

## Accepted Manuscript

Title: Modelling the relationship between CO<sub>2</sub> assimilation and leaf anatomical properties in tomato leaves

Author: Herman N.C. Berghuijs Xinyou Yin Q.Tri Ho Peter E.L. van der Putten Pieter Verboven Moges A. Retta Bart M. Nicolai Paul C. Struik



PII: S0168-9452(15)30004-2  
DOI: <http://dx.doi.org/doi:10.1016/j.plantsci.2015.06.022>  
Reference: PSL 9228

To appear in: *Plant Science*

Received date: 17-3-2015  
Revised date: 22-6-2015  
Accepted date: 23-6-2015

Please cite this article as: Herman N.C.Berghuijs, Xinyou Yin, Q.Tri Ho, Peter E.L.van der Putten, Pieter Verboven, Moges A.Retta, Bart M.Nicolai, Paul C.Struik, Modelling the relationship between CO<sub>2</sub> assimilation and leaf anatomical properties in tomato leaves, *Plant Science* <http://dx.doi.org/10.1016/j.plantsci.2015.06.022>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Modelling the relationship between CO<sub>2</sub> assimilation and leaf anatomical properties in tomato leaves

Herman N.C. Berghuijs<sup>1</sup>, Xinyou Yin<sup>1</sup>, Q. Tri Ho<sup>2</sup>, Peter E.L. van der Putten<sup>1</sup>, Pieter Verboven<sup>2</sup>, Moges A. Retta<sup>2</sup>, Bart M. Nicolai<sup>2</sup>, Paul C. Struik<sup>1</sup>

<sup>1</sup> Centre for Crop Systems Analysis – Wageningen University and Research Centre, Droevendaalsesteeg 1, 6708PB Wageningen, The Netherlands

<sup>2</sup>Flanders Center of Postharvest Technology / BIOSYST-MeBioS, Katholieke Universiteit Leuven, Willem de Croylaan 42, B-3001, Leuven, Belgium

e-mail corresponding author: herman.berghuijs@wur.nl

phone no. corresponding author: +31 317485315

## Highlights

- We use anatomical, gas exchange and fluorescence data to simulate CO<sub>2</sub> assimilation.
- Our model includes the release of (photo)respired CO<sub>2</sub> outside the stroma.
- Stroma resistance and exposed surface areas influence CO<sub>2</sub> assimilation.
- Assumed stomatal diffusivity and pathway lengths, and curvatures affect predictions.
- 3-D models are needed to include the localization of respiration.

## Abstract

The CO<sub>2</sub> concentration near Rubisco and, therefore, the rate of CO<sub>2</sub> assimilation, is influenced by both leaf anatomical factors and biochemical processes. Leaf anatomical structures act as physical barriers for CO<sub>2</sub> transport. Biochemical processes add or remove CO<sub>2</sub> along its diffusion pathway through mesophyll. We combined a model that quantifies the diffusive resistance for CO<sub>2</sub> using anatomical

Download English Version:

<https://daneshyari.com/en/article/8357677>

Download Persian Version:

<https://daneshyari.com/article/8357677>

[Daneshyari.com](https://daneshyari.com)