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Novel agrivoltaics solar array project strives to optimize farming land efficiency using solar power

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In a pioneering initiative,Â Iowa State UniversityÂ (ISU) is embarking on a research project to explore the combination of crops and solar power. The Alliant Solar Farm atÂ Iowa State UniversityÂ is a groundbreaking agrivoltaics research project merging solar power generation and agriculture to study how best to optimize land use while providing local community benefits. The array was inaugurated onÂ October 19th.

Horticulture and agriculture students will plant crops to study how they perform under solar arrays of various heights and configurations. Engineering students will review solar production data to see how various crop plantings impact solar production.

The research project received a four-yearÂ $1.8 millionÂ grant from the U.S. Department of Energy via a program called Foundational Agrivoltaic Research for Megawatt Scale (FARMS). ISU was one of only six recipients of theÂ $8 million dollarÂ program. The research team is led byÂ Ajay Nair, Associate Professor of Horticulture; Matt O'Neal Professor in Plant Pathology, Entomology and Microbiology; andÂ Anne Kimber, Director of the Electric Power Research Center.

The project is a collaboration between ISU and Alliant Energy. Alliant Energy owns and operates the solar array on land leased from the university. Waldinger Corporation was the general contractor for the project. Ideal Energy was subcontracted for solar design, procurement, monitoring, and solar commissioning for the project. Ideal Energy designers worked with ISU researchers to design a variety of solar configurations for testing purposes. Shive-Hattery, Inc. provided civil and electrical

engineering services for the project.

Ideal Energy designed the 1.757 MW_{DC} / 1.375 MW_{AC} solar field in two parts. One part is an 811 kW_{DC} fixed-tilt solar array facing south. Six fixed-tilt rows have a standard leading edge of two feet off the ground in front and three rows have a leading edge height of five feet to test to see if higher solar arrays create better growing conditions. The second part is a 946 kW_{DC} single-axis active tracker. Eighteen of the active-tracker rows are a standard five to six feet above the ground while five rows are eight to nine feet above the ground. All solar panels on the site are bifacial, meaning they generate power from both sides.

Researchers plan to explore which crops thrive in a modified solar microclimate. They plan to plant vegetables, fruits, and pollinator habitats. They also intend to study how solar site maintenance impacts cultivation.