

## PrometheusWiki: online protocols gaining momentum

Just over 1 year ago we launched *PrometheusWiki*: PROtocols, METHods, Explanations and Updated Standards Wiki: a web-based, free-content resource built primarily from volunteer contributions (Sack *et al.* 2010). In the time since, *PrometheusWiki* has grown to include over 130 protocols and 55 topic summaries written by experts across 15 key research areas. In addition, the site has 400 registered users from research institutions and countries around the world.

*PrometheusWiki* is designed for researchers in the environmental plant sciences to easily access and share protocols, and to provide a forum for discussion and debate on different practices (Fig. 1). These fields include ecophysiology, plant and crop physiology, and soil biology. The project is a collaborative effort between the *PrometheusWiki* Editorial Board and CSIRO PUBLISHING, with the support of the ARC/NZ Research Network for Vegetation Function (2005–2010).

Our aim with *PrometheusWiki* is to create a resource that combines the open communication of the internet with the traditions of peer review. This is to ensure quality and prestige whilst delivering tools for anyone designing and conducting experiments in controlled environments or the field. After just 1 year, the site usage statistics indicate that *PrometheusWiki* has become a valued resource for students and experienced researchers alike; on average, the site receives 8000 page views per month and some protocols have been downloaded more than 2500 times, such as the protocol for the LI-COR 6400 gas exchange instrument.

The incentive for this project arose from a desire to provide an up-to-date, centralised resource, using new technologies to facilitate contributions from research groups across the globe. We expect that this effort to standardise protocols in the fields of ecological and environmental plant physiology will lead to increased accessibility and demystification of approaches in these

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# PrometheusWiki

Protocols in ecological & environmental plant physiology

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**PrometheusWiki: A wiki for PROtocols, METHods, Explanations and Updated Standards in Ecological and Environmental Plant Physiology.**

PrometheusWiki uniquely combines the open communication of the Internet with the traditions of peer review to ensure quality and deliver a useful resource for the entire field. We welcome contributions from all members of the research community - from newcomers to established practitioners around the globe. Your contributions and feedback will make this endeavor a success!

**SUBMIT PROTOCOL**

**We are currently seeking Associate Editors and Editorial Interns. Read more.**

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  - Soils and Rhizosphere

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- Constructing and operating a hydraulics flow meter

**New protocol videos!**

**Biophysical microenvironments in soils.**

On: Wed 31 of Aug., 2011 01:44 UTC

This protocol details how to collect rhizosphere soil from the field and then isolate different biophysical microenvironments from both rhizosphere and non-rhizosphere soil. Read more.

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Fig. 1. *PrometheusWiki* homepage.

methods-intensive disciplines. Speeding the dissemination and standardisation of methods will especially aid the research community in progressing towards integrative goals, such as elucidating genetic loci for physiological function, and predicting responses of plants, crops and ecosystems to climate change. To reach this aim we are exploring ways to encourage input from all of our users, not just the protocol authors and invited referees.

The project has already succeeded in drawing many colleagues to visit the site and to make use of protocols; however, we note that there has been limited engagement by the community with the *interactive* Wiki components of the site. While keen to use and discuss the protocols offline, our users hesitate to comment or edit each other's work online. The opportunity for user input in 'published' scientific work

represents one of the most novel aspects of the project. We believe this element holds real promise because science moves most rapidly when researchers use similar methods and can easily repeat and build upon each other's discoveries. Thus, by encouraging open discussion and debate on *PrometheusWiki*, we can progress towards new standards in ecological and environmental plant physiology. We look forward to increasing usage of the Wiki features to realise the full potential of this resource: a place where researchers can adapt, comment on, discuss and debate methods in an open and collegial environment.

The Wiki world is changing quickly and, even over the past year, exciting technical improvements now enable users to easily include videos within protocols in addition to photographs and calculation tools (Fig. 2). A star rating

## PROTOCOL: Infrared estimations of leaf or canopy temperature

Hamlyn G Jones  
Contributors: Grant OM ★

1 Votes  
★★★★★

### Overview

Measurement of leaf temperature has traditionally been done by the use of fine-wire thermocouples attached to leaves, but it is difficult to scale this approach up to the estimation of plant or canopy temperatures. Infra-red thermometers have provided a tool for scaling up.

### Background

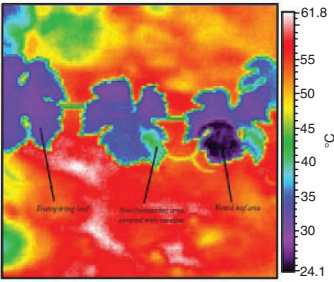
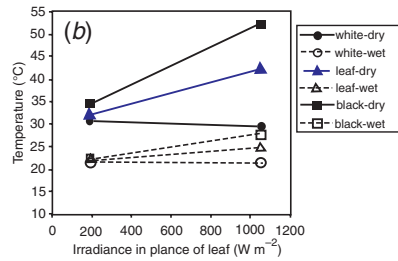
There is much interest in measurement of the temperature of leaves, plants or canopies, primarily because of its importance as an indicator of leaf transpiration rate (and hence of stomatal opening and plant "stress"). This is used primarily in irrigation scheduling and in phenotyping for drought tolerance. Measurements of plant temperature are also useful in studies of freezing, energy balance and

### Units, terms, definitions

(i) Crop Water Stress Index (CWSI) =  $(T_{canopy} - T_{nwsb}) / (T_{max} - T_{nwsb})$ , where  $T_{canopy}$  is the canopy temperature,  $T_{nwsb}$  is the temperature of a non-water stressed reference crop under similar conditions, and  $T_{max}$  is an upper temperature for a non-transpiring crop (see Idso *et al.* 1981; Jackson *et al.* 1981).

### Procedure

There is no single protocol for estimating leaf or canopy temperature by thermal infrared. Here we outline some of the key steps involved in the use of thermal imaging for the study of plant water stress and stomatal behaviour. It is useful, however, to treat thermal measurements on single leaves or small plants (e.g. *Arabidopsis*) in controlled environment chambers separately from field.

Contributors to this page: Grant OM ★ and Admin★  
Page last modified on Tuesday 24 of May, 2011 01:39:47 EDT by Grant OM★. (Version 11)

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**Download citation** so protocol can be cited in articles.

**Detailed protocols** posted by contributors can be edited and developed by all users.

**Images, videos, example diagrams, spreadsheet tools, equations and more.**

**Forums and comment features** encourage discussion and collaboration.

Fig. 2. *PrometheusWiki* enables registered users to edit, comment on, and rate existing protocols.

system also allows registered users to provide feedback on protocols, helping to develop community consensus on the quality and usefulness of certain techniques. An automated citation system allows pages to be easily referenced, and a growing number of journal publications are including a reference to a related *PrometheusWiki* protocol for readers to follow complex methodology in greater detail.

We welcome contributions from all members of the ecological and environmental plant physiology community – from newcomers to established practitioners around the globe. Your contributions and feedback will make this endeavour a success. Please visit *PrometheusWiki* and register to join the user community: <http://publish.csiro.au/prometheuswiki>.

### ***PrometheusWiki* is currently seeking Associate Editors and Editorial Interns**

As *PrometheusWiki* grows and usage increases, the Editorial team must grow as well. The *PrometheusWiki* Editorial Board is currently seeking Associate Editors and Editorial Interns. Editors have responsibility for monitoring protocols on the Wiki, for commissioning new protocols and summary articles and for working with Editorial Assistants to invite reviewer

comments. Editorial Interns, ideally advanced undergraduate or graduate students in related areas, are responsible for liaising with Editors to solicit contributions for the Wiki, inviting reviewer comments and enhancing community awareness and involvement with the Wiki. If you would like more information about joining *PrometheusWiki* as an Editor or Intern, please let us know (contact Adrienne Nicotra, Editor-in-Chief of *PrometheusWiki*: [adrienne.nicotra@anu.edu.au](mailto:adrienne.nicotra@anu.edu.au)).

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*PrometheusWiki* Editorial Assistant

### **Reference**

Sack L, Cornwell WK, Santiago LS, Barbour MM, Choat B, Evans JR, Munns R, Nicotra A (2010) A unique web resource for physiology, ecology and the environmental sciences: *PrometheusWiki*. *Functional Plant Biology* **37**, 687–693. doi:[10.1071/FP10097](https://doi.org/10.1071/FP10097)