

## Virtual Science- Hoku Group Assignment #2

Due Friday, May 23 by 1:30pm

### MICONIA (*MICONIA CALVESCENS*): A SERIOUS THREAT TO NATIVE HAWAIIAN FORESTS



**Photo: *Miconia calvenscens***

In this virtual assignment you will become familiar with Miconia (*Miconia calvenscens*) which many botanists agree is the most significant alien invasive weed in Hawai'i.

The assignment is divided into three parts. Please complete each part in order and submit your assignment to Ms. Kaufman on Google docs with the title “ **Science Virtual: Miconia calvenscens**”

**DO NOT forward the entire assignment to me with photos and instructions. The document you submit should contain the answers only.**

Part I: Meet the Alien Invasive: *Miconia calvenscens* in Hawai'i.

Using the following resources for background information, complete the questions about Miconia life cycle and introduction

<http://dlnr.hawaii.gov/hisc/info/species/miconia/> <http://www.hear.org/usgs-brd-pierc-hfs/factsheetinfo.htm#miconia>  
[http://www.ctahr.hawaii.edu/invweed/WeedsHI/W\\_Miconia\\_calvenscens.pdf](http://www.ctahr.hawaii.edu/invweed/WeedsHI/W_Miconia_calvenscens.pdf)

Part 1 questions 1-3:

1. What regions of the world is Miconia native to?
2. Where else besides Hawai'i has Miconia spread as an invasive.
3. How was Miconia introduced to the state of Hawaii and to the island of Maui?

4. Imagine you are about to go on a hike in east Maui and you want to describe Miconia to your hike companion so the two of you can record the coordinates for any plants you find and communicate that to the regulatory agency. In your own words and using commonly known objects as size comparison, create a description for Miconia to that would help your hike partner know how to identify Miconia in the wild. **(no credit will be given for “cut/paste” descriptions)**

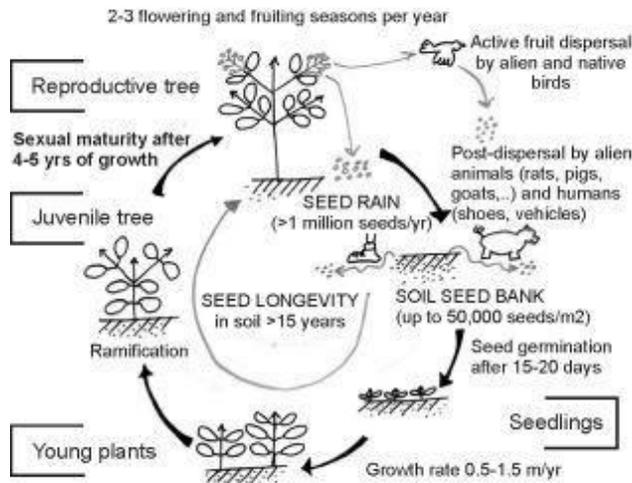


Fig. 1 Miconia life-cycle in Tahiti (in Meyer 2010).

**(use listed web resources and life cycle diagram at left to answer)**

5. What is the seed longevity of Miconia and why would a long seed longevity make it harder to control Miconia invasion?

6. What natural forces and human-impacts are responsible for the spread of Miconia?

7. **Create a timeline** for the “life of a Miconia seed”. Include **at least four** specific pieces of information from the life cycle diagram at left. You may use creativity in the format you choose to create your timeline. Must be digital submission.

**Part 2: Explore available technologies for controlling infestation of *Miconia calvescens* in Hawai'i.**

View this video for a detailed look at the devastation of Miconia in East Maui native forest, read the questions before viewing the video. Answer each question completely and accurately.

<https://www.youtube.com/watch?v=NmbysVzdKVg&feature=related>

**Part II, questions 8-10**

8. Describe the traditional methods for control of invasive weeds in Hawaiian forests. For each method, include why it is effective and how it is limited in its effectiveness.
9. According to the plant biologists featured in the video, what was the inspiration for the new technology known as ballistic herbicide control.
10. How does this new technology specifically address something about the traditional weed control methods that was not effective?



**Part Three:** Be a plant biologist! Develop a Scientific Inquiry to determine how effective the ballistic herbicide technology is in controlling the spread of Miconia infestation in Maui's native forests. Before beginning the questions, watch the following video.

**View:** <https://www.youtube.com/watch?v=hwM8qn0GLHQ>

**Part III, questions 11-13**

11. Formulate a scientific question about the control of Miconia in remote Kipahulu Valley on Maui that may use ballistic herbicide or traditional plant control methods.
12. From your question, develop a testable hypothesis to investigate the problem of Miconia invasion in Kipahulu Valley using the specific technologies .
13. Identify the variables from your testable hypothesis. (if needed, consult your field science inquiry reports for review of different variables)
  - a. Independent variable
  - b. Dependent variable
  - c. Controlled variables