

EVALUATION OF NEWLY RELEASED HIGH YIELDING AND EARLY MATURING COTTON VARIETY CRIS-585

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ABSTRACT. The newly developed variety CRIS-585 has been evolved through conventional breeding method, hybridization between CIM-496 and BH-162 at Central Cotton Research Institute Sakrand. The variety is significantly different as produced higher seed cotton yield in varietal trials as compared with other advance strains and standard check variety. The variety was tested in zonal varietal trial and national coordinated varietal trial at multi-locations of different agro-climatic conditions of Sindh and Pakistan. CRIS-585 possesses high GOT and longer staple length along with other fiber parameters. It is non Bt. variety tolerant to sucking insect pests and disease; the optimum sowing period of this variety is 15th April to 15th May. CRIS-585 has the potential to provide higher yield on 150 kg N ha⁻¹ at 30 cm spacing and this variety does not need a very high input which is difficult to manage by a common grower and gave higher yield on 5 irrigations as compared the yield of standard variety. The variety features were presented in technical expert subcommittee and after that proposal was submitted and present in Sindh Seed Council. Keeping in view the performance and silent features of CRIS-585 it was approved and recommended for general cultivation in Sindh during the year 2020.

Keywords: *Cotton Variety, CRIS-585, high yielding, longer staple, GOT*

INTRODUCTION

Cotton is potentially important profitable crop and plays a vital role in Pakistan's textile industry. It is a main earning source of foreign exchange and occupies the largest portion of land after wheat. The millions of farmers are dependent on this crop along the entire value chain from weaving to textile, clothing exports, good production and utilization in the country. Cotton production is important for Pakistan's agriculture and the overall economy. Although Pakistan has achieved an outstanding place in the world cotton market, yet its per hectare yield is much less than the advance cotton growing countries. As the research is a continuous process and improvement is always required. Globally Pakistan is 4th largest cotton producing country, while 3rd in consumption during last five years from 2014-15 to 2018-19. County economic development depends upon the production of cotton, because the nation mainly dependent on industry of cotton and related to its textile sector. That's why the principle status has been given to the cotton crop. The area under cotton cultivation in Pakistan during year 2019-20 was 2.895 million hectares and production was 12.72 million bales, as regards the provincial status, Punjab contributed 2.145 million hectares with production 7.90 million bales and Sindh was on 0.640 million hectares and 4.60

million bales production [1]. Significant differences in yield, ginning out turn, micronaire and staple length for different cultivars observed by [2]. While selecting a cultivar, different agronomic traits like yield potential, growth period and quality should be considered [3]. Significant variation in seed cotton yield due to genotypes also found by [4]. Different cotton genotypes behave differently for seed cotton yield [5]. There is need to develop high yielding and tolerant against biotic and abiotic factors. The cotton breeders of Central Cotton Research Institute, Sakrand are continuously striving hard to improve seed cotton yield through conventional plant breeding approaches and have developed a new cotton variety CRIS-585 which is high yielding, early maturing, high GOT, heat tolerant and long staple cotton variety compared with existing commercial varieties.

MATERIAL AND METHOD

CRIS-585 was developed through conventional breeding method at Central Cotton Research Institute Sakrand, Sindh Province. The crosses were attempted during the year 2005-06 at CCRI-Sakrand. The F₁ plants were raised during the year 2006-07. The F₂ segregating population was raised with the selection of superior and desired plants according to characteristics need basis through pedigree selection method in 2007-08. F₃, F₄ and F₅ generations was raised from single plant progenies in 2008-09, 2009-10 and 2010-11 respectively. The selected single plants progenies were raised at experimental farm and desirable single plants with required characteristics were identified and selection for further testing in yield trials. The CRIS-585 was tested in strain test trial (ST) 1 and 2 in year 2011-12 and 2012-13. In advance strain test trial (AST) 1 and 2, it was tested in 2013-14 and 2014-15. Along with AST trials, the CRIS-585 was also tested in zonal varietal trial at the environmental conditions of lower (Cotton Research Station Mirpurkhas), middle (Central Cotton Research Institute Sakrand) and upper (Cotton Research Station Ghotki) Sindh during the years 2013-14 and 2014-15. However, it was also tested in different district zones of Sindh at progressive growers in year 2013-14 and 2016-17. CRIS-585 was tested in National Coordinated Varietal Trial (NCVT) nationally during two consecutive years 2014-15 and 2015-16.

The newly developed CRIS-585 strain test, advance strain test, zonal varietal trial and national coordinated varietal trials were conducted in randomized complete block design with three replications. The row to row and plant to plant space was maintained 75cm and 30cm respectively. The recommended doses of fertilizer were applied as per need in split doses. The plant protection measures were also applied as per need, whenever required. The 10 plants were tagged from each replication during every year collection of data. Data collected on different parameters were analyzed statistically by using statistics software Statistix-8.1. For analysis of variance and means were separated using Fisher's protected least significant difference (LSD) and the comparison of means were tested by Duncan Multiple Range Test (DRMT) at 5% and 1% probability test [6].

RESULTS AND DISCUSSION

The development procedure of CRIS-585 was initiated during 2005-06 with crossing between two inbred lines CIM-496 x BH-162. The F₁ plants were raised in 2006-07. The F₂ segregating population was raised with the selection of superior and desired plants according to characteristics need basis through pedigree selection method in 2007-08. F₃, F₄ and F₅ generations was raised from single plant progenies in 2008-09, 2009-10 and 2010-11 respectively. In F₅ generation uniform lines were selected for further testing in yield trials.

Characterization of CRIS-585

The plant type is indeterminate. The growth habit is indeterminate. Main stem is erect, semi-hairy with medium pigmentation. The sympodial branches are medium in length with short internodes that made the plant look quite compact. The number of sympodia ranges from 22-30 per plant. The leaves are medium green with mostly 5 lobes and 1-3 nectaries per leaf. Flowers, petals and pollen are creamy, spotless with mostly 3 nectaries per flower. The boll is almost round, medium sizes with normal gossypol glands, locules mostly four but rarely five and there is a tendency of twin boll formation at the top branches. The seed is fuzzy, dusky white, medium sized, coat colour brown and seed index ranging from 6.8 to 7 gm.

Strain Test Trial

The new strain CRIS-585 was tested in strain test trial at CCRI-Sakrand. The data presented in Table 1 showed that in 2011-12 and 2012-13, CRIS-585 obtained maximum seed cotton yield, higher ginning outturn and possessed longer staple as compared with other advance strains and standard variety CRIS-342. Average performance of newly developed strains for two consecutive years are presented in Table 2, it indicated that CRIS-585 increased 40.8% seed cotton yield (4146 kg ha⁻¹) over the standard CRIS-342 and ginning higher ginning outturn (42.5%) and staple length (29.2 mm). The difference among the varieties for seed cotton yield, GOT and staple length was statistically significant.

Table 1. Performance of CRIS-585 in strain tests at Central Cotton Research Institute-Sakrand during 2011-12 and 2012-13

Variety/Strain	2011-12			2012-13		
	Seed cotton Yield (kg ha ⁻¹)	GOT (%)	Staple Length (mm)	Seed cotton Yield (kg ha ⁻¹)	GOT (%)	Staple Length (mm)
CRIS-585	4087	42.1	29.8	4305	43.8	28.6
CRIS-583	3455	41.7	28.2	3600	41.2	26.7
CRIS-584	3662	43.8	26.4	3946	43.0	26.1
CRIS-586	3451	41.1	28.4	3588	39.5	28.5
CRIS-342 (Std.)	3122	38.0	28.0	3439	38.4	27.1

Table 2. Average performance of CRIS-585 against commercial varieties in strain tests at CCRI-Sakrand

Years	CRIS-585	CRIS-342 (Std.)
Seed cotton Yield (kg ha⁻¹)		
2011-12	3987	3122
2012-13	4305	3439
Average	4146	3280
% Increase over Std.		40.80
GOT (%)		
2011-12	42.1	38.0
2012-13	43.8	38.4
Average	42.5	38.2
Staple Length (mm)		
2011-12	29.8	28.0
2012-13	28.6	27.1
Average	29.2	27.6

Advance Strain Test Trial

CRIS-585 newly developed variety was tested in advance strain test trials in 2013-14 and 2014-15 at the experimental farm of CCRI-Sakrand. The depicted in Table 3 exhibited that in both years trials CRIS-585 produced highest seed cotton yield, ginned higher GOT and given longer staple length compared with advance strains CRIS-583, CRIS-584, CRIS-586 and standard variety CRIS-342. The average performance of two consecutive years data presented in Table 4, revealed that CRIS-585 gave maximum seed cotton yield (4517 kg ha⁻¹) increased 40.94% over the standard variety CRIS-342. While 42.8% gave ginning outturn and produced long staple length (29.0 mm) as compared with standard check variety. The varieties were significantly differing for all traits.

Table 3. Performance of CRIS-585 in Advanced Strain Test Trial at CCRI-Sakrand against commercial variety during 2013-14 and 2014-15

Variety/Strain	2013-14			2014-15		
	Seed cotton Yield (kg ha ⁻¹)	GOT (%)	Staple Length (mm)	Seed cotton Yield (kg ha ⁻¹)	GOT (%)	Staple Length (mm)
CRIS-585	4413	42.4	29.1	4620	43.5	28.8
CRIS-583	3229	40.2	27.8	3700	42.2	27.4
CRIS-584	3839	41.8	27.0	3546	43.4	27.1
CRIS-586	3121	38.9	28.2	3688	39.5	28.5
CRIS-342 (Std.)	3122	38.3	27.2	3289	38.8	27.5

Table 4. Average performance of CRIS-585 against commercial varieties in Advance Strain Tests at CCRI-Sakrand

Years	CRIS-585	CRIS-342 (Std.)
Seedcotton Yield (kg ha⁻¹)		
2013-14	4413	3122
2014-15	4620	3289
Average	4517	3205
% Increased over Std.		40.94
GOT (%)		
2013-14	42.4	38.3
2014-15	43.2	38.8
Average	42.8	38.6
Staple Length (mm)		
2013-14	29.1	27.2
2014-15	28.8	27.5
Average	29.0	27.4

Zonal Varietal Trial

The CRIS-585 was tested at government farms to check the adaptability in multiple environments of upper, middle and lower Sindh in the year 2013-14 and 2014-15. The data shown in Table 5 showed evidence that; newly developed variety CRIS-585 produced higher seed cotton yield at Mirpur Khas, Sakrand and Ghotki during both individual years and when data was averaged. It was noted that CRIS-585 produced (4013 kg ha⁻¹) that increased 12.54% over the advance stain CRIS-578 and 10.46% increased over the standard check variety CRIS-342.

CRIS-585 was also tested at grower's field in various districts in different ecological zones of Sindh province in 2013-14 and 2016-17. Table 6 exhibited that in 2013-14 averaged cross locations, the seed cotton yield of CRIS-585 was (4310 kg ha⁻¹) that increased 12.26% over the standard check variety CRIS-342. Table 7 revealed that on average of all the locations, CRIS-585 given (4323 kg ha⁻¹) seed cotton yield. It was noted that the newly developed variety has a wider adaptability to perform in multiple environments that has a tolerant or combat with climate change issues.

Table 5. Performance of CRIS-585 in Zonal Varietal Trial (ZVT) at three different locations in Sindh during crop season 2013-14 & 2014-15

Year	Location	Seed cotton Yield (kg ha ⁻¹)		
		CRIS-585	CRIS-578	CRIS-342 (std.)
2013-14	Mirpurkhas	4018	3400	3800
	Sakrand	4180	3600	3900
	Ghotki	3711	3200	3100
	Average	3969	3400	3600
2014-15	Mirpurkhas	4105	3800	3700
	Sakrand	4250	3900	3600
	Ghotki	3821	3500	3700
	Average	4058	3733	3667
Average over all sites		4013	3566	3633
% Increase over controls		---	12.54	10.46

Table 6. Performance of CRIS-585 at grower's field during 2013-14

Sr. No.	Name of Grower	District	Seed cotton yield (kg ha ⁻¹)	
			CRIS-585	CRIS-342 (Std.)
1.	Mr. Mansoor Ahmed Cheema	Mirpurkhas	4322	3880
2.	Mr. Abdul Qadir Baloch	Mirpurkhas	4267	3841
3.	Mr. Haji Ghulam Qadir Chang	Badin	4136	3770
4.	Dr. M. Umar Memon	Thatta	4385	3730
5.	Peer Hafeez Jan Sarhandi	Tando M.Khan	4232	3762
6.	Mr. Abdul Latif Mangrio	Tando allahyar	4244	3890
7.	Mr. M. Siddique Leghari	Tando allahyar	4238	3921
8.	Mr. Manzoor Lakhier	Hyderabad	4324	3966
9.	Sayed Nadeem Shah	Matari	4535	4021
10.	Qadeer Farm Shahdadpur	Sanghar	4380	3940
11.	Mr. Ghulam Rasool Ahpan	Sanghar	4460	3970
12.	Syed Ghulam Sarwar Shah	Sh. Benzirabad	4231	3810
13.	Sayed Zain Shah	Sh. Benzirabad	4366	3762
14.	Mr. Jamaldin Khoso	Sh. Benzirabad	4486	3780
15.	Mr. Tufail Ahmed Jalbani	N.Feroze	4222	3725
16.	Rais Ghulam Qasim Jiskani	Khairpur Mirs	4288	3770
17.	Malik Mushtaque Awan	Sukkur	4333	3840
18.	Mr. M. Anawar	Ghotki	4132	3727
Average:			4310	3839
% Increased over control:				12.26

Table 7. Performance of CRIS-585 at grower's field during the second year 2016-17

Sr. No.	Name of Grower	District	CRIS-585
1	Sufi Nawaz Ali	Umer Kot	4250
2	Syed Nadeem Shah	Matyari	4300
3	Muhammad Irfan	Sinjhoro, Sanghar	4600
4	Haji Ayub Khaskheli	Jhol, Sanghar	4400
5	Rais Murad Ali Nizamani	Sanghar	4300
6	Rais Shahnwaz Keerio	Jhol, Sanghar	4500
7	Rais Hidayatullah Keerio	Sh.Benazirabad	4200
8	Jamal Din Khoso	Sakrand, SBA	4400
9	Muhammad Ramzan Kambo	Tando Muhammad Khan	4250
10	Mir Yunis Talpur	Khairpur	4350
11	Abdul Basit	Uthal, Lasbela, Balochistan	4000
Average			4323

National Coordinated Varietal Trial

CRIS-585 was included in national coordinated varietal trial for two consecutive years in 2014-15 and 2015-16. It was tested for regional adaptable for seed cotton yield at governmental farms with coding. The data presented in Table 8 exhibited that in 2014-15, on the average seed cotton yield data of all the four provinces CRIS-585 secured 5th position by producing (2430 kg ha⁻¹) seed cotton yield in Pakistan and got 3rd position by producing (3313 kg ha⁻¹) seed cotton yield in Sindh Province as compared with other advance strains and standard check varieties. During the second year (2015-16), on an

average of all the sites of Sindh Province CRIS-585 secured 5th position by producing (2541 kg ha⁻¹) seed cotton yield (Table 9). Whereas it also maintained 5th position in Pakistan. It was noted that CRIS-585 has potential to produced seed cotton yield in changing environments.

Table 8. Average performance of candidate varieties in respect of seed cotton yield (kg ha⁻¹) tested in NCVT overall in Pakistan during 2014-15

Sr. No.	Strains	Punjab	Sindh	Khyber Pakhtoon Khuwah	Balochistan	Pakistan Average
1.	TH-120	2633	3388	1736	2818	2795
2.	NIAB-414	2466	3216	1589	2882	2700
3.	AA-132	2395	2809	1539	2960	2599
4.	CIM-620	2608	2521	1916	2606	2534
5.	CRIS-585	1864	3313 (3rd)	1453	2720	2430 (5th)
6.	CIM-573* CRIS-342**	1955	3214	1391	2651	2416
7.	BH-177	1863	3011	1516	2881	2414
8.	CRIS-533	1830	3432	1359	2629	2409
9.	MPS-27	2030	3033	1474	2626	2402
10.	DNH-40	2147	2710	1510	2870	2358
11.	IUB-75	2173	2057	1200	2320	2116
12.	TH-122/05	1141	2915	1317	2929	2114
13.	GS-433	1876	2048	911	2640	2076

*CIM-573 (std.) for Punjab and D.I.Khan, **CRIS-342 (std.) for Sindh and Balochistan

Table 9. Average performance of candidate varieties in respect of seed cotton yield (kg ha⁻¹) tested in NCVT overall in Sindh Province during 2015-16

S. No	Strains	CCRI-Sakrand	CRS-Ghotki	ARI-Tandojam	Sindh Average
1.	CRIS-585	4264	1286	2072	2541 (5th)
2.	MPS-29	4106	1312	2247	2555 (3 rd)
3.	TH/120	4114	1202	2193	2503
4.	TH-20	3588	1438	2462	2496
5.	IUB-75	2883	1517	2207	2202
6.	NIAB-414	2126	1475	2354	1985
7.	CRIS-543	4503	1325	2637	2822 (1 st)
8.	PB-896	2511	1387	2220	2006
9.	GH-HAMMAD	3619	1542	2543	2568 (2 nd)
10.	DNH-40	2524	1277	2018	1940
11.	FH-442	3303	1380	2072	2252
12.	GS-ALI-1	2830	1140	2005	1992
13.	Tahfuz-7	1344	1139	1601	1361
14.	AA-132	1934	966	1937	1612
15.	CIM-620	1126	1099	1837	1354
16.	CRIS-129 (std.)	3881	1393	2381	2552(4 th)

Source: Directorate of Agricultural Research PCCC Karachi 2015-16

CRIS-585 was also compared with those common varieties completed two years in national coordinated varietal trial (Table 10). It was noted that on an average of two years CRIS-585 stood 3rd and produced (2226 kg ha⁻¹) as compared with other advance genotypes developed by breeders of public and private sector. On the basis of two years data of national coordinated varietal trail (Table 11), CRIS-585 proved as best and high yield cotton variety that stood 2nd in regionally tested trial with wider adaptable as compared with other advance strains.

Table 10. Average seed cotton yield (kg ha⁻¹) of CRIS-585, compared with common varieties in NCVT overall Pakistan during two consecutive years, 2014-15 and 2015-16

S. No.	Strains	2014-15	2015-16	Average
1	TH/120	2795	2222	2509 (1 st)
2	NIAB-414	2700	2019	2360 (2 nd)
3	CRIS-585	2430	2021	2226 (3rd)
4	IUB-75	2116	2056	2086
5	AA-132	2599	1779	2189
6	CIM-620	2534	1473	2004
7	DNH-40	2358	1994	2176

Table 11. Average seed cotton yield (kg ha⁻¹) of CRIS-585 in National Coordinated Varietal Trial (NCVT) in Sindh during 2014-15 and 2015-16

Sr. No.	Strains	2014-15	2015-16	Average
1	TH-120	3388	2503	2946 (1 st)
2	CRIS-585	3313	2541	2927 (2nd)
3	IUB-75	2057	2202	2130
4	NIAB-414	3216	1985	2601
5	AA-132	2809	1612	2211
6	CIM-620	2521	1354	1938
7	DNH-40	2710	1940	2325

Fiber Quality Traits

The results of fiber characters are depicted in Table 12. The replicated lint samples were tested from fiber technology section Central Cotton Research Institute Multan. The fiber traits were tested on high volume instrument. The data showed that CRIS-585 possess high GOT (42.4%), longer staple (29.0 mm), strongest fiber strength (30.6 g tex⁻¹), fineness fiber (4.5 µg inch⁻¹) and 83.3% fiber uniformity index as compared with standard check variety CRIS-342.

Table 12. Fibre characteristics of CRIS-585 in comparison with the commercial varieties

Varieties	GOT (%)	Staple Length (mm)	Fibre Strength (g tex ⁻¹)	Micronaire value (µg inch ⁻¹)	Uniformity Index (%)
CRIS-585	42.4	29.0	30.6	4.5	83.3
CRIS-342 (Std)	37.9	27.6	30.2	4.6	82.8

Host Plant Resistance

Host plant resistance studies help cotton breeders to develop/screen varieties which have natural resistance to insect pests. The natural resistance of a variety in turn reduces frequency of pesticide sprays to some extent and consequently saves resources available with the growers. Host plant resistance trials were conducted to evaluate CRIS-585 for its natural resistance to insect pests during 2013-14 and 2014-15 crop seasons at CCRI-Sakrand in unsprayed blocks. Data presented in Table 13 indicates that, on an average of two years, CRIS-585 showed a slight natural tolerance against thrips, jassid, whitefly and bollworm damage as compared to commercial variety CRIS-342.

Table 13. Host Plant Resistance Studies of CRIS-585 against sucking pests and bollworm in HPR trial during 2013-14 and 2014-15 at CCRI-Sakrand

Varieties	Average pest population/leaf			Bollworm damage (%)
	Thrips	Jassid	Whitefly	
2013-14				
CRIS-585	2.55	0.29	0.45	2.10
CRIS-342 (Std.)	2.57	0.26	0.41	2.22
2014-15				
CRIS-585	2.21	0.47	0.51	0.85
CRIS-342 (Std.)	2.53	0.56	0.49	0.98
Average				
CRIS-585	2.38	0.38	0.48	1.48
CRIS-342 (Std.)	2.55	0.41	0.45	1.60

Disease Resistance

The Pathological studies on CRIS-585 relating to seedling rot, boll rot and Cotton Leaf Curl Virus disease were conducted at Central Cotton Research Institute, Sakrand during 2013-14 and 2014-15 crop season. The average of two years data presented in Table 14 indicate that, incidence of seedling rot and boll rot were found lower 6.4% and 4.6% in CRIS-585 as compared to 7.6 % and 6.3% of CRIS-342 respectively. The incidence of CLCuV in CRIS-585 was observed 1.3% as compared to 3.1% of CRIS-342 under Sakrand conditions.

Table 14. Disease resistance comparison of CRIS-585 to other strains and standard at CCRI-Sakrand during 2013-14 and 2014-15

Variety	Seedling rot %	Boll rot %	CLCuV Incidence%
CRIS-585	6.4	4.6	1.3
CRIS-514	6.5	5.5	3.0
CRIS-527	6.7	5.8	1.5
CRIS-342 (Std.)	7.6	6.3	3.1

Agronomic Study

Sowing Date Trial

Sowing date is an important attribute that substantially contribute towards seed cotton yield. In order to determine optimum sowing time, CRIS-585 was tested under four sowing dates viz., 15th April, 1st May, 15th May and 1st June during 2014-15 and 2015-16 cotton seasons at CCRI-Sakrand. The data presented in Table 15 revealed that CRIS-585 produced higher seed cotton yield in both the years (2014 and 2015) when sowing on consecutive. On an average of two years, maximum seed cotton yield (3892 kg ha⁻¹) was obtained when the variety was sown on 15th April followed by 3711 kg ha⁻¹ of 1st May and 3117 kg ha⁻¹ of 15th May sowing. Therefore, it can be concluded that the optimum sowing period of this variety is 15th April to 15th May. CRIS-585 may also strongly be recommended for sowing in other zones having similar climatic conditions.

Table 15. Seed cotton yield (kg ha⁻¹) of advanced strain CRIS-585 as affected by different sowing dates during 2014-15 and 2015-16

Sowing Date	Seed cotton yield (kg ha ⁻¹)			
	Strains	2014-15	2015-16	Average
S1 (15 th April)	CRIS-585	3824	3959	3892
	CRIS-342	3452	3438	3445
S2 (1 st May)	CRIS-585	3681	3741	3711
	CRIS-342	3325	3160	3243
S3 (15 th May)	CRIS-585	3071	3163	3117
	CRIS-342	2654	2750	2702
S4 (1 st June)	CRIS-585	2961	3089	3025
	CRIS-342	2533	2511	2522

Fertilizer cum spacing trial

The yield performance of CRIS-585 was tested under four different levels of Nitrogen i.e. 50, 100, 150 and 200 kg Nitrogen per hectare and three plant to plant spacing i.e. 15 cm, 23 cm and 30 cm at CCRI-Sakrand during 2015-16. The data presented in Table 16 showed that, the maximum seed cotton yield (4280 kg ha⁻¹) was obtained at 30 cm spacing under 200 kg Nitrogen per hectare as compared to application of 150 kg N ha⁻¹ (4218 kg ha⁻¹), 100 kg N ha⁻¹ (3705 kg ha⁻¹) and 50 kg N ha⁻¹ (3236 kg ha⁻¹). The data indicates that CRIS-585 has the potential to provide higher yield on 150 kg N ha⁻¹ at 30 cm spacing and this variety does not need a very high input which is difficult to manage by a common grower.

Table 16. Effect of Nitrogen and plant spacing on seed cotton yield of CRIS-585, a candidate variety during 2015-16

Treatment	Nitrogen Dose	Spacing		
		15cm	23cm	30cm
T ₁	50 kg ha ⁻¹	2761	3049	3236
T ₂	100 kg ha ⁻¹	3066	3271	3705
T ₃	150 kg ha ⁻¹	3288	3468	4218
T ₄	200 kg ha ⁻¹	3223	3493	4280

Irrigation trial

Irrigation trial conducted for testing the water requirement of the CRIS-585 against standard CRIS-342 during 2015-16. Table 17 indicated that CRIS-585 with five irrigations performed well and produced highest seed cotton yield (4353 kg ha⁻¹) as compared to 4 irrigations (3975 kg ha⁻¹) and 6 irrigations (4213 kg ha⁻¹).

Table 17. Performance of CRIS-585 in irrigation trial during 2015-16

Irrigations	Strains	Plant Population (ha⁻¹)	Seed cotton yield (kg ha⁻¹)
I₁ (4 Irrigations)	CRIS-585	42217	3975
	CRIS-543	43153	4255
	CRIS-342	44980	2821
I₂ (5 Irrigations)	CRIS-585	42325	4257
	CRIS-543	43017	4353
	CRIS-342	43680	3215
I₇ (Irrigations)	CRIS-585	42712	4213
	CRIS-543	43864	4047
	CRIS-342	44785	3867
Average varieties	CRIS-585	42418	4148
	CRIS-543	43345	4218
	CRIS-342	44482	3401

The results clearly indicated that CRIS-585 gave higher yield on 5 irrigations as compared the yield of standard variety CRIS-342 (3215 kg ha⁻¹) of seed cotton yield in five irrigation treatment.

CONCLUSION

The CRIS-585 is high yield, early maturing and medium long staple variety. The variety features were presented in technical expert subcommittee and after that proposal was submitted and present in Sindh Seed Council. Keeping in view the performance and silent features of CRIS-585 it was approved and recommended for general cultivation in Sindh during the year 2020.

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