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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
(2020-21)

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

Proforma

1. Location:	Regional Research Center, (Dr. PDKV), Amravati	
2. State:-	Maharashtra	
3. Year :-	2020-21	
4. Zone :	Central	
TRIAL:	SAU trial	
Experimental Details:		
Number of Entries :-	01 (Ajeet 155)	
Number of Treatments :	06	
Number of replications :	4	
Number of Rows/ Entry :	4	
Design :	Randomised Block Design (RBD)	
Spacing :-	120 x 60 cm H x H	
Plot Size:	7.20 x 4.80 m^2	
Crop grown during previous season:	Gram	
Soil type :-	Medium Black Soil	
Sowing date :	19/06/2020	
Gap filling date :	29/06/2020	
Thinning date:	29/06/2020	
Fertilizer applied	Chemical Fertilizer applied through Straight Fertilizers viz. Urea, SSP and MOP	
Dose		
	N : P : K	**Date**
Basal Dose	45:65:65	29/6/2020
Top Dressing	40 Kg N	6/7/2020
	40 Kg N	7/8/2020
Number of Irrigations		
	Date	**Irrigation Details**
	23/11/2020	Flood Irrigation
	15/12/2020	Flood Irrigation
	31/12/2020	Flood Irrigation
Weed control/ Mechanical details		
	Date	**Details**
Weeding	8/7/2020	
Weeding	4/8/2020	
Hoeing	9/7/2020	
Hoeing	5/8/2020	

Plant Protection Measures :			
S.N.	**Chemical Dose**	**Days**	**Date**
1.	Neemark 300 ppm (50 ml /10 l water)		2/7/2020
2.	Aceitamaprid 20 SP (1.5 g/10 l water)		22/7/2020
3.	Imidacloprid 200 SC + Carbendazim 50WP		30/8/2020
4.	Neemark 300 ppm + Carbendazim 50WP (50 ml + 10 g/10 l water)		15/10/2011
5.	Emamectin Benzoate 5% SG		10/11/2020
Picking:			
Dates of Picking			
27/11/2020			
18/12/2020			
27/0/2021			

Protocol:

Treatments	Stage I (g/acre)	Stage II (g/acre)	Stage III (g/acre)	Stage IV (g/acre)
	At Sowing (Soil Applin.)	**30 DAS (Foliar Spray)**	**30 DAS (Foliar Spray)**	**30 DAS (Foliar Spray)**
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 2020-21
Regional Research Center (Dr. P.D.K.V.), Amravati

		Temperature (^{0}C)		Relative Humidity (%)		Rainfall	Rainy Days
MW	Weekly Date	$T_{min.}$	$T_{max.}$	RH_I	RH_{II}	(mm)	
17	29.04.2020 to 5.05.2020	16.6	36.2	54.6	28.0	0.0	0
18	6.05.2020 to 12.05.2020	17.7	34.7	55.9	35.4	0.0	0
19	13.05.2020 to 19.05.2020	18.2	36.7	46.4	32.7	5.4	1
20	20.05.2020 to 26.05.2020	18.4	38.5	55.1	31.9	20.8	1
21	27.05.2020 to 03.06.2020	20.9	38.0	64.0	61.4	54.0	2
22	04.06.2020 to 10.06.2020	23.7	36.5	67.4	66.7	20.8	2
23	11.06.2020 to 17.06.2020	22.7	35.2	83.1	75.3	103.0	4
24	18.06.2020 to 24.06.2020	23.5	34.8	80.9	72.3	13.6	2
25	25.06.2020 to 01.07.2020	22.5	35.2	83.1	74.6	58.6	3
26	02.07.2020 to 08.07.2020	22.8	33.4	83.7	86.0	25.4	3
27	09.07.2020 to 15.07.2020	22.4	33.4	85.9	78.7	90.6	4
28	16.07.2020 to 22.07.2020	23.1	32.2	87.9	78.4	83.2	3
29	23.07.2020 to 29.07.2020	22.1	32.8	87.1	79.6	132.8	4
30	30.07.2020 to 05.08.2020	22.6	33.0	86.4	73.3	44.0	3
31	06.08.2020 to 12.08.2020	22.4	30.4	91.6	82.0	26.2	4
32	13.08.2020 to 19.08.2020	20.9	27.0	96.0	93.9	124.0	6
33	20.08.2020 to 26.08.2020	21.3	30.1	90.3	79.0	67.8	4
34	27.08.2020 to 02.09.2020	21.4	30.4	90.3	79.7	44.0	3
35	03.09.2020 to 09.09.2020	22.4	34.6	83.4	74.0	34.2	1
36	10.09.2020 to 16.09.2020	22.3	33.6	90.4	87.3	53.2	3
37	17.09.2020 to 23.09.2020	22.4	33.4	91.0	90.0	32.6	2
38	24.09.2020 to 30.09.2020	21.8	32.3	86.3	75.1	21.2	1
39	01.10.2020 to 07.10.2020	20.0	34.0	81.7	61.3	0.0	0
40	08.10.2020 to 14.10.2020	20.9	31.9	90.7	82.3	19.2	2
41	15.10.2020 to 21.10.2020	21.4	33.1	90.3	83.7	26.0	2
42	22.10.2020 to 28.10.2020	17.7	34.5	78.0	63.6	0.0	0
43	29.10.2020 to 4.11.2020	14.1	32.9	66.9	61.3	0.0	0
44	5.11.2020 to 11.11.2020	10.4	32.2	56.4	59.7	0.0	0
45	12.11.2020 to 18.11.2020	15.7	34.5	160.7	63.3	0.0	0
46	19.11.2020 to 25.11.2020	14.6	32.6	71.6	60.7	0.0	0
47	26.11.2020 to 2.12.2020	13.8	32.5	65.7	53.6	0.0	0
48	3.12.2020 to 9.12.2020	11.3	33.5	64.3	43.1	0.0	0
49	10.12.2020 to 16.12.2020	16.5	31.3	72.9	58.7	0.0	0
50	17.12.2020 to 23.12.2020	10.4	30.6	61.0	45.3	0.0	0
51	24.12.2020 to 31.12.2020	10.5	31.2	64.6	46.1	0.0	0
	Total	**19.1**	**33.3**	**79.0**	**66.2**	**1100.6**	**60**

- Average annual rainfall of Amravati district : 851.40 mm
- Actual rainfall from 21st to 51st M.W. in 2020 : **1100.6 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	7685	5866	6102	6060	6429	2224	1697	1766	1753	1860
T2	7071	7888	7565	8712	7809	2046	2282	2189	2521	2260
T3	9704	10545	9313	9198	9690	2808	3051	2695	2662	2804
T4	7997	8114	8788	7204	8026	2314	2348	2543	2085	2322
T5	7570	7042	7713	10366	8173	2191	2038	2232	2999	2365
T6	5745	5968	5069	6238	5755	1662	1727	1467	1805	1665
S.E. (m) ±					**455.06**					**131.67**
C.D.at 5%					**1371.20**					**396.76**
C.V. (%)					**11.90**					**11.90**

Significantly highest seed cotton yield g/plot was observed in treatment T3 i.e. 9690g/plot. In case of seed yield kg per ha., same trend was observed, Significantly highest seed yield of cotton was found in treatment T3 i.e. 2804kg/ha.

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	140.20	147.20	145.50	162.40	148.83
T2	48	47	48	47	47.50	135.40	155.50	147.20	175.60	153.43
T3	47	48	48	48	47.75	172.70	172.70	167.20	160.50	168.28
T4	47	48	48	47	47.50	162.60	150.00	165.00	150.20	156.95
T5	47	48	47	47	47.25	162.40	150.80	170.80	172.40	164.10
T6	47	47	47	48	47.25	148.60	145.30	144.70	123.80	140.60
S.E. (m) ±					**0.28**					**5.81**
C.D.at 5%					**NS**					**17.51**
C.V. (%)					**--**					**7.48**

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 T3 i.e. 168.28 cm but was found on par with treatments T2, T4 and T5.

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	43.80	43.80	45.60	41.20	43.60	3.68	2.78	2.83	3.12	3.10
T2	45.20	42.60	42.60	47.40	44.45	3.22	3.96	3.67	3.95	3.70
T3	48.40	51.60	46.40	45.60	48.00	4.26	4.28	4.16	4.22	4.23
T4	46.80	45.20	45.60	40.30	44.48	3.66	3.72	4.01	3.82	3.80
T5	40.20	43.60	43.50	47.20	43.63	3.97	3.32	3.81	4.72	3.96
T6	40.20	43.80	38.60	40.60	40.80	3.03	2.88	2.80	3.20	2.98
S.E. (m) ±					**1.31**					**0.17**
C.D.at 5%					**3.95**					**0.50**
C.V. (%)					**5.94**					**9.10**

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Significantly highest Avg. No. of balls per plant was recorded in Treatment T3 i.e. 48.00 but found at par with T5, T4 and T2. Significantly highest Avg. Boll weight was observed in treatment T3 i.e. 4.23 g which was on par with T4 and T5.

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	18.20	21.60	19.40	17.80	19.25
T2	2.8	2.6	2.0	2.2	2.40	19.40	17.60	19.20	26.40	20.65
T3	2.6	2.4	2.0	3.0	2.50	22.40	23.60	21.50	24.40	22.98
T4	2.4	1.8	2.6	2.0	2.20	19.60	17.80	17.40	20.60	18.85
T5	2.6	3.0	2.4	2.2	2.55	20.80	24.40	23.20	18.60	21.75
T6	2.0	1.2	2.4	1.8	1.85	18.60	16.80	13.50	19.20	17.03
S.E. (m) ±					**0.19**					**1.23**
C.D.at 5%					**NS**					**3.72**
C.V. (%)					**--**					**12.32**

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 (22.98) but was found at par with T5, T2 and T1.

Table 5 (A): Ancillary data

Entries	Chlorophyll content index (%)					Ginning per cent	Seed index	Lint index
	RI	RII	RIII	RIV	Mean			
T1	30.20	29.40	31.20	28.20	29.75	37.15	8.45	5.02
T2	29.60	29.20	28.70	32.60	30.03	36.48	8.55	4.92
T3	32.60	33.20	34.10	33.20	33.28	38.26	8.71	5.48
T4	34.40	33.80	34.20	30.30	33.18	35.15	8.57	4.66
T5	32.60	34.20	35.90	33.20	33.98	37.12	8.60	5.10
T6	28.70	33.10	25.20	28.40	28.85	36.10	8.49	4.80
S.E. (m) ±					**1.00**			
C.D.at 5%					**3.01**			
C.V. (%)					**6.35**			

Highest chlorophyll index was recorded in T4 (33.98%). Highest ginning percent was found in T3 i.e. 38.26 while maximum seed index and lint index was recorded in T4 i.e. 8.71 and 5.48 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	27.05	25.93	3.20	83.75	6.18	0.81
T2	27.35	26.43	3.20	84.00	6.30	0.81
T3	26.53	25.93	3.38	83.00	6.40	0.82
T4	26.40	26.28	3.20	83.50	6.30	0.81
T5	27.28	26.33	3.23	84.00	6.48	0.81
T6	26.68	26.40	3.35	83.75	6.48	0.81

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Highest staple length (mm), Staple Strength g/text and Uniformity ratio were recorded in treatment T2 i.e. 27.35mm, 26.43 g/tex and 84% respectively. Highest fibre micronaire µg/in and MR was observed in Treatment T3 while maximum EL % was recorded in Treatment T5 and T6 i.e. 6.48%

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 min 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

Visual Results:

During the crop growth period, bacterial leaf blight (BLB) and grey mildew (Dahiya) were not observed in all the treatment and there was a very meager incidence of Alternaria was

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recorded on all respective Treatments. Due excessive moisture and infestation of pink ball worm, internal ball rotting was observed in most of the 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 and Pink Boll Worm were noticed but in very meager.

iii) Square damage.

There is no square damage was found up to two 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"

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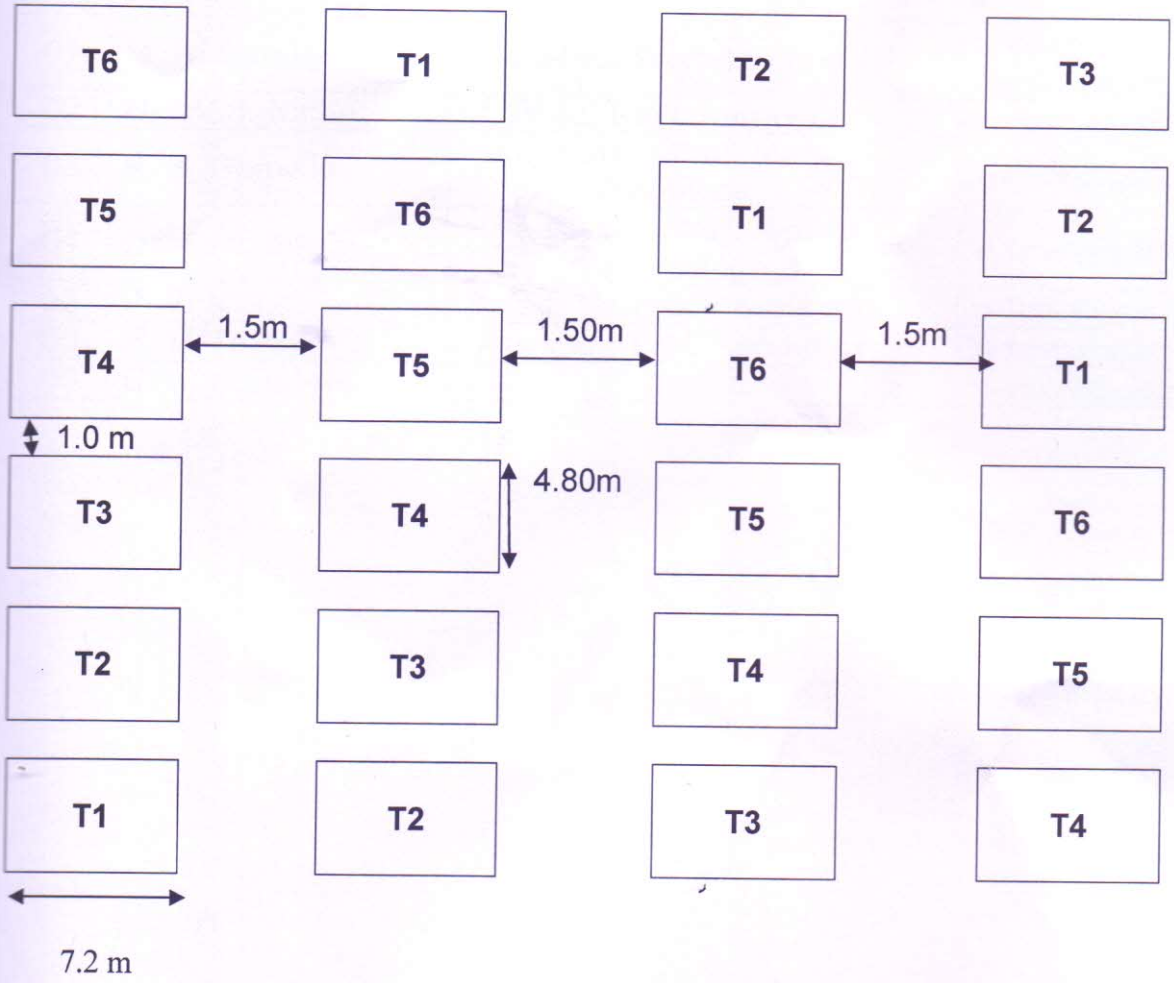
Lay out of Research Trial



Annexure-II
Invetsigaotion Profile

SN	Inverstigators Name	Designation	Remark
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

Field View