to treat this.
- Larval culture: The overall predominant larval species (almost 85%) in all the sheep and goat flocks identified from pooled faecal samples was *Haemonchus contortus* followed by *Trichostrongylus* species (13%) and *Oesophagostomum* species (2%).

Project V. Climate change mitigation initiative managed and led by women farmers (CCMIM-LWF)

Funding agency: Sir Dorabji Tata Trust, Mumbai

Scientists: Dr. Chanda Nimbkar, Dr. Pradip Ghalsasi

Collaborating organizations:

Centre for MicroFinance (CmF), Rajasthan

Centre for Integrated livelihood Initiatives (CInI), Gujarat

Vijayavahini Charitable Foundation (VCF), Andhra Pradesh

AbacusBio Ltd., New Zealand

The project got under way in May 2024.

The project aims to establish community based goat breeding (genetic improvement) programs (CBBP) through capacity building of women goat keepers and introducing innovative strategies in villages of Rajasthan and Gujarat states where the collaborating organizations CmF and CInI have organized households into primary institutions. Genetic improvement in animal performance is permanent and cumulative and is therefore an attractive method of productivity improvement of goats belonging to resource poor rearers located in remote villages. Genetic improvement entails exploitation of genetic variation identified by performance recording of large numbers of goats followed by

breeding those with genetic superiority. However, smallholder goat rearers may own just a few adult does and a CBBP is therefore necessary to have access to an adequate number of goats and their performance recording. The objective of the CBBPs is to improve the goat genetic resources owned by women to improve their livelihoods and possibly, at a later stage, to promote business in sale of breeding bucks and does. This will be ultimately achieved through selection of genetically superior offspring for breeding leading to continuous genetic improvement in a goat population. Goat rearer participation will be encouraged from inception to implementation gaining an understanding of goat rearer needs, perception and decisions when developing the program. It is intended to establish regional supply centres for high genetic value (superior productivity and adaptability) does and bucks which are managed by women goat keepers. The overarching objective is to add value to the sustainable production, management and marketing of goats belonging to smallholder village communities using community focused interventions. The objective is also to use this as a proof of concept for adoption of women-led community based small ruminant breeding approaches by the GOI/AHD and shall be showcased to them as best practice initiatives to influence policy.

Visits and activities carried out and outcomes achieved

Dr. Chanda Nimbkar visited the field areas in Rajasthan and Gujarat in July and September 2024 and January 2025. The visit in September 2024 was made together with Drs. Peter Amer and Martyn Haigh of AbacusBio to gain further understanding of goat rearing practices and expectations of goat rearing communities and give training in using the Dtreo software platform provided by AbacusBio for the project. Drs. Nimbkar and Ghalsasi together conducted a training program for 25 pashu sakhis and field assistants of CmF and CInI in Pindwara, Rajasthan in October 2024. Dr. Ghalsasi did a monitoring and evaluation visit in December 2024. Both again visited the field areas in January 2025 for village visits and a one-day discussion meeting together with AbacusBio partners and Dr. Sushmita Parai for extensive discussions on data entry and corrections, problems/challenges faced and how to resolve them.

Drs. Nimbkar and Ghalsasi also give guidance by participating in regular calls with 'single points of contact' persons from collaborating organizations. These used to be once a week; the frequency reduced to once a month by the end of the year.

Outcomes achieved:

- Observed and understood goat rearing conditions and breeding practices in villages under the project in the Aravali hills of Pindwara and Sirohi blocks in Rajasthan and Sabarkantha and Banaskantha blocks in Gujarat through interactive meetings with women goat keepers and pashu sakhis (25 to 30 women in each meeting).
- Gained understanding of goat keepers' preferences for different characteristics of their goats.
- Used the information gathered to define the breeding objectives of the community goat breeding programs to be established and to set up the goat performance recording protocol in the Dtreo database.
- Trained pashu sakhis, field assistants and other project personnel from collaborating

organization in principles of the proposed community-based goat breeding program (CGBP) and found out their expectations from the CGBP.

- Timely guidance to the participants for the operationalization of the project and the sequence of necessary steps required.
- Prepared terms of reference for the call for proposals for the baseline survey for the project, short-listed and selected the vendor agency to carry out the survey, guided them through the various steps in the survey, edited their report twice, gave suggestions for improving the report and finalized the report.
- Motivated the livestock assistants, pashu sakhis and other personnel of the collaborating organizations to do goat data measurement, recording and data entry, checked Dtreo data entries, indicated corrections and modifications needed, gave hand-holding support for the establishment of the CGBP.
- Guided the vendor agency Videowallah hired by CInI to prepare instructional videos of goat management, the CGBP concept and its expected impact.
- Fulfilled all the reporting requirements of annual work-plan, quarterly and annual reports of the funding agency.

Training of *pashu sakhis* and field assistants in Pindwara, Rajasthan by Drs. Nimbkar and Ghalsasi



PUBLICATIONS

Refereed Conference Papers

- Nimbkar, C., Ghalsasi, P., Parai, S., Rao, C. S., Patel, H., Vaghani, V., Schurink, A., Bjelland, D. and Amer, P. 2025. Community based breeding programs – opportunity for smallholder goat genetic improvement and increased incomes. Compendium of abstracts. International Committee on Animal Recording Annual Conference and IDF/ISO Analytical Week 2025. NDDDB, Anand, Gujarat, India. 29 March to 4 April 2025. p. 44.
- Schurink, A., Bjelland, D., Nimbkar, C., Kumar, N., Parai, S., Singh, C. Vaghani, V., Haigh, M., Santos, B. and Amer, P. 2025. The last data point – experience with Dtreo data

capture for impact in smallholder ruminant systems. Compendium of abstracts. ICAR Annual Conference and IDF/ISO Analytical Week 2025. NDDDB, Anand, Gujarat, India. 29 March to 4 April 2025. p. 45.

- Amer, P., Schurink, A., Bjelland, D., Haigh, M. and Nimbkar, C. 2025. Simple phenotypic indexes can bring data recording to life for smallholder farmers. Compendium of abstracts. ICAR Annual Conference and IDF/ISO Analytical Week 2025. NDDDB Anand, Gujarat, India. 29 March to 4 April 2025. p. 48.

Non-refereed conference papers

- Nimbkar, C., Ghalsasi, P.M., Sonwalkar, M.P. and Shinde, S.H. 2024. Impact of the Osmanabadi goat field unit as perceived by participating goat-keepers under the ICAR-All India Coordinated Research Project on Goat Improvement in five districts of Maharashtra from 2017/2018 to 2023. Compendium of the International Conference on Small Holders' Goat Production in Tropical Countries – Opportunities and Constraints. Held at Post Graduate Research Institute in Animal Sciences, Kattupakkam, Tamil Nadu on 8-9 August 2024. Tamil Nadu Veterinary and Animal Sciences University. pp. 570-572.
- Nimbkar C., Abeykoon, S., Amer, P., Kumar, N. and Sawhney, T. 2024. Benefits of synergies between improvement in genetic and other aspects of goat rearing in a women's economic empowerment program (Project Mesha) in Muzaffarpur district of Bihar. Compendium of the International Conference on Small Holders' Goat Production in Tropical Countries – Opportunities and Constraints. Held at Post Graduate Research Institute in Animal Sciences, Kattupakkam, Tamil Nadu on 8-9 August 2024. Tamil Nadu Veterinary and Animal Sciences University. pp. 580-582.

Report.

Nimbkar, C. 2025. Annual Report of the Osmanabadi Field Unit of the ICAR-AICRP Goat Improvement. 2024-25. P.53.

I. INVITED TALKS/LECTURES conducted by Dr. Chanda Nimbkar during 2024-2025 in virtual and physical mode

Date	Name of organizer	Topic of presentation
26 May 2024	The virtual platform Satya Zero Grazing established by Dr. Ashokkumar Valupadasu	Pastoralist rearing Vs. Organized farming of sheep and goats
8-9 August 2024	Tamil Nadu Veterinary and Animal Science University, Post Graduate Research Institute in Animal Science,	Chaired the inaugural session of the International Conference on 'Small holders' goat production in tropical countries-

	Kattupakkam, Tamil Nadu.	opportunities and constraints’ and gave a speech. Also chaired the sessions “Utility of goat rearing: Products, marketing and extension” and “Sustainable development and miscellaneous themes”
5 December 2024	Webinar organized by FAO, Rome on ‘Establishing and scaling up breeding programs in challenging environments’ for the Third report on the <i>State of the World’s Animal Genetic Resources for Food and Agriculture</i> .	Case study on two community-based goat breeding programs in India – 1. Osmanabadi goat Field Unit of the ICAR-AICRP Goat Improvement and 2. The community-based goat breeding program for Black Bengal goats under Project Mesha implemented by the Aga Khan Foundation in Bihar.

II. Buyers of frozen semen straws of bucks:

	Name	Osmanabad i	Boer	Damascus (>50% cross)
1.	MannDeshi Foundation, Mhaswad, Vaduj, Lonand, Nasik and Satara branches, Maharashtra.	2530	1715	595
2.	Ms. Archana Khude, Lonand, Dist. Satara, Maharashtra	11	6	12
3.	S.S. Bothekar, Phaltan, Dist. Satara, Maharashtra.	27	10	12
4.	Vinayak Kare, Phaltan, Dist. Satara, Maharashtra	52	16	26
5.	Mr. Dipak Mathpati, Phaltan, Dist. Satara, Maharashtra	6		6
6.	Mr. Sachin Nanware, Phaltan, Dist. Satara, Maharashtra	10		10
	Total	2636	1747	661

III. Dissemination of NARI Suwarna sheep for breeding

Sr. No.	Date	Name of the buyer	No. of animals supplied			
			Rams		Ewes	
			<i>FecB^{BB}</i>	<i>FecB^{B+}</i>	<i>FecB^{BB}</i>	<i>FecB^{B+}</i>
1.	6 April 2024	A .Ashok Reddy, Ayodhya Village, District & Mandal Mahbubabad, Telangana	1	-	9	2
2.	15 April 2024	Kailas Raosaheb Kesare, Dahifal, Osmanabad.	1	-	4	1
3.	15 April 2024	Ramhari Nana Mate, Dahifal, Osmanabad.	1	-	4	1
4.	25 April 2024	Divya Solomon W, 702 25th main 17th cross JP Nagar, Bangalore.	9	-	-	-
5.	9 June 2024	Chilakapati Eswara Chandra Vidya Sagar, Aziz Nagar, Village Road, Himayat Sagar, Bandlaguda (Jagir) K.V.Rangareddy, Telangana.	1	-	4	-
6.	9 June 2024	K.Venkat, Dilalpur Village, Gajwel Mandal, Dist. Siddipet, Telangana.	2	-	-	-
7.	17 June 2024	Shri. Annasaheb Sopan Dighe, Talegaon	-	-	-	1
8.	15 August 2024	A.N. Sudha, Kanasu, 1st floor, No.8, Dr. Rajakumar Road, New yarganahally Layout, Mysuru, Karnataka	2	-	5	5
9.	14 September 2024	Aniket Arun Gujar, Ambavade (Khurd) Satara.	1	-	-	-
10.	8 October 2024	Mr.Prasanna Kumar DB, Challakere, Gopanahalli gate , Ballari, Karnataka.	1	-	2	-
11.	8 October 2024	Mr.Gundurao Krishanarao Kulkarni, #01, Near Bus Stand, Kaginelli, PO Kaginelli, Dist: Haveri, Karnataka.	1	-	3	5
12.	8 October 2024	Dr. SP Kumbhar, rtd DDAH&VS, Basavshri Goat farm NLM Survey No.6/8, Near Bustop Golsangi NH Nidagundi Dist: Vijaypur, Karnataka.	1	-	-	-

13.	28 November 2024	Chintham Srinivas, 48-5-284, Mogilicherla, Warangal, Telangana.	2	-	6	-
14.	28 November 2024	K.Venkat, Dilalpur Village, Gajwel Mandal, Dist. Siddipet, Telangana.	1	-	-	-
15.	16 December 2024	MAT BIO – FUEL PLANTATIONS PVT.LTD, (Jorj) # 234, Narayan Nagar, 1 st stage, Doddakala Kanakapura Road, Bangalore.	2	-	-	-
16.	16 December 2024	Shri. Santosh Dinkar Khomane, At/Po: Korhale, Tal: Baramati, Dist: Pune.	-	-	4	1
17.		M.V. Shadakshari Govt. Primary School, Mugthihalli Post Chikmagalur, Karnataka.	1	-	-	-
18.	29 January 2025	Mr. Ravindra Gowda, A/t: Anjaneyalue Nallur, Po. Betha Mangala, Tal: K.G.F, Dist: Kolar, Karnataka	3	-	-	-
19.	29 January 2025	Mr. Shetty Lokesh Hanumanthappa , A/t Kunte, Po. Thotli, Tal. & Dist: Kolar, Karnataka	2	-	-	-
20.	11 February 2025	Shri. Rahul Dada Fatangare, Karanji Bk, Tal: Kopargoan, Dist: Ahilyanagar	1	-	-	-
21.	28 February 2025	M.V. Shadakshari, Govt. Primary School, Mugthihalli Post Chikmagalur, Karnataka.	1	-	-	-
			34	-	41	16

IV. Visitors during the year to AHD-NARI

Date	Name of visitor	Organization	Purpose of visit
1 August 2024	Dr. Nadeem Fairoz	Aravalli Veterinary College, Sikar, Rajasthan	To discuss setting up a sheep and goat farm at their college
29 August 2024	Dr. P.M. Mohamed Nagoor	Department of Animal Husbandry, Tamil Nadu	To learn about AHD-NARI activities
18 October 2024	Ms. Yashani Nagarajan, IAS	CEO, Satara Zilla Parishad	
21 March 2025	Mr. Jaya Bhushan Patnaik	Jaya Bhushan Agro Industries Pvt. Ltd., Vizag, A.P.	
29 March 2025	Mr. Madari Shriram Reddy		

V. Visits by groups during the year to learn about NARI-AHD's work

Sr. No.	Date	Particulars		Type of group	Organized by
		No. of persons in group	Place		
1.	5 October 2024	46	Nasik	Goat keepers and farmers	Under Aatma Nasik Taluka Agricultural Officer, Nasik
2.	8 August 2024	1	Pune		KIPL, Pune
3.	29 November 2024	8	Australia and France		Department of Hermes global leather Australia and France
4.	9 January 2025	42	Pune	6 th std. students	Aksharnandan School, Pune
5.	28 January 2025	4	Satara	Livestock supervisors	Satara district veterinary dispensary, Satara
6.	11 February 2025	14	Kolhapur	Farmers and goat keepers	Family farming producer co. Ltd. Kolhapur

Sr. No.	Date	No. of persons	Place	Type of group
1.	1 April 2024	2	Javali, Raigad	Goat keepers
2.	24 May 2024	2	Thane	District Women and Child Development Officer
3.	4 July 2024	4	Nasik	Veterinarians from BAIF Institute
4.	2 August 2024	4	Roha, Raigad	Farmers and Goat keepers
5.	5 August 2024	1	Indapur	Farmer
6.	7 August 2024	1	Yavat	Farmer
7.	9 November 2024	5	Jamkhed	Farmers
8.	9 November 2024	4	West Bengal	Students
9.	15 November 2024	2	Walchandnagar	Farmers
10.	22 November 2024	5	Bangalore	Farmers
11.	30 November 2024	4	Bangalore	Sheep rearers
12.	16 December 2024	2	Sawantwadi	Farmers
13.	23 December 2024	1	Bijwadi, Satara	Farmer
14.	31 December 2024	2		Farmers
15.	2 January 2025	4	Pune	Farmers
16.	4 January 2025	1		Farmer
17.	15 January 2025	2	Pune	NHAI, Pune
18.	25 January 2025	2		Goat keepers
19.	4 February 2025	2		Goat keepers
20.	8 February 2025	3	Pune	Farmers
21.	27 February 2025	2		Farmers
22.	3 March 2025	2	Tasgaon	Farmers
23.	18 March 2025	4	Daund, Pune	Farmers and goat keepers
24.	24 March 2025	2		Farmers
		63		

Women trainees of Self-Help Groups of Manndeshi Foundation, Satara, Dist. Satara

Sr. No.	Date	No. of persons in group	Branch
1.	3 May 2024	15	Mhaswad
2.	24 May 2024	16	
3.	27 May 2024	20	
4.	3 June 2024	15	
5.	14 August 2024	15	
6.	27 August 2024	17	
7.	5 September 2024	15	
8.	24 January 2025	30	
9.	31 January 2025	15	
10.	3 February 2025	25	
11.	10 February 2025	35	
12.	10 March 2025	15	
13.	27 May 2024	25	Lonand
14.	24 June 2024	44	Satara
	Total	302	



Annual Fact Sheet

Publications

- 18 articles in magazine and newspapers
- 2 booklets
- 3 referred conference papers
- 2 non-referred conference papers
- 2 reports

Visitors to NARI

- 8 visitors from government, commercial and educational institutions
- 10 groups of students, farmers and goat keepers
- 65 individual farmers and goat keepers

▪ Total sales

- 5944 frozen semen straws of Osmanabadi, Boer and Damascus (50% cross bucks)
- 91 Suwarna sheep for breeding
- 309 MT of sugarcane
- 70 MT of firewood
- 13 MT of food grains and oilseeds (Wheat, Soyabean, Pearl millet, sorghum)
- 4 MT of Sweet sorghum biomass (Fodder and other purposes)
- 2 MT Leucaena foliage for fodder
- 1050 Kg food products (Sweet sorghum syrup, jaggery, safflower oil, mustard oil, safflower herbal tea)
- 394 Kg seed of different varieties of Sweet sorghum, Safflower, Leucaena, Stylosanthes and Cenchrus)
- 72 Kg Opuntia (Cactus) pads



Governing Council (2023-2026)

Dr. Nandini Nimbkar, Ph.D., Permanent President, NARI

Dr. Chanda Nimbkar, Ph.D., Director, Animal Husbandry Division, NARI

Noorie Rajvanshi, Ph.D., Environmental Sustainability Lead, Global Operations, Hewlett Packard Enterprise, U.S.A.

Dr. Anil K. Rajvanshi, Ph.D., Padma Shree Awardee, Director and Hon. Secretary, NARI,

Ms. Madhura Rajvanshi, MA, Fulbright Scholar, Trustee, Pragat Shikshan Sanstha, Phaltan.

Prof. P. Balaram, Padma Bhushan Awardee, Ph.D., Former Director of Indian Institute of Science, Bengaluru.

Trustees

Dr. Nandini Nimbkar, Ph.D., Permanent President, NARI

Dr. Chanda Nimbkar, Ph.D., Director, Animal Husbandry Division, NARI

Dr. Anil K. Rajvanshi, Ph.D., Padma Shree Awardee, Director and Hon. Secretary, NARI,

Noorie Rajvanshi, Ph.D., Environmental Sustainability Lead, Global Operations, Hewlett Packard Enterprise, U.S.A.

Dr. Manjiri Nimbkar, M.B.B.S., Vice president, Pragat Shikshan Sanstha, Phaltan.

Dr. Priyadarshini Karve, Ph.D., Director, Samuchit Enviro Tech, Pune

Smt. Jai Nimbkar, M.A., Founder Trustee