Glasshouse evaluation of recombinant inbred lines for B biotype vector resistance:

At three weeks after whitefly exposure:

Twenty-five promising recombinant inbred tomato genotypes were selected from the 80 lines tested for indigenous whitefly *B. tabaci* preference based on total developmental stages (Eggs, nymphs and empty pupal cases). Selected lines were further evaluated for B biotype whitefly preference along with the checks LA 1777 (vector resistance), Arkavikas (ToLCV susceptible), Nandi, Sankranthi and Vybhav (ToLCV resistant checks) under glasshouse conditions. The data revealed that among the RIL's the least counts of total eggs and nymphs was observed in LLA 3914 (25.5), LA 3920 (33.67), LA 3921 (31.93), LA 3923 (31.9), LA 3927 (26.3), LA3937 (30.6), LA 3943 (31.6) and LA 3948 (20.4) L-30 followed by moderate values were observed in LA 3924 (58.41), LA 3926 (62.4), LA 3949 (55.2) and LA 3956 (43.26) as compared to checks LA 1777 (8.76) and ToLCV resistant checks Sankranthi (199), Nandi (232.5) and Vybhav (196.7) and Arka Vikas (306.3) (Table 1).

At six weeks after whitefly exposure:

At sixth weeks after whitefly exposure, lines LA 3914 (63.11), LA 3920 (73.06), LA 3921 (76), LA 3923 (70.91), LA 3937 (73.95), LA 3943 (66.53) LA 3948 (61.7) have recorded less counts of total developmental stages (eggs and nymphs) of *B tabaci*, while moderate numbers were observed in RIL's LA 3924 (90.7), LA 3925 (103.8) and LA 3926 (123) as compared resistant checks LA 1777 (15.1) and Sankranthi (455.6), Nandi (463), Vybhav (472.52) and Arkavikas (554.8), which have recorded high population of total developmental stages (Table 2).

At 12 weeks after whitefly exposure exposure:

At twelve weeks after whitefly exposure, Lines LA 3914 (70.14), LA 3920 (78.94), LA 3921 (80.76), LA 3923 (82.83), LA 3927 (89.72), LA 3937 (101.4), LA 3943 (83.15) and LA 3948 (104.53) recorded minimum counts of total developmental stages (eggs and nymphs) of *B tabaci*, as compared to resistant checks LA 1777 (31.26) and Sankranthi (519.98), Nandi (600.98) and Vybhav (578.34) and Arkavikas (679.66). Lines viz., LA 3924 (139.49), LA 3925 (135.98), LA 3926 (148.59), LA 3930 (177.53) and LA 3931 (180.96) had moderate counts of *B. tabaci* (Table 3).

Field evaluation of recombinant inbred lines for whitefly resistance:

At three weeks after transplanting:

Twenty five promising recombinant inbred tomato genotypes were selected from the 80 lines tested for indigenous whitefly *B. tabaci* preference based on total developmental stages (eggs, nymphs and empty pupal cases). Selected lines along with the checks LA 1777 (vector resistance), Sankranthi, Nandi, and Vybhav (ToLCV resistant checks) and Arkavikas (ToLCV susceptible check) were exposed to B biotype whitefly under glasshouse and then transplanted to main field. Average whitefly counts were made on each line at different weeks after transplanting. The

data revealed that amongst the RIL's the least counts of developmental stages were observed in LA 3914 (10.5), LA 3920 (20.7), LA 3921 (14.81), LA 3923 (17.83), LA 3924 (13.9), LA 3925 (21.32), LA 3927 (17.28), LA 3937. Moderate values were observed in L13, L16, L17, L18, L27 , L31, L36 L38 as compared to checks LA 1777, Sankranthi, Nandi and Vybhav (Table 4).

At six weeks after transplanting:

At six weeks after whitefly exposure, lines L2, L7, L8, L10, L21, L26, L30 had lower counts of total developmental stages (eggs and nymphs) of *B tabaci*, while moderate numbers were observed in RIL's L11, L12 and L13 as compared to other susceptible lines (Table 5) and resistant checks LA 1777 and Sankranthi, Nandi and Vybhav, which have recorded huge population of total developmental stages.

At 12 weeks after transplanting:

Lines L2, L7, L8, L10, L14, L21, L26, L30 have recorded minimum counts of total developmental stages (eggs and nymphs) of *B tabaci*, as compared to other susceptible lines (Table 6) and resistant checks LA 1777 and Sankranthi, Nandi and Vybhav. Lines viz., L11, L12, L13, L16 and L17 have recorded moderate counts of *B. tabaci*.

Table1. Average number of developmental stages of *Bemisia tabaci* B biotype on tomato genotypes under laboratory conditions on the third week after inoculation

Genotype		**Average number of developmental stages of *B. tabaci* B biotype**		
UAS code	**AVRDC code**	**eggs / plant**	**nymphs / plant**	**Total dev stages**
L-2	LA 3914	11.2	14.3	25.5
L-7	LA 3920	11.36	22.31	33.67
L-8	LA 3921	14.3	17.63	31.93
L-10	LA 3923	13.6	18.3	31.9
L-11	LA 3924	32.1	26.31	58.41
L-12	LA 3925	55.31	35.2	90.51
L-13	LA 3926	36.1	26.3	62.4
L-14	LA 3927	11.3	16.5	26.3
L-16	LA 3930	19.34	52.3	71.64
L-17	LA 3931	38.3	29.3	67.6
L-18	LA 3933	36.1	63.12	99.22
L-21	LA 3937	14.3	16.3	30.6
L-22	LA 3938	75.3	125.36	200.7
L-23	LA 3939	23.1	66.36	89.46
L-26	LA 3943	16.3	15.3	31.6
L-27	LA 3944	53.1	135.2	188.3
L-30	LA 3948	6.1	14.3	20.4
L-31	LA 3949	16.3	38.9	55.2
L-32	LA 3951	39.2	66.35	105.6
L-34	LA 3953	53.6	63.1	116.7
L-35	LA 3955	23.6	89.34	112.9
L-36	LA 3956	17.6	26.35	43.26
L-37	LA 3957	13.6	65.3	78.9
L-38	LA 3958	33.6	103.1	136.7
L-40	LA 3960	41.23	93.2	134.4
LA 1777	LA 1777	4.13	4.63	8.76
Sankranthi	Sankranthi	95.66	103.3	199
Nandi	Nandi	89.3	143.2	232.5
Vybhav	Vybhav	73.6	123.1	196.7
Arka Vikas	Arka Vikas	143.2	163.1	306.3

Table 2. Average number of developmental stages of *B. tabaci* B biotype on tomato genotypes under laboratory conditions on the sixth week after inoculation

Genotype		**Average number of developmental stages of *B. tabaci* B biotype**			
UAS code	**AVRDC code**	**eggs / plant**	**nymphs / plant**	**Empty pupal cases**	**Total dev stages**
L-2	LA 3914	34.2	25.3	3.61	63.11
L-7	LA 3920	33.1	35.8	4.16	73.06
L-8	LA 3921	27.3	43.1	5.6	76
L-10	LA 3923	32.3	29.3	9.31	70.91
L-11	LA 3924	38.9	36.5	15.3	90.7
L-12	LA 3925	58.3	33.2	12.3	103.8
L-13	LA 3926	65.3	41.2	16.5	123
L-14	LA 3927	29.3	36.4	8.36	74.06
L-16	LA 3930	26.1	103.1	19.23	148.43
L-17	LA 3931	53.1	66.35	23.45	142.9
L-18	LA 3933	76.3	125.3	26.36	227.96
L-21	LA 3937	26.3	31.3	16.35	73.95
L-22	LA 3938	102.3	165.3	42.03	309.63
L-23	LA 3939	36.8	125.3	23.6	185.7
L-26	LA 3943	24.3	28.63	13.6	66.53
L-27	LA 3944	83.5	189.35	36.2	309.05
L-30	LA 3948	14.3	35.1	12.3	61.7
L-31	LA 3949	41.3	92.3	22.31	155.91
L-32	LA 3951	53.26	85.3	26.35	164.91
L-34	LA 3953	81.3	156.34	49.35	286.99
L-35	LA 3955	68.7	143.6	25.3	237.6
L-36	LA 3956	48.36	64.97	16.34	129.67
L-37	LA 3957	65.3	125.34	23.4	214.04
L-38	LA 3958	72.1	145.3	31.2	248.6
L-40	LA 3960	72.3	168.3	35.2	275.8
LA 1777	LA 1777	6.3	7.6	1.2	15.1
Sankranthi	Sankranthi	156.2	176.3	123.1	455.6
Nandi	Nandi	153.2	186.3	123.5	463
Vybhav	Vybhav	135.6	213.36	123.56	472.52
Arka Vikas	Arka Vikas	156.3	213.2	185.3	554.8

Table 3. Average number of developmental stages of *Bemisia tabaci* B biotype on tomato genotypes under laboratory conditions at twelve weeks after inoculation

Genotype		Average number of *B tabaci* B - biotype			
UAS code	**AVRDC code**	**eggs / plant**	**nymphs / plant**	**Empty pupal cases**	**Total dev Stages**
L-2	LA 3914	26	34.5	9.64	70.14
L-7	LA 3920	37.33	30.11	11.5	78.94
L-8	LA 3921	36.5	32.6	11.66	80.76
L-10	LA 3923	38.33	27.4	17.1	82.83
L-11	LA 3924	60.33	47.33	27.33	134.99
L-12	LA 3925	70.4	47.33	18.16	135.89
L-13	LA 3926	76.52	52.66	19.61	148.79
L-14	LA 3927	44.12	33.3	12.3	89.72
L-16	LA 3930	47.33	110.66	19.54	177.53
L-17	LA 3931	68.3	78.66	34	180.96
L-18	LA 3933	77.41	111.12	31.33	219.86
L-21	LA 3937	48.97	28.66	23.41	101.04
L-22	LA 3938	124.3	147.25	60.33	331.88
L-23	LA 3939	71.32	151.33	47.2	269.85
L-26	LA 3943	30.25	38.3	14.6	83.15
L-27	LA 3944	115.66	198.33	42.33	356.32
L-30	LA 3948	36.53	46.66	21.34	104.53
L-31	LA 3949	60.23	100.3	37.66	198.19
L-32	LA 3951	60.66	109.64	44.66	214.96
L-34	LA 3953	111.66	185.64	64.23	361.53
L-35	LA 3955	82.33	182.33	52.33	316.99
L-36	LA 3956	74.6	99.33	36.24	210.17
L-37	LA 3957	91.33	172.33	47.56	311.22
L-38	LA 3958	105.66	192.33	53.33	351.32
L-40	LA 3960	119.54	206.33	57.66	383.53
LA 1777	LA 1777	13.66	13.66	3.94	31.26
Sankranthi	Sankranthi	211.66	163.66	144.66	519.98
Nandi	Nandi	207.66	246.66	146.66	600.98
Vybhav	Vybhav	144.35	271.66	162.33	578.34
Arka Vikas	Arka Vikas	221	303	155.66	679.66

Table 4. Average number of developmental stages of *Bemisia tabaci* B biotype on tomato genotypes under field conditions at three weeks after inoculation

Sl.	Genotype		B - biotype			
			Total	Total	Empty	Total dev
No.	UAS code	AVRDC code	eggs / plant	nymphs / plant	pupal cases	stages
1	L-2	LA 3914	3.2	4.2	3.2	10.53
2	L-7	LA 3920	7.2	9	4.5	20.7
3	L-8	LA 3921	5.13	4.4	5.3	14.81
4	L-10	LA 3923	6.3	5.2	6.3	17.83
5	L-11	LA 3924	6.2	4.2	3.5	13.9
6	L-12	LA 3925	13.2	3.5	4.6	21.32
7	L-13	LA 3926	13.6	9.3	5.3	28.22
8	L-14	LA 3927	6.32	5.1	5.8	17.28
9	L-16	LA 3930	11.2	13	4.4	28.76
10	L-17	LA 3931	13.4	15	5.4	33.96
11	L-18	LA 3933	12.2	15	4.3	31.7
12	L-21	LA 3937	10.3	5.3	5.4	21
13	L-22	LA 3938	26.3	32	5.3	63.9
14	L-23	LA 3939	10.3	23	7.5	41.1
15	L-26	LA 3943	6.24	3.6	6.2	16
16	L-27	LA 3944	14.2	15	5.4	34.86
17	L-30	LA 3948	4.93	5.3	6.3	16.53
18	L-31	LA 3949	12.3	16	6.4	34.45
19	L-32	LA 3951	16.3	25	7.3	48.9
20	L-34	LA 3953	23.3	23	5.3	51.9
21	L-35	LA 3955	12.2	26	7.3	45.8
22	L-36	LA 3956	9.6	16	5.3	30.9
23	L-37	LA 3957	7.3	25	7.6	40.2
24	L-38	LA 3958	12.3	18	5.4	35.96
25	L-40	LA 3960	16.3	23	4.3	43.9
26	LA 1777	LA 1777	3.16	2.1	1.6	6.92
27	Sankranthi	Sankranthi	35.23	30	18	83.03
28	Nandi	Nandi	36.2	39	21	96.1
29	Vybhav	Vybhav	31.3	36	16	83.8
30	Arka Vikas	Arka Vikas	53	53	23	129.1

Table 5. Average number of developmental stages of *Bemisia tabaci* B biotype on tomato genotypes under field conditions at six weeks after inoculation

		B - biotype			
Genotype		**Total**	**Total**	**Empty**	**Total dev**
UAS code	**AVRDC code**	**eggs / plant**	**nymphs / plant**	**pupal cases**	**stages**
L-2	LA 3914	34.2	25.3	3.61	63.11
L-7	LA 3920	33.1	35.8	4.16	73.06
L-8	LA 3921	27.3	43.1	5.6	76
L-10	LA 3923	32.3	29.3	9.31	70.91
L-11	LA 3924	38.9	36.5	15.3	90.7
L-12	LA 3925	58.3	33.2	12.3	103.8
L-13	LA 3926	65.3	41.2	16.5	123
L-14	LA 3927	29.3	36.4	8.36	74.06
L-16	LA 3930	26.1	103.1	19.23	148.43
L-17	LA 3931	53.1	66.35	23.45	142.9
L-18	LA 3933	76.3	125.3	26.36	227.96
L-21	LA 3937	26.3	31.3	16.35	73.95
L-22	LA 3938	102.3	165.3	42.03	309.63
L-23	LA 3939	36.8	125.3	23.6	185.7
L-26	LA 3943	24.3	28.63	13.6	66.53
L-27	LA 3944	83.5	189.35	36.2	309.05
L-30	LA 3948	14.3	35.1	12.3	61.7
L-31	LA 3949	41.3	92.3	22.31	155.91
L-32	LA 3951	53.26	85.3	26.35	164.91
L-34	LA 3953	81.3	156.34	49.35	286.99
L-35	LA 3955	68.7	143.6	25.3	237.6
L-36	LA 3956	48.36	64.97	16.34	129.67
L-37	LA 3957	65.3	125.34	23.4	214.04
L-38	LA 3958	72.1	145.3	31.2	248.6
L-40	LA 3960	72.3	168.3	35.2	275.8
LA 1777	LA 1777	6.3	7.6	1.2	15.1
Sankranthi	Sankranthi	156.2	176.3	123.1	455.6
Nandi	Nandi	153.2	186.3	123.5	463
Vybhav	Vybhav	135.6	213.36	123.56	472.52
Arka Vikas	Arka Vikas	156.3	213.2	185.3	554.8

Table 6. Average number of developmental stages of *Bemisia tabaci* B biotype on tomato genotypes under field conditions at twelve weeks after inoculation

Sl.	Genotype		B - biotype			
			Total	Total	Empty	Total dev
No.	UAS code	AVRDC code	eggs / plant	nymphs / plant	pupal cases	stages
1	L-2	LA 3914	3.61	2.36	1.36	7.33
2	L-7	LA 3920	3.65	4.29	2.13	10.07
3	L-8	LA 3921	5.16	2.46	2.78	10.4
4	L-10	LA 3923	3.12	5.16	1.23	9.51
5	L-11	LA 3924	6.13	5.31	1.64	13.08
6	L-12	LA 3925	11.34	3.16	2.5	17
7	L-13	LA 3926	13.6	2.35	2.76	18.71
8	L-14	LA 3927	8.5	2.15	1.2	11.85
9	L-16	LA 3930	12.3	13.94	2.31	28.55
10	L-17	LA 3931	6.35	9.12	2.4	17.87
11	L-18	LA 3933	9.36	13.61	0.91	23.88
12	L-21	LA 3937	4.13	4.13	0.91	9.17
13	L-22	LA 3938	16.3	23.5	3.15	42.95
14	L-23	LA 3939	8.64	18.94	2.34	29.92
15	L-26	LA 3943	5.12	3.61	2.13	10.86
16	L-27	LA 3944	11.36	14.31	0.89	26.56
17	L-30	LA 3948	3.86	3.13	1.87	8.86
18	L-31	LA 3949	6.91	8.61	1.9	17.42
19	L-32	LA 3951	12.63	26.35	3.16	42.14
20	L-34	LA 3953	16.3	18.92	3.16	38.38
21	L-35	LA 3955	8.03	25.31	3.61	36.95
22	L-36	LA 3956	6.12	7.13	0.54	13.79
23	L-37	LA 3957	4.3	23.13	5.13	32.56
24	L-38	LA 3958	13.4	16.7	3.12	33.22
25	L-40	LA 3960	13.4	19.3	1.13	33.83
26	LA 1777	LA 1777	1.3	1.5	0.53	3.33
27	Sankranthi	Sankranthi	28.3	46.15	13.6	88.05
28	Nandi	Nandi	26.3	38.46	16.3	81.06
29	Vybhav	Vybhav	26.3	35.3	13.4	75
30	Arka Vikas	Arka Vikas	38.3	43.12	16.3	97.72