

# Accepted Manuscript

Contribution of old wheat varieties to climate change mitigation under contrasting managements and rainfed Mediterranean conditions

G. Carranza-Gallego, G.I. Guzmán, R. García-Ruíz, M. González de Molina, E. Aguilera



PII: S0959-6526(18)31534-8

DOI: [10.1016/j.jclepro.2018.05.188](https://doi.org/10.1016/j.jclepro.2018.05.188)

Reference: JCLP 13045

To appear in: *Journal of Cleaner Production*

Received Date: 27 November 2017

Revised Date: 25 April 2018

Accepted Date: 22 May 2018

Please cite this article as: Carranza-Gallego G, Guzmán GI, García-Ruíz R, González de Molina M, Aguilera E, Contribution of old wheat varieties to climate change mitigation under contrasting managements and rainfed Mediterranean conditions, *Journal of Cleaner Production* (2018), doi: 10.1016/j.jclepro.2018.05.188.

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.

1 9588 words

2 **Contribution of old wheat varieties to climate change mitigation under contrasting**  
3 **managements and rainfed Mediterranean conditions**

4

5 Carranza-Gallego, G.<sup>1\*</sup>, Guzmán, G.I.<sup>1</sup>, García-Ruiz, R.<sup>1,2</sup>, González de Molina, M.<sup>1</sup>,  
6 Aguilera, E.<sup>1</sup>

7 <sup>1</sup>Agroecosystem History Laboratory, University Pablo de Olavide, Seville, Spain.

8 <sup>2</sup>CEAOAO & CEAC Tierra, Department of Animal Biology, Vegetal Biology and Ecology,  
9 University of Jaén, Spain.

10

11 **Abstract**

12 Agriculture represents about 11% of global anthropogenic greenhouse gas emissions  
13 (GHGe). Many climate change mitigation strategies have been evaluated in Mediterranean  
14 agroecosystems, including their soil organic carbon sequestration potential. High residue  
15 yielding old varieties could constitute a useful alternative, especially for organic farming,  
16 which lacks specific genetic material. In this study, old and modern wheat varieties were  
17 evaluated under organic (ORG) and conventional (CON) management during a 3-year field  
18 experiment under rainfed Mediterranean conditions. Field measurements of biomass  
19 components, literature emission factors, and soil organic carbon modeling were combined in  
20 an attributional Life Cycle Assessment, in order to estimate GHGe from “cradle to farm gate”.  
21 The resulting yield-based carbon footprints of old wheat varieties were significantly lower  
22 than those of modern varieties both under CON management, decreasing from 263 to 144 g  
23 CO<sub>2</sub>e kg<sup>-1</sup>, and under ORG management, decreasing from 29 to -43 g CO<sub>2</sub>e kg<sup>-1</sup>. Our results  
24 indicate that climate change mitigation strategies in Mediterranean rainfed cereal cropping  
25 systems should focus on diminishing GHGe from machinery and fertilizer use, and promoting  
26 carbon sequestration. The combination of organic management and old cereal varieties can  
27 constitute a promising climate change mitigation strategy in these systems, as low area-

\*Corresponding authoress. Universidad Pablo de Olavide. Ctra. Utrera km1, 41013, Seville, Spain.  
Email address: gcaral@upo.es (G. Carranza-Gallego).

Download English Version:

<https://daneshyari.com/en/article/8093894>

Download Persian Version:

<https://daneshyari.com/article/8093894>

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