

# **Wide-Area Larviciding with a Buffalo Turbine and VectoLex WDG**

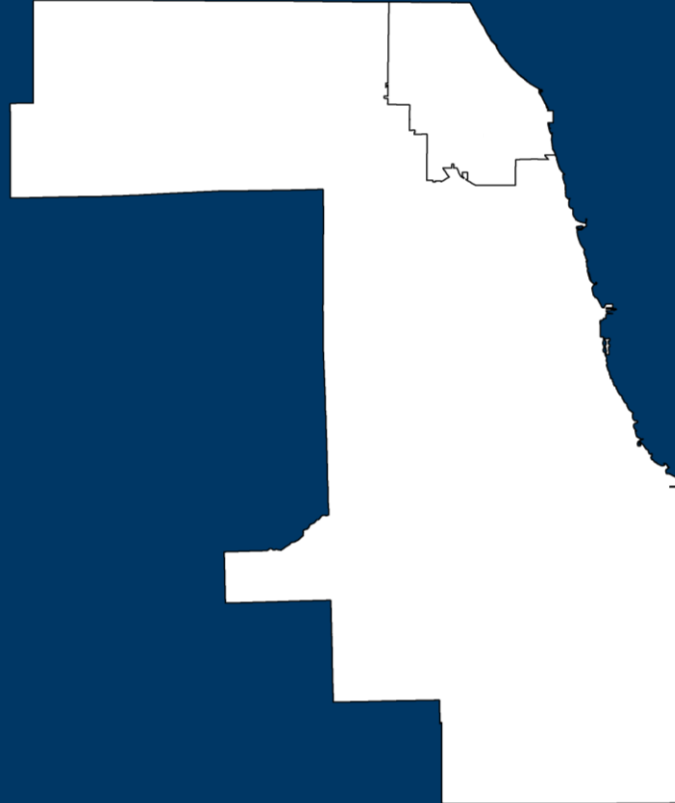


**Mark Clifton PhD   ▪   North Shore Mosquito Abatement District**  
**Amy Runde   ▪   North Shore Mosquito Abatement District**

# North Shore Mosquito Abatement District



North Shore Mosquito  
Abatement District



Cook County

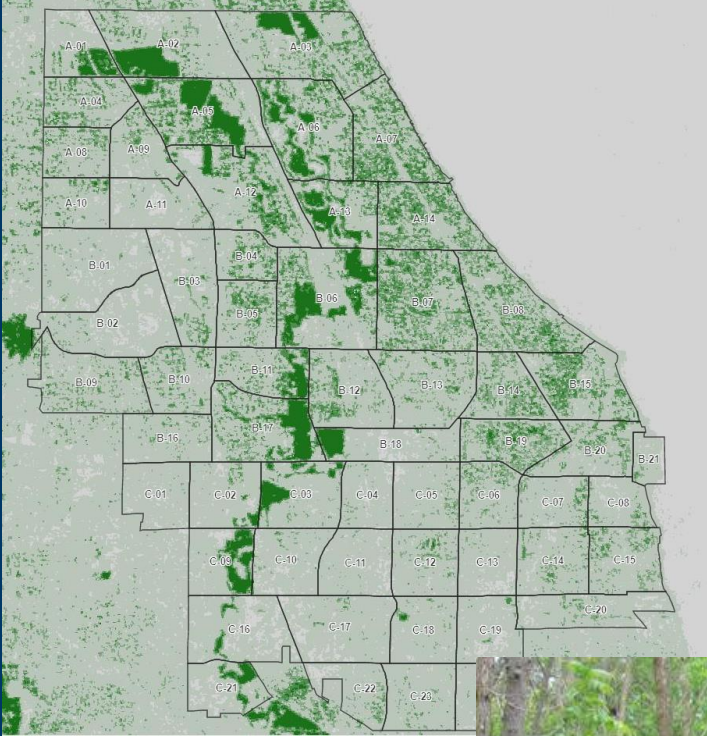


Illinois

**North Shore  
Mosquito Abatement  
District**



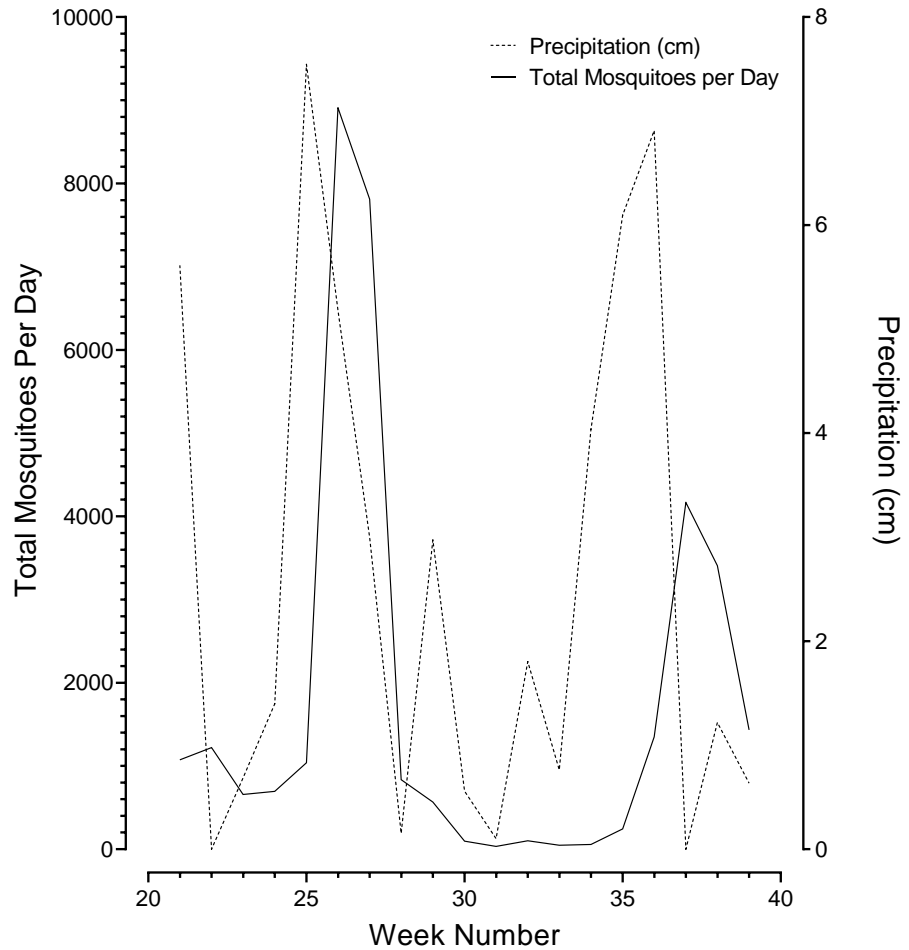
# District Profile and Habitat



**North Shore  
Mosquito Abatement  
District**

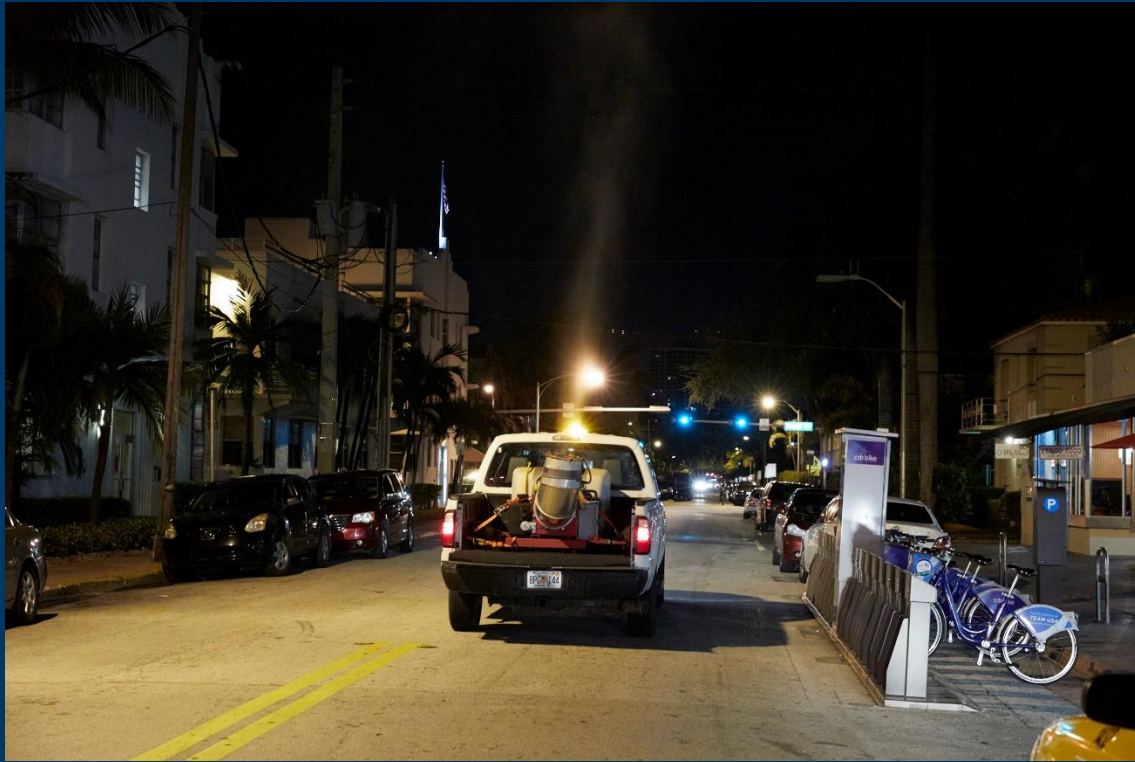


# Timing of Precipitation and Emergence



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District**

# Wide-Area Larviciding for Floodwater Mosquitoes?



Zika Response: Miami, Florida



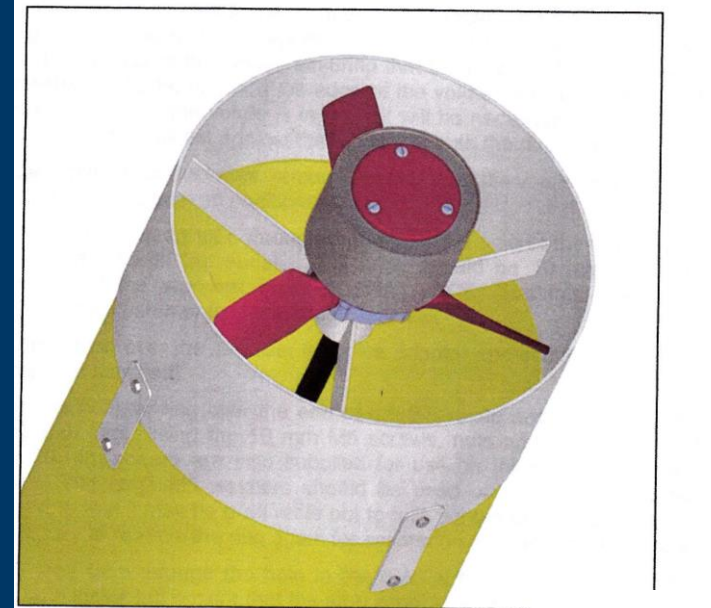
Vectobac WDG



# Wide-Area Larviciding for Floodwater Mosquitoes?



Buffalo Turbine CSM2



AU5000 Conversion on Volute of Buffalo Tur



Micronair Rotary Atomizer AU5000

Micronair P/N  
PC1131/xxx  
where xxx is the  
diameter of the  
volute in mm

Vectolex WDG  
(Water Dispersible  
Granule)

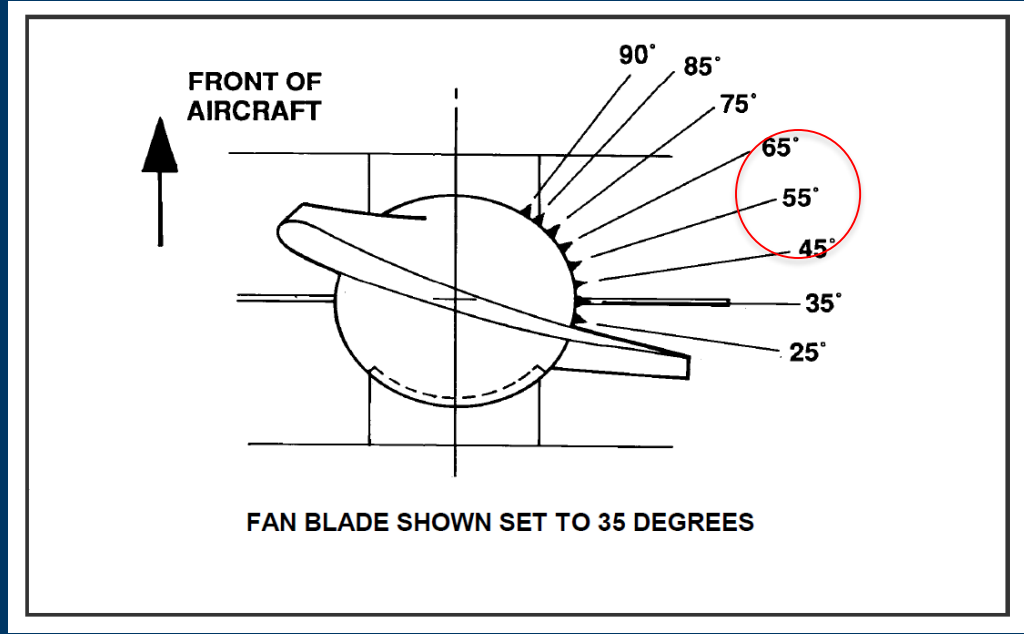
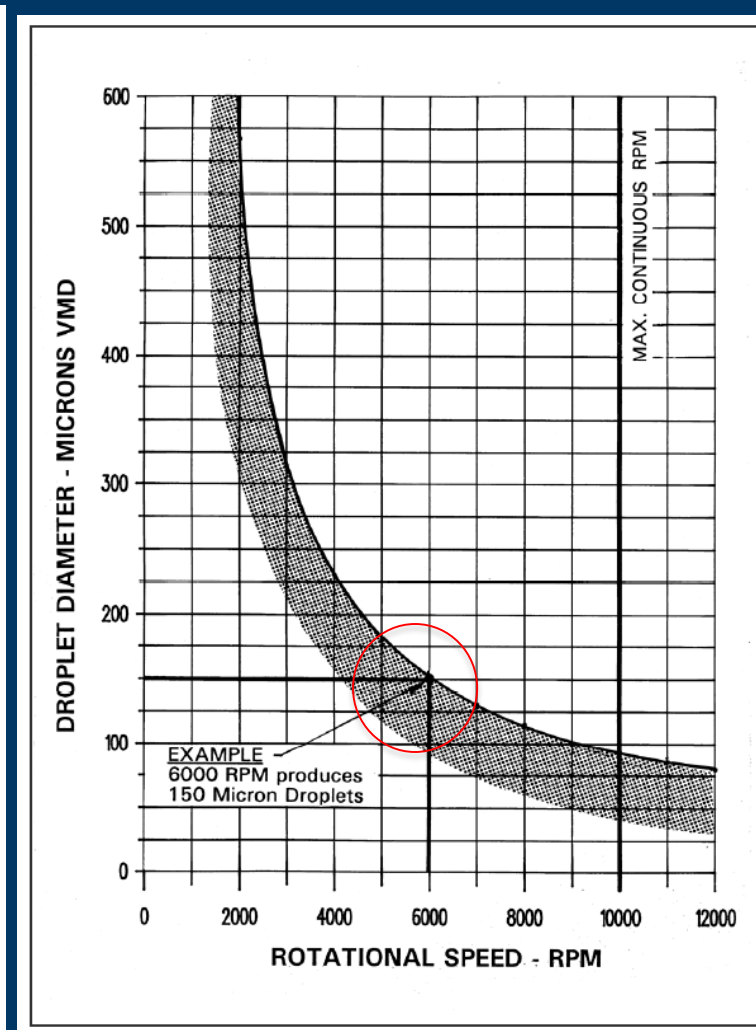
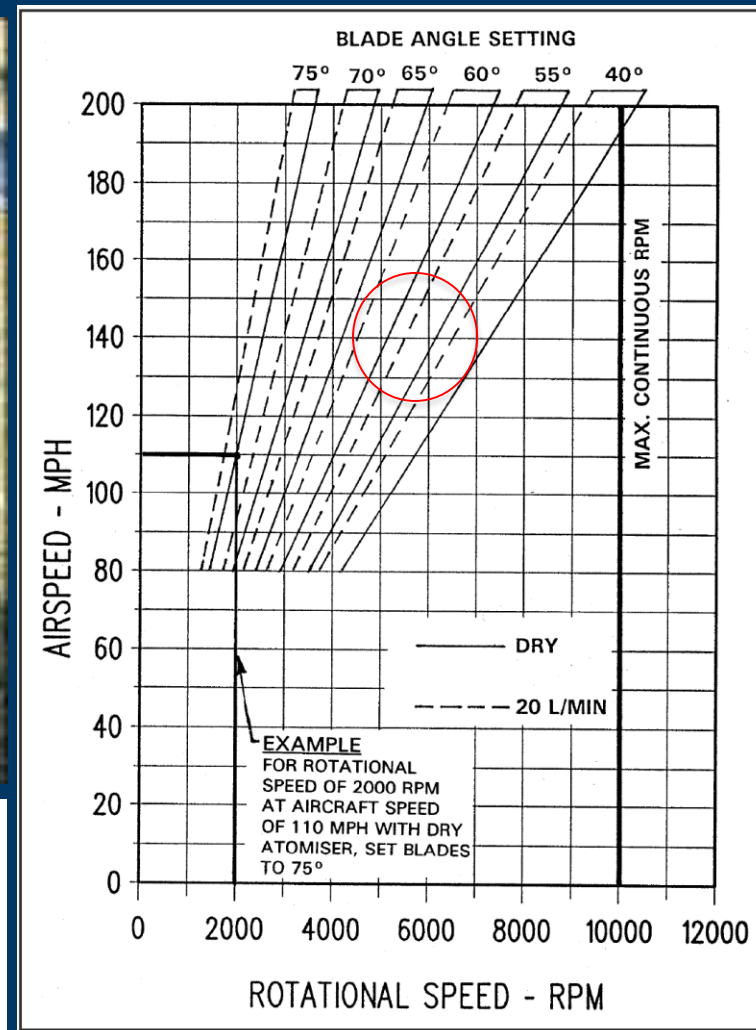


# Calibration of a Buffalo Turbine w/ a Micronair AU5000



- The Micronair AU5000 must be set up:
  - With the correct flow rate (3 gallons per minute)
  - With the correct blade size 2.75" (p/n EX6353)
  - With the correct blade angle to control atomizer speed and droplet size (55 degrees)
- The Buffalo Turbine must be set up to distribute:
  - the correct concentration (12 % w:v)
  - the correct volume (3 gallons per minute)
  - the correct pressure (50 PSI)
  - the correct vehicle speed (10 mph)
  - With the correct droplet size and distribution.





We used a 2.75" blade p/n EX6353 and a 55° degree pitch.

We calculated a flow rate of 3 gallons per minute at 10 mph would be required to deliver 0.5 lb per acre of *Bacillus sphaericus* over a 300 ft swath.



# Calibration and Characterization



Mixed 1 pound Vectolex WDG per gallon of water for a 12% W:V solution

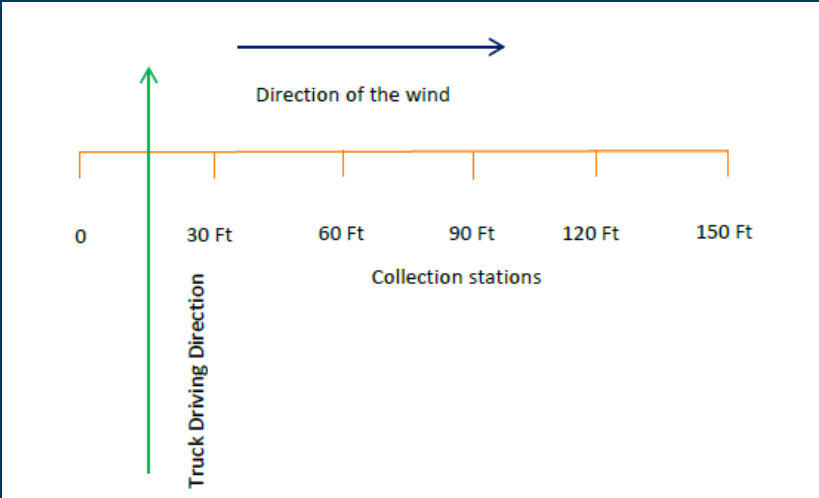


Calibrated the turbine at full speed (WOT) to deliver 3.2 gallons per minute @ 50 PSI



At 10 mph this will apply 0.5 lbs/acre of Vectolex WDG

# Characterization of the Buffalo Turbine and the Micronair AU5000



Kromecote Card

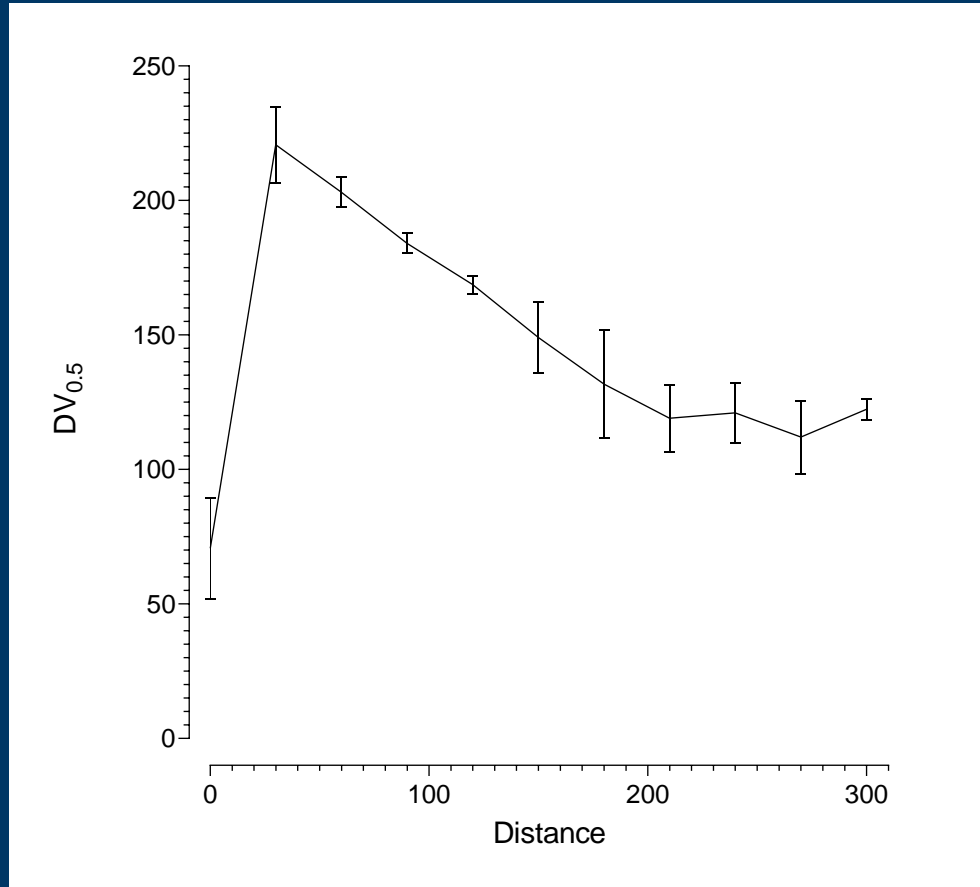


Red #5 Food coloring

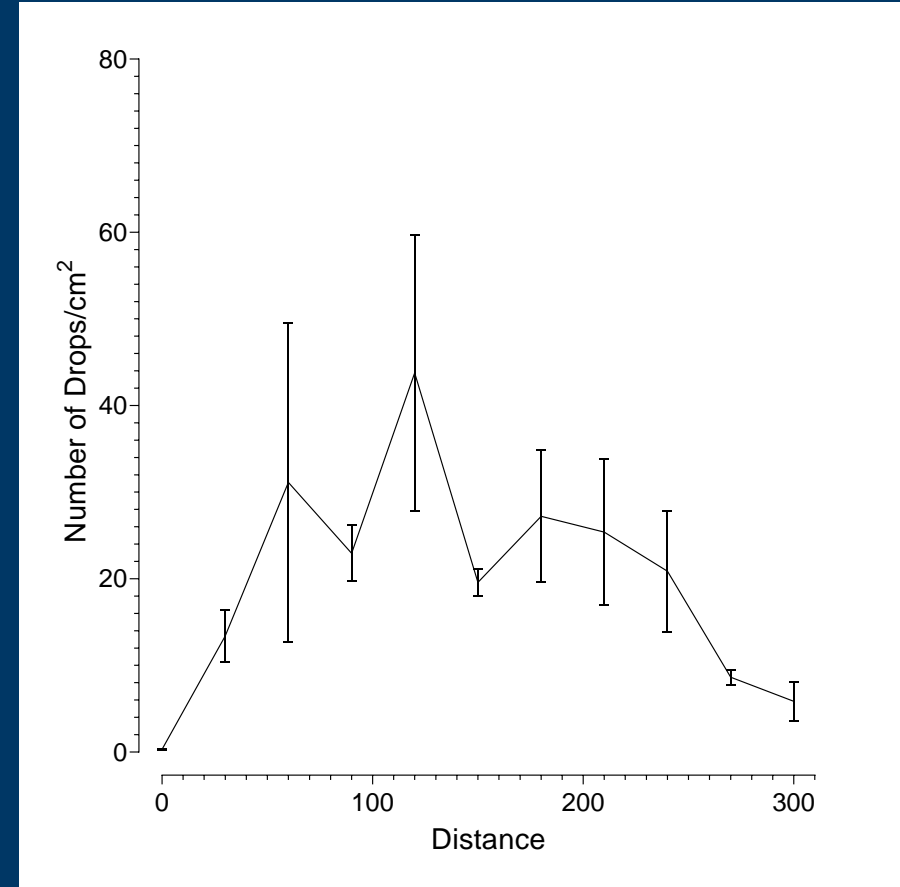
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# Characterization of the Buffalo Turbine

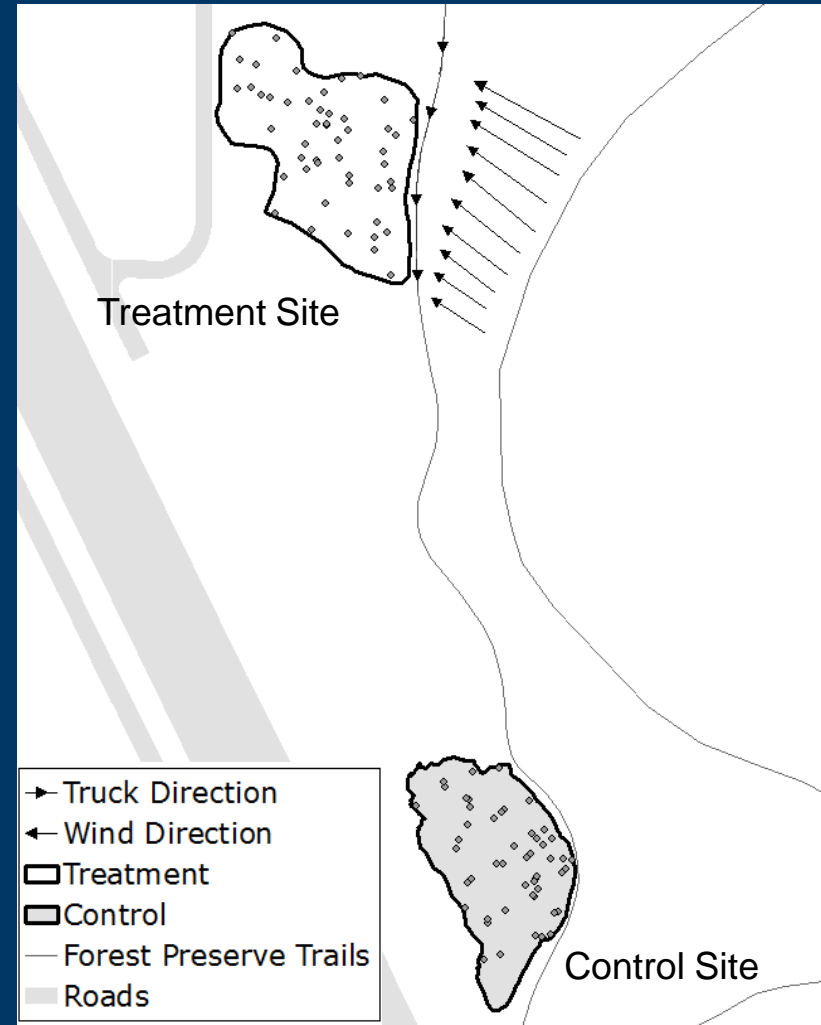
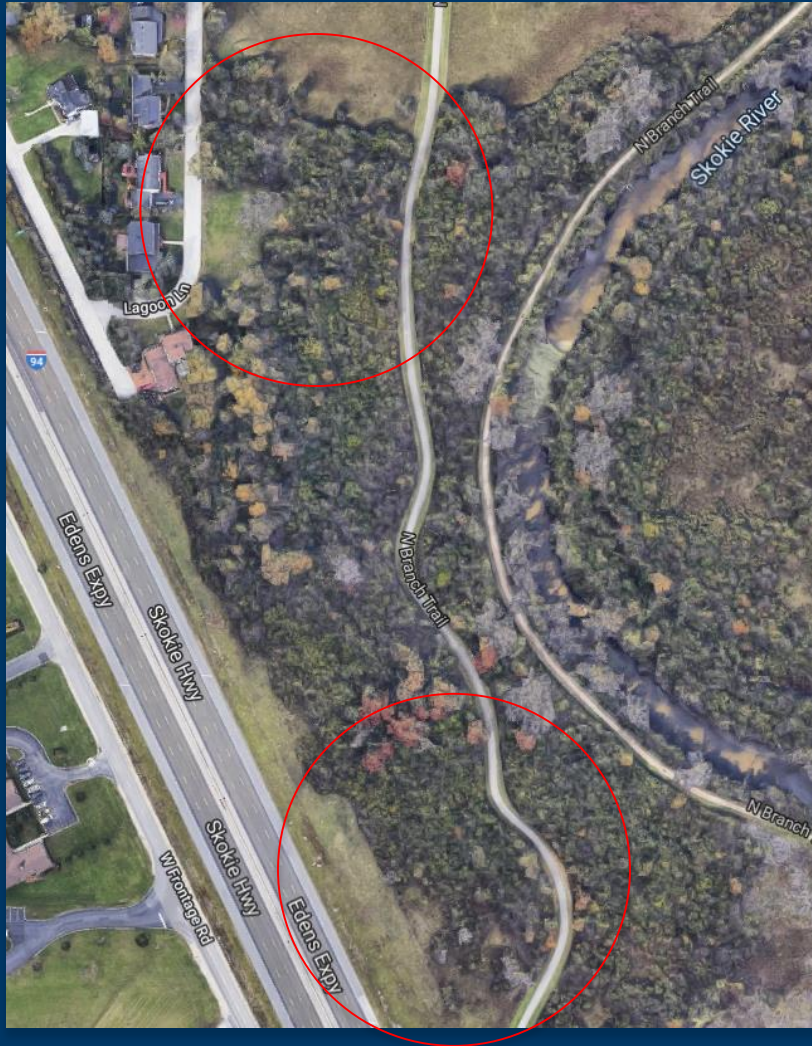


$DV_{0.5}$  127  $\mu\text{m}$



5.54 droplets/  $\text{cm}^2$  at 300'

# Study Design





# Study Design

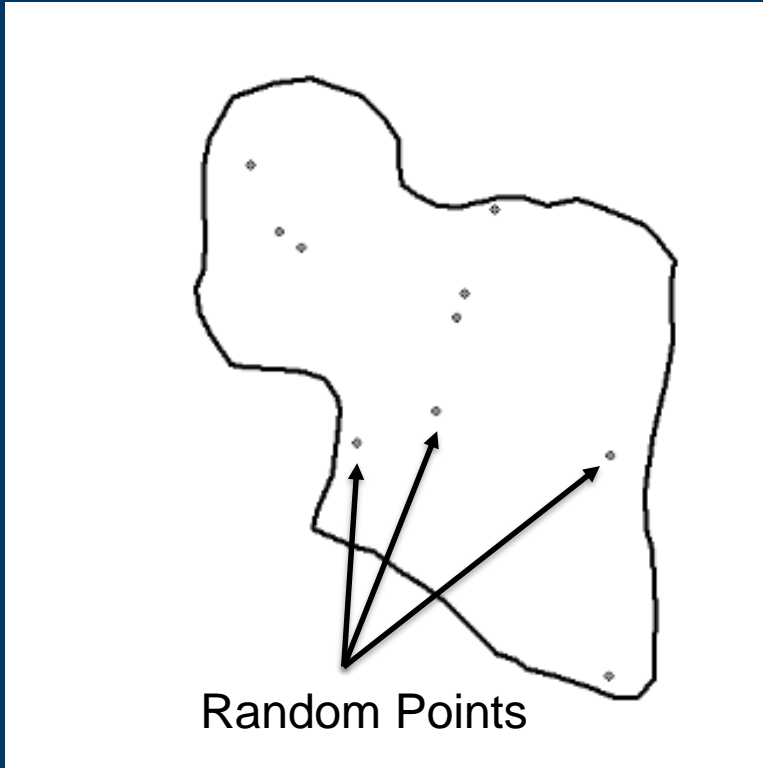


-Vectolex WDG was mixed at a rate of 1lb/g of water.

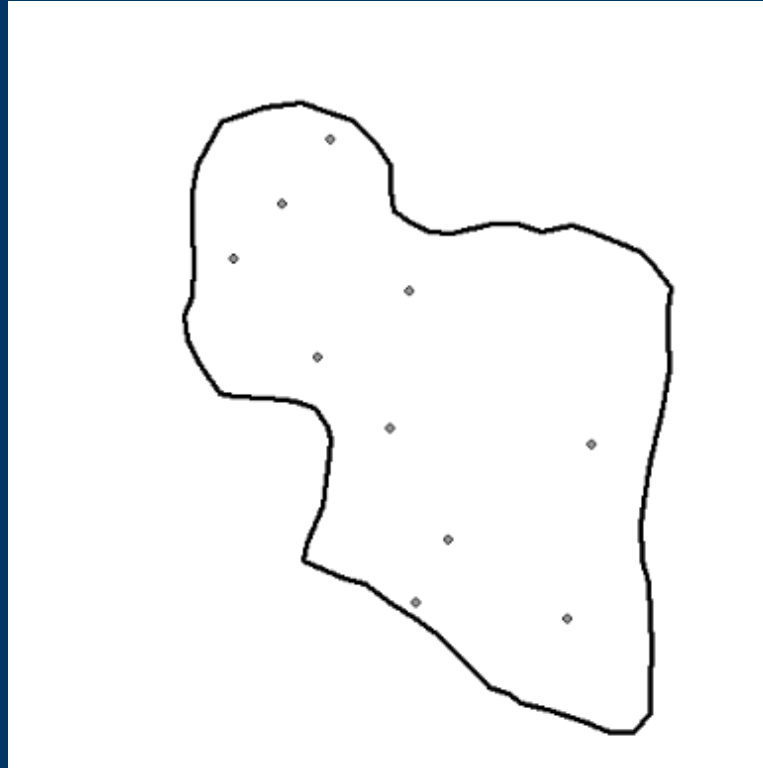
-Larvicide was applied at a rate of 0.5 lb/acre.

# Study Design

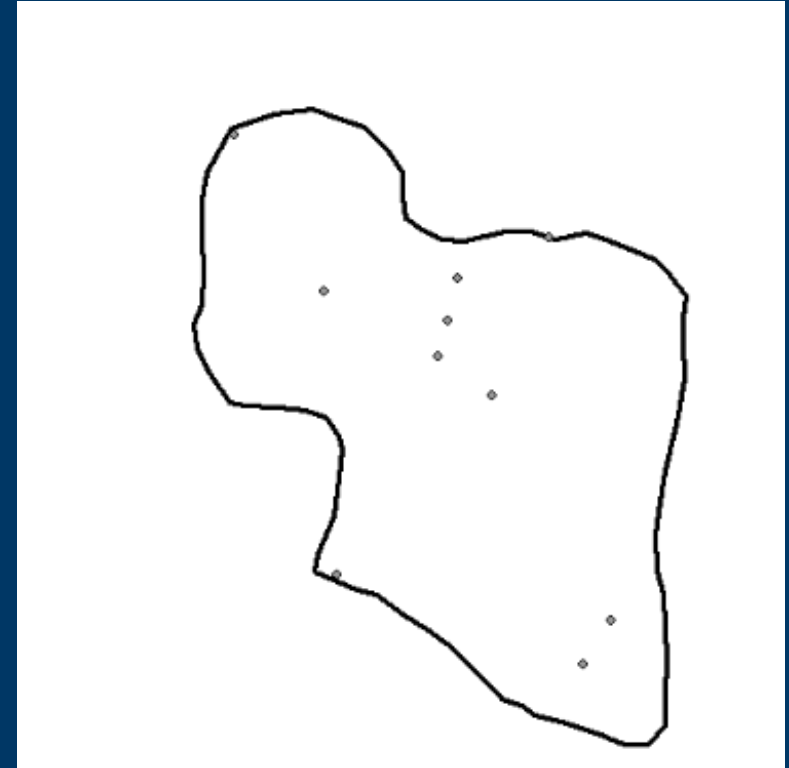
Week 1



Week 2



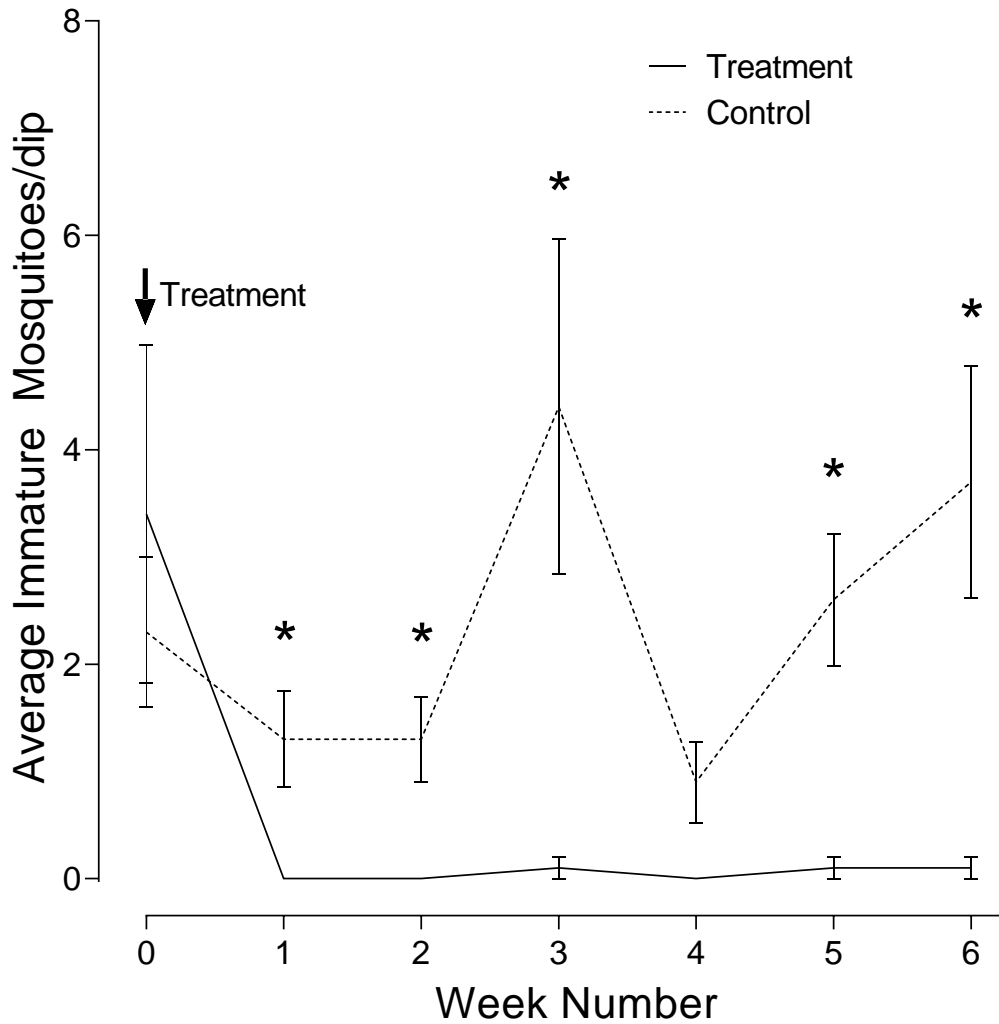
Week 3



- 10 Random points were generated for each sampling week with QGIS software.
- The random points were located by GPS and sampled with a single dip.
- Control and treatment sites were sampled each week for 7 weeks with 10 dups per site.



# Results

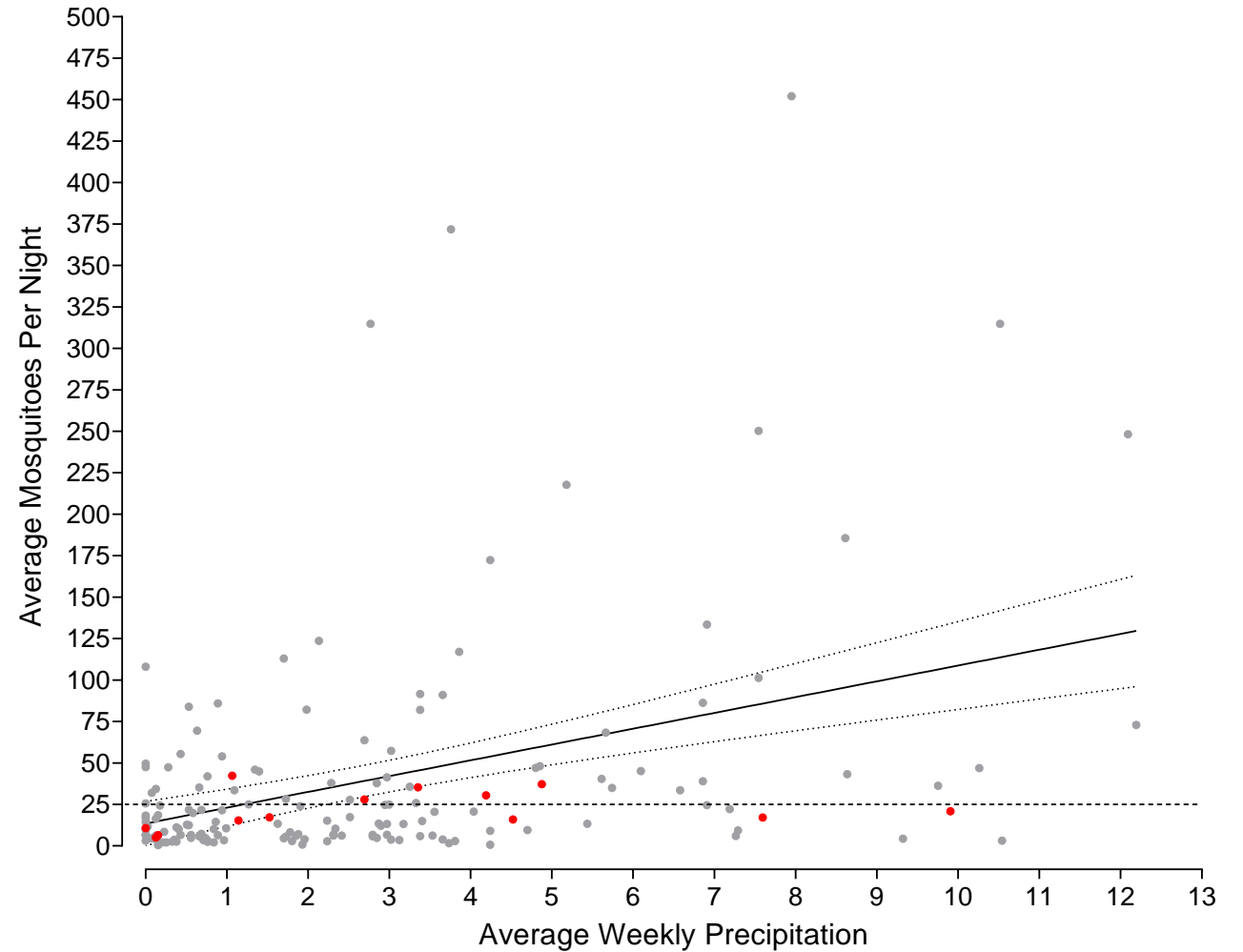
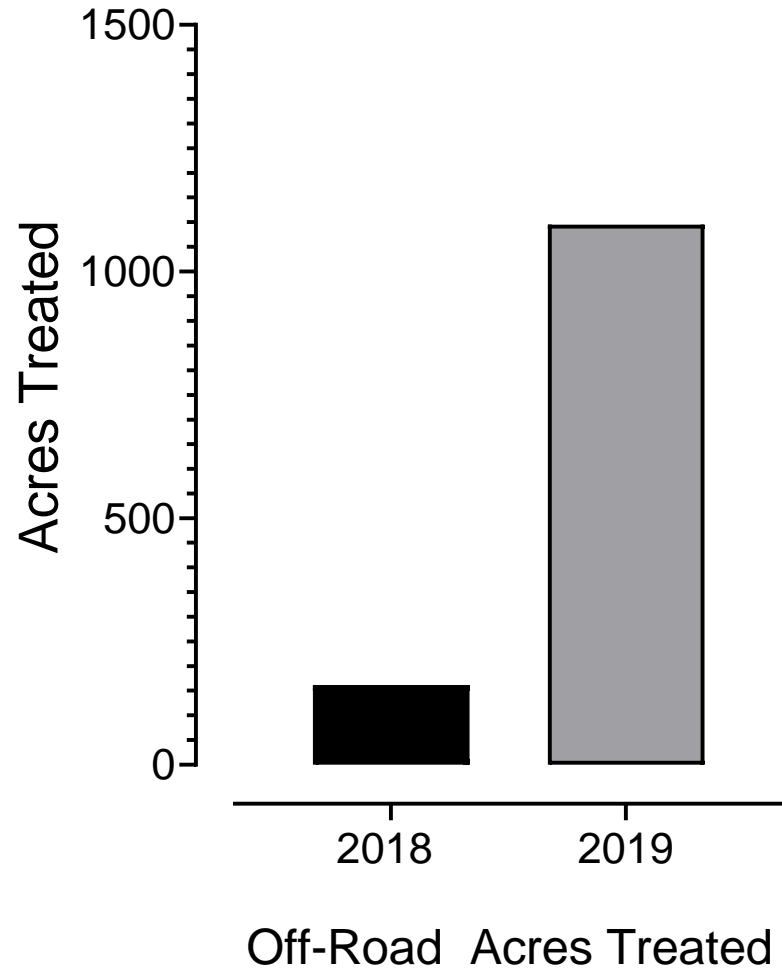


-One treatment of Vectolex WDG at 0.5 lb/acre was effective for at least 6 weeks.

\* Denotes significance at  $P < .05$ : Mann-Whitney U

	Week 0	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Median Rank Control	2	1	1.5	2.5	0	2.5	4.5
Median Rank Treatment	2	0	0	0	0	0	0
n	10	10	10	10	10	10	10
U	49.5	20	20	7	30	7	22
P value	1	0.0108	0.0108	0.0004	0.0867	0.0004	0.0108

# Operational Results





# Mixing Vectolex WDG



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# Mixing Vectolex WDG







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