

# VECTOR SURVEILLANCE IN NEW JERSEY

## EEE, WNV, SLE, LAC, DENV, CHIK and ZIKV

Prepared by Lisa M. Reed and Mark Robson  
 Center for Vector Biology, Rutgers University  
 CDC WEEK 25: 18 June to 24 June, 2017



This New Jersey Agricultural Experiment Station report is supported by Rutgers University, Hatch funds, funding from the NJ State Mosquito Control Commission and with the participation of the Department of Health, Department of Agriculture and of the 21 county mosquito control agencies of New Jersey.

### *Culiseta melanura* and Eastern Equine Encephalitis

SITE/Boxes	Inland or Coastal	Historic Population Mean	Current Weekly Mean	Total Tested* (Collected)	Total Pools Tested* (Submitted)	EEE Isolation Pools	MFIR
Bass River (Burlington Co.)/5	Coastal	0.08	0.20	(1)	(1)		
Green Bank (Burlington Co.)/25	Coastal	0.99	0.00	0	0		
Corbin City (Atlantic Co.)/25	Coastal	1.03	0.24	(48)	(4)		
Dennisville (Cape May Co.)/50	Coastal	2.68	0.06	5	2		
Winslow (Camden Co.)/50	Inland	2.82	1.18	240	7		
Centerton (Salem Co.)/50	Inland	1.65	0.14	27	3		
Turkey Swamp (Monmouth Co.)/50	Inland	0.49	0.04	3 (4)	2 (3)		
Glassboro (Gloucester Co.)/49	Inland	0.43	0.20	22	3		

\*Current week (in parentheses) results pending. ‡ corrected NC=no collection

**Remarks:** Total positive EEE pools detected is zero. No horse cases reported to date.

**Traditional Resting Box Sites:** 297 *Cs. melanura* from 16 pools have been tested for EEE, with 50 additional *Cs. melanura* from 6 pools to be tested. No positive pools were detected at these eight sites. Statewide, 499 *Cs. melanura* from 52 pools have been tested, with no positive pools detected for an overall *Cs. melanura* MFIR of 0.00. 881 specimens from eight other species have also been tested, with no positives detected. Overall MFIR for all species statewide is 0.00.

		Additional <i>Cs. melanura</i> trapped by counties			
County	Trap types*	Pools	Mosquitoes	Positives	MFIR
Burlington	LT	3	111		
Cape May	GR, RB	28	76		
Passaic	RB	1	1		
Salem	LT	1	4		
Sussex	ABC	3	10		
<b>TOTAL</b>		<b>36</b>	<b>202</b>	<b>0</b>	<b>0.00</b>

years include those horses who were either not vaccinated or had incomplete vaccination histories. **Horse owners are urged to make sure their horses are up to date on their vaccinations. Horse cases are known to occur through October and sometimes into November (see link below).** Other sensitive species are non-native birds, such as Ostriches/Emus and Gallinaceous birds such as pheasants of Eurasian origins.

**Additional *Cs. melanura*:** Counties maintain trap sites for *Cs. melanura* in other areas, using a variety of traps. No positive pools were detected in these traps.

**Horses and Humans:** No horses have been detected with EEE to date in New Jersey. Nearly all of the horse cases from previous

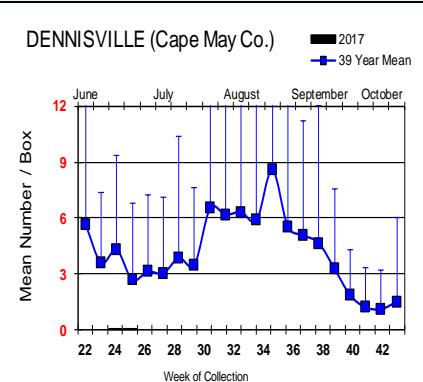
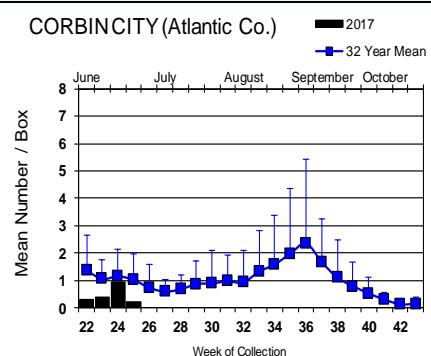
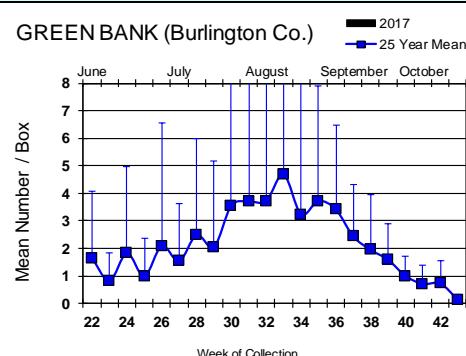
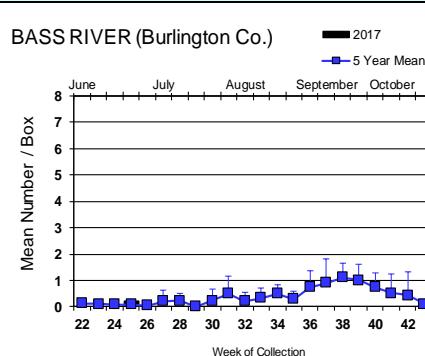
Species other than <i>Cs. melanura</i>	Pools	Mosquitoes	Positives	MFIR
<i>Aedes canadensis canadensis</i>	2	6		
<i>Aedes cantator</i>	3	3		
<i>Anopheles bradleyi</i>	9	32		
<i>Anopheles punctipennis</i>	3	7		
<i>Coquillettidia perturbans</i>	2	2		
<i>Culex erraticus</i>	1	7		
<i>Culex pipiens</i>	74	588		
<i>Culex salinarius</i>	31	210		
<i>Culex</i> sp.	4	26		
<b>State Total</b>	<b>129</b>	<b>881</b>		

**Horses and Vaccinations:** The fate of unvaccinated equids reinforces the necessity of maintaining a vaccination schedule for arboviruses. For vaccination schedules recommended by the American Association of Equine Practices, see: [http://www.aaep.org/vaccination\\_guidelines.htm](http://www.aaep.org/vaccination_guidelines.htm)

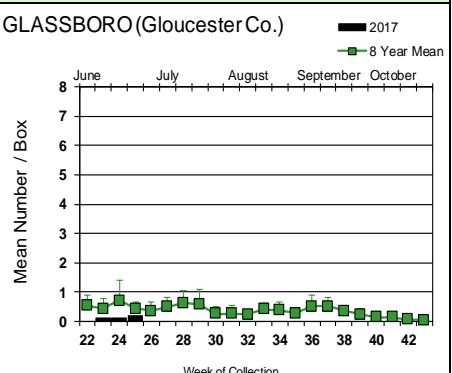
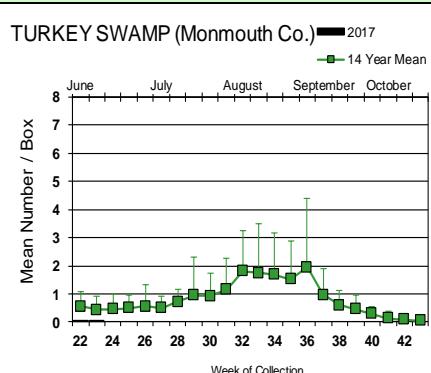
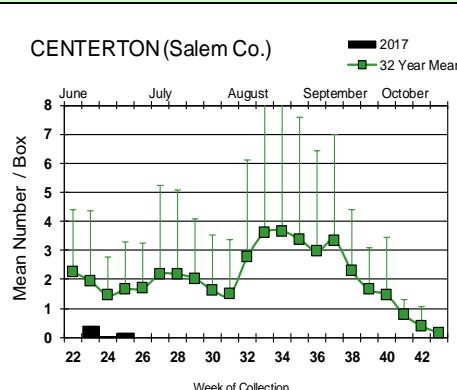
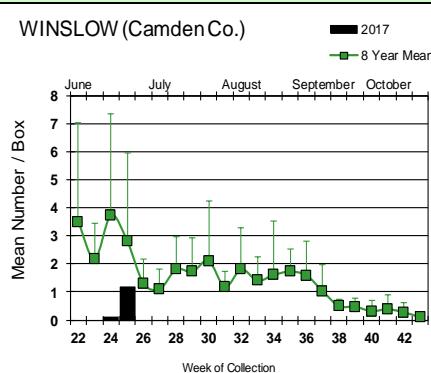
**Additional Species:** Eight additional species were tested for EEE. No additional positives were detected.

# Culiseta melanura Population Graphs

## Coastal



## Inland



No detection of EEE has occurred at the traditional resting box sites. Mosquito population levels continue to be low at these sites this week. Again, light trap data suggests populations at average levels for Coastal, Delaware Bayshore and Pinelands sites (see <http://vectorbio.rutgers.edu/reports/mosquito/> ).

Maps to right: Last year's data showed an unusual increase in activity well north of the typical areas of testing in New Jersey. The map on the left shows the area that is usually tested, with the locations of the traditional resting box sites. The map on the right shows locations and MFIR values of horse cases and positive mosquitoes. The occurrence of EEE in Middlesex County (pink) indicated the first positive EEE *Cs. melanura* of the season.

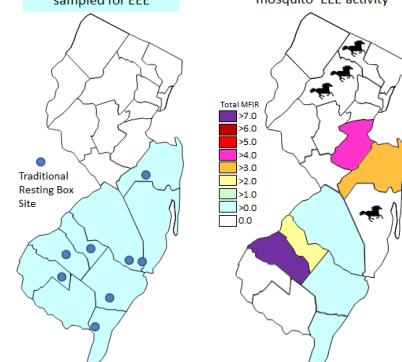


= Positive pool(s) detected (red = melanura, purple = other species).

Counties typically sampled for EEE



Counties with all mosquito EEE activity



**EEE in US** (2017 cumulative cases): (Black or Red = previous + new reported cases occurring)

- equine:
- mosquito pools:
- sentinel: FL(4) TX(3)
- human:

## West Nile Virus Positive Organisms in US, 2017

West Nile in US (2017 cumulative cases): Single black values indicate no change from previous week. Black values / red values equals previous week/**New totals**. Note: Data reported by all states should be considered provisional and subject to change. Sources for this table can be found [here](#).

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Alabama					0
Alaska					
Arizona	0	9		0	4
Arkansas				0	0
California	25/27	157/301	0		2
Colorado					0
Connecticut		0			0
Delaware					
DC					
Florida			7/8		0
Georgia		0			0
Hawaii					
Idaho		1		0	0
Illinois	2	30/53			0
Indiana	0	3/8		0	2
Iowa		1			
Kansas		1		0	1
Kentucky					1
Louisiana					
Maine					
Maryland					
Mass.		0		0	0
Michigan					
Minnesota					
Mississippi		22/24			1
Missouri		0		0	0

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Montana					
Nebraska	0	0		0	0
Nevada					
New Hampshire					
New Jersey		4		0	0
New Mexico					2
New York					
North Carolina					
North Dakota	0	0		0	0
Ohio		3			0
Oklahoma					
Oregon					
Pennsylvania	0	12/17		0	0
Rhode Island		0		0	0
South Carolina		1			
South Dakota		3			1
Tennessee					
Texas		36/47			4/5
Utah					
Vermont					
Virginia					
Washington	0	0		0	0
West Virginia					
Wisconsin	3/12	0		0	0
Wyoming					

\* Can include other species (e.g., dogs, cows) reported positive.

Protocol: New Jersey Department of Health (NJDH Public Health Environmental and Agricultural Laboratories, PHEAL) and the Cape May County Department of Mosquito Control tests mosquito pools using RT-PCR Taqman techniques.

### Mosquito Species Submitted and Tested for West Nile Virus Testing through 23 June 2017.

Species	Pools	Mosquitoes	Positives	MFIR
<i>Aedes albopictus</i>	53	338		
<i>Aedes atropalpus</i>	6	50		
<i>Aedes canadensis canadensis</i>	18	182		
<i>Aedes cantator</i>	7	64		
<i>Aedes japonicus</i>	41	111		
<i>Aedes sollicitans</i>	1	1		
<i>Aedes taeniorhynchus</i>	1	1		
<i>Aedes triseriatus</i>	36	79		
<i>Aedes vexans</i>	3	7		
<i>Anopheles bradleyi</i>	9	32		
<i>Anopheles punctipennis</i>	7	23		
<i>Anopheles quadrimaculatus</i>	7	77		
<i>Coquillettidia perturbans</i>	5	9		
<i>Culex erraticus</i>	1	7		
<i>Culex pipiens</i>	80	617		
<i>Culex restuans</i>	114	665		
<i>Culex salinarius</i>	31	210		
<i>Culex spp.</i>	110	4731	4	0.845
<i>Culex territans</i>	4	16		
<i>Culiseta melanura</i>	52	499		
<i>Orthopodomyia signifera</i>	1	1		
<i>Psorophora ferox</i>	1	4		
<b>Grand Total</b>	<b>588</b>	<b>7724</b>	<b>4</b>	<b>0.518</b>

**Remarks:** To date, 588 pools of 7,724 mosquitoes from 21 species have been tested. Four positive pools were detected, all in the enzootic vector, *Culex* (Mix). First positive *Culex* Mix pool was detected in Sussex County on 12 June. Last year, the first positive pool of *Culex* Mix was collected on 14 June in Monmouth County.

**Humans, Horses and Wild Birds:** No human or horse cases have been detected. Last year, human cases were first reported in CDC week 20, but under unusual circumstances. First typical case occurred in CDC week 27. For further information, see <http://www.state.nj.us/health/cd/westnile/techinfo.shtml>.

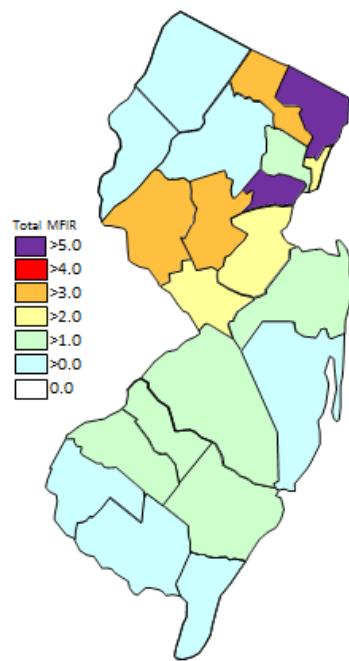
Birds are no longer routinely tested in New Jersey.

### WNV Results by County through 23 June 2017.

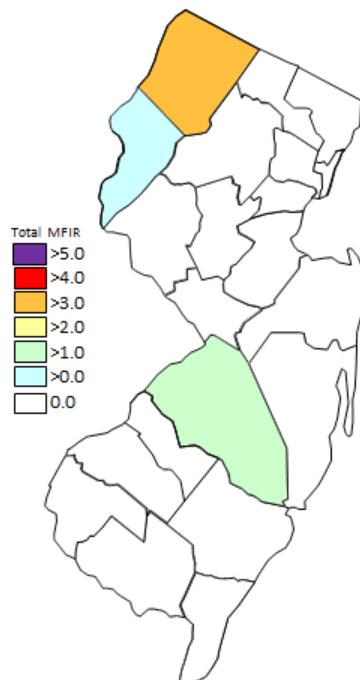
County	Species	Pools	Mosquitoes	Positives	MFIR
<b>Burlington</b>		<b>14</b>	<b>826</b>	<b>1</b>	<b>1.211</b>
	<i>Aedes japonicus</i>	1	27		
	<i>Culex salinarius</i>	2	150		
	<i>Culex spp.</i>	8	538	1	1.859
	<i>Culiseta melanura</i>	3	111		
<b>Camden</b>		<b>7</b>	<b>240</b>		
	<i>Culiseta melanura</i>	7	240		

<b>Cape May</b>	<b>379</b>	<b>1510</b>		
<i>Aedes albopictus</i>	34	50		
<i>Aedes atropalpus</i>	6	50		
<i>Aedes canadensis canadensis</i>	11	19		
<i>Aedes cantator</i>	3	3		
<i>Aedes japonicus</i>	29	47		
<i>Aedes triseriatus</i>	30	70		
<i>Aedes vexans</i>	2	2		
<i>Anopheles bradleyi</i>	9	32		
<i>Anopheles punctipennis</i>	2	4		
<i>Anopheles quadrimaculatus</i>	7	77		
<i>Coquillettidia perturbans</i>	1	1		
<i>Culex erraticus</i>	1	7		
<i>Culex pipiens</i>	75	589		
<i>Culex restuans</i>	102	392		
<i>Culex salinarius</i>	29	60		
<i>Culex</i> spp.	2	5		
<i>Culex territans</i>	4	16		
<i>Culiseta melanura</i>	30	81		
<i>Orthopodomyia signifera</i>	1	1		
<i>Psorophora ferox</i>	1	4		
<b>Essex</b>	<b>13</b>	<b>123</b>		
<i>Aedes albopictus</i>	3	3		
<i>Aedes japonicus</i>	3	4		
<i>Culex</i> spp.	7	116		
<b>Gloucester</b>	<b>3</b>	<b>22</b>		
<i>Culiseta melanura</i>	3	22		
<b>Hunterdon</b>	<b>23</b>	<b>588</b>		
<i>Culex</i> spp.	23	588		
<b>Mercer</b>	<b>12</b>	<b>306</b>		
<i>Aedes japonicus</i>	1	2		
<i>Culex restuans</i>	8	248		
<i>Culex</i> spp.	3	56		
<b>Monmouth</b>	<b>38</b>	<b>598</b>		
<i>Aedes albopictus</i>	13	268		
<i>Aedes canadensis canadensis</i>	7	163		
<i>Aedes cantator</i>	4	61		
<i>Aedes japonicus</i>	1	6		
<i>Aedes sollicitans</i>	1	1		
<i>Aedes taeniorhynchus</i>	1	1		
<i>Aedes vexans</i>	1	5		
<i>Anopheles punctipennis</i>	5	19		
<i>Culex</i> spp.	4	71		
<i>Culiseta melanura</i>	1	3		
<b>Passaic</b>	<b>17</b>	<b>80</b>		
<i>Aedes japonicus</i>	5	24		
<i>Aedes triseriatus</i>	1	1		
<i>Coquillettidia perturbans</i>	1	1		
<i>Culex pipiens</i>	5	28		

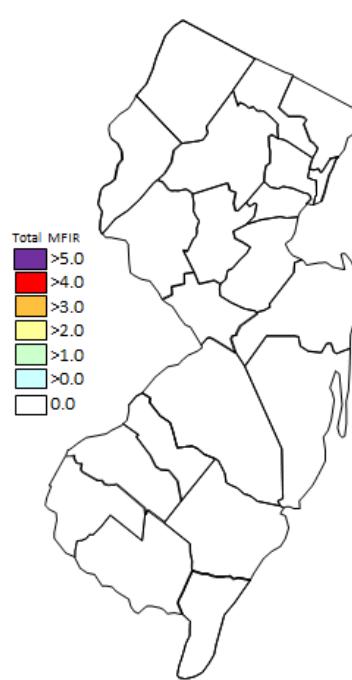
<i>Culex restuans</i>	4	25		
<i>Culiseta melanura</i>	1	1		
<b>Salem</b>	<b>17</b>	<b>168</b>		
<i>Aedes albopictus</i>	3	17		
<i>Aedes japonicus</i>	1	1		
<i>Aedes triseriatus</i>	1	2		
<i>Coquillettidia perturbans</i>	3	7		
<i>Culex</i> spp.	5	110		
<i>Culiseta melanura</i>	4	31		
<b>Somerset</b>	<b>12</b>	<b>528</b>		
<i>Culex</i> spp.	12	528		
<b>Sussex</b>	<b>13</b>	<b>267</b>	<b>1</b>	<b>3.745</b>
<i>Aedes triseriatus</i>	4	6		
<i>Culex</i> spp.	6	251	1	3.984
<i>Culiseta melanura</i>	3	10		
<b>Warren</b>	<b>40</b>	<b>2468</b>	<b>2</b>	<b>0.810</b>
<i>Culex</i> spp.	40	2468	2	0.810
<b>Grand Total</b>	<b>588</b>	<b>7724</b>	<b>4</b>	<b>0.518</b>



Cumulative WNV activity in 2016.



WNV activity to 23 June 2017.



WNV activity last week, 2017

## **Saint Louis Encephalitis (SLE) to 23 June 2017.**

New Jersey will be primarily testing for SLE this year only when adjacent states show human activity (Cape May tests mosquitoes in the Cape May lab independently). SLE has had previous activity in New Jersey, most notably in 1964 and 1975 (CDC's SLE [website](#)), the latter prompting the surveillance reporting by Rutgers. SLE is a flavivirus and has a similar transmission pattern to West Nile, with *Culex* species as the predominant vectors.

No pools of SLE have tested positive for 2017.

County	Species	Pools	Mosquitoes	Positives	MFIR
<b>Cape May</b>		<b>76</b>	<b>593</b>		
	<i>Culex pipiens</i>	74	588		
	<i>Culex</i> spp.	2	5		
<b>Grand Total</b>		<b>76</b>	<b>593</b>		

## **La Crosse Encephalitis (LAC) to 23 June 2017.**

New Jersey will be primarily testing for LAC this year only when adjacent states show human activity (Cape May tests mosquitoes in the Cape May lab independently). New Jersey has had 3 cases of this encephalitic disease since 1964 (see CDC's LAC [website](#)). The mortality is low but like other encephalitides, LAC can have both personal (lasting neurological sequelae) and economic impacts. LAC is a bunyavirus with a transmission cycle involving mosquitoes such as *Aedes triseriatus* and small mammals such as squirrels and chipmunks. LAC can not only infect *Aedes albopictus* but transovarial transmission was also demonstrated.

(Tesh and Gubler 1975 Laboratory studies of transovarial transmission of La Crosse and other arboviruses by *Aedes albopictus* and *Culex fatigans*. American Journal of Tropical Medicine and Hygiene 24(5):876-880).

No pools of SLE have tested positive for 2017.

County	Species		Positives	MFIR
<b>Burlington</b>		<b>1</b>	<b>27</b>	
	<i>Aedes japonicus</i>	1	27	
<b>Sussex</b>		<b>4</b>	<b>6</b>	
	<i>Aedes triseriatus</i>	4	6	
<b>Grand Total</b>		<b>5</b>	<b>33</b>	

## Dengue (DENV) to 23 June 2017.

New Jersey will be selectively testing for DENV (including serotypes) this year. Dengue has not had a history of local transmission here in New Jersey, but each year, travelers can bring virus back from areas in the world with virus activity. This is significant as humans are NOT dead-end hosts and thus there is the potential for local transmission (i.e., New Jersey mosquitoes biting a sick person and then biting and transmitting the disease to someone else) to be established. DENV is a flavivirus but unlike WNV, *Aedes* mosquitoes are predominant vectors. In New Jersey, *Aedes albopictus* is a candidate for local transmission. There are 4 serotypes tested for Dengue.

\*Note\* Same pools of *Ae. albopictus* are tested for the four serotypes of Dengue as well as Chikungunya.

Currently, there are no tested pools of Dengue in 2017.

County	Species	DENV1		DENV2		DENV3		DENV4		Pos.	MFIR
		Pool	Mos.	Pool	Mos.	Pool	Mos.	Pool	Mos.		
<b>Grand Total</b>											

## Chikungunya (CHIK) to 23 June 2017.

New Jersey will be selectively testing for CHIK this year. Chikungunya is similar in symptoms to Dengue, a "breakbone" fever and has a low mortality rate. But this virus has had recent worldwide activity, and in the past year has come to the Western Hemisphere. As with Dengue, transmission can occur when a mosquito bites an infected human, then bites an uninfected human who subsequently becomes ill. CHIK is an alphavirus with *Aedes* mosquitoes as potential vectors. In New Jersey, *Aedes albopictus* is the mosquito of interest.

No pools of CHIK have tested positive in 2017.

County	Species	Pools	Mosquitoes	Positives	MFIR
<b>Cape May</b>		34	50		
	<i>Aedes albopictus</i>	34	50		
<b>Grand Total</b>		<b>34</b>	<b>50</b>		

## Zika (ZIKV) to 23 June 2017.

New Jersey will be selectively testing for ZIKV this year. Zika is an emerging arboviral threat with significant health consequences for fetuses and recent activity in the Western Hemisphere. Humans are potential hosts that can transmit through sexual activity. ZIKV is a flavivirus with *Aedes* mosquitoes as potential vectors. In New Jersey, *Aedes albopictus* is the mosquito of interest.

No pools have tested positive in 2017.

County	Species	Pools	Mosquitoes	Positives	MFIR
<b>Cape May</b>		34	50		
	<i>Aedes albopictus</i>	34	50		
<b>Grand Total</b>		<b>34</b>	<b>50</b>		