INVESTIGATING PLANT BREEDING SELECTION EFFICIENCY AND PERFORMANCE TRENDS IN *Gossypium hirsutum* L.

RAJESH S. PATIL
KENCHARADDI H.G.
MANJUNATH C. PALOTI
UNIVERSITY OF AGRICULTURAL SCIENCES, DHARWAD, KARNATAKA, INDIA

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TIMELINE

2009 - 10 Production of SC hybrids in a Line X Tester scheme

2010 – 11 Hybrids evaluation and identification of 10 good crosses

2011 – 12 Individual Plant Selections in the F2 generation (87)

2012 – 13 IPS 1 and 2 in each of 22, F3 generation progeny

2013 – 14 IPS within each progeny of 1 and 2 in the F4 generation

2014 – 15 Bulking progeny of 1 and 2 in the F5 generation

2015 – 16 Evaluation of the 22 progeny pairs in the F6 generation

2016 – 17 Evaluation of the 22 progeny pairs in the F7 generation

PEDIGREE	
L3T2-2	CPD813 x 8-1-2 *9*
L3T2-6	
L9T4-7	L-761 x R-221 *8*
L9T4-8	
L9T4-3	
L1T1-7	Sahana x 1-2-1 *10*
L1T1-8	
L8T4-1	L-761 x Sahana *10*
L8T4-10	
L7T2-1	DC-12 IPS x 8-1-2 *6*
L7T2-4	
L7T2-5	
L6T4-2	L-761 x SCR-81 *8*
L6T4-3	
L6T4-8	
L5T3-4	RAH 100 x IC-6 *10*
L5T3-6	
L5T3-10	
L7T1-4	DC-12 IPS x 1-2-1 *8*
L7T1-6	
L2T1-8	L-761 X 1-2-1 *10*

44 PROGENIES EVALUATED –

Seed Cotton Yield (g/pl)			
2015-16		2016-17	
Set1	Set2	Set1	Set2
45.93	44.37	24.64	23.35
45.15		23.99	
47 % yield reduction in 2016-17			

14/22 WERE CONSISTENT IN PERFORMANCE (SCY)

18.2 % - NOT CONSISTENT

81.8 % - TRULY CONSISTENT. HIGH HERITABILITY?

	IPS 1	IPS 2
H (BS)	67.55	72.04
GAM	33.75	48.54

MSS (2015-16)			
Source	df	IPS 1	IPS 2
Trt	21	207.8*	362.4*
Rep	1	225.2	54.36

CORRELATION BETWEEN			
YEARS		IPS SETS	
Set1	Set2	2015-16	2016-17
0.41	0.22	-0.07	0.35
NON-SIGNIFICANT			

CONSISTENTLY BETTER PERFORMING 14 PROGENIES

Entry 8 (36.4%)	% Increase of IPS1 over IPS2	
	2015-16	2016-17
L9T4-3-1	49	87
L6T4-8-1	103	33
L9T4-8-1	36	13
L7T1-4-1	16	8
L5T3-10-1	13	28
L6T4-2-1	28	38
L7T2-1-1	100	62
L3T2-6-1	45	12
Average	24	

Entry 6 (27.3%)	% Increase of IPS2 over IPS1	
	2015-16	2016-17
L5T3-6-2	5	9
L1T1-8-2	46	2
L7T1-6-2	58	1
L8T4-10-2	7	45
L6T4-3-2	2	11
L3T2-2-2	75	44
Average	16	

AMONG THE 14 CONSISTENT PROGENIES

37.5 % of the 1st IPS became more productive than the 2nd IPS in the 2nd year

50.0 % of the 2nd IPS became more productive than the 1st IPS in the 2nd year.

Overall, 42.8% IPS showed improvement in the 2nd year

THIS CAN BE CONSTRUED AS

INCREASED EFFICIENCY DUE TO YIELD BASED SELECTION

TOP 5 GENOTYPES IN THE 2 IPS SETS ACROSS 2 YEARS

Entry	SCY (kg/ha)	% Imp.	FL (mm)	FS (g/tex)
L7T2-1-1*	2425	87	28.8	18.8
L3T2-2-2	2331	80	26.2	20.5
L3T2-6-1	2194	69	29.7	20.2
L8T4-1-2	2128	64	29.9	23.0
L1T1-7-2	1967	52	28.8	19.7
ARBH-813 ©	1299		26.8	20.0

* COMPACT GENOTYPE

FL and FS : 2015-16

CONCLUSIONS

PRAGMATIC SELECTION OF PARENTS

SEVERE EARLY GENERATION SELECTION

JUDICIAL USAGE OF TIME AND RESOURCES

REACHING MUTIPLE OBJECTIVES

STABILITY OF PERFORMANCE


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DHARWAD
Thank you