

Seventh Asian Cotton Research and Development Network (ACRDN) Meeting

Evaluation of Compact Genotypes of American Cotton under High Density Planting System (HDPS)

By-

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- **Vidarbha-**
 - ✓ Cotton area- 15 lakh ha
 - ✓ Productivity of 325 kg lint/ha.
- **Reasons of low productivity-**
 - ✓ About 95 % area under rainfed cultivation
 - ✓ Erratic behavior of rainfall, its distribution
 - ✓ Growing cotton on marginal and sub-marginal land
- **Farmers needs cotton varieties suitable for low cost production technology**
- **Advantage of HDPS**
 - ✓ needs less bolls / plant to achieve the same yield as conventional cotton
 - ✓ better light interception, efficient leaf area development and early canopy closure
 - ✓ early maturity do not support excessive vegetative growth that can make this system ideal for shallow to medium soils under rainfed conditions

Material and Methods

Design	:	R. B. D.
Replications	:	Three
No. genotypes	:	18 (15 + 3 checks)
Plant spacing	:	60 x 15 cm²
Plot size	:	2.4 x 6.0 m²
Fertilizer dose	:	60 : 30 : 30 kg N:P:K/ha
Year	:	2015-16

Weather 2015-16

Period	Rainfall	Remark
11/06/ 2015	53.8 mm	Monsoon started
25 /06 to 18/7/2015	Dry spell	High temperature above 36^oC
16-29/07/2015	72.1mm	Sowing of Experiment on 23/07/2015
30/7 to 19/8/2015	349.6 mm	Hampered germination,& crop growth
27/08/ to 23/09/2015	179.3 mm	Hampered inter-culture practices
24/09/2015	Monsoon withdrawn	Moisture stress occurred at flowering to boll development stage
October, 2015	Dry spell	Above 36^oC in October and evaporation reduced moisture in the rooting zone
Total	645 mm (26 rainy days) (15% less)	

Sr. No.	Genotype	No. of Monopodia	No. of Sympodia	Length of symp.	Plant height (cm)	No. of bolls/plant	Days to first boll opening	Seed cotton yield/ m ² (g)	Harvest Index
1	AKH-1303	0.2	10.9	30.4	95.0	9.9	96	219	43
2	AKH-1304	0.2	10.5	27.4	91.5	7.7	97	194	33
3	AKH-1305	0.3	10	25.7	87.6	6.4	95	134	23
4	AKH-1306	0.3	10.7	24.9	84.3	8	96	140	33
5	AKH-1307	0.4	9	30.2	82.7	8.4	96	151	37
6	AKH-1308	0.3	10.1	27.2	87.2	7.2	98	154	35
7	AKH-1309	0.3	10.1	25.7	78.3	8.5	95	180	31
8	AKH-1310	0.4	11.1	26.1	89.6	8.3	96	179	32
9	AKH-1311	0.2	11.6	25.2	95.0	9.4	97	201	33
10	AKH-1312	0.3	8.9	26.3	81.0	7.5	96	184	33
11	AKH-1313	0.2	8.5	25.5	91.9	7.6	98	182	37
12	AKH-1314	0.1	8.7	25.9	90.5	8.2	96	181	32
13	AKH-1315	0.5	9.2	26.5	90.5	7.4	96	177	33
14	AKH-1316	0.3	10.9	26.7	96.2	9.4	94	211	38
15	AKH-1317	0.1	11.8	31.1	91.2	10.1	97	221	45
16	AKH-081 Ch)	0.2	10.8	26.8	86.5	8.4	97	180	39
17	NH-615 (Ch)	0.2	9.5	30.1	89.3	8.9	95	204	29
18	Suraj (Ch)	0.3	10.1	25.5	90.0	8.9	96	208	38
	Mean	0.2	10.13	27.07	88.7	8.33	96.1	183	34.2
	S.E.(m)±	0.13	0.7	1.36	3.2	0.47	0.6	14.08	3.71
	C.D at 5%	0.376	2.01	3.92	9.1	1.35	1.73	40.46	10.68

Sr. No.	Genotype	Leaf Area Index					Total Dry Matter/plant (g)				
		30 DAS	60 DAS	90 DAS	120 DAS	135 DAS	30 DAS	60 DAS	90 DAS	120 DAS	135 DAS
1	AKH-1303	0.13	2.05	2.51	2.19	1.11	1.90	12.5	33.9	76.5	49.6
2	AKH-1304	0.14	1.66	2.27	1.74	1.34	1.40	11.8	30.5	69.8	53.0
3	AKH-1305	0.13	1.63	2.23	1.84	1.22	1.60	11.7	25.1	63.6	52.3
4	AKH-1306	0.15	1.90	2.23	2.08	1.46	1.60	10.4	27.6	67.4	47.7
5	AKH-1307	0.13	1.67	2.35	1.94	1.12	1.20	10.7	29.3	63.2	48.6
6	AKH-1308	0.13	1.73	2.21	1.73	1.31	1.10	8.8	32.1	63.6	46.2
7	AKH-1309	0.14	1.74	2.17	1.89	1.17	1.60	10.6	28.3	60.6	49.4
8	AKH-1310	0.14	1.54	2.20	1.87	1.35	1.60	10.5	30.5	71.0	56.7
9	AKH-1311	0.13	2.03	2.30	2.10	1.24	1.80	12.3	33.0	69.8	53.9
10	AKH-1312	0.13	1.58	2.02	1.70	1.30	1.70	10.3	30.2	68.1	49.1
11	AKH-1313	0.14	1.73	2.27	2.20	1.41	1.60	10.8	28.3	67.9	48.5
12	AKH-1314	0.12	1.99	2.29	2.27	1.42	1.50	9.3	30.8	66.3	41.9
13	AKH-1315	0.14	2.06	2.28	2.01	1.40	1.50	11.9	30.6	67.4	53.9
14	AKH-1316	0.14	1.99	2.28	2.04	1.36	2.00	14.0	33.5	69.3	56.4
15	AKH-1317	0.13	2.05	2.39	2.17	1.45	1.90	14.9	35.9	78.6	49.7
16	AKH-081 Ch)	0.14	1.73	2.20	1.96	1.37	1.70	10.8	32.1	66.6	44.5
17	NH-615 (Ch)	0.15	1.59	2.27	2.02	1.23	1.70	11.6	31.9	72.5	59.1
18	Suraj (Ch)	0.14	2.03	2.34	2.16	1.24	1.70	13.1	29.6	67.7	49.9
	Mean	0.13	1.81	2.26	1.99	1.30	1.60	11.4	31.0	68.2	54.9
	S.E.(m)±	0.01	0.09	0.06	0.08	0.14	0.12	0.84	1.39	2.63	3.5
	C.D at 5%	0.02	0.27	0.19	0.23	0.41	0.36	2.42	4.00	7.58	10.0

Sr. No.	Genotype	Crop Growth Rate (g/m ² /day)				Relative Growth Rate(g/g/day)			
		30-60DAS	60-90 DAS	90-120 DAS	120-135 DAS	30-60 DAS	60-90 DAS	90-120 DAS	120-135 DAS
1	AKH-1303	0.354	0.734	1.420	0.898	0.070	0.036	0.022	0.011
2	AKH-1304	0.356	0.708	1.144	0.561	0.064	0.035	0.023	0.008
3	AKH-1305	0.335	0.448	1.282	0.377	0.066	0.026	0.029	0.004
4	AKH-1306	0.293	0.574	1.326	0.658	0.062	0.033	0.03	0.004
5	AKH-1307	0.318	0.618	1.131	0.486	0.069	0.033	0.026	0.009
6	AKH-1308	0.254	0.718	1.050	0.58	0.068	0.035	0.023	0.007
7	AKH-1309	0.303	0.589	1.076	0.373	0.064	0.033	0.025	0.006
8	AKH-1310	0.295	0.649	1.349	0.478	0.062	0.035	0.03	0.008
9	AKH-1311	0.349	0.724	1.192	0.528	0.064	0.035	0.027	0.01
10	AKH-1312	0.287	0.631	1.263	0.631	0.061	0.035	0.028	0.006
11	AKH-1313	0.308	0.582	1.321	0.646	0.064	0.032	0.029	0.009
12	AKH-1314	0.259	0.746	1.181	0.812	0.061	0.028	0.025	0.012
13	AKH-1315	0.347	0.621	1.227	0.45	0.068	0.032	0.026	0.006
14	AKH-1316	0.407	0.643	1.191	0.43	0.065	0.029	0.027	0.008
15	AKH-1317	0.448	0.774	1.446	0.964	0.075	0.041	0.031	0.004
16	AKH-081 Ch)	0.304	0.710	1.150	0.739	0.061	0.037	0.024	0.009
17	NH-615 (Ch)	0.329	0.677	1.353	0.446	0.064	0.033	0.028	0.005
18	Suraj (Ch)	0.381	0.550	1.268	0.593	0.068	0.027	0.027	0.007
	Mean	0.32	0.65	1.24	0.59	0.065	0.033	0.026	0.007
	S.E.(m)±	0.02	0.04	0.08	0.12	0.004	0.002	0.0018	0.002
	C.D at 5%	0.08	0.14	0.23	0.34	0.0122	0.0072	0.0054	0.007

Sr. No.	Genotype	Net Assimilation Rate (g/dm ² /day)				Fiber quality parameter			
		30-60 DAS	60-90 DAS	90-120 DAS	120-135 DAS	UHML(mm)	UR	MIC. (µg/inch)	Fiber strength (g/tex)
1	AKH-1303	0.0573	0.0384	0.0534	0.044	31	83	3.8	25.7
2	AKH-1304	0.0658	0.0347	0.0637	0.0364	30	82	3.6	25.8
3	AKH-1305	0.0636	0.0261	0.0708	0.0176	28.7	82	3.4	27.5
4	AKH-1306	0.0479	0.031	0.0687	0.0149	27.9	81	3.8	28.0
5	AKH-1307	0.0588	0.0347	0.0588	0.0351	28.2	82	3.6	26.6
6	AKH-1308	0.0462	0.0344	0.0599	0.0297	28.4	82	4.2	27.5
7	AKH-1309	0.0532	0.0339	0.0591	0.0213	26.4	81	4.2	25.4
8	AKH-1310	0.0572	0.0391	0.0682	0.0373	29.7	82	3.7	24.2
9	AKH-1311	0.0579	0.0382	0.0512	0.0464	24.5	79	3.9	23.8
10	AKH-1312	0.0558	0.0392	0.0676	0.0288	28.3	82	5.1	26.2
11	AKH-1313	0.0558	0.0326	0.0656	0.034	27.3	81	4.0	26.7
12	AKH-1314	0.0435	0.0386	0.0568	0.040	29.4	82	3.8	26.7
13	AKH-1315	0.0544	0.0319	0.0637	0.0229	28.5	82	4.8	24.8
14	AKH-1316	0.0665	0.0336	0.0705	0.0336	27.5	81	3.7	26.9
15	AKH-1317	0.0689	0.0444	0.0772	0.0178	27.0	81	3.9	25.8
16	AKH-081 Ch)	0.0545	0.0403	0.0614	0.0324	26.8	81	3.7	25.1
17	NH-615 (Ch)	0.0635	0.0397	0.0701	0.0261	28.5	82	3.6	27.7
18	Suraj (Ch)	0.0611	0.0283	0.0627	0.0306	26.7	81	3.9	27.2
	Mean	0.057	0.035	0.064	0.03				
	S.E.(m)±	0.005	0.002	0.005	0.00993				
	C.D at 5%	0.015	0.007	0.014	0.02853				

CONCLUSION

- Genotype AKH-1317, AKH-1303 and AKH-1316 recorded higher seed cotton yield.
- Genotype AKH-1317 showed significantly higher values of yield attributes viz., number of bolls (10.1), number of sympodia (11.8), harvest index (45.0%), CGR(1.45 g/m²/day), RGR(0.031g/g/day) and NAR(0.0772 g/dm²/day) & SCY (221 g/Sq. m)
- Genotype AKH-1303 recorded significantly higher values of leaf area (22.6 dm²/plant), leaf area index (2.51), UHML (31) and UR(83).



Thanks !