



AGRONOMY DEPARTMENT



UF FORAGE TEAM

# Industrial hemp crop response to waterlogging

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## Introduction

- Industrial hemp, *Cannabis sativa* L., is recognized as a multipurpose crop with special attention to its grain and cannabinoid production potential
- Studies have been underway to identify suitable hemp germplasm that will suit Florida's environmental condition:

### Climate

### Soil

- |   |                              |
|---|------------------------------|
| ❖ Sub-tropical                          | ❖ ~70% Flatwood soils        |
| ❖ Mild winters                          | ❖ Poorly drained sandy soils |
| ❖ Hot, muggy summers                    | ❖ Warm soil temperature      |
| ❖ Frequent thunderstorms (June – Sept.) | ❖ Aquic soil moisture        |

- Result in anoxic soil conditions leading to devastating crop losses

## Objective

Evaluate the effects of flood duration and frequency on industrial hemp variety, Yuma-2, chlorophyll content and biomass.

- Flood Duration: 0 h, 24 h, 48 h, 72 h, and 96 h
- Flood Frequency: Weekly or Biweekly

## Materials and Methods

- Study established in UF Agronomy Turf and Forage Physiology Lab Gainesville, FL.
- Manual flood system within standard greenhouse setting (30°C day /20°C night)
- CRD with two factors (frequency and duration) with four replications
- Run two separate times for a 6-week period each
- Data analyzed via R software

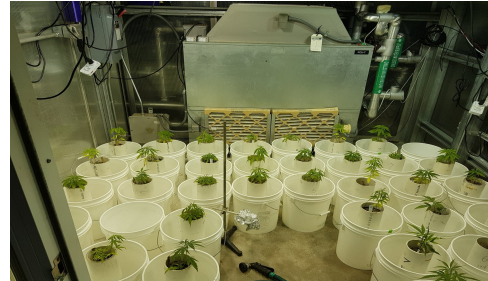
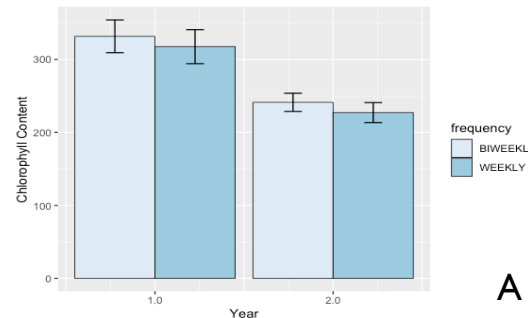
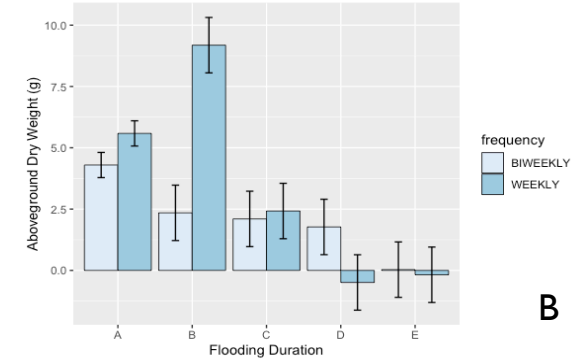


Figure 1. Manual flood system setting within controlled greenhouse.

## Results



A



B

Figure 2. A) Frequency effect on chlorophyll content by year. B) Frequency and duration effect on aboveground biomass.

- Chlorophyll content was more affected in year 2 than in year 1.
- Weekly flooding resulted in lower chlorophyll content in either study year.
- A drastic downward trend in aboveground biomass is observed after 24 h/biweekly flooding and 48h/weekly flooding.

## Conclusions

- Anoxic soil conditions reduce levels of chlorophyll content (indirect indicator of plant stress).
- Drastic turnover in plant health occurred at 48 hours of weekly and biweekly flooding.
- Determines the maximum waterlogged conditions that can result in stand loss.