CHAPTER-IV

Studies on Bivoltine × Bivoltine mulberry silkworm hybrids during Spring seasons (commercial seasons)

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Studies on Bivoltine × Bivoltine mulberry silkworm hybrids during Pooled Spring seasons (commercial seasons)

Silk production involves mulberry cultivation and silkworm rearing which are essentially akin to agriculture, particularly mulberry cultivation is land and water based and influenced by soil, climate and other edaphic factors; whereas silkworm rearing is almost exclusively dependent on the mulberry leaf production and its quality and silkworm rearing also profoundly influenced by the climate and hence there is a demand for region and season specific silkworm races(Thangvalu,1999).In India, the silkworm hybrids which have been exploited for commercial silk production are either multivoltine x multivoltine, multivoltine x bivoltine or bivoltine x bivoltine combination. Identification of different season specific silkworm hybrids for Kashmir condition were carried out and three specific hybrids were identified (Quadir *et al.*,1997). Several promising multi x bi and bi x bi silkworm hybrids were identified by Subba Rao *et al.*,(1989); Das *et al.*,(1994) ; Rao *et al.*,(1989) for west Bengal condition.

Considering the climatic condition of NE Region (temperature ranges from 5°C to 38°C and relative humidity ranges from 38% to 98% with an annual precipitation ranging from 1000 mm to 11500 mm.) it has become need of the time to identify bivoltine commercial hybrid with high qualitative and quantitative characters for rearing under rainfed condition . In the present study a comparative performance of new bivoltine breeds i.e. SLD4 x SLD8 (plate 4, page 19), Dun17 x Dun 18 (plate 1, page 19), CSR2 x CSR4 (plate 6, page 19), APS105 x APS126 (plate 2, page 19), APS45 xAPS12 (plate 5, page 20) and CSR46 x CSR47 (plate 3, page 19) were studied for its quantitative and qualitative characters were studied for spring commercial seasons.

3.1 Results of Bi x Bi hybrids in pooled Spring seasons (commercial seasons) (From Table 1 to Table 16 and Fig. 1 to Fig. 15) :

The performances of Bi x Bi hybrids i.e. SLD4 x SLD8, Dun17 x Dun 18, CSR2 x CSR4, APS105 x APS 126, APS45 x APS126 and CSR46 x CSR47 **during spring season** at different temperature levels i.e., 24±3◦C and 25±5◦C with constant humidity of 79±2 % is given below (Table 1):

Fecundity: The analysed data revealed that fecundity of Bi x Bi hybrids reared at 25±5◦C and 79±2 % ranged from 432.5 (Dun17 x Dun 18) to 497.85 (CSR46 x CSR47). Among the six hybrids highest evaluation index value was observed in the hybrid CSR46 x CSR47 (EIV 60.90428) followed by CSR2 x CSR4 (EIV 60.00) and SLD4 x SLD8 (EIV 55.58888)

Hatchability : The analysed data revealed that fecundity of Bi x Bi hybrids reared at 25±5◦C and 79±2% ranged from 51.4% (Dun17 x Dun 18) to 94.91 % (CSR2 x CSR4). Hatching percentage was observed highest in CSR2 x CSR4 (EIV 58.71585) followed by CSR46 x CSR47 (EIV 58.04918)

Effective rate of rearing (Effective rate of rearing by number): The economic output of mulberry silkworm rearing as reflected by effective rate of rearing in number (ERR) ranged from 3068 (APS45 x APS126) to 5391 (APS105 x APS 126) reared at 25±5◦C and 79±2 %. Among the six hybrids highest evaluation index value was observed in the hybrid APS105 x APS 126(E IV 60. 50109) followed by SLD4 x SLD8 (EIV 56.60311) and CSR2 x CSR4 (EIV 56. 52489)

Cocoon yield/10,000 larvae by weight: The cocoon yield by weight ranged from 4.00 kg (APS45 x APS126) to 8.62 kg (SLD4 x SLD8) at 25±5◦C and 79±2%. Significant difference in cocoon yield among the six Bi x Bi hybrids was noticed in SLD4 x SLD8 (EIV 62.03947) followed by CSR2 x CSR4 (EIV 58.45395) and CSR46 x CSR47 (EIV 49.93421).

Single cocoon weight: cocoon weight among hybrids reared at 25±5◦C and 79±2% ranged from 1.52 (Dun17 x Dun 18) to 1.729g (SLD4 x SLD8). Significant difference in single cocoon weight among the six Bi x Bi hybrids was noticed in SLD4 x SLD8 (EIV 67.28571) followed by (Dun17 x Dun 18) (EIV 62.57).

Shell weight: The shell weight ranged from 0.2995 (APS105 x APS 126) to 0.3985 g (SLD4 x SLD8) at 25±5◦C and 79±2 %. at 25±5◦C and 79±2◦C . Significant difference in shell weight for all the hybrids was recorded in SLD4 x SLD8 (EIV 65.78791) followed by (CSR46 x CSR47) (EIV 51.07239) and APS45 x APS126 (EIV 51.37027) .

Shell percentage: The analyzed data revealed that shell ratio among the six Bi x Bi hybrids reared at 25±5◦C and 79±2 % ranged from 19.595% (APS105 x APS 126) to 22.97 % (SLD4 x SLD8). Significant difference was observed among the six Bi x Bi hybrids in APS45 x APS126 (EIV 70.581605) followed by SLD4 x SLD8 (EIV 59.8512173).

Yield: Cocoon yield was calculated per 10,000 larvae brushed and expressed in terms of yield/100 dfls (kg). The cocoon yield among the six Bi x Bi hybrids reared at 25±5◦C and 79±2% ranged from 16 (APS45 x APS12) to 34.48 kg. (SLD4 x SLD8). Significant difference was observed among the six Bi x Bi hybrids in SLD4 x SLD8 (EIV 65.91)

Filament length: The trait filament length ranged from 660 (APS45 x APS126) to 816 m (CSR46 x CSR47) at 25±5◦C and 79±2%. Significant difference was observed among the six Bi x Bi hybrids in CSR46 x CSR47 (EIV 60.2653) followed by SLD4 x SLD8 (EIV 57.45165) and CSR2 x CSR4 (EIV 53.59422).

Filament weight: The trait filament weight ranged from 20.255 (APS45 x APS12) to 26.925 cg (CSR2 x CSR4) at 25±5◦C and 79±2%. Significant difference

was observed among the six Bi x Bi hybrids in CSR2 x CSR4 (EIV 61.30515) followed by CSR46 x CSR47 (EIV 60.97426) and Dun17 x Dun 18 (EIV 54.05331).

Filament size: The trait filament size ranged from 2.53 (APS45 x APS12) to 3.11d (CSR2 x CSR4) at 25±5◦C and 79±2%. Significant difference was observed among the six Bi x Bi hybrids in by CSR46 x CSR47 (EIV 68 .18721) followed by CSR2 x CSR4 (EIV 64.61187).

Reelability: The reelability of the hybrids reared at 25±5◦C and 79±2% ranged from 82.855 (APS45 x APS12) to 85.11% (Dun17 x Dun 18). Significant difference was observed among the six Bi x Bi hybrids in Dun17 x Dun 18 (EIV 66.79487) followed by SLD4 x SLD8 (EIV 58.782057).

Raw silk percentage: The raw silk percentage of the hybrids reared at 25±5◦C and 79±2% ranged from 29.715 (APS45 x APS12) to 35.88% (CSR46 x CSR47). Significant difference was observed among the six Bi x Bi hybrids in CSR2 x CSR4 (EIV 61.10879) followed by CSR46 x CSR47 (EIV 61.04603).

Neatness: Neatness did not show much variation in the breeds. It ranged from 91.5(SLD4 x SLD8, Dun17 x Dun 18) to 92.5 (CSR2 x CSR4, APS105 x APS 126, APS45 x APS126 and CSR46 x CSR47) at 25±5◦C and 79±2%, respectively.

Boil–off loss: It ranged from 26.65 (CSR46 x CSR47) to 29.26 (CSR2 x CSR4).

Significant difference was observed among the six Bi x Bi hybrids in CSR2 x CSR4 (EIV 62. 07) followed by Dun17 x Dun 18 (EIV 53. 67).

Thus study conducted on the growth and economic traits of cocoon revealed that three mulberry silkworm breeds viz. CSR46 x CSR47 (EIV60.7208), CSR2 x CSR4 (EIV57.0620) and SLD4 x SLD8 (EIV 55.9030) are the most promising for commercial exploitation in agro climatic condition of North eastern region of India.

Plate : 1

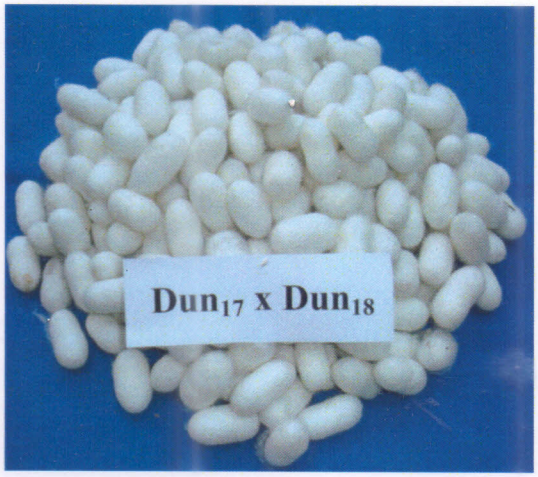

Plate : 2

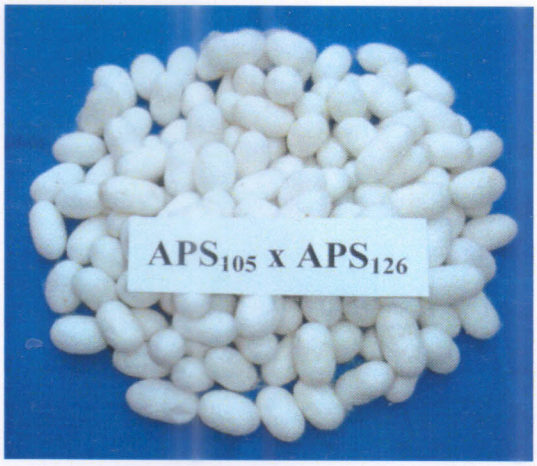

Plate : 3

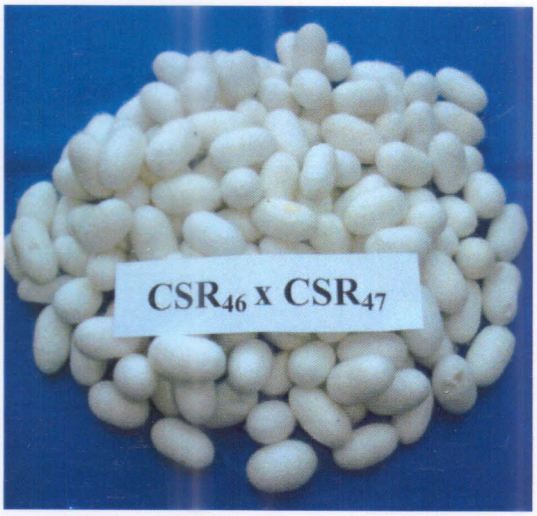

Plate 1, 2 & 3 : Photograph of BI × BI Hybrids

Plate : 4 SLD4 xSLD8 hybrid cocoons

Plate : 5 APS45 x APS12 hybrid cocoons

Plate : 6 CSR2 x CSR4 hybrid cocoons

Plate 4, 5 & 6 : Photograph of BI × BI Hybrids

Table 1: Evaluation index of six Bi x Bi Hybrids of *Bombyx- mori* L in (Spring Season) (pooled data)

	BREED	EI value for Fecundity	EI value for Hat%	EI value for ERR(No)	EI value for ERR(WT.)	EI value for S.C.wt.(g)	EI value for S.s.wt.(g)	EI value for SR%	EI value for Yield/100 dfls.	EI value for Filament Length (M)	EI value for Filament Wt.
		(a)	(b)	©	(d)	(e)	(f)	(g)	(h)	(I)	(j)
1	SLD4 x SLD8	EI 55.58888	EI 57.36612	EI 56.60311	EI 62.039	EI 67.28571	EI 65.78791	EI 59.8512173	EI 65.9148864	EI 57.451646	EI 50.01838
2	Dun17 x Dun18	32.07764	36.02732	49.61542	48.882	62.57143	50.56598	52.6375113	56.1233179	52.686586	54.05331
3	CSR2 x CSR4	60	58.71585	56.52489	58.454	54.71429	50.29789	56.3345356	62.9325665	53.594217	61.30515
4	APS105 x APS126	44.71548	36.28415	60.50109	49.046	59.21429	51.37027	70.581605	58.574185	29.905062	37.13235
5	APS45 x APS12	48.96471	54.6612	30.21675	31.645	55.42857	50.2681	55.5229937	55.9460462	46.106265	36.80147
6	CSR46 x CSR47	60.90428	58.04918	46.53875	49.934	55.14286	51.07239	51.5103697	56.8632023	60.2653	60.97426

Contd.

EI value for Filament Size (D)	**EI value** for Reelability (%)	**EI value** for Raw silk	**EI value** for Neatness (%)	**EI value** for Boil-off	**CUMULA-** TIVE EI	Av.	Rank
(k)	(L)	(m)	(n)	(o)			
EI 47.48858	EI 58.78205	EI 43.20084	EI 49.22495	EI 48.94147	838.5452	55.90302	(III)
39.26941	66.79487	42.80335	50	53.67372	747.7814	49.8521	
64.61187	45.25641	61.10879	50	62.0797	855.9301	57.06201	(II)
49.77169	49.74359	56.48536	50	48.81694	752.1421	50.14281	
38.12785	37.88462	35.25105	50	45.26775	672.0921	44.80614	
61.18721	41.53846	61.04603	50	29.57659	910.8131	60.72088	(I)

Table 2 : Mean Fecundity of different BI × BI Hybrids during spring season

SLD4×SLD8	DUN17×DUN18	CSR2×CS4	APS105×APS126	APS45×APS126	CSR46×CSR47
485.8	432.5	490.75	461.15	470.753	497.85

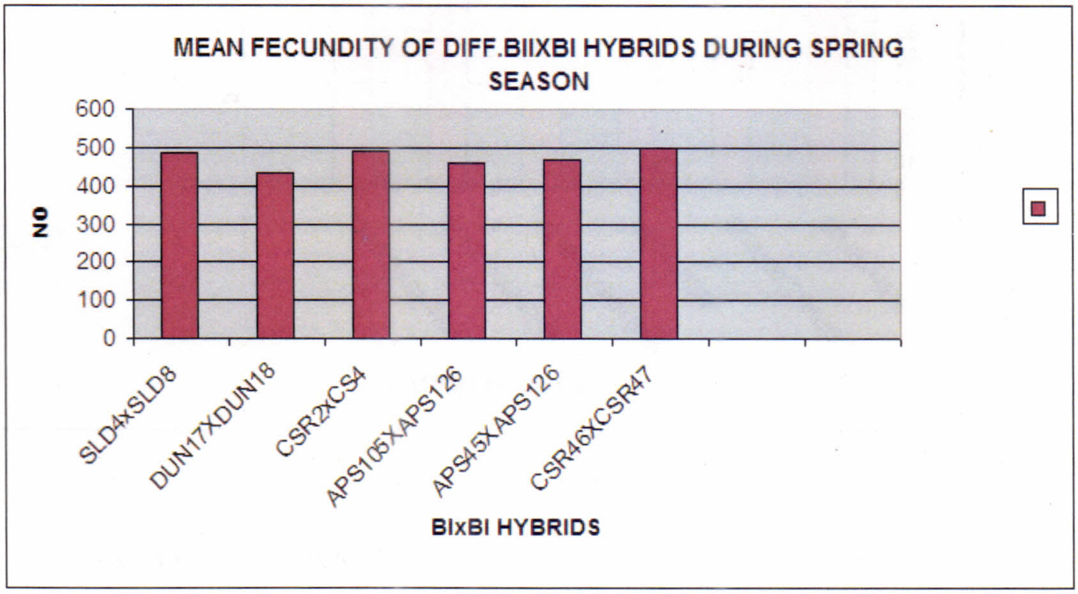

Fig 1 : Mean Fecundity of BI × BI Hybrids during spring season

Table 3 : Mean hatching % of different BI × BI Hybrids during spring season

SLD4×SLD8	DUN17×DUN18	CSR2×CS4	APS105×APS126	APS45×APS126	CSR46×CSR47
92.45	51.4	94.91	53.87	87.49	93.7

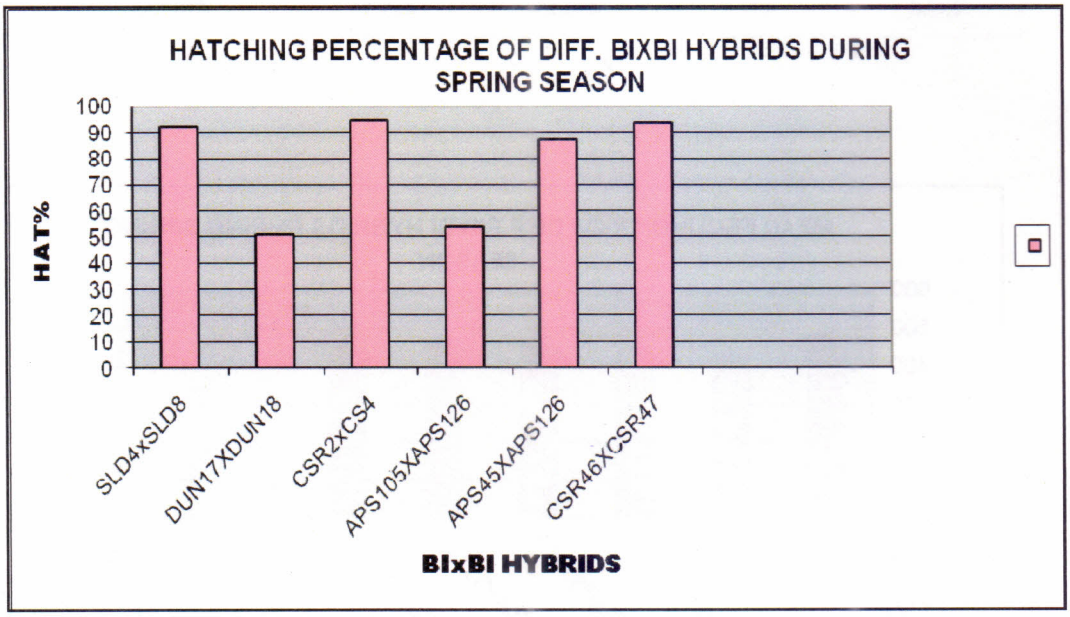

Fig 2 : Mean hatching % of BI × BI Hybrids during spring season

Table 4 : Mean Effective rate of rearing (by number) of different BI × BI Hybrids during spring season

SLD4×SLD8	DUN17×DUN18	CSR2×CS4	APS105×APS126	APS45×APS126	CSR46×CSR47
5092	4556	5086	5391	3068	4320

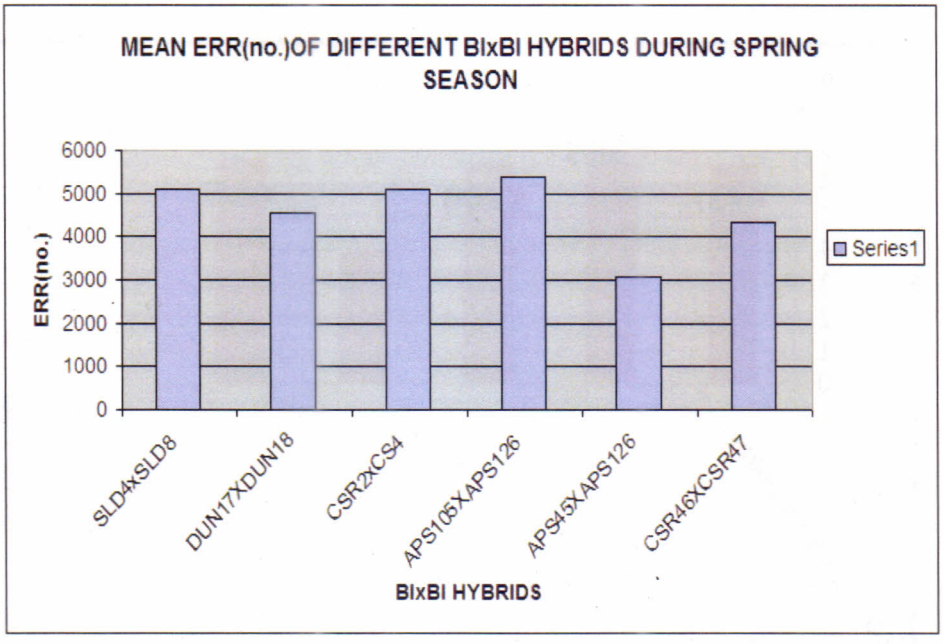

Fig 3 : Mean Effective rate of rearing (by number) of BI × BI Hybrids during spring season

Table 5 : Mean Effective rate of rearing (by weight) of different BI × BI Hybrids during spring season

DUN17XDUN18	CSR2xCS4	APS105XAPS126	APS45XAPS126	CSR46XCSR47
6.61	8.075	6.645	4	6.77

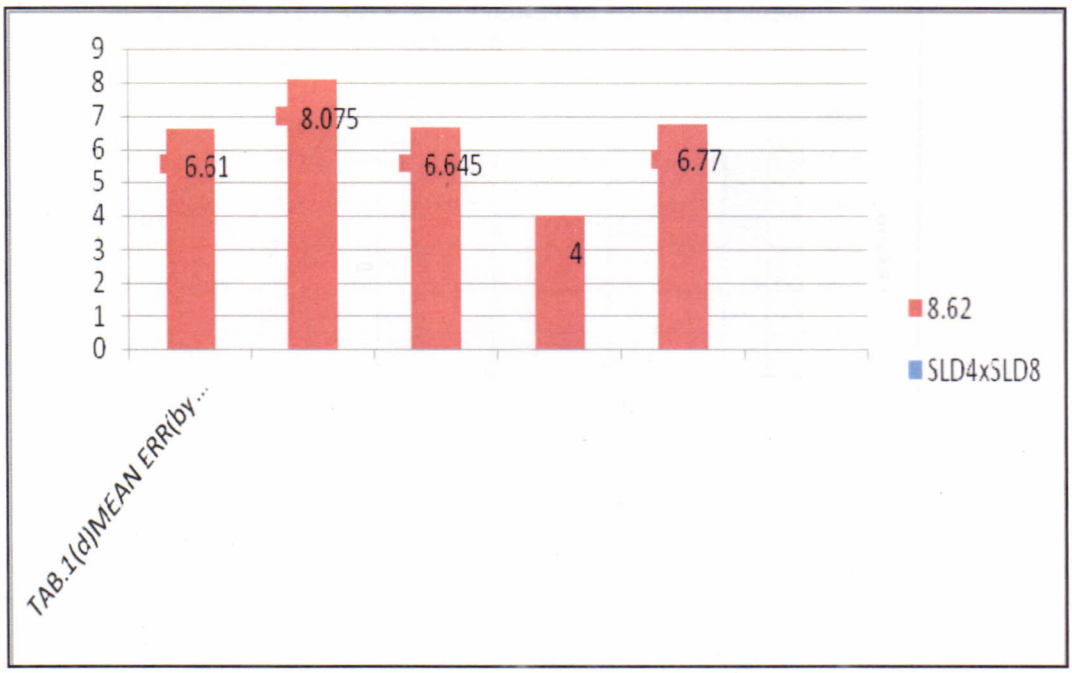

Fig 4 : Mean Effective rate of rearing (by weight) of BI × BI Hybrids during spring season

Table 6 : Mean single cocoon weight of different BI × BI Hybrids during spring season

SLD4×SLD8	DUN17×DUN18	CSR2×CS4	APS105×APS126	APS45×APS126	CSR46×CSR47
1.729	1.52	1.641	1.5435	1.57	1.644

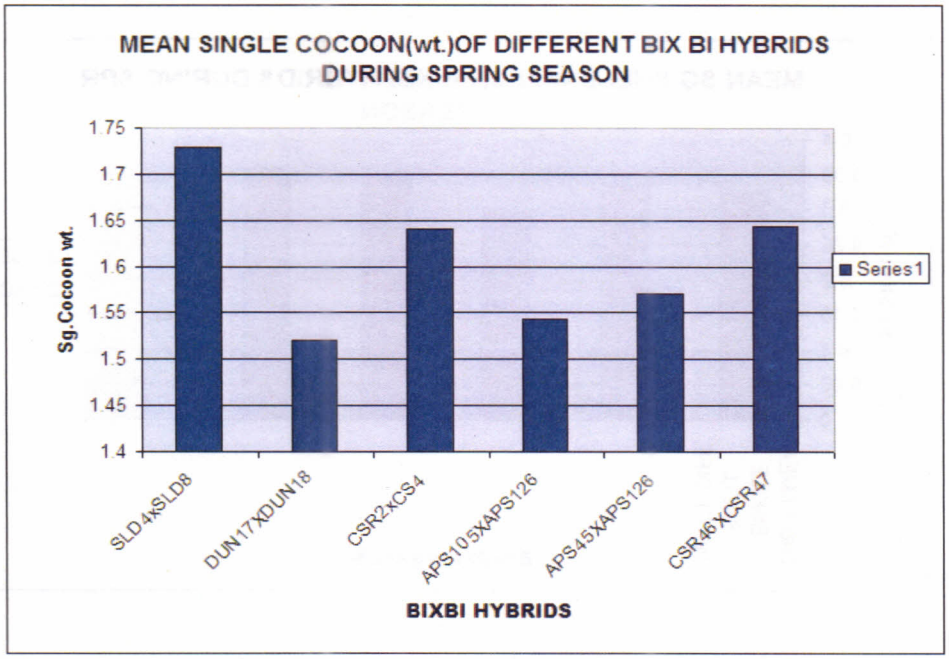

Fig 5 : Mean single cocoon weight of BI × BI Hybrids during spring season

Table 7 : Mean single shell weight of different BI × BI Hybrids during spring season

SLD4×SLD8	DUN17×DUN18	CSR2×CS4	APS105×APS126	APS45×APS126	CSR46×CSR47
0.3985	0.3265	0.3255	0.2995	0.3545	0.3585

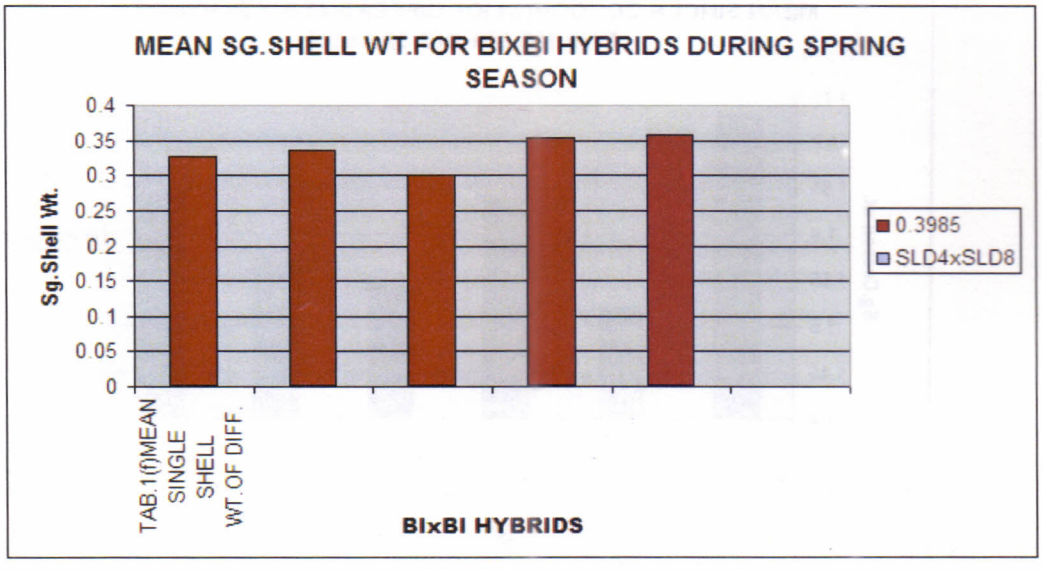

Fig : 6 Mean single shell weight of BI × BI Hybrids during spring season

Table 8 : Mean shell ratio of different BI × BI Hybrids during spring season

SLD4×SLD8	DUN17×DUN18	CSR2×CS4	APS105×APS126	APS45×APS126	CSR46×CSR47
22.97	21.585	22.58	19.595	22.49	22.045

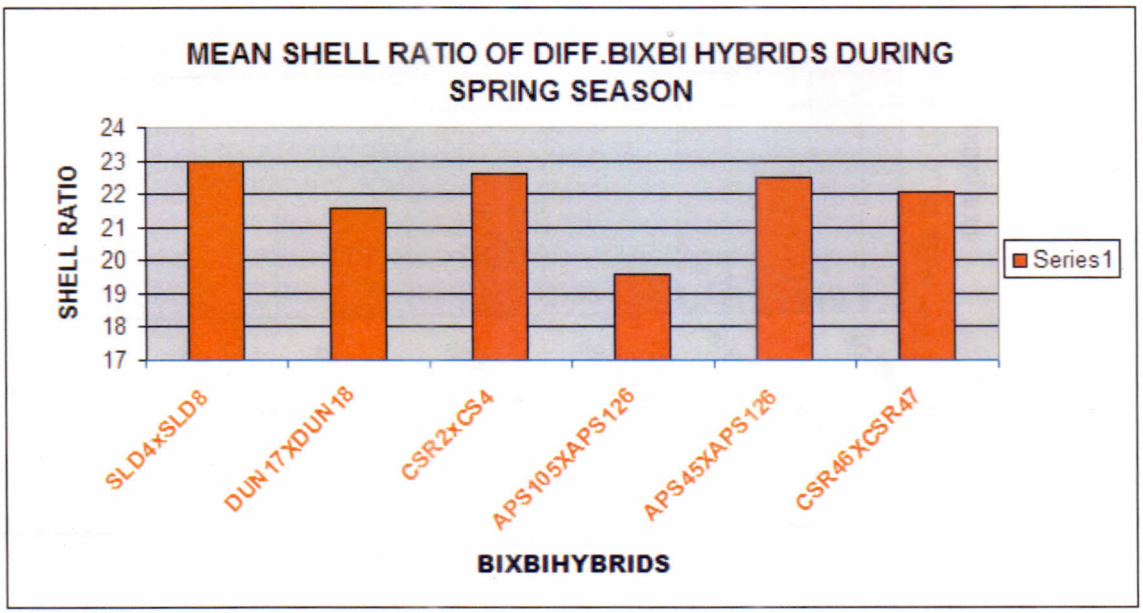

Fig 7 : Mean shell ratio of BI × BI Hybrids during spring season

Table 9 : Mean Yield/100 dfls of Different BI × BI Hybrids during spring season

SLD4×SLD8	DUN17×DUN18	CSR2×CS4	APS105×APS126	APS45×APS126	CSR46×CSR47
34.48	26.44	32.3	26.56	16	27.08

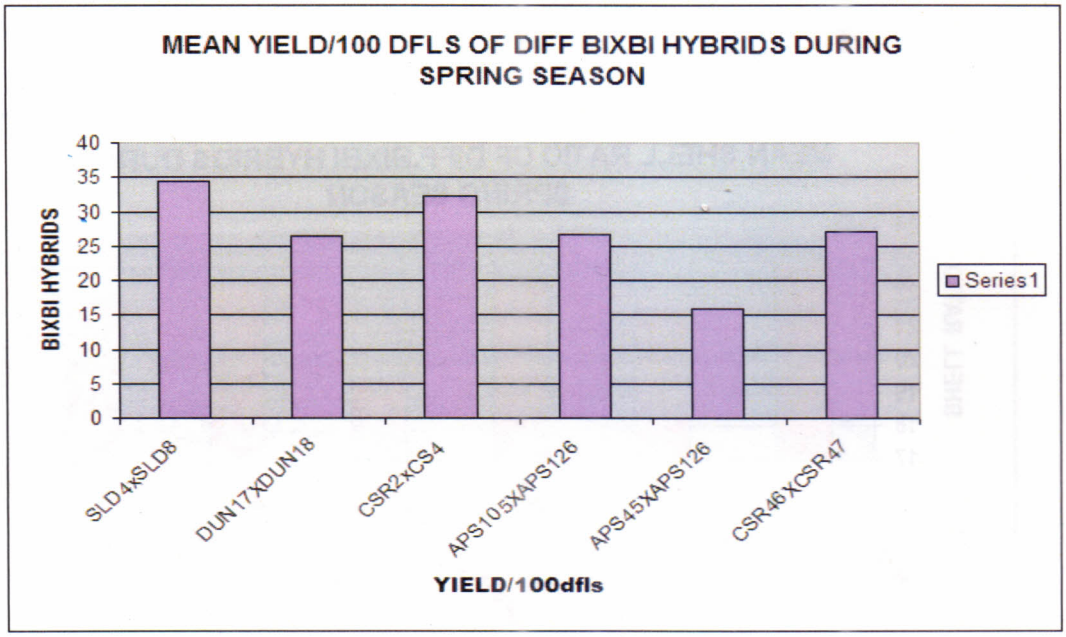

Fig 8 : Mean Yield/100 dfls of BI × BI Hybrids during spring season

Table 10 : Mean filament length (meters) of different BI × BI Hybrids during spring season

SLD4×SLD8	DUN17×DUN18	CSR2×CS4	APS105×APS126	APS45×APS126	CSR46×CSR47
785	732.5	742.5	481	660	816

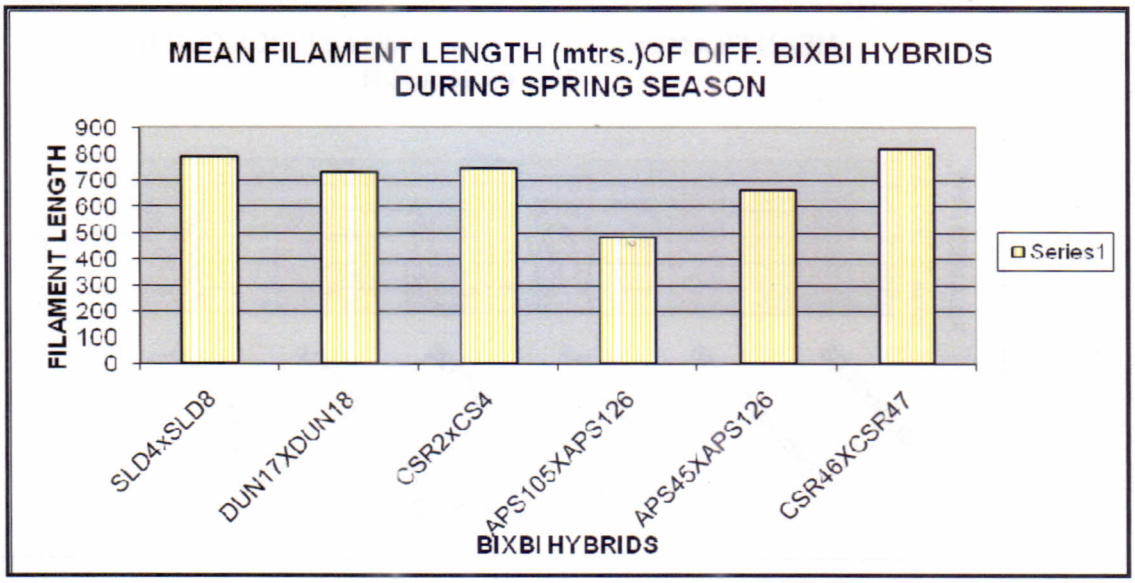

Fig 9 : Mean filament length (meters) of BI × BI Hybrids during spring season

Table 11 : Mean Filament weight of different BI × BI Hybrids during spring season (Breed)

SLD4×SLD8	DUN17×DUN18	CSR2×CS4	APS105×APS126	APS45×APS126	CSR46×CSR47
23.855	24.9	26.925	20.35	20.255	26.835

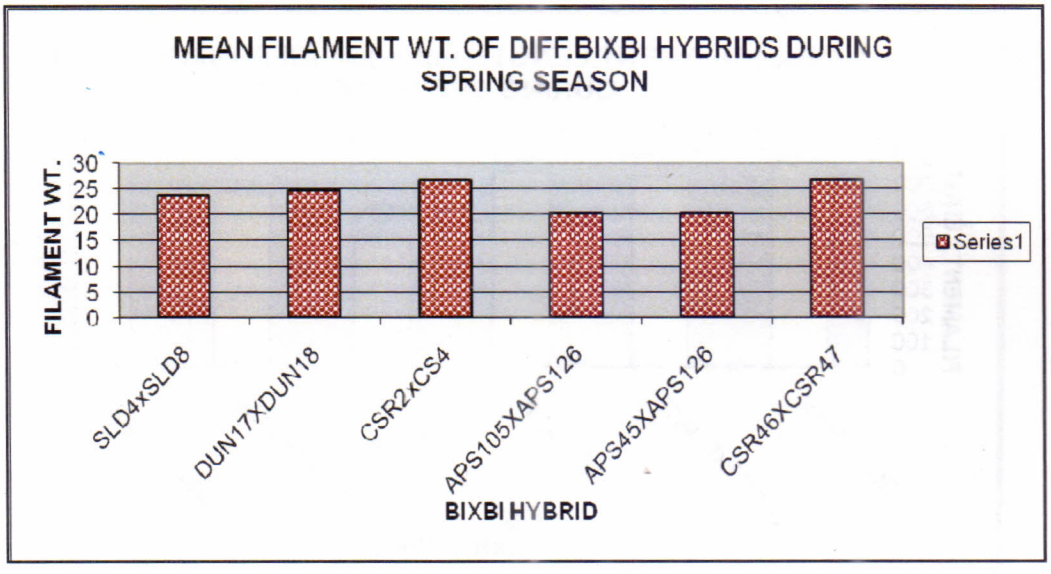

Fig 10 : Mean filament weight of BI × BI Hybrids during spring season (Breed)

Table 12 : Mean filament size (Denier) of different BI × BI Hybrids during spring season (Breed)

SLD4×SLD8	DUN17×DUN18	CSR2×CS4	APS105×APS126	APS45×APS126	CSR46×CSR47
2.735	2.555	3.11	2.785	2.53	3.035

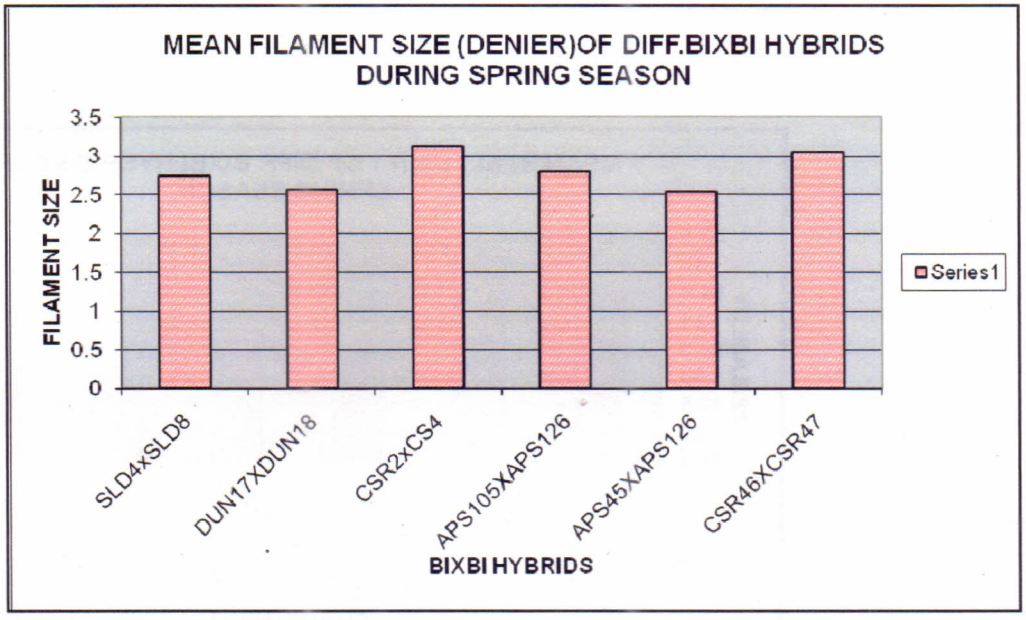

Fig 11 : Mean filament size (Denier) of BI × BI Hybrids during spring season (Breed)

Table 13 : Mean relability of different BI × BI Hybrids during spring season (Breed)

SLD4×SLD8	DUN17×DUN18	CSR2×CS4	APS105×APS126	APS45×APS126	CSR46×CSR47
84.485	85.11	83.43	84.82	82.855	83.14

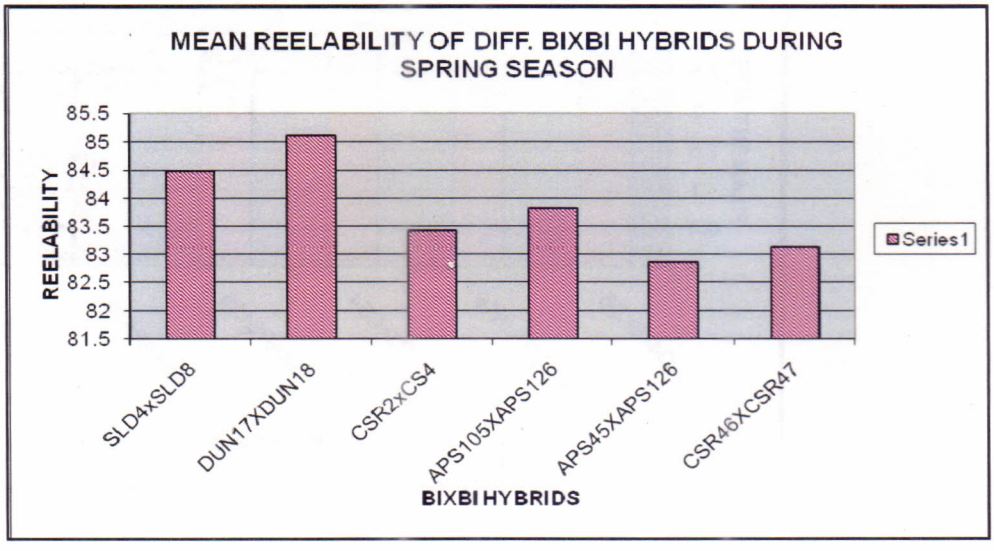

Fig 12 : Mean relability of BI × BI Hybrids during spring season (Breed)

Table 14 : Mean raw silk % of different BI × BI Hybrids during spring season (Breed)

SLD4×SLD8	DUN17×DUN18	CSR2×CS4	APS105×APS126	APS45×APS126	CSR46×CSR47
31.615	31.52	35.895	34.79	29.715	35.88

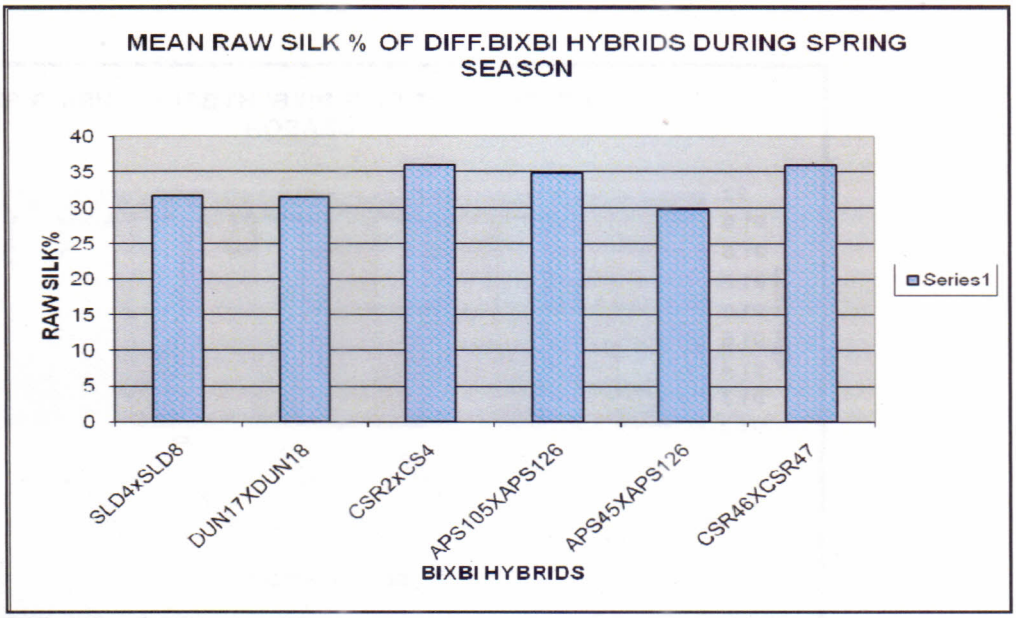

Fig 13 : Mean raw silk % of BI × BI Hybrids during spring season (Breed)

Table 15 : Mean neatness of different BI × BI Hybrids during spring season (Breed)

SLD4×SLD8	DUN17×DUN18	CSR2×CS4	APS105×APS126	APS45×APS126	CSR46×CSR47
31.615	31.52	35.895	34.79	29.715	35.88

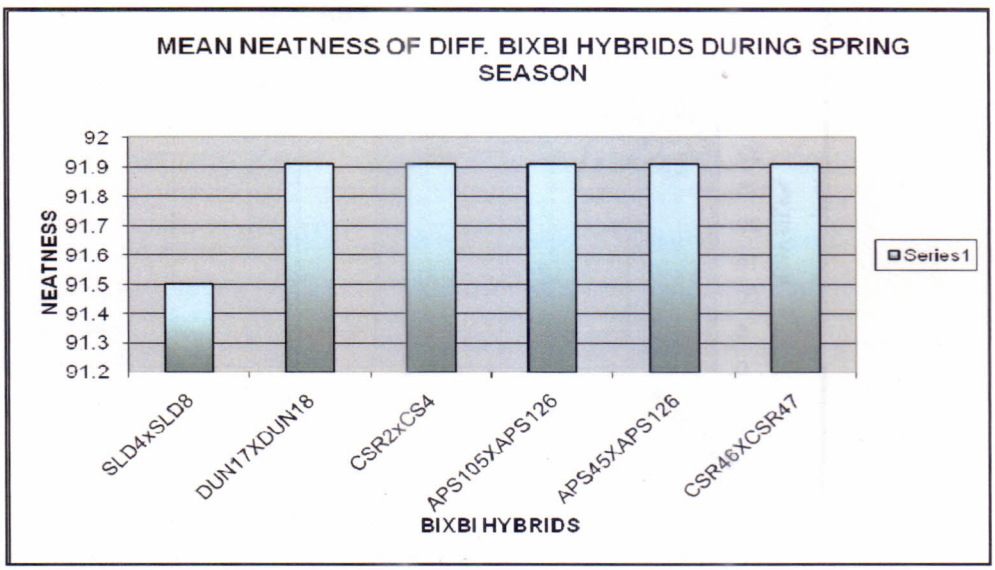

Fig 14 : Mean neatness of BI × BI Hybrids during spring season (Breed)

Table 16 : Mean boil-off % different BI × BI hybrids during spring season (Breed)

SLD4×SLD8	DUN17×DUN18	CSR2×CS4	APS105×APS126	APS45×APS126	CSR46×CSR47
28.205	28.585	29.26	28.385	28.67	26.65

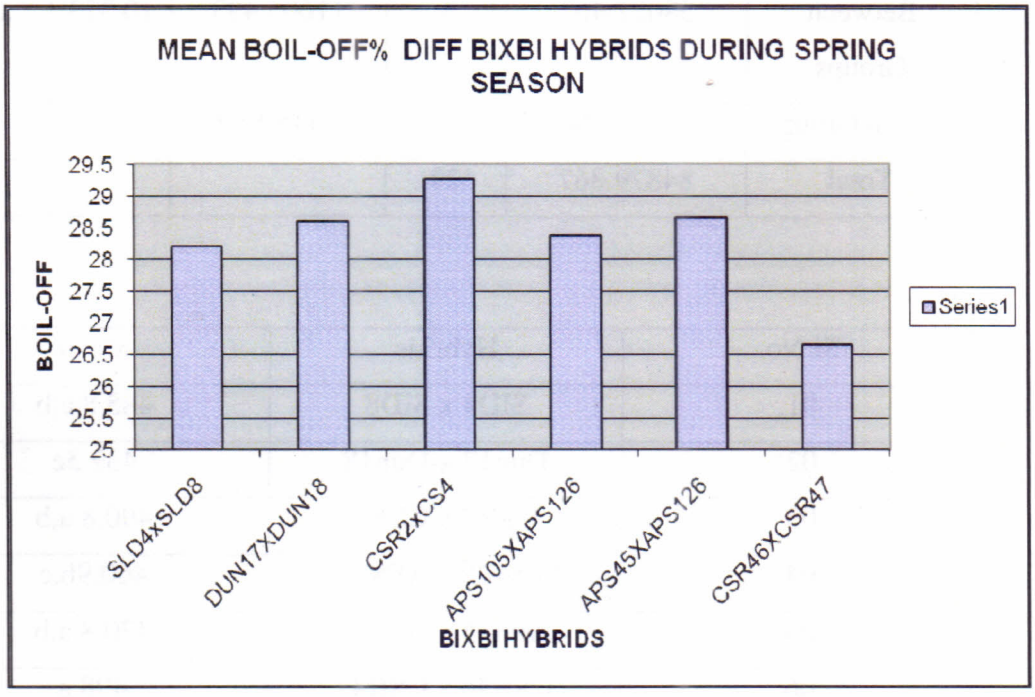

Fig 15 : Mean boil-off % BI × BI hybrids during spring season (Breed)

3.2 Statistical analysis of Bi × Bi hybrids on pooled spring seasons (commercial seasons)

One way Anova of Bivoltine × Bivoltine hybrids (pooled spring season):

Table 3.2.1: One way Anova on fecundity and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

fecundity	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	58027.467	5	11605.493	10.373	.000
Within Groups	26852.400	24	1118.850		
Total	84879.867	29			

Sl No.	Hybrids	Mean
01.	SlD4 x SlD8	485.8 a,b
02.	Dun17 x Dun18	432.5c
03.	CSR2 x CSR4	490.8 a,b
04.	APS105 x APS128	460.9b,c
05.	APS45 x APS12	470.8 a,b
06.	CSR46 x CSR47	498 a
S.Ed ±		21.1551
$CD._{.05}$		36.1964

ANOVA reveals that the bivoltine hybrids are highly significant ($p<0.01$) for the trait Fecundity. The ranking of the hybrids are shown in the above table.

Table 3.2.2 : oneway Anova on hatching and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

hatching	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	42188.217	5	8437.643	211.044	.000
Within Groups	959.531	24	39.980		
Total	43147.748	29			

Sl No.	Hybrids	Mean
01.	SlD4 x SlD8	92.45 a,b
02.	Dun17 x Dun18	51.39 c
03.	CSR2 x CSR4	94.92 a
04.	APS105 x APS128	53.97 c
05.	APS45 x APS12	87.41 b
06.	CSR46 x CSR47	93.69 a, b
S.Ed ±		3.999
$CD._{.05}$		6.841

ANOVA reveals that the bivoltine hybrids are highly significant($p<0.01$)for the hatching.

From the CD and SEd value we see that the hybrid CSR46 x CSR47 ,

SLD4 x SLD8 and CSR2 x CSR4 are at par.

Table reveals the rank of the tested hybrids.

From the ANOVA Table, it is observed that the difference among the performance of the various groups of hybrid (Bi x Bi) (pooled spring) with respect to the characteristic 'hatching percentage is highly significant.

The nature of significance of the difference between the said groups are given as below :

Vs	1	2	3	4	5	6
1	--	**	NS	**	NS	NS
2	--	--	*	NS	**	**
3	--	--	--	**	*	NS
4	--	--	--	--	**	**
5	--	--	--	--	--	NS
6	--	--	--	--	--	--

NS : Not significant

* : Significant at .05 level

** : Highly significant

Table 3.2.3:Oneway Anova on effective rate of rearing by number and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

Effective rate of rearing by number

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	71010595.767	5	14202119.153	46.998	.000
Within Groups	7252531.200	24	302188.800		
Total	78263126.967	29			

Sl No.	Hybrids	Mean
01.	SlD4 x SlD8	5112.1 a,b
02.	Dun17 x Dun18	4556.3 b,c
03.	CSR2 x CSR4	5086.1a,b
04.	APS105 x APS128	5391.2 a
05.	APS45 x APS12	3068.2
06.	CSR48 x CSR47	4320 c
S.Ed±		347.6716
$CD_{.05}$		594.8661

ANOVA reveals that the bivoltine hybrids are highly significant ($p<0.01$)for the trait

Effecting rate of rearing by number. From the CD and SEd value we see that the hybrid SLD4 x SLD8,

CSR2 x CSR4, APS105 x APS126 and SLD4 x SLD8,CSR2X CSR4 are at par.

Table reveals the rank of the tested hybrids.

From this table, it is observed that there is highly significant difference between the performance of various groups of hybrid (bi x bi) (pooled spring) with respect to the characteristic effective rate of rearing by number.

The nature of significance of the difference between the said groups are given us.

Vs	1	2	3	4	5	6
1	--	NS	NS	NS	**	**
2	--	--	NS	**	**	**
3	--	--	--	NS	**	**
4	--	--	--	--	**	**
5	--	--	--	--	--	**
6	--	--	--	--	--	--

NS : Not significant

* : Significant at .05 level

** : Highly significant.

Table 3.2.4:Oneway Anova on effective rate of rearing by weight and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

Effective rate of rearing by weight

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	268.731	5	53.746	25.600	.000
Within Groups	50.386	24	2.099		
Total	319.117	29			

Sl No.	Hybrids	Mean
01.	SlD4 x SlD8	8.624 a
02.	Dun17 x Dun18	6.613 b,c
03.	CSR2 x CSR4	8.118 a,b
04.	APS105 x APS128	6.042 c
05.	APS45 x APS12	4.002
06.	CSR46 x CSR47	6.767 b,c
S.Ed±		.9163
$CD_{.05}$		1.5678

ANOVA reveals that the bivoltine hybrids are highly significant($p<0.01$)for the trait effective rate of rearing by weight. From the CD and SEd value we see that the hybrid CSR2 x CSR4, SLD4 x SLD8, and Dun17 x Dun18,,CSR2X CSR4 are at par. Table reveals the rank of the tested.hybrids.

From this Table, it is seen that there is highly significant difference among the performance of various groups of hybrid (bi x bi) with respect to the characteristic 'effective rate of rearing by weight.

The nature of significance of the difference between the said groups are given us.

Vs	1	2	3	4	5	6
1	--	*	NS	**	**	*
2	--	--	**	NS	**	NS
3	--	--	--	**	**	*
4	--	--	--	--	**	NS
5	--	--	--	--	--	**
6	--	--	--	--	--	--

NS : Not significant

* : Significant at .05 level

** : Highly significant.

Table 3.2.5:Oneway Anova on single cocoon weight and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

Single cocoon weight

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.579	5	.116	4.032	.008
Within Groups	.690	24	.029		
Total	1.269	29			

Sl No.	Hybrids	Mean
01.	SlD4 x SlD8	1.727 a
02.	Dun17 x Dun18	1.5182 b
03.	CSR2 x CSR4	1.6398 a,b
04.	APS105 x APS128	1.5429 a,b
05.	APS45 x APS12	1.5973 a,b
06.	CSR46 x CSR47	1.6462 a,b
S.Ed±		.1077
$CD_{.05}$		.1843

It is highly significant($p<0.01$)for the trait single cocoon weight from the CD and SEd value we see that the hybrids CSR2 x CSR4,APS105 x APS126,APS45 x APS12, CSR46 x CSR47 and SLD4 x SLD8 are at par.

From the ANOVA table, it is observed that there is significant difference among the performance of various groups of bi x bi) hybrid with respect to the characteristic single coccoon weight.

Again the nature of significance of the difference between the said groups are given as.

Vs	1	2	3	4	5	6
1	--	**	NS	*	NS	NS
2	--	--	NS	NS	NS	NS
3	--	--	--	NS	NS	NS
4	--	--	--	--	NS	NS
5	--	--	--	--	--	NS
6	--	--	--	--	--	--

NS : Not significant

* : Significant at .05 level

** : Highly significant.

Table 3.2.6:Oneway Anova on single shell weight and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

Single shell weight

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.112	5	.022	9.947	.000
Within Groups	.054	24	.002		
Total	.167	29			

Sl No.	Hybrids	Mean
01.	SlD4 x SlD8	0.398 a
02.	Dun17 x Dun18	0.326 b, c
03.	CSR2 x CSR4	0.361a,b
04.	APS105 x APS128	0.300 c
05.	APS45 x APS12	0.355a,b
06.	CSR46 x CSR47	0.360 a,b
S.Ed±		.0283
$CD_{.05}$		.0484

ANOVA reveals that the bivoltinehybrids are highly significant *($p<0.01$)*for the trait single shell weight from the CD and SEd value we see that the hybrids CSR2 x CSR4, APS45 x APS12,CSR46 x CSR47 and SLD4 x SLD8 are at par. Table reveals the rank of the tested hybrids.

From the ANOVA table, it is seen that the difference of the performance among the groups of hybrid (bi x bi) with respect to the characteristic 'single shell weight' is highly significant.

The nature of significance of the difference among the groups are given below.

Vs	1	2	3	4	5	6
1	--	**	NS	**	*	NS
2	--	--	NS	NS	NS	NS
3	--	--	--	**	NS	NS
4	--	--	--	--	**	**
5	--	--	--	--	--	NS
6	--	--	--	--	--	--

NS : Not significant

* : Significant at .05 level

** : Highly significant.

Table 3.2.7:Oneway Anova on SR percentage and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

SR percentage

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	138.491	5	27.698	2.943	.033
Within Groups	225.865	24	9.411		
Total	364.356	29			

Sl No.	Hybrids	Mean
01.	SlD4 x SlD8	22.974 a
02.	Dun17 x Dun18	21.583 a,b
03.	CSR2 x CSR4	22.205 a,b
04.	APS105 x APS128	19.609 b
05.	APS45 x APS12	22.491 a,b
06.	CSR46 x CSR47	22.043a,b
S.Ed±		1.9402
$CD_{.05}$		3.3197

ANOVA reveals that the bivoltine hybrids are significant are at par. for the trait SR% ..From the CD and SEd value we see that the hybrids Dun17x Dun18, CSR2 x CSR4, APS45 x APS12, and SLD4 x SLD8 are at par.

Table reveals the rank of the tested hybrids.

Here the results of ANOVA Table indicates that there is less significant difference among the performance of the various groups of (bi x bi) hybrid with respect to the characteristic 'SR' is less significant.

So, in this case it is not necessary to study the nature of Significance of the difference between the said groups separately.

Table 3.2.8:Oneway Anova on yield and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

Yield

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4145.342	5	829.068	47.951	.000
Within Groups	414.961	24	17.290		
Total	4560.303	29			

Sl No.	Hybrids	Mean
01.	SlD4 x SlD8	34.50 a
02.	Dun17 x Dun18	26.45 b
03.	CSR2 x CSR4	32.47 a
04.	APS105 x APS128	26.56 b
05.	APS45 x APS12	16.01
06.	CSR46 x CSR47	27.07 b
S.Ed±		2.6298
$CD_{.05}$		4.4996

It is highly significant ($p<0.01$) for the trait yield. From CD and SEd value we see that the hybrids CSR2 x CSR4, SLD4 x SLD8 and APS105 x APs126, CSR46 x CSR47, Dun17 x Dun18 are at par.

From the ANOVA table, it is observed that the difference among the performance of the various groups of hybrid (bi x bi) with respect to the characteristic 'yield' is highly significant.

The nature of significance of the difference between the said group with respect to the characteristic "yield" are tabulated as.

Vs	1	2	3	4	5	6
1	--	**	NS	**	**	**
2	--	--	**	NS	**	NS
3	--	--	--	**	**	**
4	--	--	--	--	**	NS
5	--	--	--	--	--	**
6	--	--	--	--	--	--

NS : Not significant

* : Significant at .05 level

** : Highly significant.

Table 3.2.9:Oneway Anova on filament length and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

Filament length

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	352075.900	5	70415.180	12.037	.000
Within Groups	140398.400	24	5849.933		
Total	492474.300	29			

Sl No.	Hybrids	Mean
01.	SlD4 x SlD8	784.8 a, b
02.	Dun17 x Dun18	732.2 b, c
03.	CSR2 x CSR4	742.5a, b, c
04.	APS105 x APS128	681.6 c
05.	APS45 x APS12	659.8 c
06.	CSR46 x CSR47	816 a
S.Ed ±		48.3733
$CD_{.05}$		82.7667

ANOVA reveals that the bivoltine hybrids are highly significant($p<0.01$)for the trait

Filament length. From the CD and SEd value we see that the hybrid CSR46 x CSR47 and CSR2 x CSR4, SLD4 x SLD8 are at par.

Table reveals the rank of the tested hybrids.

From this table, it is seen that there is highly significant difference among the performance of various groups of hybrid (bi x bi) (Pooled spring) with respect to the characteristic 'filament length'.

The nature of significance of the difference between the said groups are tabulated as below.

Vs	1	2	3	4	5	6
1	--	NS	NS	**	**	NS
2	--	--	NS	NS	**	**
3	--	--	--	NS	*	**
4	--	--	--	--	NS	**
5	--	--	--	--	--	**
6	--	--	--	--	--	--

NS : Not significant

* : Significant at .05 level

** : Highly significant.

Table 3.2.10: Oneway Anova on filament size and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

Filament size

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.164	5	1.233	16.205	.000
Within Groups	1.826	24	.076		
Total	7.990	29			

Sl No.	Hybrids	Mean
01.	SlD4 x SlD8	2.737 c
02.	Dun17 x Dun18	2.557c
03.	CSR2 x CSR4	3.131 a
04.	APS105 x APS128	2.786 b,c
05.	APS45 x APS12	2.529 c
06.	CSR46 x CSR47	3.049a,b
S.Ed±		.1744
$CD_{.05}$		.2984

ANOVA reveals that the bivoltine hybrids are highly significant($p<0.01$)for the trait filament size. From the CD and SEd value we see that the hybrid CSR46 x CSR47 and

CSR2 x CSR4 are at par.

Table reveals the rank of the tested hybrids.

From the ANOVA table, it is observed that the difference among the various groups of hybrid (bi x bi) with respect to the characteristic 'filament size' is highly significant.

The nature of significance between the said groups are tabulated as below.

Vs	1	2	3	4	5	6
1	--	NS	**	NS	NS	NS
2	--	--	**	NS	NS	**
3	--	--	--	*	**	NS
4	--	--	--	--	NS	NS
5	--	--	--	--	--	**
6	--	--	--	--	--	--

NS : Not significant

* : Significant at .05 level

** : Highly significant.

Table 3.2.11:Oneway Anova on filament weight and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

Filament weight

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	893.282	5	178.656	86.461	.000
Within Groups	49.592	24	2.066		
Total	942.874	29			

Sl No.	Hybrids	Mean
01.	SlD4 x SlD8	23.86 b
02.	Dun17 x Dun18	24.90 b
03.	CSR2 x CSR4	26.92 a
04.	APS105 x APS128	20.35c
05.	APS45 x APS12	20.25 c
06.	CSR46 x CSR47	26.83 a
S.Ed±		.9091
$CD_{.05}$		1.5555

ANOVA reveals that the bivoltine hybrids are highly significant($p<0.01$)for the trait filament weight. From the CD and SEd value we see that the hybrid CSR46 x CSR47 and

CSR2 x CSR4 and SLD4 x SLD8 are at par.

Table reveals the rank of the tested hybrids.

Here, the difference among the performance of various groups of hybrid (Bi x Bi) (Pooled spring) with respect to the characteristic 'filament weight' is highly significant.

The nature of significance of the difference between the said groups are shown as below.

Vs	1	2	3	4	5	6
1	--	NS	**	**	**	**
2	--	--	*	**	**	**
3	--	--	--	**	**	NS
4	--	--	--	--	NS	**
5	--	--	--	--	--	**
6	--	--	--	--	--	--

NS : Not significant

* : Significant at .05 level

** : Highly significant.

Table 3.2.12:Oneway Anova on raw silk and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

Raw silk

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	688.603	5	137.721	121.300	.000
Within Groups	27.249	24	1.135		
Total	715.852	29			

Sl No.	Hybrids	Mean
01.	SlD4 x SlD8	31.617 b
02.	Dun17 x Dun18	31.522 b
03.	CSR2 x CSR4	35.895a
04.	APS105 x APS128	34.7876 a
05.	APS45 x APS12	29.712
06.	CSR46 x CSR47	35.977 a
S.Ed±		.6738
$CD_{.05}$		1.1529

ANOVA reveals that the bivoltine hybrids are highly significant ($p<0.01$) for the trait raw silk. From the CD and SEd value we see that the hybrid CSR46 x CSR47, APS105 x APS126,

CSR2 x CSR4 and SLD4 x SLD8, Dun17 x Dun18 are at par. Table reveals the rank of the tested hybrids.

From this table, it is observed that the difference of the performance among the groups of hybrid (bi x bi) with respect to the characteristic 'raw silk' is highly significant.

The nature of significance of the difference of the performance of the said groups are tabulated as.

Vs	1	2	3	4	5	6
1	--	NS	**	**	**	**
2	--	--	**	**	**	**
3	--	--	--	NS	**	NS
4	--	--	--	--	**	NS
5	--	--	--	--	--	*
6	--	--	--	--	--	--

NS : Not significant

* : Significant at .05 level

** : Highly significant.

Table 3.2.13:Oneway Anova on reelability and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

Reelability

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	73.058	5	14.612	2.786	.040
Within Groups	125.862	24	5.244		
Total	198.919	29			

Sl No.	Hybrids	Mean
01.	SlD4 x SlD8	84.48 a
02.	Dun17 x Dun18	85.11 a
03.	CSR2 x CSR4	83.43 a
04.	APS105 x APS128	83.32 a
05.	APS45 x APS12	82.85 a
06.	CSR48 x CSR47	83.14 a
S.Ed±		1.448
$CD_{.05}$		2.478

It is significant and all hybrids are at par.

From the ANOVA table, it is seen that the difference of the performance of the various groups of (bi x bi) hybrid with respect to the characteristic 'reliability' is less significant.

So, in this case there is no need to study the nature of Significance of the difference among the said groups.

Table 3.2.14: Oneway Anova on neatness and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

Neatness

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	14.167	5	2.833	1.356.	.377
Within Groups	.000	24	.000		
Total	14.167	29			

Here, the difference among the performance of various groups of hybrid (bi X bi) with respect to the characteristic 'neatness' is not significant.

Table 3.2.15: Oneway Anova on boil-off and rearing parameters of different bivoltine hybrids (pooled spring season).

ANOVA

Boil-off

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	169.721	5	33.944	1.261	.313
Within Groups	645.858	24	26.911		
Total	815.579	29			

From this ANOVA Table, it is observed that there no significant difference between the performance of various groups of hybrid (bi x bi) (pooled spring) with respect to the Characteristic 'Boil-off'.

Correlation co-efficients of Bivoltine x Bivoltine hybrids (pooled spring season):

Correlations

Simple correlation co-efficient between fecundity and other qualitative traits of First breed (SLD4xSLD8)(pooled spring) (**Table 3.2.16**)

Correlations

		fecundity	hatching	errbyno	errbywt	sgcocnwt	sgshlwt	SR	yield
Fecundity	Pearson Correlation	1	.779	.568	.732	.031	.048	-.046	.732
	Sig. (2-tailed)		.120	.317	.160	.961	.939	.942	.160
	N	5	5	5	5	5	5	5	5
Hatching	Pearson Correlation	.779	1	.877	.925*	.383	.568	.062	.925*
	Sig. (2-tailed)	.120		.051	.024	.524	.318	.922	.024
	N	5	5	5	5	5	5	5	5
Errbyno	Pearson Correlation	.568	.877	1	.976**	.715	.556	-.321	.976**
	Sig. (2-tailed)	.317	.051		.004	.175	.330	.598	.004
	N	5	5	5	5	5	5	5	5
Errbywt	Pearson Correlation	.732	.925*	.976**	1	.597	.472	-.284	1.000**
	Sig. (2-tailed)	.160	.024	.004		.288	.422	.643	.000
	N	5	5	5	5	5	5	5	5
Sgcocnwt	Pearson Correlation	.031	.383	.715	.597	1	.162	-.705	.597
	Sig. (2-tailed)	.961	.524	.175	.288		.794	.183	.288
	N	5	5	5	5	5	5	5	5
Sgshlwt	Pearson Correlation	.048	.568	.556	.472	.162	1	.447	.472
	Sig. (2-tailed)	.939	.318	.330	.422	.794		.450	.422
	N	5	5	5	5	5	5	5	5
SR	Pearson Correlation	-.046	.062	-.321	-.284	-.705	.447	1	-.284
	Sig. (2-tailed)	.942	.922	.598	.643	.183	.450		.643
	N	5	5	5	5	5	5	5	5
Yield	Pearson Correlation	.732	.925*	.976**	1.000**	.597	.472	-.284	1
	Sig. (2-tailed)	.160	.024	.004	.000	.288	.422	.643	
	N	5	5	5	5	5	5	5	5

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Conclusion : C.C between various qualitative traits of **1st hybrid (SLD4 x SLD8)** under pooled spring season.

Here, we have considered qualitative traits of six hybrid under pooled spring season. The various qualitative traits are levels as

Qualitative trait	levels
Fecundity	1
Hatching	2
Effective rate of rearing by number	3
Effective rate of rearing by weight	4
Single cocoon weight	5
Single shell weight	6
SR.	7
Yield	8

Description : The coefficient of correlation(C.C) were calculated on the basis of Pearson's coefficient of correlation and the significance of difference between various characteristics were based on t-test (Two tailed). Again the **N.H.** was considered as

Ho : ρ=O, i.e. the correlation coefficient was not significant.

From, the calculation of C.C and on the basis of the calculated value of ItI, the following table indicates the levels of significance of C.C between various qualitative characteristics as

level	1	2	3	4	5	6	7	8
1	--	NS	NS	NS	NS	NS	NS	NS
2	NS	--	NS	Sig(*)	NS	NS	NS	Sig(*)
3	NS	NS	--	Sig(**)	NS	NS	NS	Sig(**)
4	NS	Sig(*)	Sig(**)	--	NS	NS	NS	Sig(**)
5	NS	NS	NS	NS	--	NS	NS	NS
6	NS	NS	NS	NS	NS	--	NS	NS
7	NS	NS	NS	NS	NS	NS	--	NS
8	NS	Sig(*)	Sig(**)	Sig(**)	NS	NS	NS	--

NS : Not significant

Sig(*) : Significant at .05 level

Sig(**) : Highly significant (both at .05 and .01 levels).

From the above results it is observed that the coefficient of correlation between the

i) Characteristics hatching and effective rate of rearing by weight as significant.
ii) Characteristics hatching and yield is significant.
iii) Characteristics effective rate of rearing by number and effective rate of rearing by weight is highly significant.
iv) Characteristics effective rate of rearing by number and yield is highly significant.
v) Characteristics err by wt and yield is highly significant.

Correlations

Simple correlation co-efficients between fecundity and other qualitative traits of second breed (DUN17xDUN18) (pooled Spring) **Table 3.2.17**

Correlations

		fecundity	hatching	Errbyno	Errbywt	Sgcocnwt	sgshlwt	SR	yield
Fecundity	Pearson Correlation	1	-.466	-.616	.634	-.189	.442	.497	.634
	Sig. (2-tailed)		.429	.269	.250	.761	.456	.395	.250
	N	5	5	5	5	5	5	5	5
Hatching	Pearson Correlation	-.466	1	.290	-.319	.861	.111	-.121	-.319
	Sig. (2-tailed)	.429		.636	.601	.061	.859	.846	.601
	N	5	5	5	5	5	5	5	5
Errbyno	Pearson Correlation	-.616	.290	1	-.846	-.225	.220	.281	-.846
	Sig. (2-tailed)	.269	.636		.071	.715	.722	.647	.071
	N	5	5	5	5	5	5	5	5
Errbywt	Pearson Correlation	.634	-.319	-.846	1	.058	-.364	-.338	1.000**
	Sig. (2-tailed)	.250	.601	.071		.926	.547	.578	.000
	N	5	5	5	5	5	5	5	5
Sgcocnwt	Pearson Correlation	-.189	.861	-.225	.058	1	.011	-.267	.058
	Sig. (2-tailed)	.761	.061	.715	.926		.986	.664	.926
	N	5	5	5	5	5	5	5	5
Sgshlwt	Pearson Correlation	.442	.111	.220	-.364	.011	1	.958*	-.364
	Sig. (2-tailed)	.456	.859	.722	.547	.986		.010	.547
	N	5	5	5	5	5	5	5	5
SR	Pearson Correlation	.497	-.121	.281	-.338	-.267	.958*	1	-.338
	Sig. (2-tailed)	.395	.846	.647	.578	.664	.010		.578
	N	5	5	5	5	5	5	5	5
yield	Pearson Correlation	.634	-.319	-.846	1.000**	.058	-.364	-.338	1
	Sig. (2-tailed)	.250	.601	.071	.000	.926	.547	.578	
	N	5	5	5	5	5	5	5	5

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Conclusion : C.C between various qualitative traits of **2nd hybrid** (Dun17 x Dun18)under pooled spring season.

Description: The coefficient of correlation (C.C) are calculated on the basis of Pearson's coefficient of correlation and the significance of the C.C between the various characteristics are based on t-test (Two tailed) . Again the **N.H.** is considered as

Ho: ρ=O, i.e. the correlation coefficient is not significant.

From, the calculation of C.C and on the basis of the calculated value of ItI , the following table indicate the levels of significance of C.C between various qualitative Characteristics as

level	1	2	3	4	5	6	7	8
1	--	NS	NS	NS	NS	NS	NS	NS
2	NS	--	NS	NS	NS	NS	NS	NS
3	NS	NS	--	NS	NS	NS	NS	NS
4	NS	NS	NS	--	NS	NS	NS	Sig(**)
5	NS	NS	NS	NS	--	NS	NS	NS
6	NS	NS	NS	NS	NS	--	Sig(*)	NS
7	NS	NS	NS	NS	NS	Sig(*)	--	NS
8	NS	NS	NS	Sig(**)	NS	NS	NS	--

Thus from the above one may conclude that the C.C.

i) Between the characteristics effective rate of rearing by weight and yield is highly significant.

ii) Between fecundity and effective rate of rearing by number and

iii) Between characteristics single shell weight and SR is significant.

Simple correlation co-efficients between fecundity and other qualitative traits of third breed (CSR2xCSR4) (pooled spring) **Table 3.2.18**

Correlations

		fecundity	hatching	errbyno	errbywt	sgcocnt	sgshlt	SR	yield
Fecundity	Pearson Correlation	1	.203	-.211	.081	.557	-.332	-.868	.081
	Sig. (2-tailed)		.743	.734	.898	.329	.585	.056	.898
	N	5	5	5	5	5	5	5	5
Hatching	Pearson Correlation	.203	1	-.999**	-.904*	.201	.049	-.212	-.904*
	Sig. (2-tailed)	.743		.000	.035	.745	.938	.732	.035
	N	5	5	5	5	5	5	5	5
Errbyno	Pearson Correlation	-.211	-.999**	1	.892*	-.221	-.076	.198	.892*
	Sig. (2-tailed)	.734	.000		.042	.721	.903	.749	.042
	N	5	5	5	5	5	5	5	5
Errbywt	Pearson Correlation	.081	-.904*	.892*	1	.224	.170	.078	1.000**
	Sig. (2-tailed)	.898	.035	.042		.717	.785	.900	.000
	N	5	5	5	5	5	5	5	5
Sgcocnt	Pearson Correlation	.557	.201	-.221	.224	1	.530	-.294	.224
	Sig. (2-tailed)	.329	.745	.721	.717		.358	.631	.717
	N	5	5	5	5	5	5	5	5
Sgshlt	Pearson Correlation	-.332	.049	-.076	.170	.530	1	.651	.170
	Sig. (2-tailed)	.585	.938	.903	.785	.358		.234	.785
	N	5	5	5	5	5	5	5	5
SR	Pearson Correlation	-.868	-.212	.198	.078	-.294	.651	1	.078
	Sig. (2-tailed)	.056	.732	.749	.900	.631	.234		.900
	N	5	5	5	5	5	5	5	5
Yield	Pearson Correlation	.081	-.904*	.892*	1.000**	.224	.170	.078	1
	Sig. (2-tailed)	.898	.035	.042	.000	.717	.785	.900	
	N	5	5	5	5	5	5	5	5

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Conclusion : C.C between various qualitative traits of **3rd hybrid(CSR2 x CSR4)** under pooled spring season.

Description: The coefficient of correlation(C.C) are calculated on the basis of pearson's coefficient of correlation and the significance of the C.C between the various characteristics are based on t-test (Two tailed). Again the **N.H.** is considered as

Ho : ρ=O, i.e. the correlation coefficient is not significant.

From, the calculation of C.C and on the basis of the calculated value of ItI, the following table indicates the levels of significance of C.C between various qualitative characteristics as

level	1	2	3	4	5	6	7	8
1	--	NS	NS	NS	NS	NS	NS	NS
2	NS	--	Sig(**)	Sig(*)	NS	NS	NS	Sig(*)
3	NS	Sig(**)	--	Sig(*)	NS	NS	NS	Sig(*)
4	NS	Sig(*)	Sig(*)	--	NS	NS	NS	Sig(**)
5	NS	NS	NS	NS	--	NS	NS	NS
6	NS	NS	NS	NS	NS	--	NS	NS
7	NS	NS	NS	NS	NS	NS	--	NS
8	NS	Sig(*)	Sig(*)	Sig(**)	NS	NS	NS	--

NS : Not significant
Sig(*) : Significant at 0.5 level
Sig(**) : Highly significant (both at .05 and .01 levels).

From the above results it can be conclude that the coefficient of correlation

i) Between hatching & effective rate of rearing by number is highly.
ii) Between hatching & effective rate of rearing by weight is significant.
iii) Between hatching & yield is significant.

iv) Between effective rate of rearing by weight and yield is highly significant.

Correlations

Simple correlation co-efficients between fecundity and other qualitative traits of 4th breed (APS105xAPS126)(pooled Spring) Table 3.2.19

Correlations

		fecundity	hatching	errbyno	errbywt	sgcocont	sgshlwt	SR	yield
Fecundity	Pearson Correlation	1	.610	-.038	.896*	-.386	-.536	-.088	-.092
	Sig. (2-tailed)		.275	.952	.039	.521	.352	.888	.882
	N	5	5	5	5	5	5	5	5
Hatching	Pearson Correlation	.610	1	.244	.856	.487	-.245	-.684	.214
	Sig. (2-tailed)	.275		.693	.064	.406	.691	.203	.730
	N	5	5	5	5	5	5	5	5
Errbyno	Pearson Correlation	-.038	.244	1	.087	.185	-.249	-.460	.997**
	Sig. (2-tailed)	.952	.693		.890	.765	.687	.435	.000
	N	5	5	5	5	5	5	5	5
Errbywt	Pearson Correlation	.896*	.856	.087	1	.005	-.597	-.504	.027
	Sig. (2-tailed)	.039	.064	.890		.993	.288	.386	.966
	N	5	5	5	5	5	5	5	5
Sgcocont	Pearson Correlation	-.386	.487	.185	.005	1	.372	-.642	.213
	Sig. (2-tailed)	.521	.406	.765	.993		.537	.243	.731
	N	5	5	5	5	5	5	5	5
Sgshlwt	Pearson Correlation	-.536	-.245	-.249	-.597	.372	1	.468	-.169
	Sig. (2-tailed)	.352	.691	.687	.288	.537		.427	.786
	N	5	5	5	5	5	5	5	5
SR	Pearson Correlation	-.088	-.684	-.460	-.504	-.642	.468	1	-.423
	Sig. (2-tailed)	.888	.203	.435	.386	.243	.427		.478
	N	5	5	5	5	5	5	5	5
Yield	Pearson Correlation	-.092	.214	.997**	.027	.213	-.169	-.423	1
	Sig. (2-tailed)	.882	.730	.000	.966	.731	.786	.478	
	N	5	5	5	5	5	5	5	5

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Conclusion: C.C between various qualitative traits of 4th hybrid(APS105 x APS126) under pooled spring season.

Description: The coefficient of correlation(C.C) are calculated on the basis of pearson's coefficient of correlation and the significance of the C.C between the various characteristics are based on t-test (Two tailed). Again the **N.H**. is considered as

Ho : ρ=O, i.e. the correlation coefficient is not significant.

From, the calculation of C.C and on the basis of the calculated value of ItI, the following table indicates the levels of significance of C.C between various qualitative characteristics as

level	1	2	3	4	5	6	7	8
1	--	NS	NS	Sig(*)	NS	NS	NS	NS
2	NS	--	NS	NS	NS	NS	NS	NS
3	NS	NS	--	NS	NS	NS	NS	Sig(**)
4	Sig(*)	NS	NS	--	NS	NS	NS	NS
5	NS	NS	NS	NS	--	NS	NS	NS
6	NS	NS	NS	NS	NS	--	NS	NS
7	NS	NS	NS	NS	NS	NS	--	NS
8	NS	NS	Sig(**)	NS	NS	NS	NS	--

NS : Not significant

Sig(*) : Significant at 0.5 level

Sig(**) : Highly significant (both at .01 and .05 levels).

From the above results it can be conclude that the C.C between

i) Fecundity Effective rate of rearing by weight is significant.

ii) Effective rate of rearing by number and yield is highly significant.

Correlations

Simple correlation co-efficients between fecundity and other qualitative traits of 5th hybrid (APS45x APS12)(pooled spring) Table 3.2.20

Correlations

		fecundity	hatching	errbyno	errbywt	sgcocnwt	sgshlwt	SR	yield
Fecundity	Pearson Correlation	1	.499	.509	.530	-.505	-.116	.230	.530
	Sig. (2-tailed)		.392	.381	.358	.385	.853	.710	.358
	N	5	5	5	5	5	5	5	5
Hatching	Pearson Correlation	.499	1	.508	.594	-.372	.801	.638	.594
	Sig. (2-tailed)	.392		.382	.291	.538	.103	.247	.291
	N	5	5	5	5	5	5	5	5
Errbyno	Pearson Correlation	.509	.508	1	.995**	.109	.208	-.046	.995**
	Sig. (2-tailed)	.381	.382		.000	.862	.737	.941	.000
	N	5	5	5	5	5	5	5	5
Errbywt	Pearson Correlation	.530	.594	.995**	1	.051	.294	.041	1.000**
	Sig. (2-tailed)	.358	.291	.000		.935	.631	.948	.000
	N	5	5	5	5	5	5	5	5
Sgcocnwt	Pearson Correlation	-.505	-.372	.109	.051	1	-.132	-.849	.051
	Sig. (2-tailed)	.385	.538	.862	.935		.832	.069	.935
	N	5	5	5	5	5	5	5	5
Sgshlwt	Pearson Correlation	-.116	.801	.208	.294	-.132	1	.620	.294
	Sig. (2-tailed)	.853	.103	.737	.631	.832		.264	.631
	N	5	5	5	5	5	5	5	5
SR	Pearson Correlation	.230	.638	-.046	.041	-.849	.620	1	.041
	Sig. (2-tailed)	.710	.247	.941	.948	.069	.264		.948
	N	5	5	5	5	5	5	5	5
Yield	Pearson Correlation	.530	.594	.995**	1.000**	.051	.294	.041	1
	Sig. (2-tailed)	.358	.291	.000	.000	.935	.631	.948	
	N	5	5	5	5	5	5	5	5

**. Correlation is significant at the 0.01 level (2-tailed).

Conclusion: C.C between various qualitative traits of **5th hybrid (APS45 x APS12)** under pooled spring season.

The Coefficient of correlation (C.C) are calculated on the basis of pearson's coefficient of correlation and the significance of the C.C between the various characteristics are based on t-test (Two tailed). Again the **N.H.** is considered as

Ho : ρ=O, i.e. the correlation coefficient is not significant.

From, the calculation of C.C and on the basis of the calculated value of ItI, the following table indicates the levels of significance of C.C between various qualitative characteristics as

level	1	2	3	4	5	6	7	8
1	--	NS	NS	NS	NS	NS	NS	NS
2	NS	--	NS	NS	NS	NS	NS	NS
3	NS	NS	--	Sig(**)	NS	NS	NS	Sig(**)
4	NS	NS	Sig(**)	--	NS	NS	NS	Sig(**)
5	NS	NS	NS	NS	--	NS	NS	NS
6	NS	NS	NS	NS	NS	--	NS	NS
7	NS	NS	NS	NS	NS	NS	--	NS
8	NS	NS	Sig(**)	Sig(**)	NS	NS	NS	--

NS: Not significant.
Sig(**): Highly significant (both are .05 & .01 levels).
From the above results it is observed that
C.C between the following characteristics are
Highly significant. (both at .05 & .01 levels)

(i) Between effective rate of rearing by number & Effective rate of rearing by weight.
(ii) Between effective rate of rearing by number & yield
(iii) Between effective rate of rearing by weight & yield.

Correlations

Simple correlation co-efficients between fecundity and other qualitative traits of 6th hybrid (CSR46x CSR47)(pooled spring) **Table 3.2.21**

Correlations

		fecundity	hatching	errbyno	errbywt	sgcocnwt	sgshlwt	SR	yield
Fecundity	Pearson Correlation	1	-.736	.899*	.267	-.391	-.760	-.145	.267
	Sig. (2-tailed)		.156	.038	.664	.516	.136	.816	.664
	N	5	5	5	5	5	5	5	5
Hatching	Pearson Correlation	-.736	1	-.834	-.141	.527	.961**	.055	-.141
	Sig. (2-tailed)	.156		.079	.821	.362	.009	.929	.821
	N	5	5	5	5	5	5	5	5
Errbyno	Pearson Correlation	.899*	-.834	1	.152	-.545	-.840	.044	.152
	Sig. (2-tailed)	.038	.079		.808	.342	.075	.944	.808
	N	5	5	5	5	5	5	5	5
Errbywt	Pearson Correlation	.267	-.141	.152	1	.731	.098	-.961*	1.000**
	Sig. (2-tailed)	.664	.821	.808		.160	.875	.009	.000
	N	5	5	5	5	5	5	5	5
Sgcocnwt	Pearson Correlation	-.391	.527	-.545	.731	1	.723	-.804	.731
	Sig. (2-tailed)	.516	.362	.342	.160		.168	.101	.160
	N	5	5	5	5	5	5	5	5
Sgshlwt	Pearson Correlation	-.760	.961**	-.840	.098	.723	1	-.177	.098
	Sig. (2-tailed)	.136	.009	.075	.875	.168		.776	.875
	N	5	5	5	5	5	5	5	5
SR	Pearson Correlation	-.145	.055	.044	-.961**	-.804	-.177	1	-.961**
	Sig. (2-tailed)	.816	.929	.944	.009	.101	.776		.009
	N	5	5	5	5	5	5	5	5
Yield	Pearson Correlation	.267	-.141	.152	1.000**	.731	.098	-.961*	1
	Sig. (2-tailed)	.664	.821	.808	.000	.160	.875	.009	
	N	5	5	5	5	5	5	5	5

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Conclusion : Correlation of coefficient between various qualitative traits of **Six hybrid** under pooled spring season.

The coefficient of correlation (C.C) are calculated on the basis of Pearson's coefficient of correlation and the significance of the C.C between the various characteristics are based on t-test (Two tailed) . Again the Null Hypothesis **(N.H).** is considered as

Ho : ρ=O, i.e. the correlation coefficient is not significant.

From, the calculation of C.C and on the basis of the calculated value of ItI , the following table indicate the levels of significance of C.C between various qualitative characteristics as

	1	2	3	4	5	6	7	8
1	--	NS	Sig(*)	NS	NS	NS	NS	NS
2	NS	--	NS	NS	NS	Sig(**)	NS	NS
3	Sig(*)	NS	--	NS	NS	NS	NS	NS
4	NS	NS	NS	--	NS	NS	Sig(**)	Sig(**)
5	NS	NS	NS	NS	--	NS	NS	NS
6	NS	NS	NS	NS	NS	--	NS	NS
7	NS	NS	NS	Sig(**)	NS	NS	--	Sig(**)
8	NS	NS	NS	NS	NS	NS	NS	--

NS : Not significant

Sig(*) : Significant at 0.5 level

Sig(**) : Highly significant (both at .05 and .01 levels).

Thus from the above results it is observed that

(a) C.C between the following characteristic are significant (.05 level)

(i) Between fecundity and effective rate of rearing by number and

(ii) C.C between the following characteristics are highly significant (both at .05 and .01 levels).

(i) Between hatching and single shell weight.

(ii) Between effective rate of rearing by weight and SR

(iii) Between effective rate of rearing by weight and yield.

(iv) Between SR and yield.