AICSIP-Progress Report
Coimbatore Centre

Multicut Forage Sorghum CSV 33 MF (SPV 2242 F)

Centre: Coimbatore

1. Name of the officer - In charge (AICSIP):	Dr. B.Selvi, Professor (Breeding)
2. Associated Scientists (AICSIP) and their discipline:	1. Dr. A.Yuvaraja Assistant Professor (Breeding) 2. Dr.R.Kalpana, Associate Professor (Agronomy)
2. Associated Scientists from state project:	Nil
3. Annual budget	Pay and allowances: 44.44 lakhs Recurring : 1.69 lakhs TA : 1.50 lakhs
4. Any other financial support	TNAU, Main

Staff changes during the year

Retired	**-**
Transferred	**Dr.R.Kalpana, Associate Professor (Agronomy)**
New recruits	**-**

Major thrust at the centre

Evolving dual purpose sorghum varieties /hybrids with improved shoot fly and stem borer resistance

Evolving single cut/multicut forage sorghum varieties

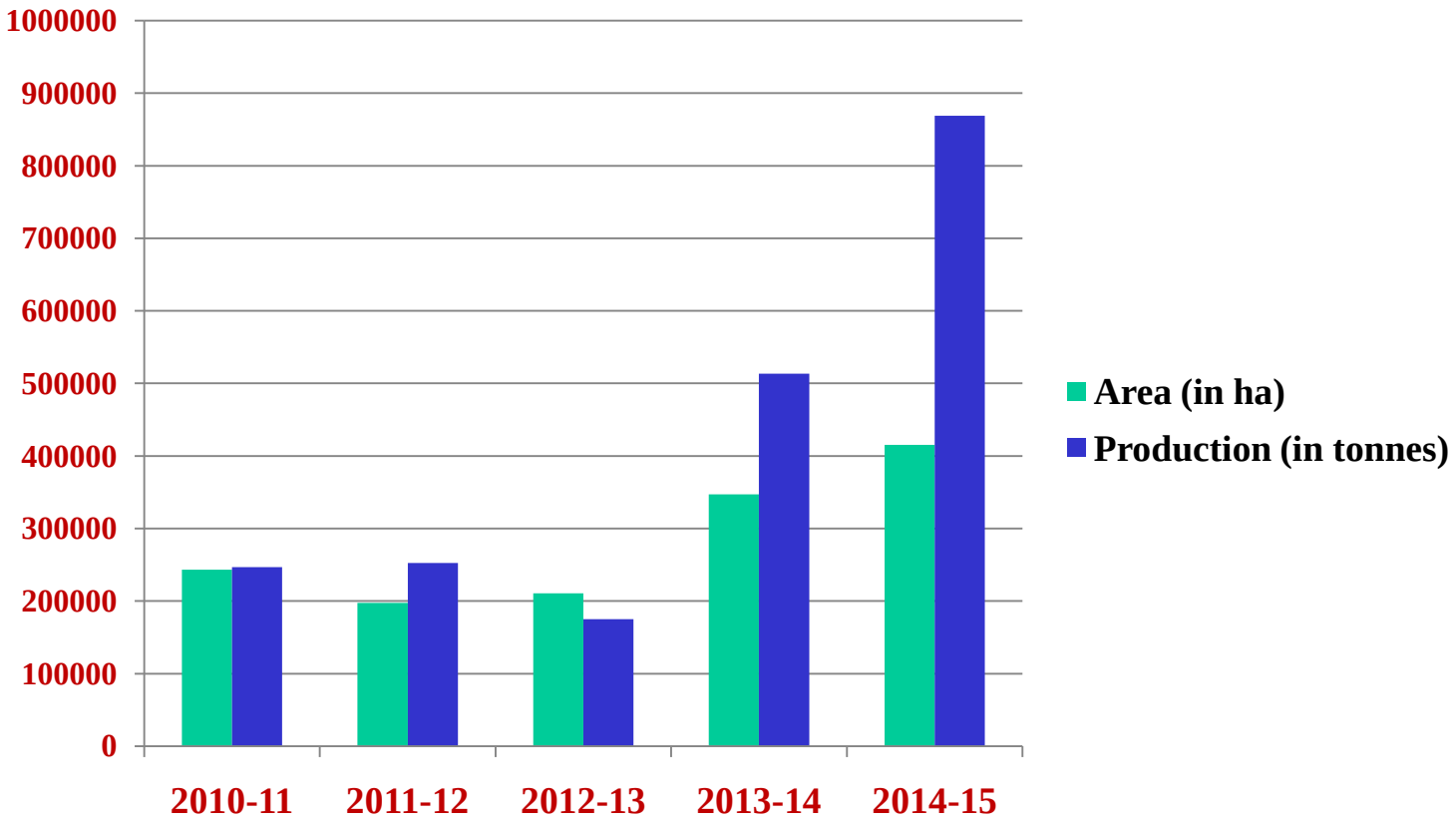
Collection, conservation, documentation and utilization of germplasms

Developing cost effective and labour saving technologies for sorghum

Seasonal information

	Kharif	Rabi
Tamil Nadu Rainfall (mm)	283	235
Coimbatore Rainfall (mm)	58.8	96.8
Area covered (lakh ha)	0.02	0.16
Total production (lakh tonnes)	0.012	0.097

Trends in Area, Production and Productivity in Tamil Nadu



Trials conducted

Discipline	No. of AICRP-sorghum trials allocated	No. of station trials	No. of trials successfully conducted	Shortfall
Grain sorghum	6	6	All	Nil
Forage & Sweet sorghum	5	8	All	Nil
Agronomy	3	-	All	Nil
Pathology	9	-	All	Nil
Entomology	8	-	All	Nil
Total	31	14	45	

Major achievements during 2016-17

Discipline: Plant Breeding : Grain sorghum–Segregating materials

Sl. No.	Generation	Crosses evaluated	No. of families/ single plants selected
R x R line			
1	F1	12	12
2	F2	10	Raised for evaluation
3	F4	2	9
3	F5	12	29
	Total	36	54
Shoot fly /Stem borer			
1	F1	12	12
2	F4	2	9
	Total	14	21
Drought			
1	F4	1	6
Total		**51**	**87**

Major achievements during 2016-17

Discipline: Plant Breeding : Grain sorghum

Name of trial	Entries tested	Checks	Superior entries
MLT Grain sorghum (S2016)	4	Co 30 K12 APK 1	Highest grain yield of 4200 kg/ha was noted by TNS 648 with yield increase of 11 % over the check Co 30 and fodder yield of 12981 kg/ha with yield increase of 10 per cent. The culture also recorded shoot fly incidence of 11.9 %
MLT grain sorghum (K 2016)	5	Co 30 K12 CO 5 Paiyur 2	Three TNS cultures and two hybrids were tested along with checks. TNS 648 recorded highest grain yield of 3319 kg/ha with yield increase of 16.3 and 31.7 per cent increase over the check CO 30 and K12 respectively. The hybrids viz., TNSH 487 and TNSH 488 recorded highest grain yield of 36 and 20 % over Co 5.

Major achievements during 2016-17

Discipline: Plant Breeding : Grain sorghum

Trial	Cultures	Checks used	Superior entries
UVT-I	13	Co 30	Six entries recorderd highest grain yield and ranged from 2176 (IS 18417 x CO 25-4-3-1-3) to 2685 kg/ha (APK 1 x M 35-1-2-2-3). The grain yield increase observed was 11.9 to 38.1 percent than the check. The highest fodder yield was also noted in the cross derivative IS 18417 x CO 25-4-3-1-3 (12638 kg/ha) followed by CO 26x IS 4646-3-1-1-2 (12768 kg/ha.) The fodder yield increase observed was 5.6 to 21.8 per cent. The shoot fly incidence noted was below 14 % in all the entries
UVT-II	11	Co 30	Five entries excelled in grain yield than Co 30. The highest grain yield was noted in the cross derivatives TNS 636 x TNS 634-5-1-2 (2867 kg/ha) and TNS 633 x TNS 636-2-3-1 (2585kg/ha) with yield increase of 21 and 35 % over check. The highest fodder yield was observed in TNS 630 x TNS 634-5-2-2 (12926 kg/ha) followed by TNS 631 x TNS 633-3-2-5 (12400 kg/ha).

Major achievements during 2016-17

Discipline: Plant Breeding : Grain sorghum

Sl. No.	Name of trial	Entries tested	Checks used	Superior entries
5	NRRYT	15	CO 30	15 entries were evaluated under NRRYT. The grain yield performance were recorded and it ranged from 648 (CO 26 x EP 60 - 5-1-1-3-1-1) to 2222 kg/ ha (CO 26 x EP 60 - 5-1-1-3-2-3). Many of the entries excelled check CO 30
6	Hybrid evaluation	5		Five cross combinations were evaluated. Among this the cross combination ICS 12 A x Co 26 recorded highest single plant yield (33 g) as well showed phenotypic uniformity.
7.	Breeder seed	1		For state released variety Co 30, 40 kg of breeder seeds and 700 kg of TFL seeds were produced
8	New crosses	-	-	Nine new crosses using Co 26, APK 1, CO 28 and BSR 1 as seed parent and SPV 2296, Chinna vellai cholam, Vellai cholam , ICSV 700 as pollen parent were made
9	AX R cross synthesised			The cross combinations viz., ICS 51 A x CO 30, ICS 486 A x CO 30, ICS 452 A x CO 30, ICS 49 A x CO 30, ICS 323 A x Co 30 ICS 486 A x TNS 30, ICS 452 A x TNS 30, ICS 49 A x TNS 30, and ICS 323 A x TNS 30 were synthesized for further evaluation

Major achievements during 2016-17

Discipline: Plant Breeding : Forage sorghum

Multicut Forage Sorghum CSV 33 MF (SPV 2242 F): National Check

Identified: 2016
Released and Notified: 2017
PPV&FRA Application submitted

Discipline: Plant Breeding : Forage sorghum

Salient features of CSV 33MF

Pedigree	**EMS mutant of CO FS 29**
Foliage	**Tall, thin stem, leafy and capable for multiple harvests (cuts)**
Harvests	**Fast growing and high tillering, first cut (60-65 days), subsequent cuts (every 45 days)**
Green fodder yield:	**1039.31 q/ha (3 cuts), Heterosis:19.69 % than SSG 59-3**
Dry fodder yield :	**280.57 q/ha, Heterosis:15.65 %**
Green fodder yield per day	**7.36 q/ha, Heterosis:19.03 %**
Dry fodder yield per day	**2.0 q/ha, Heterosis:22.70 %**
Seed yield	**904.69 kg/ha 1000 seed weight 5.9 g, SSG 59-3 -14.8 g (others 30 g)**
Diseases	**Resistant to Leaf Blight, Anthracnose, Rust and moderately resistant to Downy mildew**
Pests	**Resistant to Stem Borer, Midge and moderately resistant to Mite and Shoot fly.**

Discipline: Plant Breeding : Forage sorghum

Quality parameters of CSV 33MF

Protein yield	25.57 q/ha, 26.7 % higher than SSG 59-3
TSS %	6.65%
Tillering	High (5.23)
IVDMD (%)	48.81%
Dry Digestible Matter (DDM)	135.19
Regenerability score	4.17
Low HCN content	63.07 ppm

Discipline: Plant Breeding : Forage sorghum

Target – Development of Single cut forage sorghum

Name of trial	Entries	Checks	Superior entries
MLT Forage sorghum (S 2016)	3	K 11	Culture TNFS 213 recorded highest green fodder yield of 34.2 t/ha by recording 18 % increase over check K11. (Grain yield 1800kg/ha)
MLT Sweet sorghum (S 2016)	2	CSV 24 SS	Culture TNSS 212 recorded green fodder yield of 31.83 t/ha and16 %
MLT- Forage sorghum (K 2016)	4	CO 27 K 11	The entry TNFS 213 (29.41 t/ ha) expressed 38 and 48 % superior performance over checks Co 27 and K11, respectively.
RRYT-Forage sorghum	27	K11 CSV 24 SS	Heterosis: 8-45 % CO 26 x EP 58-4-1-3-5-2 (34 t/ha), COS 28 x IS 18527-4-4-1-1-1 (34 t/ha), COS 28 x IS 2501-3-1-2-5-1 (33 t/ha), CO 26 x EP 58-4-1-1-2-2 (33t/ha)
RRYT Sweet sorghum	8	K11 CSV 24 SS	Heterosis: 22-35 %. TNS 603 x SPV 462)-4-2-1-4-3 (32.5 t/ha)

Discipline: Plant Breeding : Forage sorghum

Target – Development of Single cut forage sorghum

Segregating Progenies:

Sl. No.	Generation	No. of crosses evaluated	No. of families/single plant selected	Target Traits
1	F1	7	7	High green fodder and quality
2	F2	9	25	High green fodder and quality
3	F3	7	7	High green fodder and quality
5	F5	9	24	High green fodder and quality
	Total	32	63	

Discipline: Plant Breeding : Forage sorghum

Target – Development of Single cut forage sorghum

Male Sterile based crossing:

ICSA 324xCSV 19SS
ICSA 12x SSV84
ICSA12xR 820

Emasculation based crossing:

BSR 1x Co 27
Co26 x Co 18,
Co 26 x Black sorghum
CO 26 x Irungu sorghum
CO 30 x Irungu sorghum
K12 x Black sorghum
K12 x CO 18
CSV 22SS x Co 18
IS18551 x Vellai sorghum

Seed production	**CSV 33 MF**	**A quantity of 200 kg produced.**

Discipline: Germplasm

S.No	Activity	Studied	Remarks
1	Dr Ramaih Gene Bank , TNAU	3881	Characterization and documentation :2354
2	Exploration	13	Local land races fromTirunelveli, Virudunagar and Thooticorin Districts, Tamil Nadu with GIS data
3	Collection	60 80	IIMR, Field day, Hyderabad ICRISAT Field Day, Hyderabad
4	Characterization and documentation	186	17 DUS traits
5	AB lines	26	Maintained and utilized in breeding pregrammes
6	R lines	56	Maintained and utilized in breeding pregrammes
7	Screening of Drought tolerance	100	5 Nos (genotypes IS23399, DRT1030, MS7735, KO5SS53 and KO5SS186, B 35 (R) and Co 26 (S))
8	Screening of Shoot fly tolerance	60	13 Nos.(EG16, EG 50, EG77, Irungucholam, chinna vellai cholam, K11, Co (FS)29, Co(FS) 31, SSV 84, Ko5 SS 178, KO5SS255, KO3SS 281, MTRS 2336, IS 18551(R), IS 2204 (R), DJ 6514 (S) and Swarna (S))

Major achievements during 2016-17

Discipline: Agronomy

Trial 1 KB. Response of pre-released grain sorghum genotypes to different fertility	Application of **125 % RDF** (112.5:56.25:56.25 kg NPK/ha) registered higher yield and all the genotypes responded to increasing levels of fertilizer application. Among the genotypes tested, none of the test entries performed better than the checks, with respect to yield and economics.
Trial 7K. Mechanization of Sorghum	Adoption of a spacing of **60 x 10 cm** for grain sorghum instead of the recommended spacing of **45 x 15 cm** will help to mechanize the operations of sowing, weeding and harvesting and save labour and time without reduction in yield and economic returns.
Trial 8K. Evaluation of spacing and fertilizer doses for multicut forage sorghum (SPV 2242)	Though wider spacing of **30 x 25 cm** resulted in higher number of tillers/plant but green fodder yield/ha was less due to reduction in population. But under closer spacing though tiller count was less, it was compensated by the increased population. So recommended spacing of **30x10 cm** resulted in higher green fodder yield.

Constraints

Sl. No.	Constraints	Suggestions
1	Allottement under Recurring contingency may be improved	Contingency may be increased @ 1.5 lakhs/scientist
2	Pathologist may be provided for evaluation of pathology trials	-

Publications from AICRP-Sorghum centre

Formal	Number
Journal Papers (International)	As 1st author: -
	As co-author: -
Journal Papers (National)	As 1st author:
	As co-author: 6
Review papers	As 1st author:
	As co-author:
Posters	2
Popular	
Popular articles	1
Field days organized/attended	3

Other activities rendered by all scientists

Sl. No	Activities	Number	% time spent
1	Trainings organized by centre	-	-
2	Trainings attended by scientists	8	5
3	Guiding students	3 (Chairman) 2 (Member)	5
4	Institutional activities	-	10
5	Recognitions	-	-

Major activities/objectives for 2017-18

Discipline	Major activities envisaged
Breeding-Grain sorghum	Evaluation of AICSIP trials, Evaluation of promising entries in MLT and ART for further release and identification of new entries in grain sorghum and Breeder seed production of released varities (C0 30)
Breeding-Forage sorghum	Evaluation of AICSIP trials, Development of single / multicut varieties and Breeder seed production of CSV 33MF
Agronomy	•To develop agronomic practices for increasing the yield of grain sorghum. •To improve yield and quality of forage sorghum through improved management practices

Thank you