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Seasonal dynamics of mirid bug (*Creontiades biseratense* Distant.) population in Bt cotton in Haveri district of Karnataka*

Introduction of synthetic pyrethroids during 1980's was overwhelming success in cotton, but unscientific and indiscriminate use of such pesticides resulted in the development of resistance in bollworms, resurgence of sucking pests and residue problems in many parts of the world. Though, the current Integrated Pest Management (IPM) strategies proved effective, economical and ecofriendly (Patil and Bheemanna, 1998), its complexity and non-availability of the critical components hindered the complete adoption of IPM package among the farming community on large scale basis in conventional cotton era. Thus switching over to transgenic Bt cotton was felt inevitable in many countries. India adopted commercial Bt cotton cultivars in 2002 and initially transgenic bollworms resistant cultivars were occupied 50,000 ha (Choudhary and Gour, 2002) in our country. As expected there was shift in insect pest scenario of cotton with large scale adoption of Bt cotton cultivars.

In recent years, the mirid bug, *Creontiades biseratense* (Distant.) (Hemiptara : Miridae) has emerged as a key sucking pest in South India causing a severe damage to Bt cotton. The green colour morph mirid, *C. biseratense* is appearing in Karnataka since 2005 and posing a threat to the Bt cotton cultivation in several parts of Karnataka (Patil *et al.,* 2006). The pest has also been reported from Tamil Nadu, Andhra Pradesh and Maharashtra (Surulivelu and Dhara Jothi, 2007; Udikeri *et al.* 2010). Presently, mirid bug is appearing in severe form throughout the Karnataka, with most aggressive status in Haveri district (Rohini *et al.,* 2009 and Udikeri *et al.,* 2009). Since its first wide spread incidence in Haveri district (Karnataka: India), mirid bugs are considered to be historically associated with cotton cultivation in Haveri. Thus, the district with its diversity in cultivation *viz.,* rainfed/irrigated situations, black/red soil, *khariff*/summer season cultivations, huge Bt cotton cultivar diversity offered a suitable geographical locality for exploring functional guilds involved in mirid dynamics and damage. However, previous studies were not season long observations across district.

Table 1. Details of fixed plot survey locations for mirid bug dynamics in Haveri

Taluk	Villages	Latitude	Longitude	Altitude (MSL)
Shiggaon	Bisanalli	14°57.451'	75°14.636'	576
	Kabanur	15°03.320'	75°14.188'	679
Savanur	Hattimattur	14°56.251'	75°25.767'	557
	Hiremagadur	14°53.592'	75°69.559'	548
Hanagal	Adur	14°46.472'	75°15.119'	549
	Akki-Alur	14°43.887'	75°10.701'	578
Hirekerur	Rattihalli	14°25.038'	75°30.205'	575
	Hiremorab	14°23.751'	75°28.283'	569
Ranebennur	Kakol	14°40.339'	75°33.356'	595
	Belur	14°46.685'	75°88.720'	547
	Ankasapur	14°41.189'	75°42.692'	554
Haveri	Aladkatti	14°36.368'	75°22.462'	580
	Totad Yellapur	14°40.244'	75°35.568'	557

Table 2. Seasonal incidence of mirid bug, *Creontiades biseratense* in Bt cotton at different villages of Haveri district

Month/ Fortnight		Mirid bugs per 100 squares± S.D.												
		Shiggaon		Savanur		Ranebennur			Hirekerur		Hanagal		Haveri	
		Bisanalli	Kabanur	Hattimattur	Hiremagadur	Kakol	Ankasapur	Belur	Rattihalli	Hiremorab	Adur	Akkialur	Aladakatti	Totad Yellapur
Aug 2010	I FN	0	0	0	0	0	0	0	0	0	0	0	0	0
	II FN	0	0	0	0	0	0	0	0	0	0	0	0	0
Sept 2010	I FN	9	23	45	29	20	19	17	56	52	12	16	47	42
	II FN	33	56	114	65	54	49	53	109	103	31	48	91	84
Oct 2010	I FN	64	101	140	84	82	90	80	155	137	49	67	144	135
	II FN	114	153	198	147	124	115	118	218	203	117	102	195	184
Nov 2010	I FN	207	170	261	234	154	242	151	281	270	175	155	258	242
	II FN	191	217	332	318	272	310	280	390	341	247	231	367	341
Dec 2010	I FN	143	187	263	215	151	160	178	323	303	159	180	272	259
	II FN	109	133	163	156	116	131	146	225	243	114	104	195	173
Jan 2011	I FN	53	63	115	97	64	74	81	141	144	69	68	127	117
	II FN	34	36	58	59	40	51	56	66	72	35	37	58	42
Feb 2011	I FN	9	12	13	21	15	16	18	23	26	11	14	18	13
	II FN		-	-	-	-	-	-	-	-	-		-	-
Mar-2011	I FN	-	-	-	-		-	-	-	-	-	-	-	-
	II FN	-	-	-	-		-	-	-	-	-	-	-	-
Apr-2011	I FN	-	-	-	-		-	-	-	-	-	-	-	-
	II FN	-	-	-	-		16*	13*	-	-	-	-	-	
May-2011	I FN	-	-	-			68*	59*	-	-	-	-	-	-
	II FN	-	-	-	-		125*	122*	-	-	-	-	-	-
June -2011	I FN	-	-	-	-		223*	208*	-	-	-			
Mean±S.D.		87.8± 70.2	104.6± 71.3	154.7± 100.7	129.1± 94.0	99.3± 75.4	105.9± 81.7	108.3± 77.0	180.4± 115.6	172.2± 106.7	95.5± 80.5	92.6± 70.5	164.5± 108.3	148± 103.2

* Summer crop FN- Fortnight

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Fixed plot surveys were carried out to study the population dynamics of mirid bugs across Haveri during 2010-11. In entire district thirteen locations were selected comprising minimum two/ three villages from each taluka representing different rainfall pattern. At every fortnight interval fixed plots of farmers fields were visited to know the dynamics of mirid bugs. The ground positioning (Table 1) of every field plot/village was done with the help of e-Trex H personal navigator (German made). At each location the genotype selected as fixed plot was MRC 7351 (Kanaka) only a second generation bollgard (BG II) intraspecific Bt cotton hybrid from M/S Mahyco Seeds Co Pvt Ltd, Jalna (Maharastra). This genotype was occupied larger area in Haveri district as well as Karnataka state since last couple of years. The observations were recorded on fortnightly bases in every fixed plot on number of mirid bugs, *Crentiades biseratense* per 100 squares per plot.

Among different villages the population initiation was with higher level in Rattihalli (56/100 squares) and Hiremoraba (52/100 squares). In rest of the places it varied from 9.0 (Bisanalli) to 47.0 (Aladakatti) mirds/100 squares in seasonal first notice *i.e.* September first fortnight itself. With advancement of age of the crop there was increasing trend in mirid bug population till November first fortnight. The highest population observed at this period was again from Rattihalli (390/100 squares) and Aladakatti (367/100 squares). In all places from September second fortnight itself the population appeared to be moderate and increased with time. By October first fortnight every square plucked used to have more than one mirid bug adult or nymph in Kabanur, Hattimattur, Rattihalli, Hiremoraba, Aladakatti and Totad Yellapur. The decline in population started from December end reaching the least possible by February first fortnight (Table 2).

Thus, in the *kharif/rabi* main season of cotton cultivation the highest incidence of mirid bug noticed was 390/100 squares (Rattihalli) and the lowest was 9/100 squares (Bisanalli) with peak incidence in November month. In two villages of Ranebennur taluk the crop was sown for again summer season. This crop was under protective irrigation from river banks. The incidence noticed in summer crop (Anakasapur and Belur) ranged from 13 to 223/100 squares highest being by end of June. In May and June the crop suffered with heavy incidence of mirid bug. The seasonal mean incidence of mirid bug was highest (180.4±115.6) in Rattihalli followed by (172.3±106.7) in Hiremoraba. The present findings confirmed previous studies in Haveri for the fact of mirid severity (Udikeri *et al.,* 2009 and Rohini *et al.*, 2009), wherein maximum incidence of the mirid bugs was observed during second fortnight of November.

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References

Choudhary, B. and Gour, K., 2002, Adoption and impact of Bt cotton in India. www.isaaa.org.

Patil, B. V. and Bheemanna, M., 1998, Integrated pest management strategy for irrigated cotton. In: *Proc., World Cotton Conference-2,* Athens, Greece. 801-805.

Patil, B. V., Bheemanna, M., Patil, S. B., Udikeri, S. S. and Hosmani, A., 2006, Record of mirid bug, *Creontiades biseratense* (Distant.) on cotton from Karnataka, India. *Insect Environ.* 11 : 176-177.

Rohini, R. S., Mallapur, C. P. and Udikeri, S. S., 2009, Incidence of mirid bug, *Creontiades biseratense* (Distant) on Bt cotton in Karnataka. *Karnataka J. Agric. Sci.,* 22: 680-681.

Surulivelu, T. and Dhara Jothi, B., 2007, Mirid Bug, *Creontiodes biseratense* (Distant.) damage on Cotton in Coimbatore. http://www.cicr.gov.in

Udikeri, S. S., Kranthi, K. R., Patil, S. B., Modagi, S. A and Vandal,N.B., 2010, Bionomics of mirid bug, *Creontiades biseratense* (Distant.) and oviposition pattern in Bt cotton. *Karnataka J. Agric. Sci*., 23: 153-156.

Udikeri, S. S., Patil, S. B., Shaila, H. M., Guruprasad, G. S., Patil, S. S., Kranthi, K. R. and Khadi, B. M., 2009, Mirid Menace - A potential emerging sucking pest problem in cotton. In*: Proc., 4th Asian Cotton Res. Devl. Network meeting* Anyang, China. www. icac. org.