Agrivoltaics: Solar Energy Production Paired with Agricultural Use

March 31, 2021 Hosted by Amy Berg Pickett
Intro Host

Credit: Danner Boots in photo Eric Prizza & Amy Berg Pickett Bend, OR
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Acknowledgement: "This material is based upon work supported by the U.S. Department of Energy’s Office of Energy Efficiency and Renewable Energy (EERE) under the State Energy Strategies Award Number DE-EE0007665."

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Intro to Topic

- Ag Land vs Solar Energy
- Undisturbed Land vs Human Disturbed landscapes
- State & National Goals
- Customer Demand
- Colocation of Land Use
- Policy, Perception, Design Considerations

Credit: Cypress Creek EPC
Uses—Pollinator Habitat Creation

- Native Forbs
- Native Grasses

Credit: Understory Consulting Sean Prive
Apiaries

Credit: Pine Gate Renewables
Grazing

Credit: Oregon State University
Crops-Seed Production & Food Crops

Credit: Understory Consulting Sean Prive
Benefits

- Income diversification
- Sustainable development practices,
- Habitat restoration & creation,
- Agricultural products,
- Carbon sink
- Water conservation,
- Soil Quality
- Sediment & erosion conservation,
- Increased biodiversity
- Community Benefits
- Clean Energy
Case Study-Amish Farmer’s Organic Crops

- Pollinator Dependent Crops
- Pollinator Friendly Solar Array
- Compatible and Complementary Uses

Credit: Rob Davis Fresh Energy Center for Pollinators in Energy
Findings-Native Grasses and Forbs

Pollinator Supply (Pollinator Insect Quantity) 3 X’s increase vs previous use of land
Native Grassland Restoration in Array

Leroy J. Walston et al, Modeling the ecosystem services of native vegetation management practices at solar energy facilities in the Midwestern United State, 2021 (see last slide for citation)
Case Study-Pollinator Habitat Creation & Seed Production

• Photo: second year wildflower crop
• Planted as Pollinator Habitat
• Understory Consulting, LLC
• Guest Speaker: Sean Prive

M.S. Oregon State University / B.S. Evergreen State College / Restoration Ecologist / Botanist

Credit: Understory Consulting Sean Prive
Case Study - Apiary-Oregon

Eagle Point Solar-Jackson County

- 67.5 ac previous use subpar grazing
- Adjacent to Harry & David Pear Orchards
- 10MW 46.5 ac Utility Scale Solar operation 2018
- 57 honeybee hive Apiary
- Old Sol Bees & Apiaries
- Guest Speaker: John Jacobs
- President Oregon State Beekeepers Association
Grazing

- Livestock on Solar Farm
- Maintenance of Vegetation
- Shelter for Sheep

Research
Oregon State University Findings
- Improved Animal Welfare
- 200% Land Carrying Capacity

Alyssa C. Andrew et al 2020 (see last for citation)

Guest Speaker: Trent Hendricks of Cabriejo Ranch
Case Study - Sheep Grazing - Oregon

Sheep Solar - Marion County
- 40 ac. Sheep Ranch
- 3MW 17-acre Utility Scale Solar operational 2018
- Vegetation Maintenance
- Landowner & Sheep Love it!
- Shelter Shade In Summer & Protection from Rain

Credit: Amy Berg Pickett

Credit: Google Earth
Case Study - Solar Harvest

• Oregon Community Solar Project & Agrivoltaics Research Project

Prof. Chad Higgins  
Assoc. Professor  
Biological and Ecological Engineering

Dan Orzech  
General Manager

Guest Speaker: Dan Orzech
BIOMASS PRODUCTION ROUGHLY DOUBLED

PLANT WATER-USE EFFICIENCY TRIPPLED

Major Global and National Impacts

- ~1% of cropland would offset the global energy demand if converted to agrivoltaics.

- ~1% of US cropland would reach the nation’s sustainable energy targets, costing ~1% of the annual budget.

- Re-purpose excess energy to make agriculture more sustainable.
Findings-Siting on Agricultural Land

Efficiency of PV Equipment

“The top three land covers associated with greatest solar PV power potential are croplands, grasslands and wetlands. Solar panels are most productive with plentiful insolation, light winds, moderate temperatures and low humidity. These are the same conditions that are best for agricultural crops.....” Elnaz H. Adeh et al, Scientific Reports 08.07.19
Design Considerations & Policy Wish List

• Enact policy for streamlining process and encourages the opportunity to design & operate sustainable Agrivoltaic Systems.
• Remove arbitrary Limitations
• Prioritize education on PV infrastructure as a key element of a farm operation
• Policy Wish list, pollinator Score Card, Agrivoltaic siting incentives
Contact Information

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