

US EPA ARCHIVE DOCUMENT

Special Report 2006:**Local Movement of Sterile Pink Bollworm Moths In The San Joaquin Valley of California**

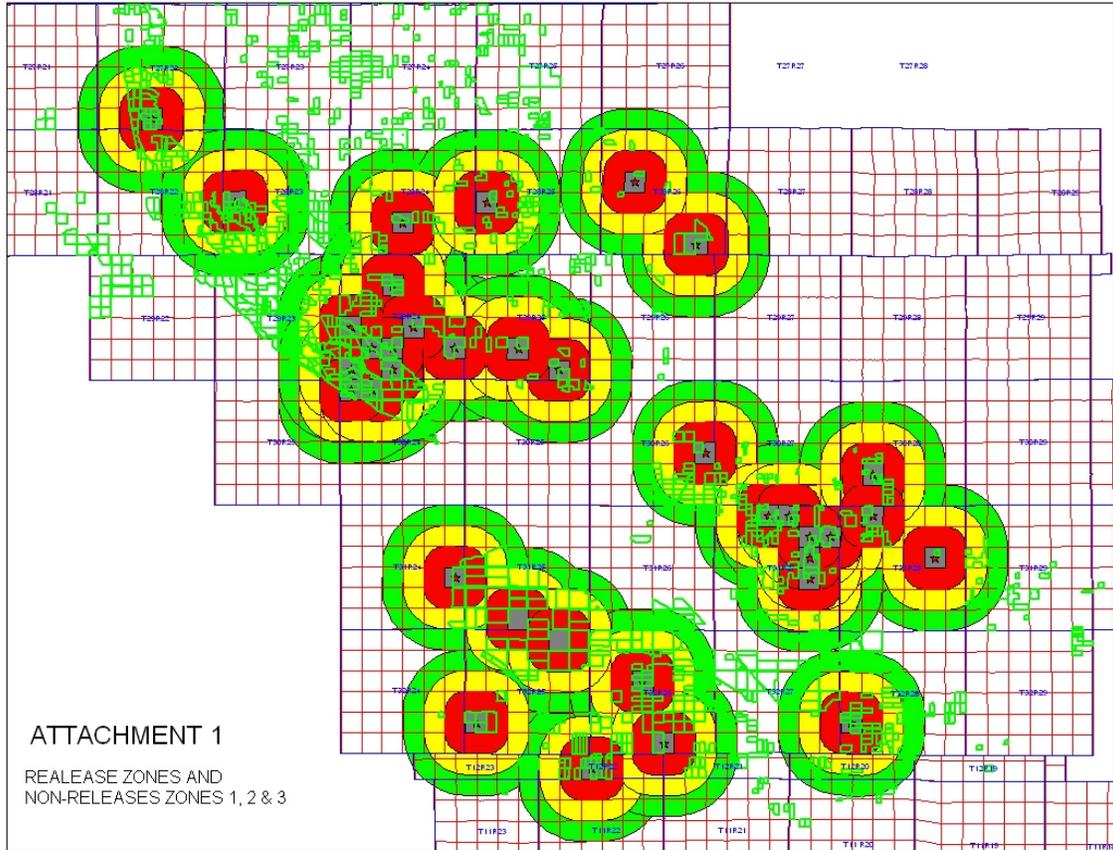
Dan Keaveny , Jim Hessler , Jim Rudig, California Department of Food and Agriculture and Robert Staten ,Consultant ,University of Arizona

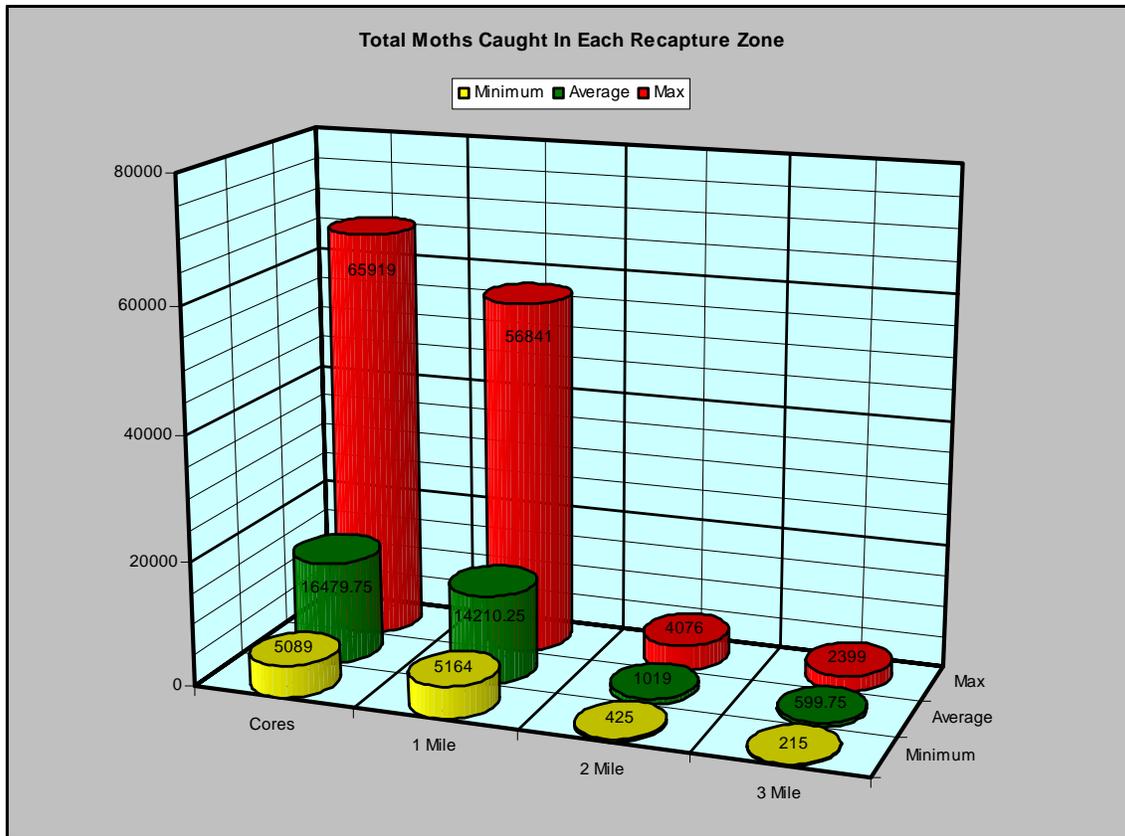
Introduction: Many attributes of the climate in the San Joaquin Valley are extremely conducive to Pink Boll Worm (*Pectinophora gossypiella*) population development . No sustainable population has ever been found. This has correctly been attributed to a continuous 36 year program relying almost exclusively on detection and sterile release. The fundamental processes and procedures have remained unchanged throughout this time. Sterile moths are released on all sections (square mile) during the beginning of a current season where native, non sterile moths were detected in the previous season. As the current crop is accurately mapped any section without a current cotton crop is removed from a release zone. As non sterile moths are detected in a current season in non released sections a release zone is expanded to include that new section. This results in a period during July and August when releases are relatively stagnant or constant. This offers an ideal place and time to use programmatic data to asses dispersal away from the targeted section of release. It is important to note that error in aircraft is rare or nearly non existent . All aircraft flights are guided ,monitored and recorded using a global positioning system (Trimble 170 field computer ag. GPS Trimflight 3 System). The flight pattern is north to south using five “swaths” starting at the west edge, ¼ mile, ½ mile, ¾ mile and the eastern edge of a release section. Releases are made on these lines three times a week.

Methods and Materials: Adult Pink Bollworm populations are monitored using a program wide standard PBW delta trap and a standard 2 mg concept lure. Traps are placed in the southern part of this zone at 1 trap per 60 acres and in the remainder on the area used in this study at 1 trap per 80 acres. The release area used in this study was in Kern County. No other release section could be within 6 miles of the closest release study section. Trap data was then sorted for all traps as 4 distinct capture zones. These are the area within the section of release (release zone), all traps in an area from the zone boundary to an outer boundary of 1 mi (zone 1), all traps from the 1 mile boundary to a 2 mile boundary (zone 2), and all traps from the 2 mile boundary to a 3 mile boundary (zone3). All data was manipulated in Map Info. The number of acres in each band and the actual data including total moths per week could be used as all trap locations and all field boundaries are obtained with GPS units.

Results: The field arrangement and spatial relationships of each data zone is shown in the attached map (Attachment 1). Sections which actually contain fields are marked on this map. All traps are then placed in fields. This gives a frame of reference as to where the data actually comes from. All trap date are based on numbers of sterile moths per week. Attachment 2 provides a summary of total moth capture in each zone over all times that the study is conducted. The zone or band covering the mile adjacent had almost as high a number of a total moth capture as the targeted sections. Moth activity is still readily apparent over the next two bands even though it is reduced as expected. This study is conducted during the time when the pink bollworm moth is the least mobile and is most prone to remain in favorable habitat. Attachments 3 gives more detailed data including total recapture over seven weeks and the number of positive traps i.e. traps with one or more sterile moths in each zone. This table also provides basic acres in each zone and total traps used in each zone. All data is then expressed in percentage points for comparative purposes.

Conclusions: The most important and simple conclusion is that almost as many moths reside in the mile zone around a release zone as within it. This is not surprising as release is at 500 feet to ensure moth flight before their fall to the ground can be completed.





ATTACHMENT 3 Recapture Data for Kern County 2005
 Release sections and 1, 2 and 3 mile buffers

SUMMARY	SECTIONS	ACRES	TRAPS	7/15		7/22		7/29		8/5		8/12		8/19		8/26		Total
				STER	TRAP+													
Cores	34	9,855	167	9,885	145	8500	111	19,166	144	9,031	142	5,089	106	6,857	148	7,391	158	65,919
1 Mile	114	33,440	576	8,718	335	6120	279	15,228	419	9,472	330	6,506	303	5,633	346	5,164	362	56,841
2 Mile	128	32,160	568	425	122	873	147	662	186	687	143	428	136	557	122	444	109	4,076
3 Mile	102	26,015	447	319	85	377	103	319	85	215	86	349	85	312	108	508	90	2,399
Total	378	101,470	1,758	19,347	687	15,870	640	35,375	834	19,405	701	12,372	630	13,359	724	13,507	719	129,235

	%			ave*	%**	ave	%	ave	%	ave	%	ave	%	ave	%	ave	%	ave
Cores	9.0%	9.7%	9.5%	290.7	86.8%	50.9	66.5%	114.8	86.2%	54.1	85.0%	30.5	63.5%	41.1	88.6%	44.3	94.6%	56.4
1 Mile	30.2%	33.0%	32.8%	76.5	58.2%	10.6	48.4%	26.4	72.7%	16.4	57.3%	11.3	52.6%	9.8	60.1%	9.0	62.8%	14.1
2 Mile	33.9%	31.7%	32.3%	3.3	21.5%	1.5	25.9%	1.2	32.7%	1.2	25.2%	0.8	23.9%	1.0	21.5%	0.8	19.2%	1.0
3 Mile	27.0%	25.6%	25.4%	3.1	19.0%	0.8	23.0%	0.7	19.0%	0.5	19.2%	0.8	19.0%	0.7	24.2%	1.1	20.1%	0.8
Combined	100.0%	100.0%	100.0%	51.2	39.1%	9.0	36.4%	20.1	47.4%	11.0	39.9%	7.0	35.8%	7.6	41.2%	7.7	40.9%	10.5

* ave = steriles / total traps in area

** % = traps catching moths / total traps in area