Title

The century experiment: the first twenty years of UC Davis' Mediterranean agroecological experiment

Journal

Ecology, 99(2)

ISSN

0012-9658

Authors

Wolf, Kristina M

Torbert, Emma E

Bryant, Dennis

et al.

Publication Date

2018-02-01

DOI

10.1002/ecy.2105

Peer reviewed

Data Papers

Ecology, 99(2), 2018, pp. 503

The century experiment: the first twenty years of UC Davis' Mediterranean agroecological experiment

Kristina M. Wolf,[1,8,9] Emma E. Torbert,[1,2] Dennis Bryant,[3] Martin Burger,[4] R. Ford Denison,[5] Israel Herrera,[1] Jan Hopmans,[4] Will Horwath,[4] Stephen Kaffka,[3] Angela Y. Y. Kong,[6] R. F. Norris,[3] Johan Six,[7] Thomas P. Tomich,[1] and Kate M. Scow[1,8]

[1]*Agricultural Sustainability Institute, UC Davis, 143 Robbins Hall, One Shields Avenue, Davis, California 95616 USA*
[2]*The Cloverleaf Farm, 627 Lessley Place, Davis, California 95616 USA*
[3]*Department of Plant Sciences, UC Davis, One Shields Avenue, Davis, California 95616 USA*
[4]*Department of Land, Air and Water Resources, UC Davis, One Shields Avenue, Davis, California 95616 USA*
[5]*Department of Ecology, Evolution, and Behavior, University of Minnesota, St. Paul, Minnesota 55108 USA*
[6]*Center for Climate Systems Research, Columbia University, 545 W. 112th Street, New York, New York 10025 USA*
[7]*Department of Environmental Systems Science, ETH Zurich, Dep. Umweltsystemwissenschaften Madlaina Vera Gartmann, CHN H 47, Universitätstrasse 16, 8092 Zürich, Switzerland*

Abstract. The Century Experiment at the Russell Ranch Sustainable Agriculture Facility at the University of California, Davis provides long-term agroecological data from row crop systems in California's Central Valley starting in 1993. The Century Experiment was initially designed to study the effects of a gradient of water and nitrogen availability on soil properties and crop performance in ten different cropping systems to measure tradeoffs and synergies between agricultural productivity and sustainability. Currently systems include 11 different cropping systems–consisting of four different crops and a cover crop mixture–and one native grass system. This paper describes the long-term core data from the Century Experiment from 1993–2014, including crop yields and biomass, crop elemental contents, aerial-photo-based Normalized Difference Vegetation Index data, soil properties, weather, chemical constituents in irrigation water, winter weed populations, and operational data including fertilizer and pesticide application amounts and dates, planting dates, planting quantity and crop variety, and harvest dates. This data set represents the only known long-term set of data characterizing food production and sustainability in irrigated and rainfed Mediterranean annual cropping systems. There are no copyright restrictions associated with the use of this dataset.

Key words: *agroecology; California; carbon; crop rotations; crop yield; irrigation; long-term agricultural systems comparison; nitrogen; resilience; soil; sustainability; xeric.*

The complete data sets corresponding to abstracts published in the Data Papers section in the journal are published electronically as Supporting Information in the online version of this article at http://onlinelibrary.wiley.com/doi/10.1002/ecy.2105/suppinfo.

Manuscript received 23 April 2017; revised 8 November 2017; accepted 17 November 2017. Corresponding Editor: William K. Michener.
[8] Current address: H.T. Harvey & Associates, 1331 Garden Highway, Suite 300, Sacramento, California 95833 USA.
[9] E-mail: kwolf@harveyecology.com