

Accepted Manuscript

Title: Long-term exogenous application of melatonin improves nutrient uptake fluxes in apple plants under moderate drought stress

Authors: Bowen Liang, Changqing Ma, Zhijun Zhang, Zhiwei Wei, Tengeng Gao, Qi Zhao, Fengwang Ma, Chao Li



PII: S0098-8472(18)31102-X
DOI: <https://doi.org/10.1016/j.envexpbot.2018.08.016>
Reference: EEB 3542

To appear in: *Environmental and Experimental Botany*

Received date: 23-7-2018
Revised date: 15-8-2018
Accepted date: 15-8-2018

Please cite this article as: Liang B, Ma C, Zhang Z, Wei Z, Gao T, Zhao Q, Ma F, Li C, Long-term exogenous application of melatonin improves nutrient uptake fluxes in apple plants under moderate drought stress, *Environmental and Experimental Botany* (2018), <https://doi.org/10.1016/j.envexpbot.2018.08.016>

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.

Long-term exogenous application of melatonin improves nutrient uptake fluxes in apple plants under moderate drought stress

Bowen Liang, Changqing Ma, Zhijun Zhang, Zhiwei Wei, Tengeng Gao, Qi Zhao, Fengwang Ma*, Chao Li*

State Key Laboratory of Crop Stress Biology for Arid Areas/Shaanxi Key Laboratory of Apple, College of Horticulture, Northwest A&F University, Yangling 712100, Shaanxi, China

Bowen Liang: lbwnwsuaf@126.com;

Changqing Ma: macqing@126.com;

Zhijun Zhang: 15030127393@163.com

Zhiwei Wei: weizhiwei89@126.com;

Tengeng Gao: gaotengeng@nwsuaf.edu.cn;

Qi Zhao: zhaoqi93@nwsuaf.edu.cn

*To whom correspondence should be addressed. E-mail: lc453@163.com, fwm64@nwsuaf.edu.cn & fwm64@sina.com; Tel: 86-29-87082648; Fax: 86-29-87082648

Highlights

The effect of drought-induced stress can be alleviated by melatonin.

Melatonin positively influenced the growth and physiological parameter of *Malus*.

Melatonin increased ¹⁵N uptake, utilization and accumulation.

Activity of enzymes involved in N-metabolism can be increased by melatonin.

Melatonin increased nutrient uptake by increasing related genes transcription.

Abstract

To examine the potential roles of melatonin in nutrient uptake, we investigated the influence of its long-term exogenous application on ‘Naganofuji No.2’ apple (*Malus domestica* Borkh.) under moderate drought conditions. Both growth and the uptake of macro- and micronutrients were generally decreased in stressed plants. However, the application of exogenous melatonin significantly mitigated this growth reduction and enabled plants to maintain uptake fluxes. This addition of melatonin also markedly alleviated the inhibitory effects of drought on photosynthesis, stomatal apertures, chlorophyll levels, and relative water content, and it controlled the burst of

Download English Version:

<https://daneshyari.com/en/article/8886924>

Download Persian Version:

<https://daneshyari.com/article/8886924>

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