biosensors

Early-Stage Detection of Biotic and Abiotic Stress on Plants by Chlorophyll Fluorescence Imaging Analysis

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Table S1. Definitions of the most common used chlorophyl fluorescence parameters

Parameter	Definition	Calculation
F_v/F_m	Maximum efficiency of PSII photochemistry	$(F_m - F_o)/F_m$
Φ_{PSII}	Effective quantum yield of PSII photochemistry	$(F_m' - F_s)/F_m'$
Φ_{NPQ}	Quantum yield of regulated non-photochemical energy loss in PSII	$F_s/F_m' - F_s/F_m$
Φ_{NO}	Quantum yield of nonregulated energy loss in PSII	F_s/F_m
F_v'/F_m'	Efficiency of PSII reaction centers	$(F_m' - F_o')/F_m'$
F_v/F_o	Efficiency of the oxygen evolving complex (OEC) on the donor side of PSII	$(F_m - F_o)/F_o$
ETR	Electron transport rate	$\Phi_{PSII} \times PAR \times c \times abs$, where PAR is the photosynthetically active radiation, c is 0.5, and abs is the total light absorption of the leaf taken as 0.84
q_p	Photochemical quenching, representing the redox state of quinone A (Q_A), or in other words the fraction of PSII reaction centers in open state	$(F_m' - F_s)/(F_m' - F_o')$
NPQ	Non-photochemical quenching reflecting the dissipation of excitation energy as heat	$(F_m - F_m')/F_m'$
EXC	Excess excitation energy	$(F_v/F_m - \Phi_{PSII})/F_v/F_m$
$1-q_p$	Excitation pressure	$1 - [(F_m' - F_s)/(F_m' - F_o')]$