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Photovoltaic Structures for Use in Agriculture Farms

Low-profile PV arrays optimize crop growth and solar output for full-scale farming with current equipment.

Researchers at Purdue University have developed new photovoltaic (PV) structures for agrivoltaic farming. These structures can simultaneously be used for growing food and generating electricity. Shadows from current PV modules decrease corn, rice, and wheat yields, and the modules are often expensive . The solar powered devices and design software created at Purdue can optimize food production for farmers while maximizing PV energy production. This PV setup can be implemented for full-scale farming utilizing current farm equipment and is designed with row crops such as corn, soybeans, wheat, and rice in mind. Further, the ideal dimensions and lower height of the new PV structures enable dynamic changes between light and shadow as desired.

Advantages:

-Low cost PV systems for agriculture farms

-Lower height PV structures

-Maximizes land space use for agriculture crops

-Provides increased food production

-Systems adjust upon rain, approaching equipment

Applications:

-Agriculture

-Farming

-Electric Utility

-Renewable Energy

Technology ID

2021-AGRA-69267

Category

Agriculture, Nutrition, & AgTech/Precision Agriculture & Smart Farming
Chemicals & Advanced Materials/Green & Bio-Based Chemistry
Energy & Power Systems/Power Generation

Further information

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View online

Technology Validation: The dimensions of the new PV structures have been fine-tuned to allow sunlight, rain, and shadows to reach plants as needed. In addition, the new PV modules were found to withstand harsh weather conditions like rain or wind.

Recent Publication:

"Sustainable Co-Production of Food and Solar Power to Relax Land-Use Constraints"

Nature Sustainability

DOI: 10.1038/s41893-019-0388-x

TRL: 2

Intellectual Property:

Provisional-Gov. Funding, 2020-11-13, United States

CIP-Gov. Funding, 2021-09-13, United States

Keywords: agribusiness, Agriculture, Agrivoltaics, Chemical Engineering, Crop Management, Crop Yield, Electrical Engineering, Farm Equipment, Farming, Green Technology, Materials and Manufacturing, Materials Engineering, Materials Science, Photovoltaics, profitability agriculture, PV Structures, Renewable, Solar Farm Modeling, Solar Technology