



## mini-PAM II

### *Photosynthesis yield analyser*

#### **What can the mini-PAM detect?**

Detection of abiotic stress e.g. drought stress, nutrient deficiencies ... before symptoms are visible.

#### **How do you use the mini-PAM?**

For best results, measure the '**maximum quantum yield of photosystem II**' ( $F_v/F_m$ ) on leaves adapted to the dark. For adaptation to darkness, place a **leaf clip on the leaf for 30 minutes before measurement**, preferable in the middle of on the youngest, fully developed leaf. The measurement is made in a second. Alternatively, you can measure '**effective quantum yield of photosystem II**' ( $Y(II)$ ) under light conditions, but you must select leaves with similar light illumination conditions, age, and position. Take at least **5 scattered measurements** per plot every couple of days to detect early stress.

#### **Scientific background & interpretation of the results**

The sensor emits a strong flash of light. The excess of light excites the chlorophyll in the leaf, which re-emits light in the form of chlorophyll fluorescence. The amount of fluorescence depends on the state of the photosystem II.

If plant experiences abiotic stress:

- ➔  $F_v/F_m$  = (Maximal efficiency of photosystem II) will decrease ↓. The optimal and stress values differ from plant species to species, but commonly values below 0.79 are considered as early stress.
- ➔  $Y(II)$  = (Effective efficiency of photosystem II) will decrease ↓, but values will vary more depending on conditions during the measurement.

#### **Pros & Cons**

- + robust, fast, sensitive measurements available in light and dark
- expensive, indirect measurement of photosynthetic performance, measurements highly affected by environment

**Price range:** € 10000 - 30000

**Company:** Walz

#### **More information?**

[https://www.walz.com/products/chl\\_p700/mini-pam-II/introduction.html](https://www.walz.com/products/chl_p700/mini-pam-II/introduction.html)