

Developing a Method of Monitoring for the Multicolored Asian Lady Beetle (MALB) in the Great Lakes Growing Region, Roger N. Williams and Dan S. Fickle, The Ohio State University/OARDC, Wooster, Ohio 2008.

In late August and continuing until 8 Nov. weekly trips were taken to 3 Northern Ohio vineyards with a history of MALB fall activity. On 29 August, 4 yellow sticky traps were placed around the vineyard perimeter at the Sandusky, Geneva and Kingsville Ohio vineyard locations. Traps were hung approximately 3m above the ground from metal stakes and placed 10 paces from the outer perimeter of the vineyard. An Optic StowAway Temp® recorder was also placed in the arbor at each vineyard and set to record temperature data every two hours for the duration of the study. The goal of this study was to determine how well sticky traps perform as an indicator of beetle presence and also evaluate a modeling program based on accumulative cooling degree days, for its ability to predict beetle migration in relationship to the ripening grape crop. Traps and grape clusters were checked on a weekly base until late fall when grape harvest was complete at which time traps and data loggers were removed from the vineyards.

Results:

Yellow sticky traps worked as a means of determining whether the MALB's were present. Beetles were captured the first week of September but numbers were minimal and it turned out to be indicative of the very low MALB population we encountered this season. One vineyard (Geneva) had only one beetle captured during the entire monitoring period. Cluster examinations were conducted weekly at each vineyard with negative results for Geneva and Kingsville, however at Sandusky beetles were in damaged clusters the week of 18 Oct which corresponded to when the greater number of beetles (12) were captured in the yellow sticky traps (Table 1). It should be noted that all of the grapes except for one row had been harvested at the Sandusky vineyard prior to 18 Oct and this was true at Markko's vineyard where only a few rotten bunches were left in the vineyard by 18 Oct. The Geneva vineyard still had grapes hanging in late Oct but, no MALB's were encountered in the clusters. The first week of November traps and data recorders were retrieved from all study sites however, at the Geneva vineyard our data logger was missing. Since this vineyard uses a mechanical harvester we believe that the harvester must have dislodged our logger and it ended up being covered by dirt when the grape hoe passed through the vineyard post harvest. We were not able to recover it but, since we had negligible MALB data from Geneva the loss was not significant to our prediction work.

Our main goal in monitoring MALB activity was to correlate activity with degree day data. Degree day data for predicting the late fall overwintering flight activity of the MALB is based on the number of cooling degree days accumulated below 65°F. According to previous research once 200 cooling degree days have been reached you can expect to see a spike in MALB flight activity the next day the temperature reaches 65°F or greater. With this in mind we had hoped to

relate this information in some way to what we were observing in the vineyard. Since the numbers of MALB's we encountered this season were extremely low it did not allow us much data for comparisons. However, we were able to calculate the number of cooling degree days and compare them with what MALB data we recorded at the Sandusky and Kingsville vineyards. What we found was that the peak in observed activity at both vineyards corresponded to degree day data of 133-134 cooling days on 17-18 Oct (Table 1 & 2). Despite one of these vineyards being toward the western end of Lake Erie and the other the eastern end they were very similar in accumulative weather data by late October indicating that lake effect is similar in nature across the growing region. We then compared the cooling degree data with what we had recorded for Wooster and found that by 18 Oct, Wooster had reached 180 cooling days as compared to 134 for both vineyards. This was indicative of the Lake Erie growing region and the still warm waters of the lake.

In conclusion our data was minimal this season due to the overall MALB populations but, we were able to generate some information on MALB activity as it relates to temperature. This information will provide a basis for further studies which are needed to determine if cooling degree days can be correlated to MALB activity and used as a means of predicting impending MALB vineyard invasions.

Table 1. Firelands Vineyard/Winery, Sandusky, Ohio 2007

Date	Max	Min	Ave.	DD<65	Formula	Accum. Cooling DD	
9/1/2007	83	56	69.5	-4.5	0	0	
9/2/2007	85	48	66.5	-1.5	0	0	
9/3/2007	92	54	73	-8	0	0	
9/4/2007	91	61	76	-11	0	0	
9/5/2007	94	60	77	-12	0	0	
9/6/2007	89	64	76.5	-11.5	0	0	→ 5 Beetles trapped
9/7/2007	89	66	77.5	-12.5	0	0	
9/8/2007	82	68	75	-10	0	0	
9/9/2007	77	67	72	-7	0	0	
9/10/2007	78	64	71	-6	0	0	
9/11/2007	73	60	66.5	-1.5	0	0	
9/12/2007	69	46	57.5	7.5	7.5	7.5	
9/13/2007	80	46	63	2	2	9.5	
9/14/2007	84	54	69	-4	0	9.5	
9/15/2007	64	46	55	10	10	19.5	
9/16/2007	71	36	53.5	11.5	11.5	31	
9/17/2007	77	42	59.5	5.5	5.5	36.5	
9/18/2007	87	48	67.5	-2.5	0	36.5	
9/19/2007	89	54	71.5	-6.5	0	36.5	
9/20/2007	80	59	69.5	-4.5	0	36.5	→ 3 Beetles trapped
9/21/2007	92	57	74.5	-9.5	0	36.5	
9/22/2007	82	49	65.5	-0.5	0	36.5	
9/23/2007	80	44	62	3	3	39.5	
9/24/2007	92	50	71	-6	0	39.5	
9/25/2007	94	69	81.5	-16.5	0	39.5	
9/26/2007	76	66	71	-6	0	39.5	
9/27/2007	74	56	65	0	0	39.5	
9/28/2007	75	51	63	2	2	41.5	
9/29/2007	79	43	61	4	4	45.5	
9/30/2007	82	47	64.5	0.5	0.5	46	
10/1/2007	71	53	62	3	3	49	
10/2/2007	80	56	68	-3	0	49	
10/3/2007	78	63	70.5	-5.5	0	49	
10/4/2007	80	56	68	-3	0	49	
10/5/2007	91	59	75	-10	0	49	
10/6/2007	90	64	77	-12	0	49	
10/7/2007	89	62	75.5	-10.5	0	49	
10/8/2007	94	63	78.5	-13.5	0	49	
10/9/2007	76	58	67	-2	0	49	
10/10/2007	60	46	53	12	12	61	
10/11/2007	62	45	53.5	11.5	11.5	72.5	
10/12/2007	54	41	47.5	17.5	17.5	90	
10/13/2007	61	36	48.5	16.5	16.5	106.5	
10/14/2007	64	34	49	16	16	122.5	
10/15/2007	80	43	61.5	3.5	3.5	126	

10/16/2007	64	52	58	7	7	133	
10/17/2007	79	57	68	-3	0	133	
10/18/2007	79	59	69	-4	0	133	12 Beetles trapped and 40 beetles found in canopy on damaged grapes
10/19/2007	81	57	69	-4	0	133	
10/20/2007	75	50	62.5	2.5	2.5	135.5	
10/21/2007	86	56	71	-6	0	135.5	
10/22/2007	85	52	68.5	-3.5	0	135.5	
10/23/2007	61	47	54	11	11	146.5	
10/24/2007	56	45	50.5	14.5	14.5	161	
10/25/2007	68	50	59	6	6	167	
10/26/2007	64	51	57.5	7.5	7.5	174.5	
10/27/2007	58	45	51.5	13.5	13.5	188	
10/28/2007	64	32	48	17	17	205	Threshold based on 200 degree day cooling accumulations
10/29/2007	69	29	49	16	16	221	
10/30/2007	73	36	54.5	10.5	10.5	231.5	
10/31/2007	74	39	56.5	8.5	8.5	240	

Table 2. Markko's Vineyard/Winery, Kingsville, Ohio 2007

Date	Max	Min	Ave.	DD<65	Formula	Accum. Cooling DD	
9/1/2007	86	52	69	-4	0	0	
9/2/2007	94	50	72	-7	0	0	
9/3/2007	93	55	74	-9	0	0	
9/4/2007	94	58	76	-11	0	0	
9/5/2007	96	59	77.5	-12.5	0	0	1 Beetle trapped
9/6/2007	96	64	80	-15	0	0	
9/7/2007	92	68	80	-15	0	0	
9/8/2007	86	69	77.5	-12.5	0	0	
9/9/2007	70	65	67.5	-2.5	0	0	
9/10/2007	78	63	70.5	-5.5	0	0	
9/11/2007	67	56	61.5	3.5	3.5	3.5	
9/12/2007	68	50	59	6	6	9.5	1 Beetle trapped
9/13/2007	76	46	61	4	4	13.5	
9/14/2007	85	54	69.5	-4.5	0	13.5	
9/15/2007	64	48	56	9	9	22.5	
9/16/2007	66	45	55.5	9.5	9.5	32	
9/17/2007	73	42	57.5	7.5	7.5	39.5	
9/18/2007	80	48	64	1	1	40.5	
9/19/2007	84	54	69	-4	0	40.5	1 Beetle trapped
9/20/2007	87	59	73	-8	0	40.5	
9/21/2007	85	62	73.5	-8.5	0	40.5	
9/22/2007	85	55	70	-5	0	40.5	
9/23/2007	82	50	66	-1	0	40.5	
9/24/2007	85	52	68.5	-3.5	0	40.5	
9/25/2007	91	65	78	-13	0	40.5	
9/26/2007	74	66	70	-5	0	40.5	
9/27/2007	70	59	64.5	0.5	0.5	41	

9/28/2007	69	54	61.5	3.5	3.5	44.5	
9/29/2007	79	44	61.5	3.5	3.5	48	
9/30/2007	80	46	63	2	2	50	
10/1/2007	81	56	68.5	-3.5	0	50	
10/2/2007	75	57	66	-1	0	50	
10/3/2007	71	57	64	1	1	51	→ 2 Beetles trapped
10/4/2007	81	56	68.5	-3.5	0	51	
10/5/2007	89	61	75	-10	0	51	
10/6/2007	90	66	78	-13	0	51	
10/7/2007	91	67	79	-14	0	51	
10/8/2007	90	67	78.5	-13.5	0	51	
10/9/2007	73	54	63.5	1.5	1.5	52.5	
10/10/2007	57	45	51	14	14	66.5	
10/11/2007	59	44	51.5	13.5	13.5	80	
10/12/2007	55	43	49	16	16	96	
10/13/2007	58	44	51	14	14	110	
10/14/2007	70	38	54	11	11	121	
10/15/2007	69	48	58.5	6.5	6.5	127.5	→ 3 Beetles trapped
10/16/2007	72	48	60	5	5	132.5	
10/17/2007	72	55	63.5	1.5	1.5	134	→
10/18/2007	77	55	66	-1	0	134	
10/19/2007	72	60	66	-1	0	134	
10/20/2007	71	50	60.5	4.5	4.5	138.5	
10/21/2007	85	50	67.5	-2.5	0	138.5	
10/22/2007	81	54	67.5	-2.5	0	138.5	
10/23/2007	59	48	53.5	11.5	11.5	150	
10/24/2007	63	48	55.5	9.5	9.5	159.5	
10/25/2007	69	41	55	10	10	169.5	
10/26/2007	55	46	50.5	14.5	14.5	184	
10/27/2007	59	49	54	11	11	195	→ Threshold based on 200 degree day cooling accumulations
10/28/2007	57	33	45	20	20	215	
10/29/2007	64	31	47.5	17.5	17.5	232.5	
10/30/2007	75	38	56.5	8.5	8.5	241	
10/31/2007	71	42	56.5	8.5	8.5	249.5	