



**For office use only**

*A  
Report  
On*

*Evaluation of product  
**RCM-HARIT SANJIVANI***

*(NOCA Certified nutrient supplement)  
on Cotton for yield and quality improvement  
(Agency Trial)*

**Conducted at  
RRC, (Dr. PDKV, Akola), Amravati  
During  
(2019-20)**



*Submitted by*  
**Head**  
**Regional Research Center (Dr. PDKV)**  
**Morshi Road, Amravati (MS)**

### Proforma

<b>1. Location:</b>	Regional Research Center, (Dr. PDKV), Amravati	
<b>2. State:-</b>	Maharashtra	
<b>3. Year :-</b>	2019-20	
<b>4. Zone :</b>	Central	
<b>TRIAL:</b>	SAU trial	
<b>Experimental Details:</b>		
<b>Number of Entries :-</b>	01 (Ajeet 155)	
<b>Number of Treatments :</b>	06	
<b>Number of replications :</b>	4	
<b>Number of Rows/ Entry :</b>	4	
<b>Design :</b>	Randomised Block Design (RBD)	
<b>Spacing :-</b>	120 x 60 cm H x H	
<b>Plot Size:</b>	7.20 x 4.80 m <sup>2</sup>	
<b>Crop grown during previous season:</b>	Gram	
<b>Soil type :-</b>	Medium Black Soil	
<b>Sowing date :</b>	11/07/2019	
<b>Gap filling date :</b>	22/07/2019	
<b>Thinning date:</b>	29/07/2019	
<b>Fertilizer applied</b>	Chemical Fertilizer applied through Straight Fertilizers viz. Urea, SSP and MOP	
<b>Dose</b>		
	<b>N : P : K</b>	<b>Date</b>
<b>Basal Dose</b>	45:65:65	24/7/2019
<b>Top Dressing</b>	40 Kg N	26/8/2019
	40 Kg N	26/9/2019
<b>Number of Irrigations</b>		
	<b>Date</b>	<b>Irrigation Details</b>
	19/7/2019	Sprinkler Irrigation
	30/9/2019	Sprinkler Irrigation
	29/11/2019	Flood Irrigation
	6/12/2019	Flood Irrigation
	24/12/2019	Flood Irrigation
<b>Weed control/ Mechanical details</b>		
	<b>Date</b>	<b>Details</b>
Weeding	6/8/2019	
Weeding	23/8/2019	
Hoeing	7/8/2019	
Hoeing	26/8/2019	

<b>Plant Protection Measures :</b>			
<b>S.N.</b>	<b>Chemical Dose</b>	<b>Days</b>	<b>Date</b>
1.	Neemark 300 ppm (50 ml /10 l water)		16/8/2019
2.	Aceitamaprid 20 SP (1.5 g/10 l water)		3/9/2019
3.	Imidacloprid 200 SC + Carbendazim 50WP		16/9/2019
4.	Neemark 300 ppm + Carbendazim 50WP (50 ml + 10 g/10 l water)		15/10/2019
<b>Picking:</b>			
<b>Dates of Picking</b>			
07/12/2019			
15/01/2020			
04/03/2020			

**Protocol:**

<b>Treatments</b>	<b>Stage I (g/acre)</b>	<b>Stage II (g/acre)</b>	<b>Stage III (g/acre)</b>	<b>Stage IV (g/acre)</b>
	<b>At Sowing (Soil Applin.)</b>	<b>30 DAS (Foliar Spray)</b>	<b>30 DAS (Foliar Spray)</b>	<b>30 DAS (Foliar Spray)</b>
T1	150	75	125	150
T2	200	100	150	200
T3	250	125	175	250
T4	300	150	200	300
T5	350	200	250	350
T6	0	0	0	0

**Annexure-I**

**Weekly Meteorological Data 2019-20  
Regional Research Center (Dr.P.D.K.V.), Amravati**

MW	Weekly Date	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Rainy Days
		T <sub>min.</sub>	T <sub>max.</sub>	RH <sub>I</sub>	RH <sub>II</sub>		
22	28.05.2019 to 03.06.2019	31.80	46.13	41.33	20.00	0	0
23	04.06.2019 to 10.06.2019	28.29	45.47	41.29	37.43	19.4	1
24	11.06.2019 to 17.06.2019	29.00	42.27	50.71	29.57	0	0
25	18.06.2019 to 24.06.2019	26.19	38.96	69.14	44.57	62	4
26	25.06.2019 to 01.07.2019	23.89	36.10	73.43	66.43	50.2	2
27	02.07.2019 to 08.07.2019	22.60	31.33	89.86	85.00	68.2	5
28	09.07.2019 to 15.07.2019	23.84	34.66	76.57	52.14	4	1
29	16.07.2019 to 22.07.2019	24.36	36.33	74.00	56.29	68.6	2
30	23.07.2019 to 29.07.2019	23.64	31.86	89.86	78.71	68.8	4
31	30.07.2019 to 05.08.2019	21.84	27.44	94.86	90.43	140.6	6
32	06.08.2019 to 12.08.2019	22.33	28.86	91.43	85.71	131.4	5
33	13.08.2019 to 19.08.2019	22.81	30.76	86.14	72.71	5	1
34	20.08.2019 to 26.08.2019	22.94	30.61	89.14	81.43	13.9	2
35	27.08.2019 to 02.09.2019	22.41	30.16	91.29	85.14	54	2
36	03.09.2019 to 09.09.2019	22.93	30.10	92.57	89.00	63.2	4
37	10.09.2019 to 16.09.2019	22.09	28.71	93.57	87.57	43	5
38	17.09.2019 to 23.09.2019	22.33	31.51	91.86	81.86	22.4	3
39	24.09.2019 to 30.09.2019	21.73	31.46	93.14	80.86	109.8	6
40	01.10.2019 to 07.10.2019	22.90	33.47	86.86	72.57	8.2	1
41	08.10.2019 to 14.10.2019	19.77	33.67	79.71	62.29	0	0
42	15.10.2019 to 21.10.2019	19.39	31.60	86.57	76.14	41.2	2
43	22.10.2019 to 28.10.2019	19.74	29.17	87.43	84.14	24.4	4
44	29.10.2019 to 4.11.2019	19.89	32.53	88.43	77.14	2.8	1
45	5.11.2019 to 11.11.2019	18.20	32.73	78.14	70.71	0	0
46	12.11.2019 to 18.11.2019	14.64	32.04	73.71	60.00	0	0
47	19.11.2019 to 25.11.2019	13.86	32.79	76.29	59.71	0	0
48	26.11.2019 to 2.12.2019	10.13	23.50	55.00	43.71	0	0
		<b>Total</b>				<b>1001.1</b>	<b>61</b>

- Average annual rainfall of Amravati district : 851.40 mm
- Actual rainfall from 21<sup>st</sup> to 42<sup>nd</sup> M.W. in 2017 : 1001.1 mm

**Table 1: Seed cotton yield**

Entries	Seed cotton yield (g/plot)					Seed cotton yield (Kg/ha.)				
	RI	RII	RIII	RIV	Mean	RI	RII	RIII	RIV	Mean
T1	6988	5412	6013	6218	6158	1799	1756	1721	1792	1767
T2	6925	7586	6812	7650	7243	1995	2391	1966	2026	2094
T3	8418	9074	8295	9208	8749	2428	2609	2372	2652	2515
T4	7280	8118	9088	4698	7296	2109	2339	2216	1730	2099
T5	7522	7685	7633	8112	7738	2154	1935	2200	2610	2225
T6	5393	4528	5050	5113	5021	1459	1381	1432	1431	1426
S.E. (m) ±					471.80					99.77
C.D.at 5%					1421.64					300.64
C.V. (%)					13.41					9.87

Significantly highest seed cotton yield g/plot was observed in treatment T3 i.e. 8749g/plot but was found at par with T5. In case of seed yield kg per ha., significantly highest seed yield of cotton was found in treatment T3 i.e. 2515kg/ha but found at par with treatment T5.

**Table 2: Ancillary data**

Entries	Final plant count (per Plot)					Plant height (cm)				
	RI	RII	RIII	RIV	Mean	RI	RII	RIII	RIV	Mean
T1	48	48	47	47	47.50	154.80	141.00	151.00	138.00	146.20
T2	48	47	48	47	47.50	171.60	174.40	146.00	122.00	153.50
T3	47	48	48	48	47.75	150.80	159.20	164.00	156.00	156.00
T4	47	48	48	47	47.50	162.60	139.00	180.00	150.20	157.95
T5	47	48	47	47	47.25	163.20	168.40	169.20	172.00	168.20
T6	47	47	47	48	47.25	145.80	138.00	122.60	127.00	133.35
S.E. (m) ±					0.28					6.67
C.D.at 5%					NS					20.12
C.V. (%)					--					8.75

Highest plant stand was found in almost all the treatments. Overall more than ninety percent plant population was observed at harvest time. So any treatment did not show significant effect on final plant stand. In respect of plant height, significantly highest plant height was found in Treatment T5 i.e. 168.20 cm but was found on par with treatments T2, T3 and T4.

**Table 3: Ancillary data**

Entries	Av. number of bolls/ plant					Average boll wt. (g)				
	RI	RII	RIII	RIV	Mean	RI	RII	RIII	RIV	Mean
T1	38.80	41.50	45.20	43.20	42.18	3.71	2.70	2.80	3.05	3.06
T2	46.40	46.60	39.20	36.80	42.25	3.10	3.93	3.61	3.85	3.62
T3	43.20	50.60	42.80	41.40	44.50	4.13	4.14	3.99	4.09	4.09
T4	43.20	46.60	48.20	36.10	43.53	3.59	3.61	3.91	2.71	3.46
T5	40.20	42.80	42.80	40.40	41.55	3.94	3.26	3.78	4.75	3.93
T6	39.40	35.40	37.60	32.20	36.15	2.91	2.66	2.80	3.20	2.89
S.E. (m) ±					1.67					0.22
C.D.at 5%					5.04					0.67
C.V. (%)					8.03					12.73

Significantly highest Avg. No. of balls per plant was recorded in Treatment T3 i.e. 44.50 but found at par with T1, T2, T4 and T5. Significantly highest Avg. Boll weight was observed in treatment T3 i.e. 4.09 g which was on par with T5, T2 and T4.

**Table 4: Ancillary data**

Entries	Monopodia/plant					Sympodia/plant				
	RI	RII	RIII	RIV	Mean	RI	RII	RIII	RIV	Mean
T1	2.6	2.2	2.0	2.6	2.35	18.40	22.80	18.80	18.20	19.55
T2	2.8	2.6	2.0	2.2	2.40	18.20	16.40	18.60	26.20	19.85
T3	2.6	2.4	2.0	3.0	2.50	20.20	21.80	22.80	24.40	22.30
T4	2.4	1.8	2.6	2.0	2.20	20.40	18.00	17.00	19.40	18.70
T5	2.6	3.0	2.4	2.2	2.55	22.60	20.60	20.20	19.20	20.65
T6	2.0	1.2	2.4	1.8	1.85	16.20	17.00	14.80	16.40	16.10
S.E. (m) ±					0.19					1.18
C.D.at 5%					NS					3.56
C.V. (%)					--					12.10

In respect of no. of Monopodia/plant, any treatment did not show significant effect. Significantly highest no. of Sympodia/plant was noticed in treatment T3 but was found at par with T5, T1 and T2.

**Table 5 (A): Ancillary data**

Entries	Chlorophyll content index (%)					Ginning per cent	Seed index	Lint index
	RI	RII	RIII	RIV	Mean			
T1	27.50	28.30	30.40	29.50	28.93	41.41	8.41	6.06
T2	28.20	28.40	30.40	29.20	29.05	40.78	8.49	5.86
T3	30.40	32.60	34.80	30.80	32.15	36.57	8.62	4.99
T4	34.20	33.60	33.20	29.60	32.65	39.94	8.69	5.80
T5	32.80	33.40	34.80	32.40	33.35	40.10	8.62	5.84
T6	28.50	30.40	27.50	28.60	28.75	40.28	8.50	5.74

Highest chlorophyll index was recorded in T5 (33.35%). Highest ginning percent was found in T1 i.e. 41.41 while maximum seed index and lint index was recorded in T4 (8.69) and T1 (6.06) respectively.

**Table 5 (B): Ancillary data**

Entries	Staple length UHML (mm)	Staple Strength Tenacity 3.2 mm (g/tex)	Fibre Micronaire MIC µg/in	Uniformity Ratio UI (%)	EL (%)	MR
T1	29.43	30.05	4.75	83.00	6.33	0.87
T2	29.50	29.68	4.75	83.00	6.23	0.87
T3	29.05	29.65	4.68	82.50	6.30	0.87
T4	29.15	30.88	4.75	82.75	6.20	0.87
T5	28.78	30.98	4.65	82.50	6.33	0.87
T6	29.53	29.70	4.85	82.75	6.33	0.87

Highest staple length (mm), fibre micronaire  $\mu\text{g/in}$  and EL % were recorded in treatment T6 i.e. 29.53 mm, 4.85  $\mu\text{g/in}$  and 6.33% respectively. Highest Staple Strength g/text was found in T5 (30.98 g/text) while maximum Uniformity ratio was observed in Treatment T1 and T2. Any treatment did not show any effect on MR.

**Plant Pathology Data:**

**Incidence of BLB and Grey mildew on tested entries:**

**Methodology:**

The weekly observations on foliar disease like Bacterial blight and Grey mildew was recorded on randomly selected 10 plants by using 0-4 point prescribed grade scale (CICR, Nagpur, 1988).

**Following 0-4 scale used for bacterial blight disease as per AICCIP**

Grade	Disease reaction	Description
0	Immune (I)	Plants completely free from infection
1	Resistant (R)	Spots few scattered nearly 1 mm diameter, dry not coalescing, reddish, angular, veins free, infection area covered up to 5%
2	Moderately Resistant (MR)	Spot initially wet but rapidly drying, reddish brown veins and vein lets free or with dry lesions, leaf area covered 6-10%.
3	Moderately susceptible (MS)	Lesions larger than 2 mm or more in diameter, angular turning brown and black coalescing, spreading linearly along the smaller veins. 11-20% leaf area covered or water soaked. Vein infection along the main veins.
4	susceptible (S)	Lesions larger, water soaked coalescing as above but covering more than 20% leaf area or veins infected and extending up to pulvinus and petioles. Lesions larger and coalescing, water soaked at first, later turning to brown black in severe cases branches and stem also attacked.

**Following 0-4 scale used for Dahiya/grey mildew disease as per AICCIP**

Grade	Disease reaction	Description
0	Immune (I)	No infection
1	Resistant (R)	Small spots covers up to 5% area
2	Moderately Resistant (MR)	Spot bigger covering 6-20% leaf area
3	Moderately susceptible (MS)	Spots coalescing 21 to 40% leaf area covered.
4	susceptible (S)	Many spots coalescing more than 40% leaf area, many leaves fall of

  
**Jr. Agronomist**  
**A.I.C.R.P. on Soybean**  
**R.R.C. (Dr.P.D.K.V.),**  
**AMRAVATI.**

  
**HEAD**  
**Regional Research Centre**  
**(Dr.P.D.K.V.), Amravati.**

**Visual Results:**

During the crop growth period, bacterial leaf blight (BLB) was prominently observed in all the treatment but in very meager incidence and there was no incidence of grey mildew (Dahiya) on respective Treatments.

**Entomology Data:**

**Visual Results:**

**i) Sucking pest:**

Sucking pest like Aphids, Jassids, Thrips and Whiteflies were found in all the treatments but below ETL. Precautionary control measures were taken immediately.

**ii) Green boll damage by American Boll Worm.**

Green boll damage by American Boll Worm was noticed but in very meager.

**iii) Square damage.**

There is no square damage was found up to three picking.

**Tolerance of crop to abiotic stress:**

There is no abiotic stress was observed during entire growth period of crop in this season.

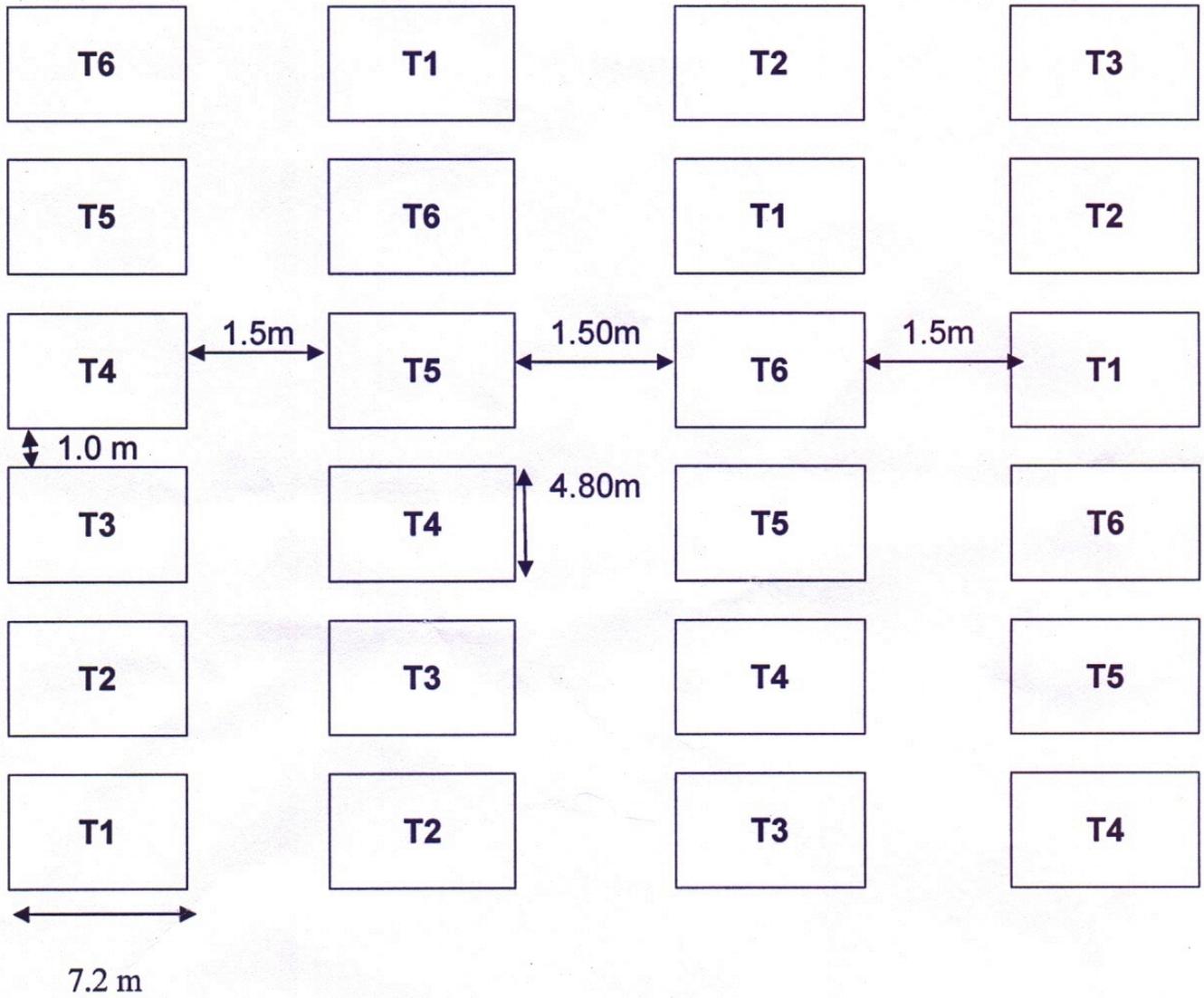
**"This Report is limited only for product testing trial and not as a recommendation"**

  
Jr. Agronomist  
A.I.C.R.P. on Soybean  
R.R.C. (Dr. P.D.K.V.),  
AMRAVATI.

  
HEAD  
Regional Research Centre  
(Dr. P.D.K.V.), Amravati.

  
Director of Research  
Dr. R.D.K.V., Akola

## Lay out of Research Trial



**Annexure-II**  
**Invetsigaotion Profile**

<b>SN</b>	<b>Inverstigators Name</b>	<b>Designation</b>	<b>Remark</b>
01	M. S. Dandge	Assistant Prof. Agronomy	Principal Investigator
02	Dr. S. S. Nichal	Head, RRC, Amravati	Co-Investigator
03	R. S. Ghawde	Assistant Prof. Plant Pathology	Co-Investigator
04	Dr. S. S. Munje	Assistant Prof. Agril. Entomology	Co-Investigator
05	P. V. Mohod	Senior Research Assistant	Co-Investigator
06	H. H. Dikey	Assistant Prof. Agronomy	Co-Investigator
07	U. N. Shinde	Agril. Assistant	Co-Investigator



*Visit of Dr. S. R. Bhonde, Consultant Scientist, ASPL, Nashik at Research Trial, RRC, Amravati*

