

عنوان مقاله:

A greenhouse energy-crop growth modeling framework to estimate energy demand and crop yield production

محل انتشار:

هشتمین کنفرانس بین المللی کشاورزی پایدار در محیط زیست، غذا، انرژی و صنعت (سال: 1396)

تعداد صفحات اصل مقاله: 5

نویسندگان:

Ramin Roshandel - *Department of Energy Engineering, Sharif University of Technology, Tehran, Iran*

Farzin Golzar - *Institute of Environmental Engineering, Chair of Ecological System Design, ETH Zurich, Zurich, Switzerland*

Niko Heeren - *Institute of Environmental Engineering, Chair of Ecological System Design, ETH Zurich, Zurich, Switzerland*

Stefanie Hellweg - *Institute of Environmental Engineering, Chair of Ecological System Design, ETH Zurich, Zurich, Switzerland*

خلاصه مقاله:

An integrated modeling framework is proposed to estimate the energy demand and crop yield production of greenhouses. The physical model of greenhouse energy demand is based on the dynamic energy and mass balance while yield production is based on a physiological crop model. The integrated model framework couples these two models, thus allowing one to investigate and track direct and indirect impacts of greenhouse energy-yield tradeoffs during every stage of crop growth over different seasons. The integrated model is validated with energy demand and crop yield datasets available in literature. There was good agreement between modeled results and measured data. Model accuracy for energy demand was measured by R2 (0.88), RRMSE (0.24) and PBIAS (0.23) and for crop yield by R2 (0.954), RRMSE (0.23) and PBIAS (0.19). The results confirm the ability of the integrated model to be used as a decision support tool for analyzing the tradeoff between energy demand and crop yield, which is particularly relevant for growers.

کلمات کلیدی:

Greenhouse, energy demand, crop yield model, integrated framework, dynamic modeling

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/771718>

