

# **Relative Water Content of Leaves**

Jayden Lefebvre

Trent University

SAFS 3530H 2025WI

Dr. Fallon Tanentzap

**Word Count:** 1000

February 11th, 2025

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**Abstract:**

## **1 Introduction**

### **1.1 Background**

Relative water content (RWC) is the measurement of crop hydration relative to saturated (aka turgid, hydrated) conditions, and is a standard indicator of plant water usage and drought stress (Arjenaki et al. 2012). RWC is calculated as follows:

$$\text{RWC} = \frac{m_{\text{fresh}} - m_{\text{dry}}}{m_{\text{turgid}} - m_{\text{dry}}} \times 100\%$$

### **1.2 Focus**

Leaves are the most sensitive to dehydration, as leaf tissue adapts more quickly to stress. Readings depend on leaf age, site characteristics, soil moisture, angle of leaf, and time of day (diurnal changes). Readings can be faulty due to improper methodology, transportation and processing time, or temperature exposure.

### **1.3 Objectives**

The primary objective of this study is to investigate whether leaf chlorophyll content is influenced by leaf relative water content.

## 2 Methods

### 2.1 Sampling

### 2.2 Data Collection

1. At-pot measurements are recorded, including:
  - Soil moisture, electroconductivity, temperature;
  - Light intensity; and
  - Relative humidity and leaf temperature.
2. Plants are harvested and each is labelled with the pot number.
3. One complete leaf is sampled and the **fresh mass** ( $m_{\text{fresh}}$ ) is taken.
4. A photo is taken of the sample with its label and a ruler for scale.
5. Chlorophyll content readings are taken.
6. Leaf samples are packaged inside a hydrated paper towel and, after resting for 24 hours, **turgid mass** ( $m_{\text{turgid}}$ ) is taken.
7. All soil is removed from the root system, and roots and shoots are separated and placed into a drying oven for one week, after which **dry mass** ( $m_{\text{dry}}$ ) is taken.
8. Data from all samples are digitized and compiled into a single spreadsheet for analysis.

## **2.3 Analysis**

## **3 Results**

## **4 Discussion**

**References**

Arjenaki, F. G., Jabbari, R., & Morshedi, A. (2012). Evaluation of drought stress on relative water content, chlorophyll content and mineral elements of wheat (*Triticum aestivum* L.) varieties. *International Journal of Agriculture and Crop Sciences*, 4(11), 726–729.