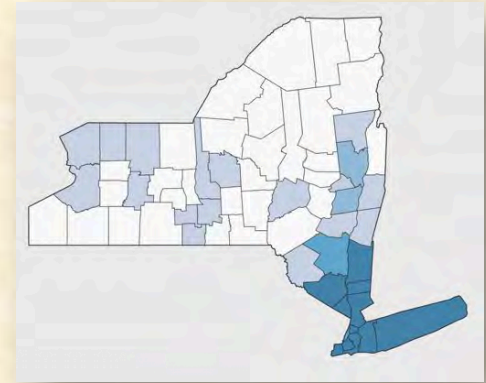


Integrated BMSB Management in Organic Pepper



Tree of Heaven *Ailanthus altissima*



Brown Marmorated
Stink Bug on Jalapeno Pepper



BMSB Infected with
Beauveria bassiana strain GHA

2013 BMSB Injury to Organic Pepper Hudson Valley, NY

- On August 12th, 15% injury was observed in a 1-acre organic planting of Jalapeno Pepper in Marlboro, NY.





d Indian Rd

Hudson
River

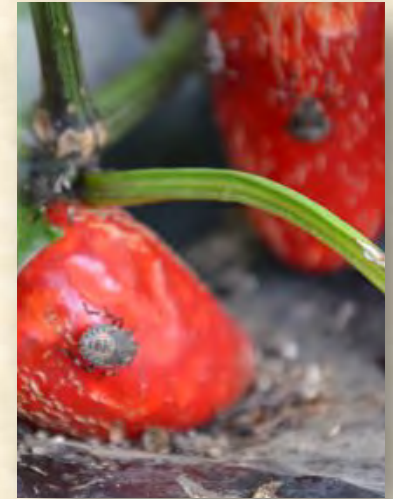




BMSB in Jalapeno Pepper
12th August, Marlboro, NY
15% feeding injury
Averaging 4 nymphs per plant

2013 BMSB Injury to Pepper Marlboro, NY

- On August 12th, 15% injury was observed in a 1 acre organic planting of Jalapeno Pepper.



- Integrated pest management using 4 components employed to reduce BMSB field populations.

2013 BMSB Injury to Pepper

- Employing 3 applications of Mycotrol-O @ 16 oz./A made on 14 August, 1 & 14 September.
- Pheromone lure combinations to attract BMSB away from agricultural commodity
- Bifenthrin insecticide treated netting to capture and kill insect
- High intensity lighting

- Net traps were established along a 1-acre Jalapeno pepper field spaced 30 meters apart
- Each net was made of Blockade™ Insect Screen 36 x 25 mils by PAK Unlimited, INC.
- Onto each net were placed two #10 and two 'Rescue' MDT BMSB lures
- To a single trap was added a 500W light.
- On day 0 (9 September) , each net were sprayed with 0.75 gal. of Bifenthrin 10DF solution using 3.0 oz./gal.
- On days 1-2, nets were monitored with no captures of BMSB observed.
- On day 3, lures and overnight light were added.
- Continued sampling of netted traps were made through October.



MDT



USDA #10



- Generator driven 500W Halogen light directed toward the field population of BMSB.
- Plastic sheets were used to define location and number of BMSB trap and kill data.
- Study was designed to:
 - Determine the attractiveness of lights with net relative to net alone
 - Determine the number of BMSB observed coming from field versus forest sides of trap



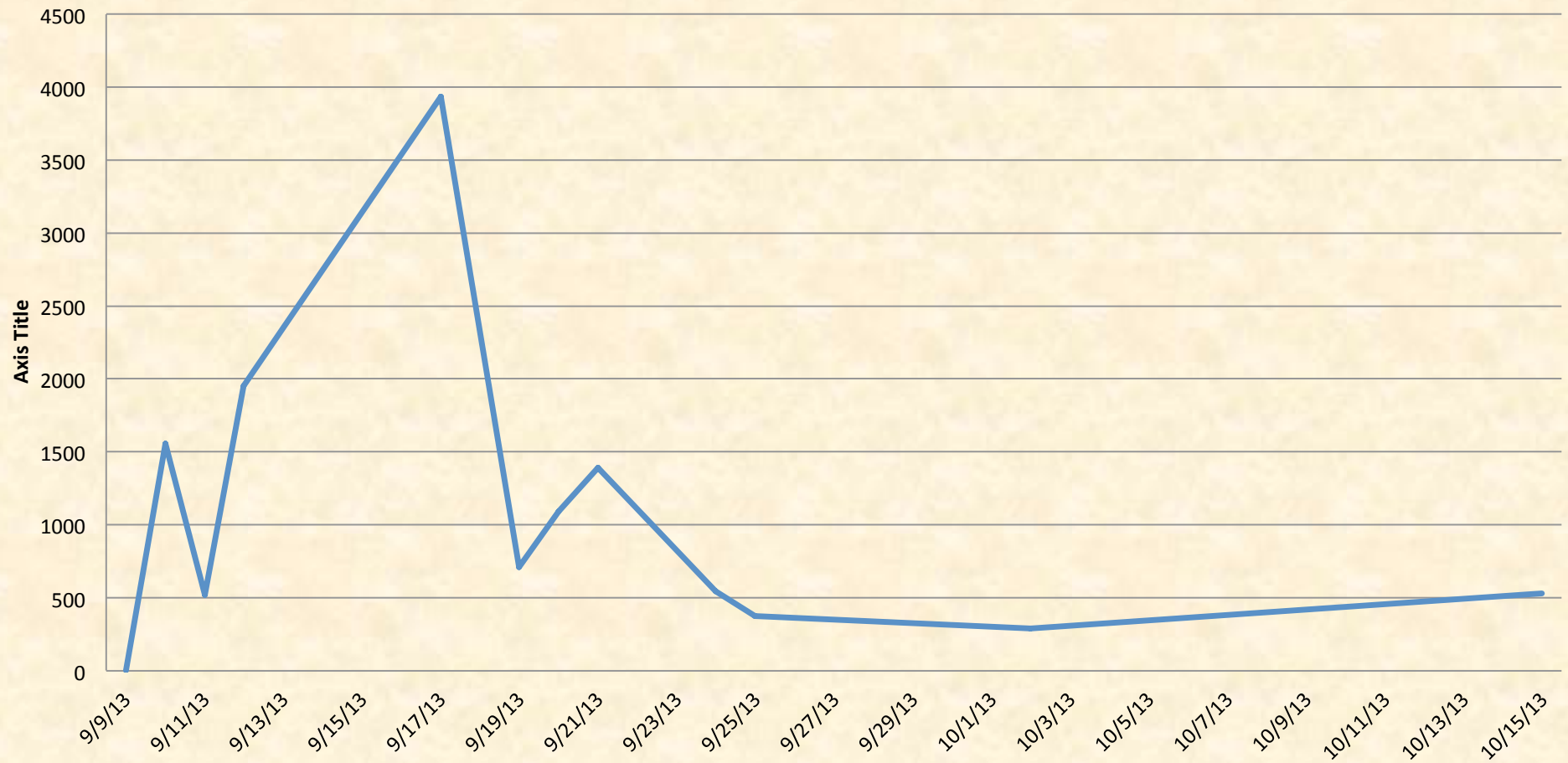


- BMSB populations were observed on Black Walnut and Tree of Heaven, which may have acted as intermediate hosts, fostering migrations to pepper in high numbers.
- BMSB locations on netting traps with pheromone were equally dispersed on the field and forested sides of net.
- Nights when lights were on, BMSB were heavily concentrated on the field side in front of the light with higher numbers observed.

Ailanthus altissima ○
Juglans nigra ○

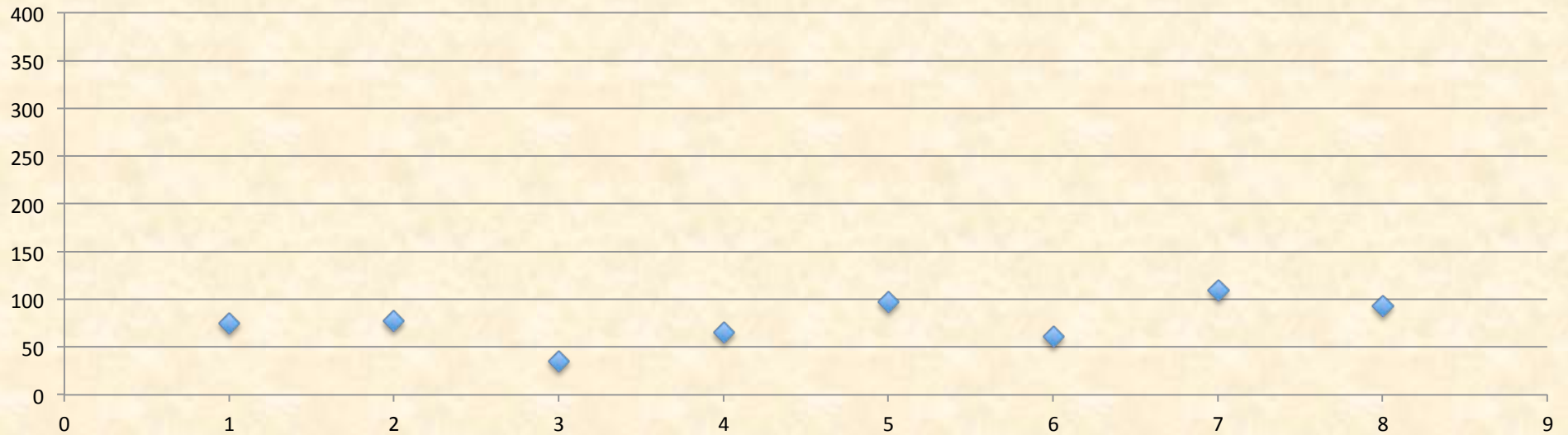
Studies of the Brown Marmorated Stink Bug, *Halyomorpha halys* (Stål), in New York State

Combined Seasonal Trap Captures Using Pheromone and Pheromone + Light

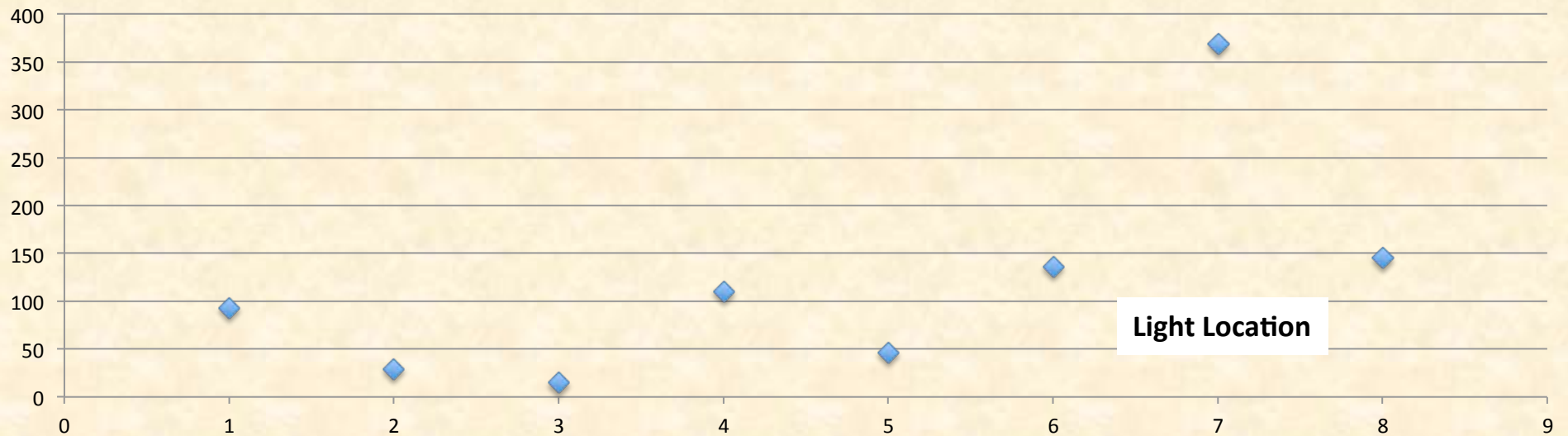


Adult BMSB Capture Locations Along the Base of Netting Of Two Trap Types on morning of 11 September, 2013

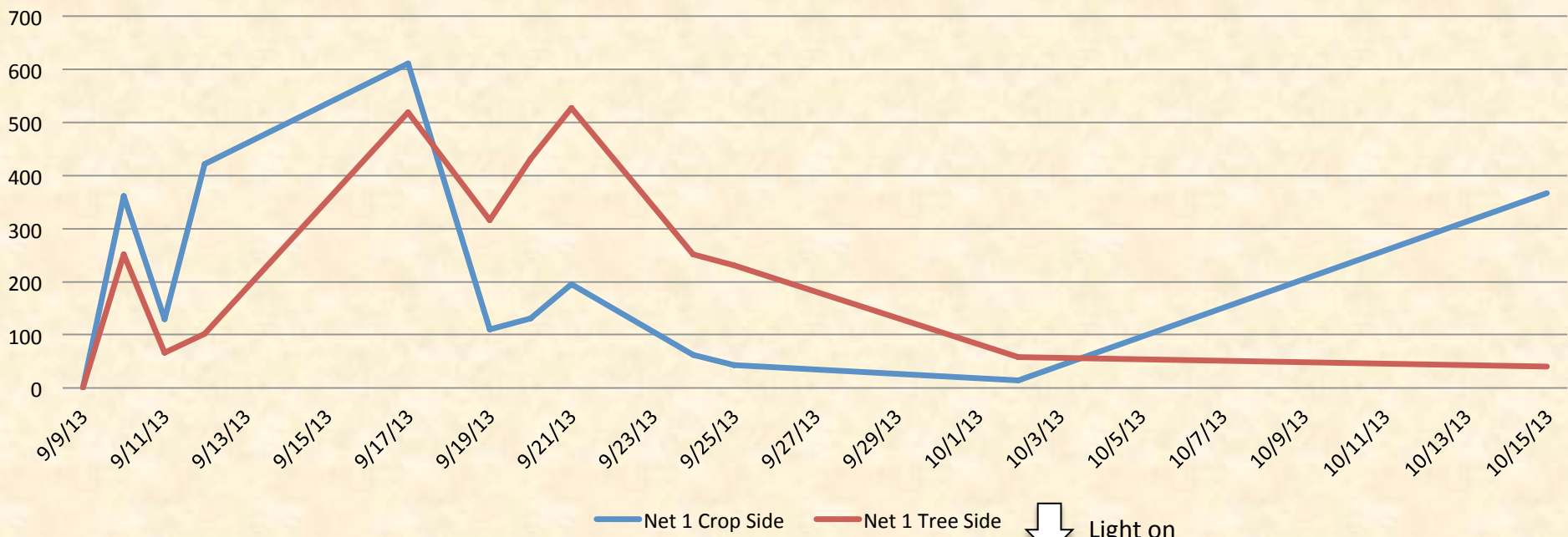
#10 + MDT Lure only



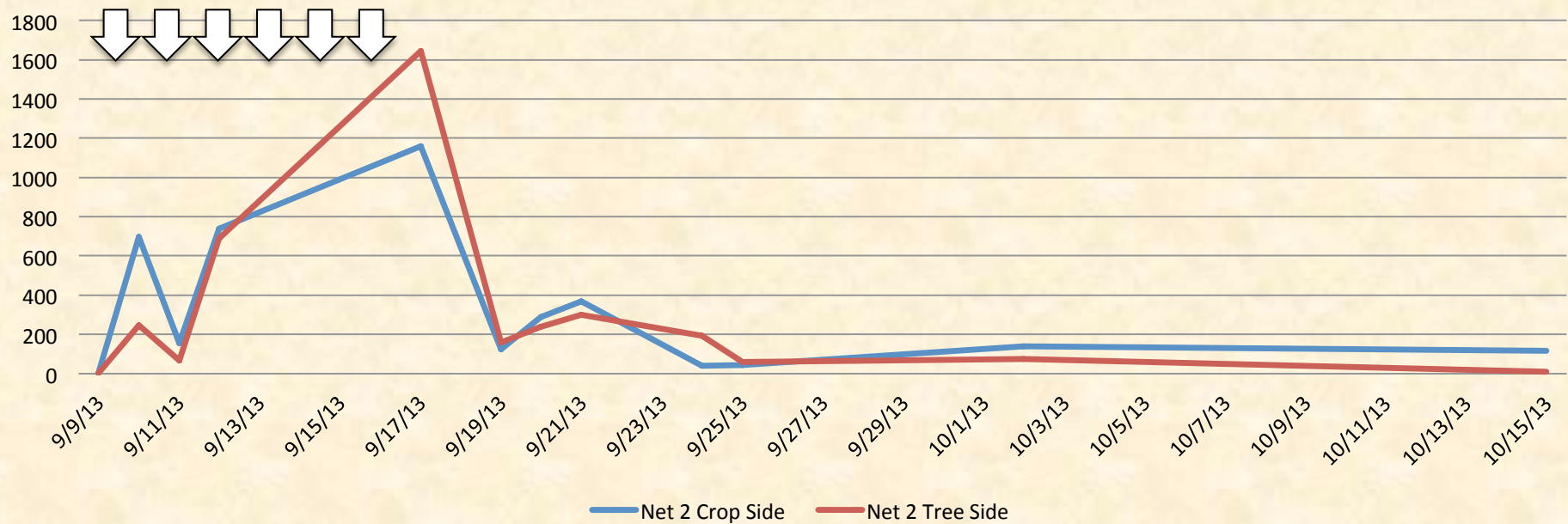
#10 + MDT Lure + 500W Halogen Lamp



Pheremone only Net



Pheremone + Lighted Net



BMSB Infested With
Beauveria bassiana strain GHA
(Mycotrol-O @ 16 oz./A)



B. bassiana expression over Time



	8/22/13	8/29/13	9/9/13	9/10/13	9/11/13	9/16/13	9/17/13	9/19/13	9/20/13	9/21/13	9/24/13	9/25/13	10/2/13	10/15/13	
Net 1 infection	0.00%	0.00%	20.00%			73.66%		75.00%	80.00%	100.00%	85.71%	76.92%		80.00%	100.00%
Net 2 infection	0.00%	14.29%	0.00%			82.95%		75.00%	80.95%	84.62%	100.00%	82.76%		75.00%	78.57%
Population	0			0	1556	521	1954		3935	708	1090	1392	545	375	287



- *Beauveria bassiana* strain GHA applications
(Mycotrol-O @ 16 oz./A)



Key points to remember

- BMSB is arboreal, forest pest, very mobile to and out of agricultural crops
- Fruit damage takes 2-3 weeks for expression mid-late season.
- Low populations can equate to high feeding injury levels

Strategies for control

1. Early trapping **with Tedders trap + #10 and MDT combo lure**
2. **Scouting** pome and stone fruit **at first trap capture**
3. Border applications at first observation along border
4. Maintain border applications if BMSB presence continues
5. Alternate row applications at 4-7 days as BMSB enter orchard

Insecticide efficacy is critical

- Use materials **with greatest efficacy & longest residual**
- Maintain 'fresh' residue every 4-5 days when needed employing alternate row middle (ARM) applications.



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- | | |
|--|-----------------------|
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