

Evolution of Early Maturing, High Yielding and High Got Upland Cotton Variety Cris-129

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Abstract:

CRIS-129 a new high yielding, early maturing and heat tolerant cotton cultivar evolved by CCRI-Sakrand, compared to commercially grown varieties; CRIS-9, NIAB-78 and CRIS-134. It gave 25.7% increased seedcotton yield (kg ha⁻¹) over CRIS-9, 37.7% over NIAB-78 and 11.8% over CRIS-134. The yield potential of CRIS-129 is 4800 kg ha⁻¹, 48 maunds per acre. It has been passed through different stages of experiments conducted for observations of quantitative and qualitative characters.

This variety has been tested in different trials at CCRI-Sakrand and other research stations and proved to be high yielding. It showed best performance in Sindh, in particular and in Pakistan in general. The Demonstration Trials were also conducted at progressive grower's field of different ecological zones of Sindh during 2006-07 and 2007-08. Results obtained from these trials showed superiority of CRIS-129 over commercial varieties. CRIS-129 also maintained its

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superiority in National Coordinated Varietal Trial and secured first position in 2007-08 and second position in 2008-09.

CRIS-129 ginned better as compared to commercial varieties with the increase of 5.07% over CRIS-9, 6.5% over NIAB-78 and 4.5% over CRIS-134.

CRIS-129 measured slightly high staple length (27.5 mm) compared to commercial varieties CRIS-9 (26.5 mm), NIAB-78 (26.3 mm) and CRIS-134 (27.0 mm).

CRIS-129 also recorded 98.5 fibre strength compared to CRIS-9 (97.0), NIAB-78 (95.0) and CRIS-134 (97.0) fibre tpsi and possesses better uniformity ration (54.8%) against CRIS-9 (42.5%), NIAB-78 (46.3%) and CRIS-134 (50.0%).

CRIS-129, an early maturing if exploited fully with recommended production technology and better after care management. After 120 days of planting, it attains 61.8% boll opening as compared to CRIS-9 (35.6%) and NIAB-78 (53.3%). This earliness makes CRIS-129 fit better than CRIS-9 and NIAB-78 in cotton-wheat rotation fields. Its short stature escape lodging consequently saves yield losses caused by the bolls and seedcotton laying on the ground and get rotted. In the trials conducted at CCRI-Sakrand, it has shown fair degree of host plant resistance to insect pests, disease and heat tolerance as compared to other commercially grown varieties of Sindh province.

Key words: Earliness, Gossypium Hirsutum, GOT, Yield.

Introduction

Cotton is an important cash crop for Pakistan known as “white gold”. It accounts for 8.2% of the value added in agriculture and about 3.2% to GDP. Cotton is an important economic and fiber crop in 70 countries in the world & over 180 million peoples are associated with the fiber industry. Cotton is main source of foreign exchange earnings and bring about 60% of the total annual earnings from the export of raw cotton material and the furnish products. Pakistan is the 4th largest cotton producing

country in the world. Cotton has been enjoying very important position in crop production ever since the dawn of civilization. The earliest cottons grown and spun into fabrics were in the Indus Valley as displayed by the excavations at Mohenjo-Daro, dating back to 3500 BC. Cotton seeds about 9,000 years old, the oldest in the world so far, have been found at the foot of Bolan Pass in Balochistan.

It is hope that this commercial cultivation of this variety, CRIS-129 will significantly contribute to the overall cotton production. Due to immense importance of cotton crop in the economy of Pakistan, breeders made tremendous efforts to make the plant more profitable.

Singh *et.al* 1973 reported that significance differences in raw cotton yield of American cottons were due to the varieties. Ahmed *et.al* 1982 obtains highly significant differences in yield of upland cotton due to varieties. Soomro *et.al* 1986 reported significance differences in yield, ginning outturn percent and staple length for varieties. Due to indeterminate of growth habit of cotton earliness is a complex trait, and thus cannot be measured easily. However, some morphological features which provided an estimate of earliness in cotton had been reported in literature. For example, node of first fruiting branch, number of vegetative branches and percentage of bolls on vegetative branches are the reliable features clues to earliness in cotton Ray and Richmond, 1966.

Majeedano *et.al* 2009 conducted study on comparative performance of six upland cotton varieties regarding earliness and seedcotton yield. Results revealed that CRIS-134 with highest Bartlett's Index of 0.464 was observed as most early genotype in the test. The second ranking genotype CIM-499 had BEI of 0.461. CRIS-5A was observed as late genotype with BEI 0.423 followed by CIM-506 with BEI of 0.427. Rehana Anjum *et al* 2001 which carrying out earliness studies on five genotypes by evaluating five characters viz. plant height, main stem node number, 1st sympodial branch, number of days to bloom 1st

flower/boll and number of days to attain 5 NAWF (Nodes above white flower) stage for their effectiveness in measuring earliness opinion that character attaining date of 5 NAWF stage and date of opening 1st flower/boll were more reliable indicators of earliness.

Materials and Methods

CRIS-129, a new high yielding, early maturing and heat tolerant variety has been evolved at Central Cotton Research Institute, Sakrand, through conventional breeding methods by crossing CIM-70 with B-909. CIM-70, semi dwarf, short statured, early maturing variety was used as female parent while B-909, high yielding and heat tolerant variety as male parent. The crosses were attempted during 1991 at Central Cotton Research Institute- Sakrand. F₁ Generation was planted during 1992 and F₂ segregating generation in single plant progeny rows in 1993. In F₅, the desirable uniform plants from the best family rows were selected and bulked to form a new strain CRIS-129.

The CRIS-129 has passed a series of testing in Strain Tests, Varietal Trials, Zonal Varietal Trials and National Coordinated Varietal Trials (NCVT) of Pakistan Central Cotton Committee (PCCC). Besides these trials, CRIS-129 was also tested in demonstration trials at CCRI, Sakrand and at various progressive growers/farmer's field of Sindh to ascertain its stability and yield potential against other commercial varieties presently grown in Sindh.

Result and Discussions

After its bulk, CRIS-129 was tested in preliminary as well as advanced yield comparison trials (Strain test trials, Varietal trials, Zonal Varietal trials and National Coordinated Varietal trials). The performance of this variety is discussed here under:

1. Strain Test Trials

The new variety CRIS-129 was tested in replicated test trials against commercial varieties viz. CRIS-9 and NIAB-78 continuously for two years from 1992 to 1993 at central Cotton Research Institute, Sakrand. The data presented in Table 1 shows that on an average of two years, CRIS-129 out yielded both of the standards by producing maximum seed cotton yield (3836 kg ha⁻¹) compared to CRIS-9 (2807 kg ha⁻¹) and NIAB-78 (2433 kg ha⁻¹).

Table-1: Yield Performance of CRIS-129 in strain test trials at Central Cotton Research Institute-Sakrand during 1992 and 1993

Years	CRIS-129	CRIS-9 (Std)	NIAB-78 (Std)
1. Seedcotton Yield (kg ha⁻¹)			
1992	3836	2807	2433
1993	3950	3368	2826
Average	3893	3088	2630
% Increase over Std.	-	20.68%	32.44%

2. Varietal Trials

Likewise CRIS-129 was also tested in replicated varietal trials continuously for two crop seasons from 1994 and 1995 at Central Cotton Research Institute, Sakrand. The data presented in Table 2 indicate on average of two years, CRIS-129 produced maximum seedcotton yield (3837 kg ha) compared to CRIS-9 (2863 kg ha) and NIAB-78 (2244 kg ha). CRIS-129 produced 24.85% and 59.39% more seedcotton yield than CRIS-9 and NIAB-78, which revealed that the adaptability of new variety.

Table-2: Yield performance of CRIS-129 in varietal trials at Central Cotton Research Institute, Sakrand

Years	CRIS-129	CRIS-9 (std)	NIAB-78 (std)
1. Seedcotton Yield (kg ha⁻¹)			
1994	3837	2863	2245

1995	3768	3228	2526
Average	3803	3046	2386
Increase over Std.	-	24.85%	59.39%

3. Zonal Varietal Trials

CRIS-129 was tested at three different ecological zones of Sindh against commercial varieties CRIS-9 and NIAB-78 for three years. The data presented in Table-3a shows that, on the basis of individual locations and overall average, CRIS-129 maintained its superiority over controls by producing (3461 kg ha⁻¹) seedcotton yield as compared to CRIS-9 (2420 kg ha⁻¹) and NIAB-78 (2304 kg ha⁻¹). Thus CRIS-129, on an average exceeded CRIS-9 by 43.02% and NIAB-78 by 50.22%.

Table-3a Performance of CRIS-129 in Zonal Varietal Trials at three different locations in Sindh during 1995, 1996 and 1997

Year	Locations	Varieties and Seedcotton Yield (kg ha ⁻¹)		
		CRIS-129	CRIS-9	NIAB-78
1995	CCRI, Sakrand	3842	3087	2993
	CRS, Dadu	3021	3401	2275
	CRS, Mirpurkhas	3453	2260	1980
	Average	3439	2583	2416
1996	CCRI, Sakrand	3895	2343	2272
	CRS, Dadu	3460	2006	1890
	CRS, Mirpurkhas	3250	2117	1940
	Average	3535	2155	2034
1997	CCRI, Sakrand	3913	2968	2819
	CRS, Dadu	3043	2237	2526
	CRS, Mirpurkhas	3270	2359	2045
	Average	3409	2521	2463
Average overall sites		3461	2420	2304
%Increase over Controls		-	43.02%	50.22%

4. Performance of Cris-129 at Growers' Field

CRIS-129 was tested on growers' fields at different locations of Sindh against commercial variety CRIS-134 during 2008-09 crop season. Data given in Table-3b show that CRIS-129 gave

higher seedcotton yield (4208 kg ha⁻¹) as compared to CRIS-134 (3595 kg ha⁻¹) over 14 different locations of Sindh at growers' fields.

Table-7: Performance of CRIS-129 at growers' field, during 2008-09

Sr. No.	Location	District	Seedcotton yield (kg ha ⁻¹)		
			CRIS-129	CRIS-342	CRIS-134
1.	Mr. Muneer Ahmad Gahotee	Matiari	4400	4000	3560
2.	Mr. Mir Mohammad Gahotee	Matiari	4200	3800	3600
3.	Mr. Khamiso Khan Farash	Matiari	4060	3900	4000
4.	Mr. Mohammad Juman Jono	Matiari	4000	3800	3800
5.	Mr. Jam Makkan	Sanghar	4300	4100	3900
6.	Syed Noor Ali Shah	Umerkot	4450	4300	3550
7.	Syed Ghulam Rasool Shah	Umerkot	4200	4000	3940
8.	Mr. Soofi Akbar Hussain	Umerkot	4400	4500	3570
9.	Mr. Mansoor Ahmed Cheema	Umerkot	4100	4000	3500
10.	Mr. Yar Mohammad Baloch	Mirpurkhas	4000	4200	3200
11.	Mr. Abdul Karim Pahi	S. Benazirabad	3560	3260	3000
12.	Mr. Gul Hassan Rahoo	S. Benazirabad	4550	3450	3460
13.	Mr. Mohammad Soomar Rahoo	S. Benazirabad	4500	4150	3800
14.	Dr. Ranjhan Panhwar	N. Feroze	4200	3460	3450
Average:			4208	3923	3595
Increase over controls:			-	7.0%	17.0%

5. Performance in Demonstration Trials

The demonstration trials conducted for two consecutive years (2006 and 2007) at CCRI- Sakrand Farm Table-4 indicate that CRIS-129 maintained its yield superiority and excelled other commercial varieties with greater margin during both the years. On an average of two years Table-4, CRIS-129 gave 4223 kg ha⁻¹ of seedcotton and ranked first as compared to 3314 kg ha⁻¹ of CRIS-134 and 3096 kg ha⁻¹ of CRIS-9.

Table 4: Performance of CRIS-129 against commercial varieties in Demonstration Trials at CCRI- Sakrand during 2007 and 2008

Variety/Strain	Seedcotton Yield (kg ha ⁻¹)			Increase Over (%)
	2006	2007	Average	
CRIS-129	4140	4306	4223	-
CRIS-134	2980	3648	3314	27.43
CRIS-9 (Control)	2910	3289	3096	36.40

6. National Coordinated Varietal Trials

CRIS-129 was among eighteen candidate varieties tested under coded system of PCCC at different ecological zones of Pakistan for two years 2007-8 and 2008-09. CRIS-134 was kept as control for Sindh and Balochistan and CIM-496 was for Punjab and Khyber Pakhtoon Khuwah (NWFP).

The yield data presented in Table-5 indicated that, on an average of four provinces in National Coordinated Varietal Trial, CRIS-129 secured first position on Pakistan level by producing 2635.92 kg ha⁻¹ seedcotton yield followed by CRIS-342 (2593 kg ha⁻¹), SLH-284 (2471.61 kg ha) and CIM-496 (2265.42 kg ha) compared with commercial varieties.

Table-5: Average performance of candidate varieties in respect of seedcotton yield (kg ha⁻¹) tested in NCVT overall in Pakistan during 2007-08

S. No.	Strains	Sindh (5 locations)	Balochistan (4 locations)	Punjab (11 locations)	Khyber Pakhtoon Khuwah (1 location)	Pakistan Average
1.	CRIS-129	2619.95	1746.55	2927.07	3087	2635.92
2.	CRIS-342	2526.09	1727.55	2962.59	2401.00	2593.46
3.	SLH-284	2359.41	1657.31	2821.91	2549.00	2471.61
4.	NIAB-846	2296.84	1832.14	2694.42	2132.00	2403.65
5.	GS-1	2505.96	1753.23	2497.53	2105.00	2346.66
6.	CIM-554	2033.76	1627.11	2516.51	2018.00	2200.46
7.	GH-102	2289.59	1753.88	2369.01	1843.00	2211.59
8.	NIAB-777	2142.88	1753.73	2508.65	2152.00	2255.42
9.	BH-167	2098.39	1633.88	2338.84	2408.00	2148.2
10.	RH-610	2092.76	1632.67	2497.40	2246.00	2218.40

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11.	CRSM-38	1354.62	1689.18	2366.73	2542.00	1975.46
12.	ASR-1	1911.87	1665.60	2313.54	1890.00	2066.92
13.	CRSM-70	1877.61	1611.08	2568.68	1486.00	2156.89
14.	NIBGE-115	1719.00	1733.70	2821.53	2731.00	2318.92
15.	TH-86/02	1969.15	1646.13	2117.17	1332.00	1955.46
16.	TH-198/94	1818.82	1679.98	1907.18	1386.00	1818.06
17.	CIM-541	2056.89	1605.42	1724.04	1486.00	1782.44
18.	CRIS-134	2195.77	1811.61	-	-	2163.86
19.	CIM-496	-	-	2325.74	1601.00	2265.42

Source: Summary Annual Progress Report 2007-08 of PCCC.

The average seedcotton yield data of only those varieties which are tested in two consecutive years during 2007-08 to 2008-09 are given in Table-6. The data indicates that, on an average of two consecutive years, FH-142 secured 1st position on Pakistan level by producing 2681 kg ha seedcotton yield whereas, CRIS-129 gave seedcotton yield (2498 kg ha⁻¹) and secured 2nd position among nineteen varieties sown continuously during both the seasons followed by NIAB-852 (2374 kg ha⁻¹) and NH-3 (2358 kg ha⁻¹).

Table-6: Average performance of CRIS-129 in National Coordinated Varietal Trials (NCVT) on National Level during 2008-09

S. No.	Strains	Seedcotton yield (kg ha ⁻¹)			National Average
		Sindh	Punjab & DI Khan	Balochistan	
1.	FH-941	3143	3074	1826	2681
2.	CRIS-129	2449	3007	2037	2498
3.	NIAB-852	2462	2818	1843	2374
4.	NH-3	2525	2764	1784	2358
5.	PB-900	2416	2719	1832	2322
6.	NIAB-777	1997	2962	1997	2319
7.	NIA-78	2940	2077	1916	2311
8.	FH-942	2428	2627	1814	2290
9.	BH-172	1972	3107	1761s	2280
10.	SLH-313	2054	2695	1936	2228
11.	CRSM-2007	2078	2590	2005	2224
12.	CIM-554	2000	2804	1798	2201
13.	GH-102	2331	2341	1895	2189
14.	GS-14	1861	2691	1768	2107

15.	GS-1	2084	2418	1778	2093
16.	CIM-557	1622	2857	1768	2082
17.	TH-8612	2127	2116	1834	2026
18.	CRSM-38	1562	2614	1799	1992
19.	VH-278	1775	2290	1799	1955
20.	CRIS-134 (std)	2223	-	1738	-
21.	CIM-496 (std)		2737	-	-

On an average of two years' data presented in Table-7 shows that, CRIS-129 produced the highest seedcotton yield (2479 kg ha⁻¹) in Sindh and also secured 1st position among other varieties sown continuously during both the seasons (2007 and 2008) in Sindh.

Table-7: Average seedcotton yield (kg ha⁻¹) of CRIS-129, compared with common varieties in NCVT during two consecutive years, 2007 and 2008

S. No.	Strains	2007	2008	Average
1.	CRIS-129	2459	2498	2479
2.	GS-1	2215	2093	2154
3.	CIM-554	2199	2201	2200
4.	GH-102	2184	2189	2187
5.	NIAB-777	2139	2319	2229
6.	CRSM-38	1988	1992	1990
7.	TH-86/2	1766	2026	1896
8.	CRIS-134 (std)	2003	2180	2092

7. Ginning and Fiber Characteristics

CRIS-129 had 37.5% ginning out-turn percentage which is higher than the CRIS-9, NIAB-78 and CRIS-134 as presented in Table 8. The staple length of CRIS-129 is higher (28.5 mm) than the standard whereas the fiber fineness is also better than CRIS-9, NIAB-78 and CRIS-134 had 4.6 ug inch⁻¹ fineness and fiber strength is 98.5tppsi.

Table-8 Ginning Out-turn and Fibre Characters of CRIS-129

Varieties	GOT (%)	Staple Length (mm)	Fibre Strength (tppsi)	Micronaire value ($\mu\text{g inch}^{-1}$)	Uniformity Ratio (%)	Fibre Maturity Percent
CRIS-129	37.5	28.5	98.5	4.4-4.6	54.8	82.5
CRIS-9	35.7	26.5	97.0	4.4-4.8	42.5	79.4
NIAB-78	35.4	26.3	95.0	3.9-4.9	46.3	76.3
CRIS-134	36.5	27.0	97.0	4.0-4.5	50.0	80.5

8. Earliness Studies

Earliness of CRIS-129 was compared with commercially grown varieties in advance trials i.e. strains tests and varietal trials conducted at CCRI- Sakrand. The data of earliness is presented in Table-9. In strain test, on an average of two years CRIS-129 was recorded as the earliest among all the varieties since it formed maximum of 91.0% and opened 61.80% bolls at early stages 120 Days After Planting (DAP). While control NIAB-78 formed 84.0 % and opened 53.3% bolls at 120 DAP.

In varietal trial, CRIS-129 also formed and opened maximum of 86.0% and 59.4% bolls at 120 DAP followed by 83.0% and 48.5% bolls of control NIAB-78 respectively. The data clearly indicates that CRIS-129 mature earlier as compared to commercial varieties so due to earliness it also helps the growers to vacate early field for wheat sowing.

Table-9: Earliness of CRIS-129 in comparison with standard varieties grown in Sindh in various trials conducted by Central Cotton Research Institute, Sakrand

Detail of Trial	Year of Test	Varieties	Bolls formed at			Bolls opened at	
			90 DAP	120 DAP	150 DAP	120 DAP	150 DAP
Strain Tests	1992-93 to 1993-94	CRIS-129	18.3 (52.7%)	31.7 (91.4%)	34.7 (100%)	21.4 (61.8%)	32.1 (92.5%)
		CRIS-9	7.7 (24.7%)	21.5 (68.0%)	31.2 (100%)	11.1 (35.6%)	28.0 (89.7%)
		NIAB-78	12.8 (44.0%)	24.3 (84.0%)	28.7 (100%)	17.3 (53.3%)	26.0 (90.6%)
Varietal Trials	1994-95 to	CRIS-129	21.6 (61.7%)	30.2 (86.0%)	35.0 (100%)	20.8 (59.4%)	32.9 (94.0%)

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	1995-96	CRIS-9	10.0 (43.5%)	18.0 (77.0%)	23.2 (100%)	8.0 (34.5%)	20.8 (89.6%)
		NIAB-78	10.6 (41.0%)	21.6 (83.0%)	25.8 (100%)	12.5 (48.5%)	23.5 (91.1%)

DAP: Days after planting

9. Host Plant Resistance

The Entomological studies on CRIS-129 were conducted by the entomology section of Central Cotton Research Institute, Sakrand in host plant resistant trial to assess its tolerance level against thrip, jassid, white fly and boll worms compared with commercial variety CRIS-134. The data of pest population revealed that the new variety had about equal level of tolerance against pests as the commercial variety of CRIS-134.

Table-10: Host Plant Resistance Studies of CRIS-129 against sucking pests and bollworm in HPR trial during 2007 and 2008 at CCRI-Sakrand

Varieties	Average pest population/leaf			Bollworm damage (%)	Seedcotton yield (kg ha ⁻¹)
	Thrips	Jassid	Whitefly		
2007					
CRIS-129	3.85	1.05	0.81	4.67	3358
CRIS-134 (std)	3.88	1.90	0.87	5.02	3119
2008					
CRIS-129	6.84	1.60	0.36	6.72	3229
CRIS-134 (std)	8.88	2.07	0.44	7.12	3109
Average					
CRIS-129	5.13	1.32	0.58	5.70	3294
CRIS-134 (std)	6.38	1.96	0.65	6.07	3114

10. Pathological studies

The Pathological studies on CRIS-129 relating to seedling rot, boll rot and Cotton Leaf Curl Virus disease were conducted at Central Cotton Research Insitute, Sakrand during 2007-08 and

2008-09 crop season. The average of two years data is presented in Table-11 indicate that, incidence of seedling rot and boll rot were found 2.5% and 8.6% in CRIS-129 at par/compared to 2.7% and 8.7% of CRIS-134, respectively. The incidence of CLCuV in CRIS-129 was 4.8% compared to 5.4% of CRIS-134 under Sakrand conditions.

Table-11: Disease resistance comparison of CRIS-129 to other strains and standards at CCRI-Sakrand

Variety	Seedling rot	Boll rot	CLCuV
	Incidence%		
CRIS-461	3.0	12.8	5.6
CRIS-129	2.5	8.6	4.8
CRIS-342	2.6	9.3	5.0
CRIS-134	2.7	8.7	5.4
CRIS-121	3.0	8.7	5.4

11. Agronomical Studies

a) Fertilizer Trial

The yield performance of CRIS-129 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 2007-08.

Table-12: Effect of Nitrogen and plant spacing on seedcotton yield of CRIS-129, a candidate variety during 2007-08

Treatment	Nitrogen Dose	Spacing		
		15cm	23cm	30cm
T ₁	50 kg ha ⁻¹	3133	2785	2298
T ₂	100 kg ha ⁻¹	3435	3064	2947
T ₃	150 kg ha ⁻¹	3644	3458	3389
T ₄	200 kg ha ⁻¹	3621	3551	3435

The data presented in Table-12 showed that, the maximum seedcotton yield (3644 kg ha⁻¹) was obtained at 15 cm spacing under 150 kg Nitrogen per hectare as compared to application of 200 kg N ha⁻¹ (3621 kg ha⁻¹), 100 kg N ha⁻¹ (3435 kg ha⁻¹) and 50 kg N ha⁻¹ (3133 kg ha⁻¹) at the spacing of 15 cm. CRIS-129

did not show response to higher doses of N application. The data indicates that CRIS-129 has the potential to provide higher yield on 150 kg N ha⁻¹ at 15 cm spacing and this variety does not need a very high input which is difficult to manage by a common grower.

b) Sowing Date Trial

In order to determine optimum sowing time, CRIS-129 was tested in four sowing dates viz; 15th April, 1st May, 15th May and 1st June during 2007 and 2008 cotton seasons at CCRI-Sakrand.

Table-13: Seedcotton yield (kg ha⁻¹) of advanced strain CRIS-129 as affected by different sowing dates during 2007 and 2008.

Sowing Date	Seedcotton yield (kg ha ⁻¹)			
	Strains	2007	2008	Average
S1 (15 th April)	CRIS-129	2946	2841	2894
	CRIS-134	2385	2554	2470
S2 (1 st May)	CRIS-129	2891	3066	2979
	CRIS-134	2773	2953	2863
S3 (15 th May)	CRIS-129	2741	2677	2709
	CRIS-134	2320	2215	2268
S4 (1 st June)	CRIS-129	1683	2471	2077
	CRIS-134	1424	2157	1791

The data presented in Table-13 revealed that, CRIS-129 produced higher seedcotton yield in both the years (2007 and 2008) 1st May sowing. On an average of two years, maximum seedcotton yield (2979 kg ha⁻¹) was also obtained when the variety was sown on 1st May followed by 2894 kg ha⁻¹ of 15th April and 2709 kg ha⁻¹ of 15th May sowing.

Therefore, it can be concluded that the optimum sowing date of this variety is 15th April to 15th May. CRIS-129 may also be recommended for sowing in other zones having similar climatic conditions.

c) Irrigation Trial

Irrigation requirement trials were conducted to explore the optimum number of irrigation required by CRIS-129. Optimum irrigation intervals play a crucial role in crop growth and development for getting higher yields. On this aspect, experiments were conducted for two years during 2007 and 2008. First irrigation as a common treatment was given after 40 days of planting to all three irrigation treatments; however, subsequent irrigations were applied at 15, 22 and 29 days intervals.

Table-14: Performance of CRIS-129 in irrigation trial at CCRI-Sakrand during 2007-08 and 2008-09

Irrigation interval	Seedcotton yield (kg ha ⁻¹)		Average
	2007	2008	
T ₁ (15 days interval)	3427	3569	3498
T ₂ (22 days interval)	2655	2720	2687
T ₃ (29 days interval)	2464	2530	2497

The data presented in Table-14 reveals that, subsequent irrigations at 15 days interval gave the highest yield (3498 kg ha⁻¹) as compared to other treatments during both the crop seasons. Subsequent irrigations at 22 days interval produced next maximum yield (2687 kg ha⁻¹) as compared to 29 days interval (2497 kg ha⁻¹). This clearly shows that CRIS-129 produced highest yield when irrigation was applied at 15 days interval.

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