

TAMIL NADU AGRICULTURAL UNIVERSITY

PROCEEDINGS

**37th Cotton Scientists' Meet 2019
(April 22-23, 2019)**

Lead Centre
Department of Cotton
Centre for Plant Breeding and Genetics
Coimbatore- 641 003

Directorate of Research
Tamil Nadu Agricultural University
Coimbatore 641 003

2019

37th Cotton Scientists' Meet 2019 (April 22-23, 2019)

PROCEEDINGS

The 37th Cotton Scientists Meet was held during April 22-23, 2019 at the Tamil Nadu Agricultural University, Coimbatore. **Dr. N. Kumar** flagged off the event narrating the cotton production scenarios in the state of Tamil Nadu. **Dr. K.S. Subramanian**, Director of Research presented the research highlights of the year 2018-19 including varieties and technologies developed for adoption. He encouraged the cotton scientists to develop Bt cotton with multiple resistance, interspecific hybridization to evolve genotypes tolerance to abiotic and biotic stresses, farm mechanization and crop boosters to sustain farm productivity. **Dr. K.R. Ashok**, Director (CARDS) elucidated the reasons for declining cotton area and production in India and Tamil Nadu over the years. The action taken reports on the 36th Cotton Meet was presented by the lead scientists from the Department of cotton. The technical directors had reviewed the on-going university research projects (25), action plan projects (2), core projects (8), AICRPs (2) besides externally funded projects (7). **Dr. S. Geetha**, Director (CPBG), **Dr. V. Geethalakshmi**, Director (Crop Management) and **Dr. K. Prabakar**, Director (CPPS) presented the significant outcomes of the review and proposed action plan for the year 2019-2020. The Vice Chancellor concluded the meet with a note to the scientists to propose externally funded projects to improve the quality of research in TNAU.

The proceedings of the 37th Crop Scientists' Meet on cotton 2019 were furnished under the following headings:

I. CROP IMPROVEMENT

- A. Decisions made on the entries for Variety Release Proposal/ART/MLT evaluation
- B. Research projects on cotton
- C. Remarks on the ongoing university research projects/AICRP/Externally funded projects
- D. General remarks
- E. Action Plan 2019-2022

II. CROP MANAGEMENTT

- A. Decisions made on OFT
- B. Research projects on cotton
- C. Remarks on the ongoing University Research projects/AICRP/Externally funded projects
- D. General remarks
- E. Action Plan 2019-2022

III. CROP PROTECTION

- A. Decisions made on OFT
- B. Research projects on cotton
- C. Remarks on the ongoing university research projects/AICRP/Externally funded projects
- D. General remarks
- E. Action Plan 2019-2022

IV. CLOSING REMARKS & WAY FORWARD

V. PARTICIPANTS

I. CROP IMPROVEMENT

A 1. Entry for variety release proposal

Culture	Pedigree	Duration (days)	Seed cotton yield (kg/ha)	Yield increase over Suraj (%)	Special features
TCH 1819	Khandwa 2 x LH 220	125-135	1835	1595	<ul style="list-style-type: none"> • Compact and erect plant type • Zero monopodia and short sympodial branch • 15-20 bolls/plant • Boll weight between 3.50 g and 4.00 g • Synchronized boll maturity • High ginning outturn of 35.10 % • Upper Half Mean Halo length is 27.0 mm • High bundle strength of 26.1g/tex

A 2. Entry proposed for Central Variety Identification Committee

Culture	Pedigree	Duration (days)	Seed cotton yield (kg/ha)	Yield increase over Suvin (%)	Special features
TCB 37	Selection from EC 101786	185	1048	24.5	<ul style="list-style-type: none"> • Ginning outturn : 32.3 % • High fibre length of 34.0mm • Fibre strength : 36.3 g/tex • Fibre uniformity : 49.7 • Minimum micronaire value of 3.4 µg/inch

A 3. Popularization of SVPR HYBRID 1

Hybrid name	Pedigree	Duration (days)	Seed cotton yield (kg/ha)	Yield increase over Bunny (%)	Special features
Cotton Hybrid SVPR 1	TSH 311 X TSH 306	165	2216	16.4	<ul style="list-style-type: none"> • Ginning outturn : 35.8 % • Boll weight : 4.3 g • UHML : 28.1 mm • Fibre strength : 27.0 g/ tex • Micronaire value :4.0 µg/inch

A 4. Cultures nominated for ART- I

S. No	Culture	Duration (days)	Seed cotton yield (kg/ha)	Yield increase Over CO 14 /SVPR 4	Special features
1	TCH 1828	150	1825	17.0 per cent increase over CO 14	<ul style="list-style-type: none"> • Ginning outturn : 35.2 % • Boll weight : 4.3 g • UHML : 31.6 mm • Fibre strength : 30.7 g/tex • Micronaire value : 4.6 µg/inch
2	TSH 325	150	2155	29.8 per cent increase over SVPR 4	<ul style="list-style-type: none"> • UHML : 28.5 mm • Fibre strength : 28.2 g/tex • Micronaire value : 4.6 µg/inch • Moderately resistant to leaf hopper
3	TCH 1199	150	2210	10.9 per cent increase over CO 14	<ul style="list-style-type: none"> • Ginning outturn :35.2 • UHML : 28.7 mm • Fibre strength : 26.5 g/tex • Micronaire value : 4.9 µg/inch
4	TSH 0533	150	1945	22.8 per cent increase over SVPR 4	<ul style="list-style-type: none"> • Ginning outturn :34.2 • UHML : 29.5 mm • Fibre strength : 30.1 g/tex • Micronaire value : 4.2 µg/inch
Checks : CO14 and SVPR 6					

Distribution of ARTs

Trial	<i>Gossypim hirsutum</i>	
Season	Winter Irrigated	Summer Irrigated
Districts	Coimbatore , Theni, salem , Dharmapuri, Erode, Villupuram, Namakkal, Tiruppur, Trichy and Dindigul	Theni, Salem, Tuticorin, Virudhunagar, Tirunelveli, Madurai, Dindigul, Thanjavur, Trichy and Thiruvarur

A5. Cultures nominated for ART- II

S.No	Culture	Duration (Days)	Seed cotton yield (Kg/ha)	Yield increase over (%)		Special features
				SVPR 4	KC 3	
1.	TKH 1197	140	1081	16.7	10.6	<ul style="list-style-type: none"> Ginning outturn : 36.8 Fibre length: 39.9 mm Fibre strength: 30.2 g/tex Micronaire value : 3.4 µg/inch Highly resistant to leaf hopper and tolerant to drought
2.	TKH 1185	140	1033	17.9	14.9	<ul style="list-style-type: none"> Ginning outturn : 36.6 Fibre length: 32.5 mm Fibre strength: 28.8g/tex Micronaire value : 3.6 µg/inch
Checks: SVPR 4 and KC 3						

Distribution of ARTs

Trial	<i>Gossypium hirsutum</i>
Season	Winter rainfed
Districts	Tuticorin, Virudhunagar, Tirunelveli, Ramanathapuram, Madurai and Perambalur

A6. Cultures nominated for OFT

S.No.	Culture	Duration (Days)	Seed cotton yield (Kg/ha)	Yield increase over (%)		Special features
				SVPR 4	KC 3	
1.	TKH 1197	140	1081	16.7	10.6	<ul style="list-style-type: none"> • Ginning outturn : 36.8 • Fibre length: 39.9 mm • Fibre strength:30.2 g/tex • Micronaire value: 3.4 µg/inch • Highly resistant to leaf hopper and tolerant to drought
2.	TKH 1185	140	1033	17.9	14.9	<ul style="list-style-type: none"> • Ginning outturn : 36.6 • Fibre length: 32.5 mm • Fibre strength: 28.8 g/tex • Micronaire value: 3.6 µg/inch
Checks : SVPR 4 and KC 3						

A7. MLT on *G. hirsutum* (Variety)

Design : RBD	No. of replications	:	Three
Plot size : 6m x 4.5 m (27 m ²)	Seed Quantity	:	200 g/entry/location
Spacing : 90 x 30 cm	Season	:	Winter irrigated and Winter rainfed

Features of the MLT cultures

S. No.	Culture	Parentage	Seed cotton yield (kg/ha)	Duration (Days)	Special features
1.	TSH 363 (N)	SVPR 3 x GJHV 370	1667	150	<ul style="list-style-type: none"> • Ginning outturn : 35.5 • UHML (mm) : 30.0 • Fibre strength (g/tex):29.8 • Micronaire value :4.3 µg/inch

2.	TSH 383 (N)	SVPR 3 x H 96	2501	150	<ul style="list-style-type: none"> • Ginning outturn : 35.6 • UHML (mm) : 27.4 • Fibre strength (g/tex) : 28.4 • Micronaire value :4.6 µg/inch
3.	TVH 003 (N)	Suraj x CPD 1452	1640	150	<ul style="list-style-type: none"> • Fibre length :34.3 mm • Fibre strength :26.4 g/tex • Micronaire value :3.5 µg/inch
4.	TVH 005 (N)	Suraj x AKH 08-3	1651	150	<ul style="list-style-type: none"> • Fibre length :31.6 mm • Fibre strength 27.5 g/tex • Micronaire value :4.2 µg/inch
5	TKH 1225 (N)	BS 49 x SVPR 4	1221	135-140	<ul style="list-style-type: none"> • UHML (mm) :30.0 • Fibre strength (g/tex): 21.6
6	TCH 1837 (R)	TCH 1002 x SRT -1	1978	150	<ul style="list-style-type: none"> • Ginning outturn : 33.7 • UHML (mm) :29.3 • Fibre strength (g/tex): 27.5 • Micronaire value : 4.6 µg/inch
7	TSH 324 (R)	GJHV 97/6/2 X H99	1938	150	<ul style="list-style-type: none"> • Ginning outturn : 34.7 • UHML (mm) :30.0 • Fibre strength (g/tex): 29.5 • Micronaire value : 3.7 µg/inch
8	TSH 357 (R)	TSH 311 x TSH 306	2278	150	<ul style="list-style-type: none"> • Ginning outturn : 35.2 • UHML (mm) : 29.8 • Fibre strength (g/tex): 28.9 • Micronaire value: 4.4 µg/inch • Moderately resistant to leaf hopper under field condition
9	TSH 367 (R)	MCU 13 x	2349	150	<ul style="list-style-type: none"> • Ginning outturn : 37.6 • UHML (mm) : 28.2

		GJHV 97/6/2			<ul style="list-style-type: none"> • Fibre strength (g/tex) : 26.6 • Micronaire value :4.5 µg/inch • Moderately resistant to leaf hopper under field condition
Checks	SVPR 6, CO14 and KC 3				
Locations	Winter irrigated: Dept.of Cotton, Coimbatore and CRS, Srivilliputhur Winter rainfed :ARS, Kovilpatti, CRS, Veppanthattai and RRS, Aruppukottai Summer irrigated : CRS, Srivilliputtur and TRRI, Aduthurai				

A8. MLT on *G. hirsutum* (Compact)

Design : RBD	No. of replications	:	Three
Plot size : 6m x 4.5 m (27 m ²)	Seed Quantity	:	300 g/entry/location
Spacing : 90 x 30 cm	Season	:	Winter irrigated, Winter rainfed and Summer irrigated

Features of the MLT cultures

S. No.	Culture	Parentage	Seed cotton yield (kg/ha)	Duration (Days)	Special features
1.	TVH 002 (N)	Suraj x TCH 1819	1925	130-140	<ul style="list-style-type: none"> • Fibre length (mm) : 20.4 • Fibre strength (g/tex): 24.0 • Micronaire value: 4.3 µg/inch
2.	TCH 1897 (R)	Selection from BPCH 1101-5	2079	125-135	<ul style="list-style-type: none"> • Fibre length (mm) : 28.8 • Fibre strength (g/tex): 27.3 • Micronaire value: 3.42 µg/inch
Checks	Suraj and CO 15				
Locations	Winter irrigated : Dept.of Cotton, Coimbatore and CRS, Srivilliputhur Winter rainfed : ARS, Kovilpatti, CRS, Veppanthattai and RRS, Aruppukottai Summer irrigated : CRS, Srivilliputhur and TRRI, Aduthurai				

A9. MLT on *G. arboreum* (Variety)

Design : RBD	No. of replications	: Seven
Plot size : 6m x 5.4 m (33 m ²)	Seed Quantity	: 250 g/entry/location
Spacing : 90 x 30 cm	Season	: Winter irrigated and Winter rainfed

Features of the MLT cultures

S. No.	Culture	Parentage	Seed cotton yield (kg/ha)	Duration (Days)	Special features
1.	TKA 0365	CINA 329 x Gshr 820/91	886	135 -140	Ginning outturn (%) : 34.9 2.5% Span length : 29.2mm Bundle Strength :23.4(g/t) Fibre Fineness : 5.6
Checks		K 11 and K 12			
Locations		Winter rainfed : ARS, Kovilpatti, CRS, Veppanthattai and RRS, Aruppukottai			

Important Dates in conduct of MLT & ART

Date of receiving the seed material of the proposed entries at Coimbatore	15.06.2019
Date of dispatching the coded entries for ART/ MLT as per season's requirement	30.06.2019
Date of receiving sowing report at CBE season wise	Winter irrigated 15.09.2019 Winter rainfed 15.10.2019 Summer irrigated 20.03.2020
Visit of MLT/ monitoring teams	Coimbatore Nov. 2019 and May 2020 Srivilliputhur Nov. 2019 and May 2020 Veppanthattai Dec. 2019 Kovilpatti Dec. 2019
Visit of ART monitoring team season wise	Winter irrigated November 2019 Summer irrigated April 2020 Winter rainfed December 2019
Date for receiving the trials results at CBE for compilation season wise	Winter irrigated 31.03.2020 Winter rainfed 15.04.2020 Summer irrigated 31.03.2020

Monitoring team to visit MLT

Name of the scientist (s)	Station to be visited
Dr.M.Gnanasekaran, AP (PBG), CRS, SVPR Dr.S. Hariramakrishnan,AP(PBG), ARS, KPT	Department of Cotton, Coimbatore
Dr. S.Rajeswari, Professor and Head, Dept. of Cotton, Coimbatore Dr. N. Premalatha, AP (PBG), Dept. of Cotton, Coimbatore	Cotton Research Station, Veppanthattai Regional Research Station, Aruppukkottai
Dr. L. Mahalingam , Professor (PBG), Dept. of Cotton, Coimbatore Dr. N. Sakthivel AP (PBG), CRS, VPT	Cotton Research Station, Srivilliputhur
Dr. S. Sivakumar, P&H, CRS, VPT Dr. M. Gnanasekaran, AP(PBG), CRS, SVPR	Agricultural Research Station, Kovilpatti

B. Research Projects on Cotton

S.No	Centres	URP	AICRP	EFP	CP	Total	No. of Scientists
1	Coimbatore	5	1	1	2	9	3
2	Srivilliputhur	3	1	-	-	3	2
3	Veppanthattai	1	-	-	-	1	2
4	Kovilpatti	3	-	-	-	3	2
5	CPMB (National PDF)	-	-	1	-	1	-
6	Aduthurai	1	1	-	-	2	1
	Total	13	3	2	2	20	10

C. Remarks on the ongoing research sub projects

S.No.	Project No. & Project title	Project Leader	Duration	Remarks
1.	CPBG/CBE/PBG/COT/2016/001: Maintenance and evaluation of germplasm stocks of <i>G.barbadense</i> and <i>G.hirsutum</i>	Dr. N. Premalatha	June 2015 to May 2020	The germplasm accessions may be documented in character wise for using in crossing programme for the development of new variety. The project may be continued.

2.	CPBG/ CBE/ PBG/ COT/ 2016/002: Development of high yielding jassid resistant cotton varieties by introgression of genes from wild species	Dr. L.Mahalingam	June 2016 to May 2021	Jassid resistant variety with high yield may be evolved. The project may be continued.
3.	CPBG/ CBE/ PBG/ COT/ 2016/003: Maintenance and production of nucleus and breeder seeds of cotton varieties of Department of Cotton, Coimbatore.	Dr. L.Mahalingam	June 2016 to May 2021	Breeder seed should be supplied over and above the targeted quantity for the indent received from state government and private seed production agencies without any shortfall. The project may be continued.
5.	CPBG/CBE/PBG/COT/ 2017/001: Breeding for long and extra long staple cotton genotypes with high ginning out turn.	Dr. S. Rajeswari and Dr. N. Premalatha	June 2017 to May 2022	Desirable segregants may be selected with high yield in F ₂ generations. The project may be continued.
6.	CPBG/SVP/PBG/COT/2016/001: Evolution of short duration and high yielding cotton (<i>Gossypium hirsutum</i> L.) genotypes suitable for rice fallow and rainfed conditions of southern districts of Tamil Nadu	Dr. K. Thiyagu	August 2016 to July 2021	Title of the project should be renamed. The project may be continued.
7.	CPBG/SVP/PBG/COT/2016/002: Evolving high yielding medium staple upland cotton varieties (<i>Gossypium hirsutum</i> L.) resistant to jassids for summer irrigated tracts of Tamil Nadu	Dr. M. Gnanasekaran	April 2016 to March 2021	Number of crosses should be limited with specific objectives. The project may be continued.
8.	CPBG/SVP/PBG/COT/2015/004: Maintenance of mass pedigree lines and production of nucleus and breeder seeds of SVPR 2, SVPR 3 and SVPR 4 cotton varieties	Dr. K. Thiyagu	June 2015 to May 2020	Breeder seed should be supplied over and above the targeted quantity for the

				indent received from state government and private seed production agencies without any shortfall. The project may be continued.
9.	CPBG/KPT/PBG/COT/2015/006: Evolution of medium staple <i>G.hirsutum</i> cotton cultivar with resistance to leaf hopper (Jassids)	Dr. A.Ramalingam	Sept.2015 to Aug. 2020	The project may be continued
10.	CPBG/KPT/PBG/COT/2015/007: Evolving of high yielding <i>G.arboreum</i> cotton varieties suitable for rainfed condition in southern districts of Tamil Nadu	Dr. S. Hari Ramakrishnan	Oct. 2015 to Sept. 2020	The project may be continued
11.	CPBG/KPT/PBG/COT/2018/001: Nucleus and breeder seed production of cotton varieties of Tamil Nadu	Dr. S. Hari Ramakrishnan	Oct.2018 to Sept.2021	Breeder seed should be supplied over and above the targeted quantity for the indent received from state government and private seed production agencies without any shortfall. The project may be continued.
12.	CPBG/VPT/PBG/COT/2016/002: Development of high yielding long staple cotton varieties and hybrids for winter rainfed tracts in Tamil Nadu	Dr. S.Sivakumar	Dec. 2015 to Dec. 2019	Research programme may be intensified and the variety should be released at the earliest since the station established long back. The project may be continued

13.	Core Project: Identification and evaluation of high yielding compact genotypes in cotton fitting to high density planting system	Dr. N.Premalatha	June 2018 to May 2020	The project may be continued
14.	AICRP/ PBG/ CBE/ COT/ 023: ICAR- All India Coordinated Research Project on Cotton	Dr.S.Rajeswari	2017-18 to 2019-20	The project may be continued
15.	AICRP/PBG/SVR/COT/024 : AICRP on Cotton improvement at CRS, Srivilliputtur	Dr. K. Thiyagu	2017-18 to 2019-20	The project may be continued
16.	DBT/CPBG/CBE/COT/2017/004: DBT Network project – Development of consensus genetic linkage map for <i>Gossypium</i> L. spp. with SNP markers and QTL analysis for fibre traits.	Dr. N.Premalatha		The project may be continued
17.	CPBG/ADT/PBG/GMC/2017/001: Evolving sunnhemp variety with high biomass suitable to Cauvery Delta Zone of Tamil Nadu	Dr. R.Puspha	Sept.2017 to Aug. 2020	Screening of AICRP entries for high biomass and fibre quality for releasing new variety to fit in Cauvery delta Zone. The project may be continued

D. General remarks:

1. Ploidy level Confirmation by flow cytometry & polyploidation may be done using Oryzalin. (Action: Department of Cotton, TNAU, Coimbatore).
2. Evaluation of prerelease cultures may be taken up in co-ordination with crop management group (Action: Director, DCM, Director, NRM, Director, CPBG).

E. ACTION PLAN (2019 – 2022)

Theme No 1	Development of pre-breeding materials by introgression of wild species			
Theme Leader	Dr. L.Mahalingam, Professor (PBG), Dept. of Cotton, Coimbatore			
Name of the scientist and Centre	2019-20	2020-21	2021-22	Deliverables
Dr.N.Premalatha, Asst. Prof. (PBG) Department of Cotton, TNAU, Coimbatore	<ul style="list-style-type: none"> Raising of parents and effecting crosses with wild species (MCU 5 & TCH 1819 as female parent & <i>G. armourianum</i>, <i>G. aridum</i> & <i>G. anamolium</i> (Aug 2019 – Jan 2020) 	<ul style="list-style-type: none"> Raising of F₁, hybridity confirmation and polyploidation by colchicine treatment (Feb 2020 – July 2020). Raising of hexaploids and selfing (Aug 2020 – Jan 2021) 	<ul style="list-style-type: none"> Identification of tetraploid using flow cytometer and repeated backcross with CO 14 Evaluation of leaf hopper resistant population Development of leaf hopper resistant lines (Feb 2021– July 2022) 	<ul style="list-style-type: none"> Development of cotton genotypes with wide genetic base. Identification of cotton genotype with good fibre quality and jassid resistance.

Theme No 2	Development of Zero monopodia and short sympodia cotton genotypes			
Theme Leader	Dr.S.Rajeswari, Professor and Head, Dept. of Cotton, TNAU, Coimbatore			
Name of the scientist and centre	2019-20	2020-21	2021-22	Deliverables
<p>Dr.S.Sivakumar, Professor (PB&G) & Head CRS,Veppanthattai</p> <p>Dr. M. Gunasekaran, Professor (PB&G),ARS Aruppukottai</p> <p>Dr. N.Premalatha, Asst. Professor (PBG), Dept. of Cotton</p> <p>Dr.M.Gnanasekaran Asst. Professor (PB&G), CRS,Srivilliputhur</p> <p>Dr.S.Hariramakrishnan Asst. Prof.(PB&G), ARS, Kovilpatti</p>	<ul style="list-style-type: none"> • Development of double crosses involving four parents (KC2 x TCH 1819) (CO 14 x TVH 002) (CBE) (Crossing block - May – Sep' 2019) at Coimbatore • Double crossing (Oct 2019 - Jan 2019-20) at Coimbatore • Raising of DCF₁ population and selfing at SVPR (Feb - May 2020) • Evaluation of DCF₂ at CBE (May- Sep 2020) 	<ul style="list-style-type: none"> • Evaluation of DCF₃ families at SVPR, CBE, VPT, KPT and APK (Oct- Jan 2020-21) • Generation advancement at SVPR (Feb - May 2021) 	<ul style="list-style-type: none"> • Generation advancement and screening for leaf hopper at CBE (May – Sep 2021) • PYT at CBE, SVPR, VPT, KPT (Oct-Jan 2021-22) • Seed multiplication of promising lines at SVPR (Feb - May 2022) 	Evolution of high yielding compact variety with jassid resistance

Theme No. 3	Rapid Generation Advancement for improving boll weight in Desi cotton			
Theme Leaders	Dr.A.Ramalingam, professor (PBG), ARS, Kovilpatti			
Name of the scientist and centre	2019-20	2020-21	2021-22	Deliverables
<p>Dr.S.Sivakumar, Professor (PBG) & Head,CRS, Veppanthattai</p> <p>Dr.M.Gunasekaran, Professor (PBG) ARS, Aruppukottai</p> <p>Dr.K.Thiyagu, Asst.Prof. (PBG), CRS,Srivilliputhur</p> <p>Dr.S.Hariramakrishnan, Asst.Prof.(PB&G), ARS, Kovilpatti</p>	<ul style="list-style-type: none"> • Crossing block (Camilla with 3 parents – K12, RG 8 & PA 812) at KPT (May – Sep 2019) • Fixing of F₁ at KPT (Oct 2019 -Jan 2019-20) • Evaluation of F₂ at SVPR (Feb 2020 - May 2020) 	<ul style="list-style-type: none"> • Evaluation of F₃ at KPT (May – Sep'2020) • Evaluation of F₄ at KPT, VPT & APK (Oct 2020 -Jan 2021) • Seed multiplication of stabilized lines at SVPR (Feb -May 2021) 	<ul style="list-style-type: none"> • PYT at KPT (May – Sep 2021) • MLT/OFT at KPT, VPT & APK (Oct-Jan 2021-22) • Proposal for variety release (Feb-May 2022) 	<p>Development of desi cotton variety with higher boll weight and high yield</p>

CROP MANAGEMENT

A. Decisions made on OFT

Salient Findings:

Application of Mepiquat chloride spray @ 50 g a.i /ha at square formation and boll development stage and tembotrione spray @ 200 ml/ha at 130 days after sowing recorded higher number of bolls per plant (14.9) with higher seed cotton yield (2189 kg/ha) with higher net return (Rs. 50575/ha) in the cotton genotype.

On Farm Testing				
1.	Study on growth retardant and defoliant in cotton	Dr. R. Veeraputhiran, Asst. Professor(Agro.),CRS, Srivilliputtur (Lead centre)	April 2018 to March 2019	Demonstration in farmers field
2.	Study on growth retardant and defoliant in cotton	Dr.N.Sakthivel (Assoc. Prof), Dept. of cotton	June 2018- May 2019	
3.	Study on growth retardant and defoliant in cotton	Dr. S.Subbulakshmi, Asst. Prof (Agro.), ARS, Kovilpatti	October' 2018 to May 2019	

B. List of URP/AICRP

Crop	DCM			NRM		TOTAL
	CENTRE	URP	AICRP	URP	AICRP	
Cotton	Coimbatore	1	1	-	2	4
	Srivilliputtur	1	1	-	-	2
	Veppanthattai	1	-	-	-	1
	Kovilpatti	1	-	-	1	1
Aduthurai	Aduthurai	-	1	-	-	1

C. Remarks on the ongoing University research projects

Sl. No	Project No. and Title	Scientists incharge	Duration	Remarks
University Research Projects				
1	DCM/SVPR/AGR/COT/2016/001 Management of plant density and architecture under high density planting system (HDPS) for mechanized cotton production	Dr.R.Veeraputhiran Assistant Professor (Agronomy) CRS, Srivilliputtur	July, 2016 to June, 2019	1.STCR based nutrient management worked out 2.The experiment may be continued for one more year
2	DCM/CBE/AGR/COT/2018/001 Nutrient management for cotton under high density planting system(HDPS)	Dept. of Cotton, TNAU, CBE (Main Centre) Dr.S.Thirubarassan Asst. Professor (Agronomy)	June 2018 to May 2021	The experiment may be continued
3	DCM/KPT/AGR/COT/2016/001 Drought mitigation technology for rainfed cotton	Dr.S.Subbulakshmi Asst.Prof (Agronomy), ARS, Kovilpatti	October 2016 to July 2019	Continued
4	DCM/KPT/AGR/COT/2016/001 Effect of drought mitigation technology on growth and yield of rainfed cotton.	Dr.N.Meyyazhagan Professor(Agro.) Cotton Research Station, Veppanthattai	August 2016 to July,2019	Continued
AICRP				
1	AICRP/ PBG/SVR/ COT/024/ AICRP on Cotton	Dr.R.Veeraputhiran Assistant Professor (Agro.)	Apr'2018 to March, 2021	Continued
2	AICRP/ PBG/CBE/ COT/023/ AICRP on Cotton	Dr. R.Kalpna Assoc. Prof (Agro.) Department of Cotton	April 2018 to March 2019	Continued
3	AICRP/NRM/CBE/SAC/004 /AICRP on Cotton	Dr. T. Chitdeshwari, Professor (SS&AC) Dr.D.Jegadeeswari, Assoc. Prof. (SS&AC) Dept. of Soil Science & Agrl. Chemistry, NRM, TNAU,Coimbatore	2018 - 2020	Continued
4	AICRP/NRM/TRY/005/ AICRP on Cotton	Dr.A.Alagesan Assistant Professor (Agro.) ADAC& RI, Tiruchirappalli	2018-2019	Continued

5	KOVI/INM/CROP/2017-LT/OS All India Coordinated Research Project for Dryland Agriculture (AICRPDA)	Dr. V. Sanjivkumar Assistant Professor (SS&AC) Dr. K. Baskar Prof.(SS&AC), ARS, Kovilpatti	2018-2019	Continued
6	PROJECT NP (JA) 6.19 (modified): Nutrient management for mesta based cropping system	TRRI. Aduthurai	2018-19	Continued

D. General remarks:

1. Drought mitigation technology for rainfed cotton demonstrated in the farmers field (**Action:** Veppanthattai and Kovilpatti)
2. Split application of nutrients study may also be given to students (**Action:** Coimbatore and Srivilliputhur)

E. New Action plan proposals for 2019 – 2020

Sl.No.	Title	Centres and Scientists	Period	Remarks
1.	<p>Drought management for Rainfed cotton</p> <p>Objective: To study the land configuration and drought management options on rainfed cotton productivity</p> <p>Treatments: T₁ - Control T₂ - Broad bed furrow (BBF) T₃ - BBF+ Super absorbent 12.5 kg/ha T₄ - T₃ + Foliar application of 2% KNO₃ + T₅ - T₃ + Salicylic Acid 100 ppm T₆ - T₃ + 1% PPFM</p>	<p>1.Dr.S.Subbulakshmi, Asst.Prof (Agro.), ARS, Kovilpatti</p> <p>2.Dr.N.Meyyazhagan, Professor (Agro.) Cotton Research Station, Veppanthattai</p>	2019 2021	Proposal may be submitted through proper channel to obtain URP number

<p>2.</p>	<p>Split application of N in cotton Objectives: To study the split application of N on growth and yield To study the nutrient uptake pattern Treatments: T1 – Absolute control T2 – Control –Three split (Basal + 2 top dressing at 25 and 45 DAS) T3- Four splits (Basal, 25,45,65 DAS) T4- Five splits (Basal, 25,45,65,85 DAS) T5 – Six splits (Basal, 25,45,65, 85, 105 DAS)</p>	<p>Centres: 1.Dept. of Cotton, TNAU, CBE (Main Centre) 2.CRS, Srivilliputtur</p>	<p>2019 - 2021</p>	<p>Proposal may be submitted through proper channel to obtain URP number</p>
<p>3.</p>	<p>Physiological effects of high temperature on popular Cotton varieties Objectives 1.Physiological parameters of high temperature effects on cotton varieties during reproductive stage 2. Impact on growth and yield parameters, partitioning of biomass, WUE and NUE in cotton Treatments: 1. Control (Ambient temp) 2. Ambient temp + 1°C 3. Ambient + 2 °C</p>	<p>Coimbatore centre Experiment conducted in the main centre Kovilpatti & Arupukottai Field evaluation during summer season</p>	<p>2019-2020</p>	<p>Proposal may be submitted through proper channel to obtain URP number</p>

	<p>Observations to be made</p> <ul style="list-style-type: none"> • Cell membrane integrity • Chlorophyll stability index • Relative water content • Chlorophyll index • Canopy temperature • Yield and yield components <p>Expected Outcome: Varieties tolerant to high temperature will be identified</p>			
4.	<p>Synchronized flowering in cotton nutrients and PGRs under changing climate</p> <p>Treatment Details:</p> <ol style="list-style-type: none"> 1. Control 2. Mepiquat chloride @ 125ppm 3. Ethrel @ 20ppm 4. Ethrel @ 30ppm 5. Ethrel @ 40ppm <p>*Foliar spray during 35-45 DAS</p> <p>Observation to be recorded</p> <p>Plant height, TDMP, Chlorophyll index, Photosynthetic rate, stomatal conductance, transpiration rate, Chlorophyll fluorescence, Yield and yield attributes</p>	<p>Centres:</p> <ol style="list-style-type: none"> 1. Dept. of Crop Physiology, TNAU, Coimbatore; ACRC, TNAU 2. ICAR-CICR, Coimbatore 	2019-2020	Proposal may be submitted through proper channel to obtain URP number

III. CROP PROTECTION

A. Decisions Made on OFT

OFT-1: Assessing the efficacy of *Bacillus* spp. for the management of cotton necrosis caused by Tobacco streak virus

S. No.	Treatment details (Three foliar sprays from 25 DAS at 15 days interval) – 10% Buttermilk based suspension
1.	T ₁ - <i>B. amyloliquefaciens</i> (VB7) (LF) – 1%
2.	T ₂ – <i>Bacillus subtilis</i> - 1%
3.	T ₃ – Untreated control

*LF- Liquid formulation
Hybrid: RCH 659
No. of replications: 7

I. Observations to be recorded:

- Per cent Disease Incidence of TSV
- Seed Cotton Yield with CB ratio

II. Participating Centres:

- TNAU, Coimbatore - (Dr. P. Latha)
- FC&RI, Mettupalayam – (Dr. Renukadevi- (Erode)
- ADAC&RI, Trichy - (Dr.T. Saravanan)

B. List of URP/Core/AICRP/ERP

Crop	Centre	URP	Core	AICRP	Total	
Cotton	Coimbatore	Entomology	2	1	1	4
		Pathology	-	-	1	1
	Srivilliputtur	Entomology	1	1	1	3
		Pathology	1	-	-	1

C. Remarks on projects

Agricultural Entomology

S. No.	Project Number and Title	Name and Designation of the Project leader	Duration	Remarks
URP				
1	CPPS/CBE/ENT/COT/2015/001 Studies on thrips diversity of cotton ecosystem and it's management	Dr. K. Senguttuvan, Asst. Prof. (Ento.)	June 2015 to March 2017	Completion report submitted. The article may be published.
2	CPPS/SVR/ENT/COT/2016/001 Population dynamics and management of pink bollworm <i>Pectinophora gossypiella</i> (Saunders) in upland cotton	Dr. K. Sasikumar, Asst. Prof. (Ento.)	August 2018 to July 2020	The project may be continued.
3.	CPPS/CBE/ENT/COT/2018/001 Studies on the impact of ginger, garlic and green chilli extract for the management of insect pests in organic cotton	Dr. K. Ganesan, Asst. Prof. (Ento.)	February 2018 to January 2020	The project may be continued.
4.	CPPS/SVP/ENT/COT/2018/CP108 Management package for sucking pest complex of cotton under high density planting system	Dr. K. Sasikumar, Asst. Prof. (Ento.)	Oct.2018 to Oct. 2019	The project may be continued with modification of treatments.
5.	CPPS/CBE/ NT/COT/2018 / CP072 Semiochemical based Pitfall trap for the Management of Cotton Stem weevil, <i>Pempherulus affinis</i>	Dr. N. Muthukrishnan Professor (Ento.) Dept. of Agrl. Entomology	October 2018 to March 2020	The project may be continued.
6.	CPPS/CBE/ AEN/00S01 Professorial Chair on Pesticides Development Technology	Dr. N. Muthukrishnan Professor (Ento.) Dept. of Agrl. Entomology	1995 – till date	The project may be continued.

AICRP				
7.	AICRP/ PBG/ CBE/ COT/ 023 All India Coordinated Research Project on Cotton	Dr. K. Senguttuvan, Asst. Prof. (Ento.)	2019 - 2020	The project may be continued.
8.	AICRP/ PBG/ SVR/ COT/ 024 All India Coordinated Research Project on Cotton	Dr. K. Sasikumar, Asst. Prof. (Ento.)	2019 - 2020	The project may be continued.

Plant Pathology

S. No.	Project Number and Title	Name and Designation of the Project leader	Duration	Remarks
URP				
1.	CPPS/SVP/PAT/COT/2016/001 Management strategies for diseases of cotton under high density planting system	Dr. R. Vimala, Professor and Head, CRS, Srivilliputtur	June 2015 to March 2017	This project is recommended for deletion. New URP may be proposed.
AICRP				
3.	AICRP/ PBG/ CBE/ COT/ 023 All India Coordinated Research Project on Cotton	Dr. P. Latha, Asst. Professor (Pathology)	2019 - 2020	The project may be continued.

D. GENERAL REMARKS

- ❖ All the Plant Protection scientists working in the stations need to have at least three URPs and if working in AICRP schemes/teaching campuses need to have at least one URP. Those who do not meet this criterion shall submit URPs before 31.07.2019 (Action: Dr. P. Latha, Assistant Professor (Plant Pathology) and Dr. R. Vimala, Professor and Head, CRS, Srivilliputtur).
- ❖ Any new URP proposals related to plant protection is to be presented before the RPAC convened by the Director (CPPS) before getting final approval.

E. Action Plan for 2019-2020

AGRICULTURAL ENTOMOLOGY & PLANT PATHOLOGY

Action Plan 1: Pests and Diseases surveillance and forecasting

Theme Leader		Dr. K. Senguttuvan, Assistant Professor (Entomology), Department of Cotton, TNAU, Coimbatore		
S. No	Action Plan	Name of the scientist(s) and centre	Activity	Deliverables
1.	Survey and surveillance for incidence of sucking pests, bollworms, stem weevil and diseases viz, Alternaria leaf blight, Grey mildew, Tobacco streak virus and root rot monitored throughout the crop period	Dr. K. Senguttuvan Asst. Prof. (Entomology) & Dr. P. Latha Asst. Prof. (Pathology) Department of Cotton, Coimbatore & ACRC, Coimbatore Districts : Coimbatore, Tiruppur, Salem, Perambalur, Erode, Krishnagiri, Dharmapuri and Vellore	Monitoring and surveillance; correlation and regression analysis of pest and diseases incidence and damage with weather parameters.	<ul style="list-style-type: none"> Forecast for pest and disease management decision
2.	Survey and surveillance for incidence of sucking pests, bollworms, stem weevil and diseases viz, Alternaria leaf blight, Grey mildew, Tobacco streak virus and root rot monitored throughout the crop period	Dr. K. Sasikumar Asst. Prof. (Entomology) & Dr. R. Vimala Prof. (Pathology) & Head, Cotton Research Station, Srivilliputtur & ACRC, Coimbatore Districts : Virudhunagar, Tirunelveli, Tuticorin, Madurai and Theni	Monitoring and surveillance correlation and regression analysis of pest and diseases incidence and damage with weather parameters.	<ul style="list-style-type: none"> Forecast for pest and disease management decision

Action Plan 2: Screening of pre-release cultures against pests and diseases

Theme Leader		Dr. K. Sasikumar , Assistant Professor (Entomology), CRS, Srivilliputtur		
S. No	Action Plan	Name of the scientist(s) and centre	Activity	Deliverables
1.	Preliminary screening under natural condition and advanced screening under artificial condition for key insect pests of cotton.	Dr. K. Senguttuvan Asst. Prof. (Entomology) & Dr. P. Latha Asst. Prof. (Pathology) Department of Cotton, Coimbatore	Screening pre-release cultures obtained from the breeders under natural and artificial condition as per the standard screening methods Observations on the incidence of pests and diseases (sucking pests, bollworms, stem weevil, <i>Alternaria</i> leaf blight, Tobacco streak virus and root rot) - under field screening	<ul style="list-style-type: none"> • Identification of resistant donors • Integration in resistance breeding programmes
2.	Preliminary screening under natural condition and advanced screening under artificial condition for key insect pests of cotton.	Dr. K. Sasikumar Asst. Prof. (Entomology) & Dr. R. Vimala Prof. (Pathology) & Head, Cotton Research Station, Srivilliputtur	Screening pre-release cultures obtained from the breeders under natural and artificial condition as per the standard screening methods Observations on the incidence of pests and diseases (sucking pests, bollworms, stem weevil, <i>Alternaria</i> leaf blight, Tobacco streak virus and root rot) - under field screening	<ul style="list-style-type: none"> • Identification of resistant donors • Integration in resistance breeding programmes

Action Plan No. 3 Exploring mechanisms of resistance against pests and diseases

Theme Leader		Dr. K. Senguttuvan, Assistant Professor (Entomology), Department of Cotton, TNAU, Coimbatore		
S. No	Action Plan	Name of the scientist(s) and centre	Activity	Deliverables
1.	Study of physical and biochemical characters for identified cotton entries	Dr. K. Senguttuvan Asst. Prof. (Entomology) Department of Cotton, Coimbatore	Entomology – Measurement of trichome density and phenol, protein, carbohydrate and reducing sugars levels in germplasm expressing resistance	<ul style="list-style-type: none"> • Elucidation of mechanisms of resistance and correlation of biophysical and biochemical characters with resistance for sucking pests
2.	Study of physical and biochemical characters for identified cotton entries	Dr. P. Latha Asst. Prof. (Pathology) Department of Cotton, Coimbatore	Pathology – Measurement of trichome density and phenol, protein, carbohydrate and reducing sugars levels in germplasm expressing resistance	<ul style="list-style-type: none"> • Elucidation of mechanisms of resistance and correlation of biochemical factors with resistance for diseases

Action Plan No. 4. Semiochemical based management of cotton stem weevil, *Pempherulus affinis*

Theme Leader		Dr. K. Senguttuvan, Assistant Professor (Entomology), Department of Cotton, TNAU, Coimbatore		
S. No	Action Plan	Name of the scientist(s) and centre	Activity	Deliverables
1.	Identification of Semiochemicals and Standardization of trap	Dr. K. Senguttuvan Asst. Prof. (Entomology) Department of Cotton, Coimbatore	Identification of semiochemicals (2019-2020) Investigation on cotton plant volatiles (2020-2021) Standardization of trapping methods (2021-2022)	Development of phagostimulant pitfall trap for stem weevil and Standardization
2.	Standardization of trap	Dr. K. Sasikumar Asst. Prof. (Entomology), Cotton Research Station, Srivilliputtur	Standardization of trapping methods (2021-2022)	Standardization of pitfall trap for stem weevil

Action Plan No. 5. Management of sucking pests of cotton under high density planting system

Theme Leader		Dr. K. Sasikumar , Assistant Professor (Entomology), CRS, Srivilliputtur		
S. No	Action Plan	Name of the scientist(s) and centre	Activity	Deliverables
1.	Management of sucking pests of cotton under high density planting system T1 - Seed treatment with Imidacloprid 70	Dr. K. Sasikumar Asst. Prof. (Entomology), Cotton Research Station, Srivilliputtur	Observation to be recorded : Sucking pests (leaf hopper, thrips, whitefly, aphids and mealy bug), Crop damage, Natural enemies & Yield	Management package for sucking pest under HDPS

	<p>% WS @ 7ml/ kg of seed + need based spray of Diafenthiuron 50% WP @ 600 g/ha or Thiamethoxam 25 % WG @ 100g/ha or NSKE 5%</p> <p>T2 - Seed treatment with <i>Beauveria bassiana</i> @ 10 g/kg of seed + soil application of neem cake @ 250 kg/ha + yellow sticky trap @ 40 nos./acre + release of green lacewing @ 1 lakh eggs/ha at 30 DAS + need based spray of Dinotefuran 20 % SG@ 150 g/ha or Flonicamid 50% WG @ 150 g/ha or azadirachtin 10000ppm @ 1 lit./ha</p> <p>T3 - Farmer practice (Fipronil 5% SC@ 2000ml/ha on 25 DAS + Imidacloprid 30.5 SC@ 75g/ha on 40 DAS + Thiamethoxam 25 % WG @ 100g/ha on 55 DAS)</p> <p>T4 - Untreated check</p>	<p>Dr. K. Senguttuvan Asst. Prof. (Entomology Department of Cotton, Coimbatore,</p> <p>Dr. R. P. Soundararajan Associate Professor (Entomology), HC & RI (W), Trichy</p>		
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Action Plan No. 6 Management of cotton diseases including TSV using biocontrol agents

Theme Leader		Dr. R. Vimala , Professor and Head, CRS, Srivilliputtur		
S. No	Action Plan	Name of the scientist(s) and centre	Activity	Deliverables
1.	<p>Management of cotton diseases including through biocontrol agents</p> <p>T₁ - ST- <i>Pseudomonas fluorescens</i> 1 (TF) (10g/kg)</p> <p>T₂ - ST- <i>Bacillus subtilis</i> (10g/kg) (TF)</p> <p>T₃ - <i>Pseudomonas fluorescens</i> 1 (TF) Foliar spray of 0.5% on 30, 45 DAS</p> <p>T₄ - <i>Bacillus subtilis</i> (TF) Foliar spray 0.5% on 30, 45 DAS</p> <p>T₅ - ST- <i>Pseudomonas fluorescens</i> 1 (TF) (10g/kg) + Foliar spray of 0.5% on 30, 45 DAS</p> <p>T₆ - ST- <i>Bacillus subtilis</i> (10g/kg) (TF) + Foliar spray 0.5% on 30, 45 DAS</p> <p>T₇ - Untreated Control</p> <p>*TF-Talc formulation</p>	<p>Dr. R. Vimala Prof. (Pathology) & Head, Cotton Research Station, Srivilliputtur</p> <p>Dr. P. Latha Asst. Prof. (Pathology), Dept. of Cotton, TNAU, Coimbatore</p>	Observations to be recorded : disease incidence and yield	Management package for diseases of cotton

IV Closing Remarks & Way Forward

Vice Chancellor

- Lab and field scale study to be done before releasing of a variety for pest resistance
- Pre-release culture to be tested by DCM and CPPS
- Holistic approach has to be formulated involving WTC, DCM, CPBG, Agricultural Engineering for Drip fertigation and mechanization in cotton

Director of Research

Way forward

- Evolve Bt cotton with multiple resistance against both sucking and defoliators
- Mechanized cotton cultivation to promote area expansion
- Design multi-functional cotton boosters
- Technology capsule for managing devastating pests (boll worms, jassids and stem weevil) and diseases (ALB, Root rot)
- inter-specific hybridization between *Gossypium hirsutum* x *G. arboreum* to develop genotypes resistant to pests and diseases

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