THE EFFECTS OF NEEM LEAF-BASED ORGANIC INSECTICIDE TO APHIDS

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STEP-UP PROGRAM

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GOAL

- The goal of this experiment is to examine the effects of a neem leaf-based organic insecticide on three specific aphids: *Aphis craccivora, Aphis gossipii,* and *Myzus persicae.*

Azadirachta indica

- Commonly known as the neem plant
- Native to India
- Known for its diverse number of applications
  - Insecticide (Focus)
  - Medicinal uses
  - Other uses

AZADIRACHTIN

- Active ingredient azadirachtin in *A. indica* are similar to hormones called ecdysones found in insects
  - Acts as an antifeedant as well as and ecdysone "blocker", disrupting reproduction cycle
- Does not kill instantaneously
- Has low toxicity levels to non-target animals
- Biodegradable

APHIDS

- Soft-bodied insects
- Over 4,400 species
- Highly successful in a zoological standpoint
- One of the most destructive pests on cultivated plants

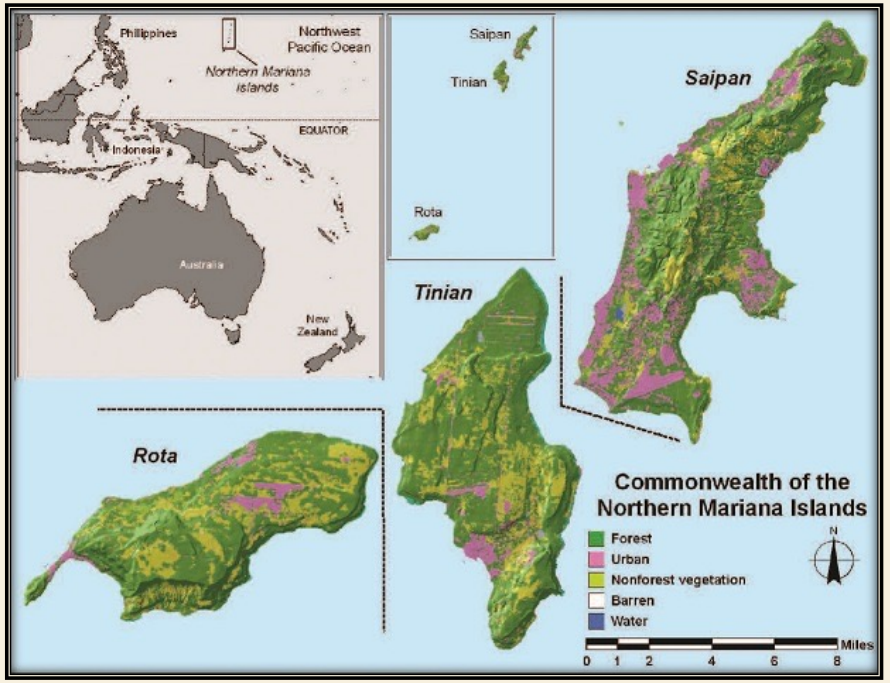
Aphis craccivora
(Cowpea Aphid)

Aphis gossipii
(Melon Aphid)

Myzus persicae
(Green Peach Aphid)

IMPORTANCE

- Agricultural production is prominent within the Commonwealth of the Northern Mariana Islands (CNMI)
- CNMI is not immune to the destructive nature of aphids



HYPOTHESIS

- We hypothesize that the organic insecticide based on the neem leaves will significantly reduce the population of our aphid samples.

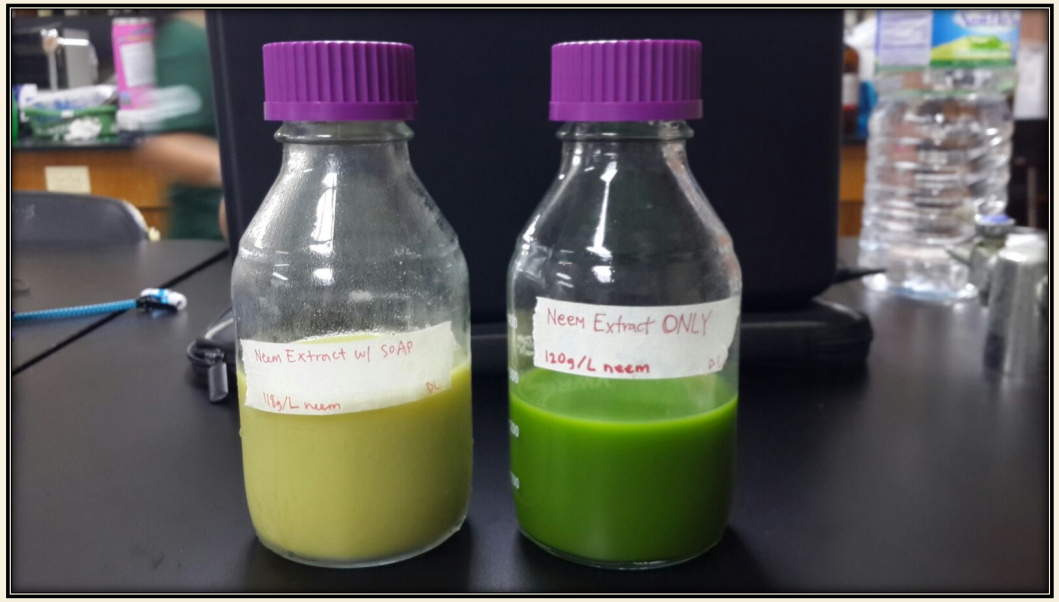
NULL HYPOTHESIS

- We hypothesize that the organic insecticide based on the neem leaves will NOT significantly reduce the population of our aphid samples.

PART I: ORGANIC INSECTICIDE

Neem Insecticide WITH Soap

- Neem leaves
- Distilled Water



Neem Insecticide WITHOUT Soap

- Neem leaves
- Distilled Water
- Dr. Bronner's Peppermint Pure-Castile Liquid Soap™*

* Soap acts as a spreader-sticker.

MAKING THE INSECTICIDE (WITHOUT SOAP)

1. Blend 453.592g (~1 lb.) **neem leaves** with 3785.41mL (~1 gal.) of **distilled water** in blender and break down leaves.
2. Strain mixture twice through a strainer and a layer of cheesecloth.
3. Cover mixture with plastic wrap and let sit for three days.
4. After letting it set for three days, strain twice with strainer and cheesecloth.

Neem leaves and distilled water are incorporated in a blender.

Mixture is strained to get rid of leaf residue.

MAKING THE INSECTICIDE (WITH SOAP)

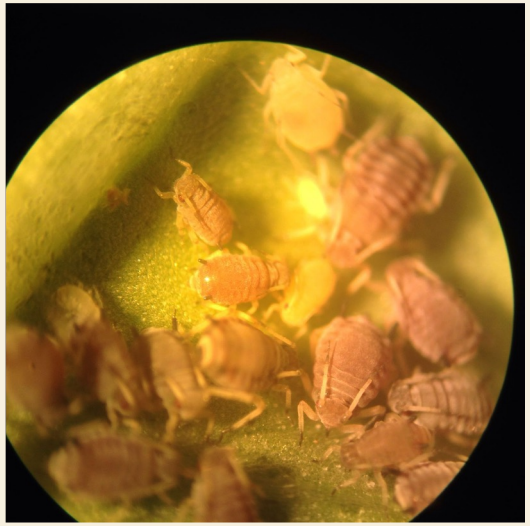
1. Follow steps on making insecticide (without soap).
2. Add 59.147mL (~2 fl. Oz) of **Dr. Bronner's Peppermint Pure-Castile Liquid Soap™** to solution, mixing well.

Both solutions are stored in containers and placed in refrigerator until needed for use.

PART II: COLLECTION

- Aphid-infected leaves were collected at a local farm in Kagman, Saipan.
- Specimen were never exposed to insecticides, organic or chemical.
- Samples were placed in paper bags and brought to the lab located the Northern Marianas College, Saipan.

Okra crops at Kagman Farm



Close up of *A. craccivora*

A. gossipii on pumpkin leaves

A. craccivora on string bean crops

PART III: EXPERIMENT

- **ONE TRIAL:**

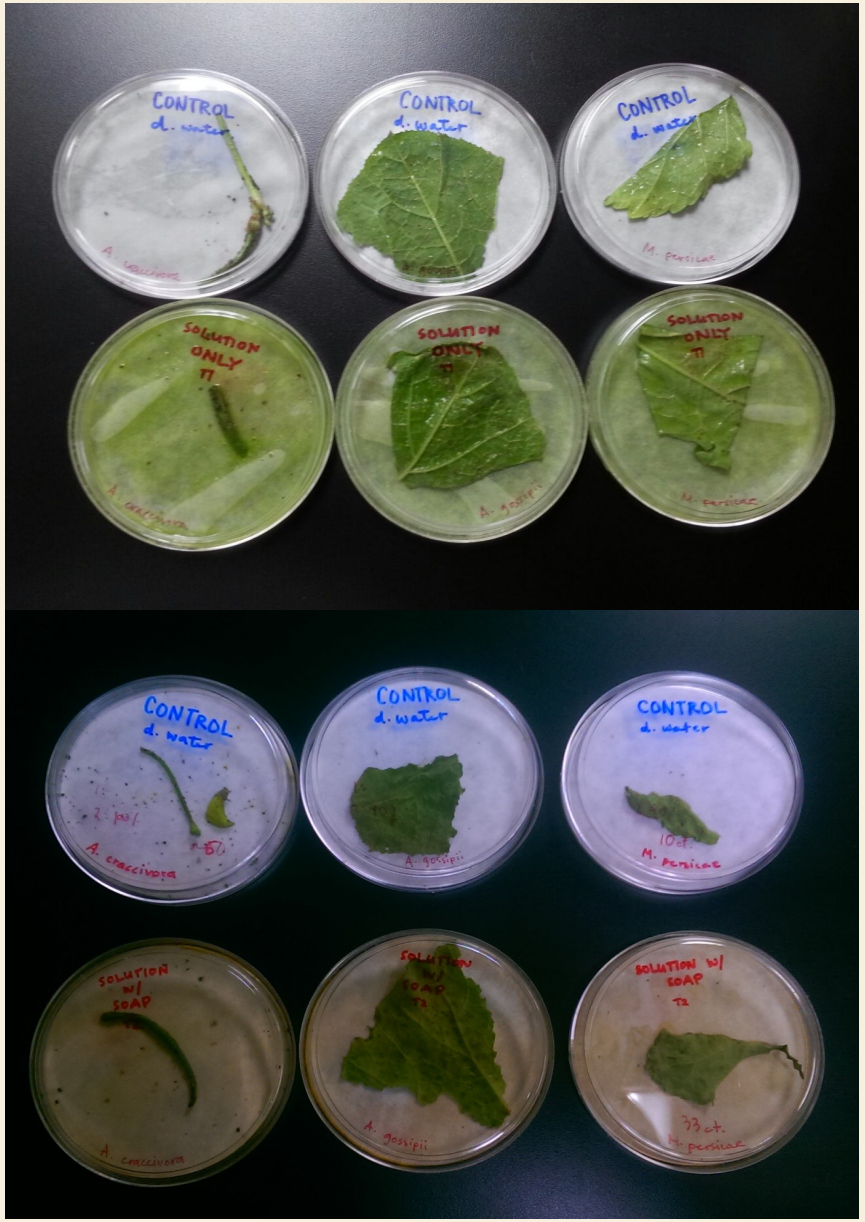
1.) Three sets of three petri dishes (Control, Solution Only, and Solution with Soap) were lined with filler paper.

2.) Infected leaves were cut to 2-3 in. samples.

Each sample has ~50 aphids.

3.) Aphids were placed in corresponding plates.

4.) Both neem solutions and distilled water (control) were poured into spray bottles.

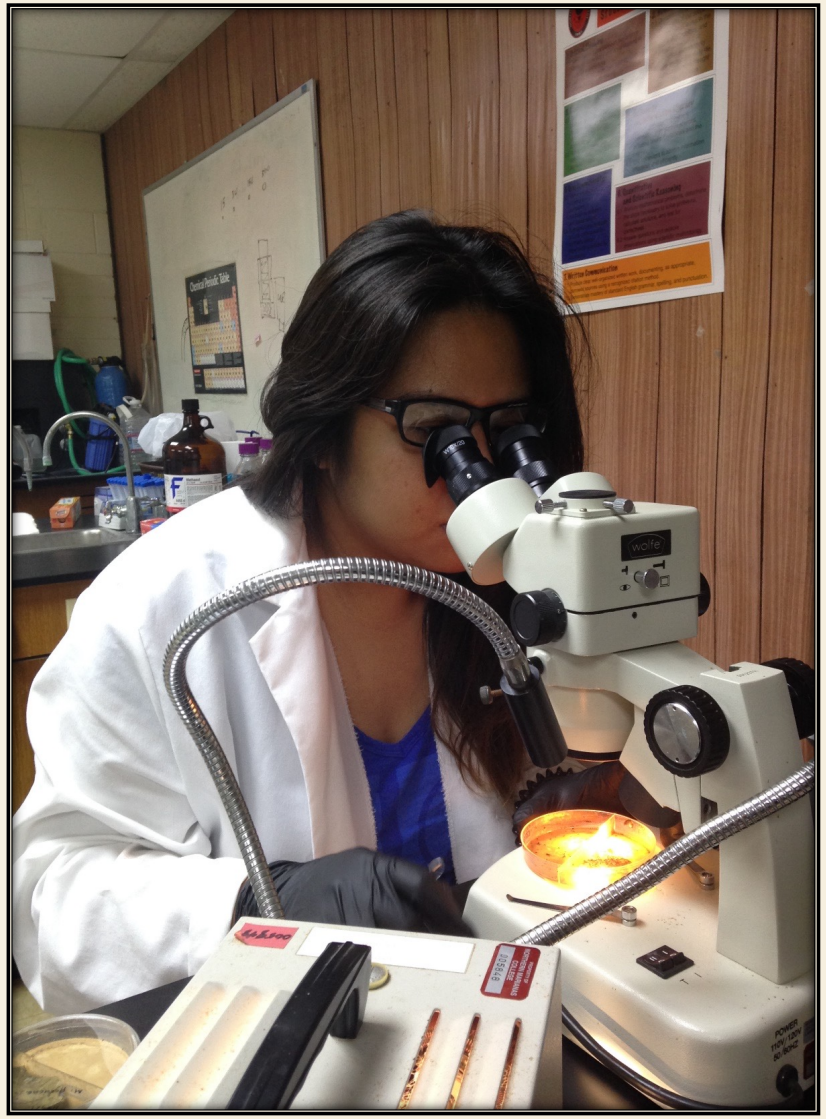


5.) Control were sprayed three times each (~5mL).

6.) Solution Only were sprayed three times each (~5mL).

7.) Solution with Soap were sprayed three times each (~5mL).

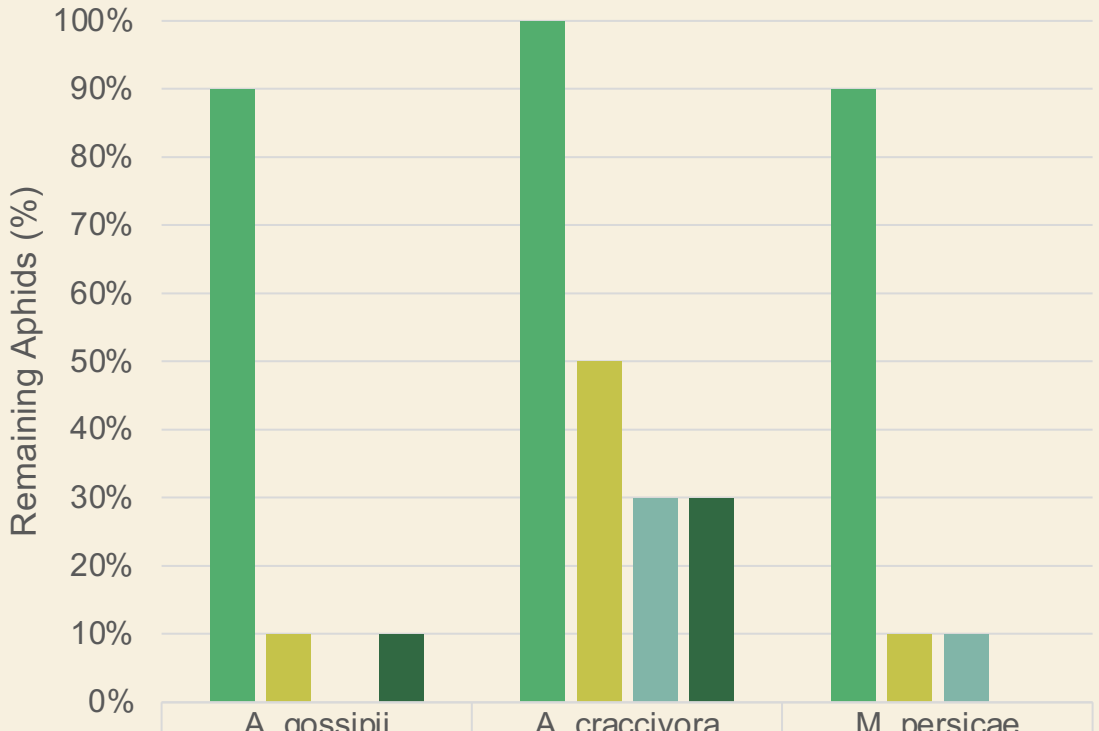
8.) Observe mortality of aphids through a stereo microscope every 24 hours for two days.



Plates are observed to see the effects of the neem solutions on selected aphids.

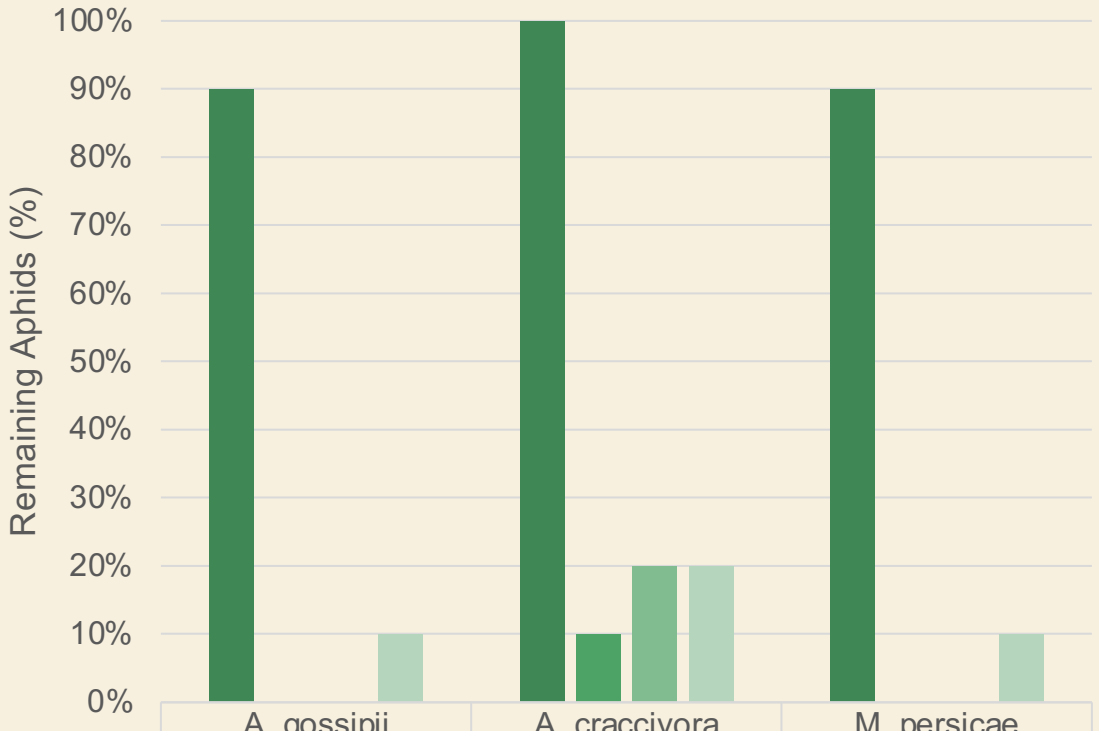
RESULTS

% Aphids Remaining After 48HR Exposure to Neem Solution Only**



	A. gossipii	A. craccivora	M. persicae
Control	90%	100%	90%
Trial 1	10%	50%	10%
Trial 2	0%	30%	10%
Trial 3	10%	30%	0%

% Aphids Remaining After 48HR Exposure to Neem Solution with Soap**



	A. gossipii	A. craccivora	M. persicae
Control	90%	100%	90%
Trial 1	0%	10%	0%
Trial 2	0%	20%	0%
Trial 3	10%	20%	10%

**Percentages are estimations based on aphid populations of 50.

CONCLUSION

- Exposure to the insecticide did significantly reduce aphid sample population, as compared to control group
- **Null hypothesis rejected**

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- CNMI Public School System


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Thank you!

Any questions?