



Agrivoltaics



The practice of simultaneous use of land for both agricultural production & solar electricity generation

Agriculture + Photovoltaics = Agrivoltaics

Other terms

Agrophotovoltaics

Agrisolar

Dual-use solar

Low impact solar

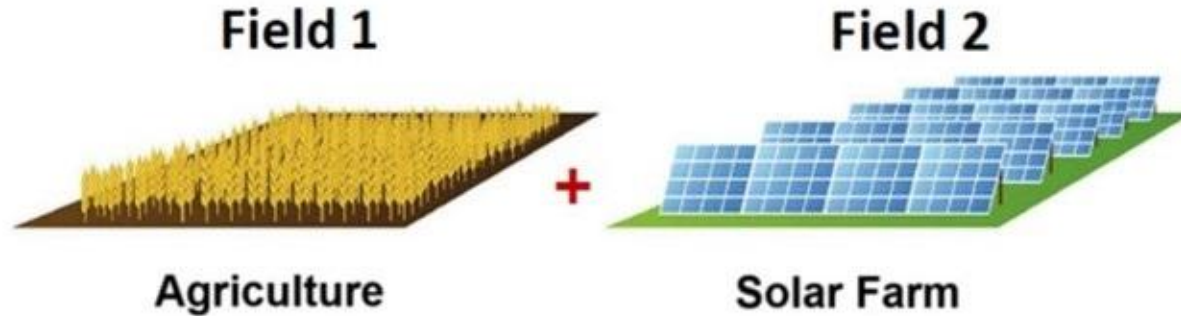


Agrivoltaics - Dual use of land for crops & solar electricity

Conventional

Agriculture and solar electricity generation on separate fields

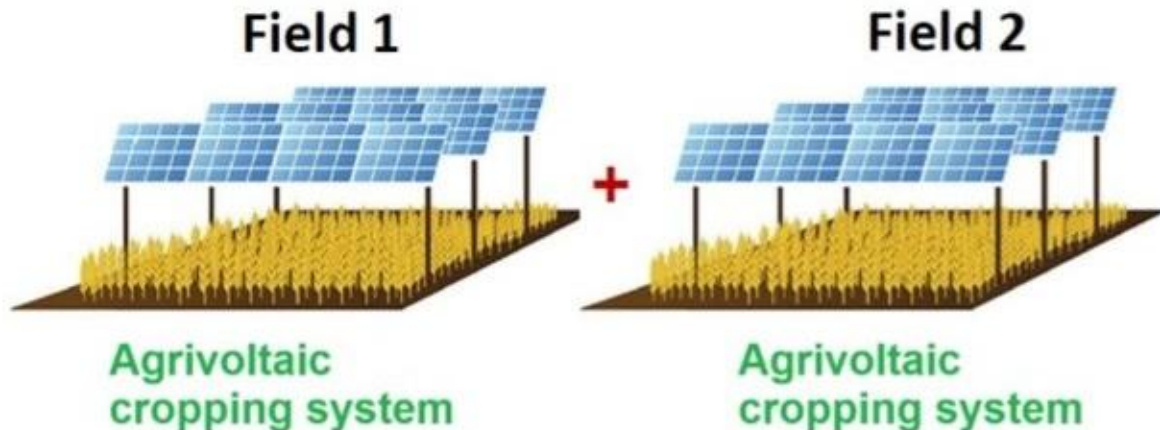
Solar generation reduces productive farmland



Agrivoltaics

Agriculture and solar electricity generation on the same fields

Increase land use efficiency and profitability





In agrivoltaic cropping systems

- ❖ Solar panels are installed on farmland to generate electricity with higher and wider spacing
- ❖ Crops are growing in space between panel arrays & under panels to produce food & feed
 - grain crops
 - vegetables
 - fruit trees
 - forage crops
 - solar grazing (w/ livestock)

Common agrivoltaics (AV) architects

A 72-cell panel sizes 3.25' by 6.42'

One solar array contains numerous pairs of panel

8-15' high of the leading edge from the ground

15-30' between-array spacing



Fixed tilt facing S



Single axis tracker W/E



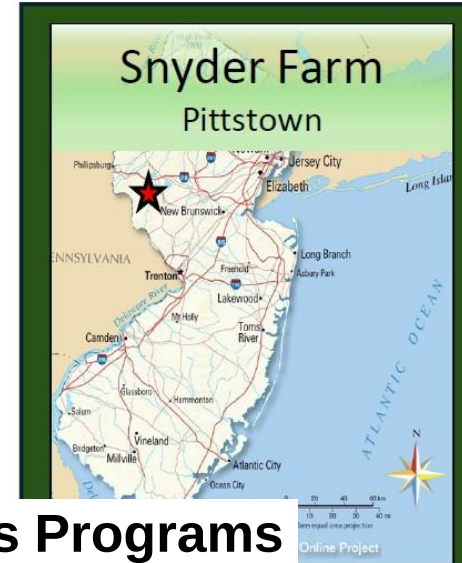
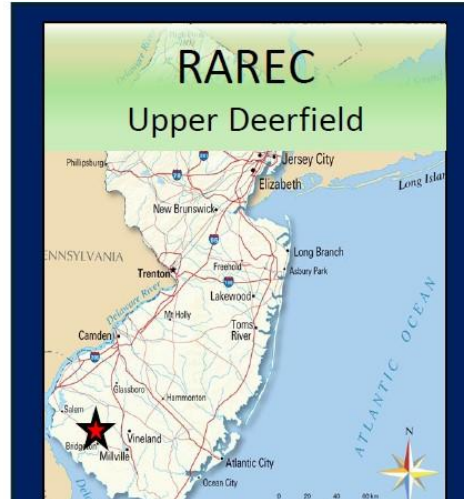
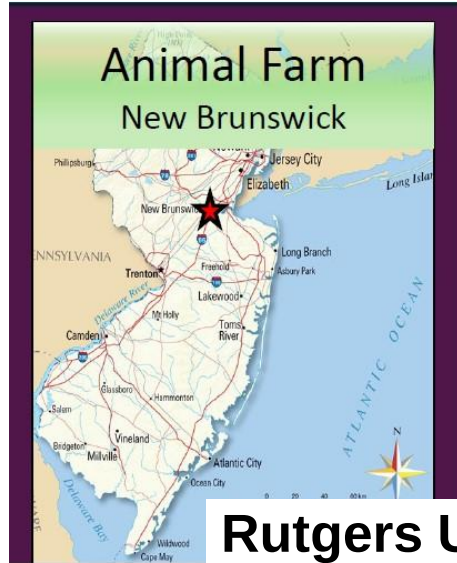
Vertical bifacial



**Solar panels on a farm in Grafton, MA.
Cattle grazes under the 14'-tall panels**



Between-panel array soil is tilled for planting squash



Rutgers University Agrivoltaics Programs
<https://agrivoltaics.rutgers.edu/>



Vertical bifacial panels for
beef cattle grazing and
forage production



Tomato, eggplant & pepper
under double wide single-
axis tracker arrays



Hay production under
single wide single-axis
tracker arrays

RUTGERS AGRIVOLTAICS PROGRAM 2024

Rutgers University Agrivoltaics Programs

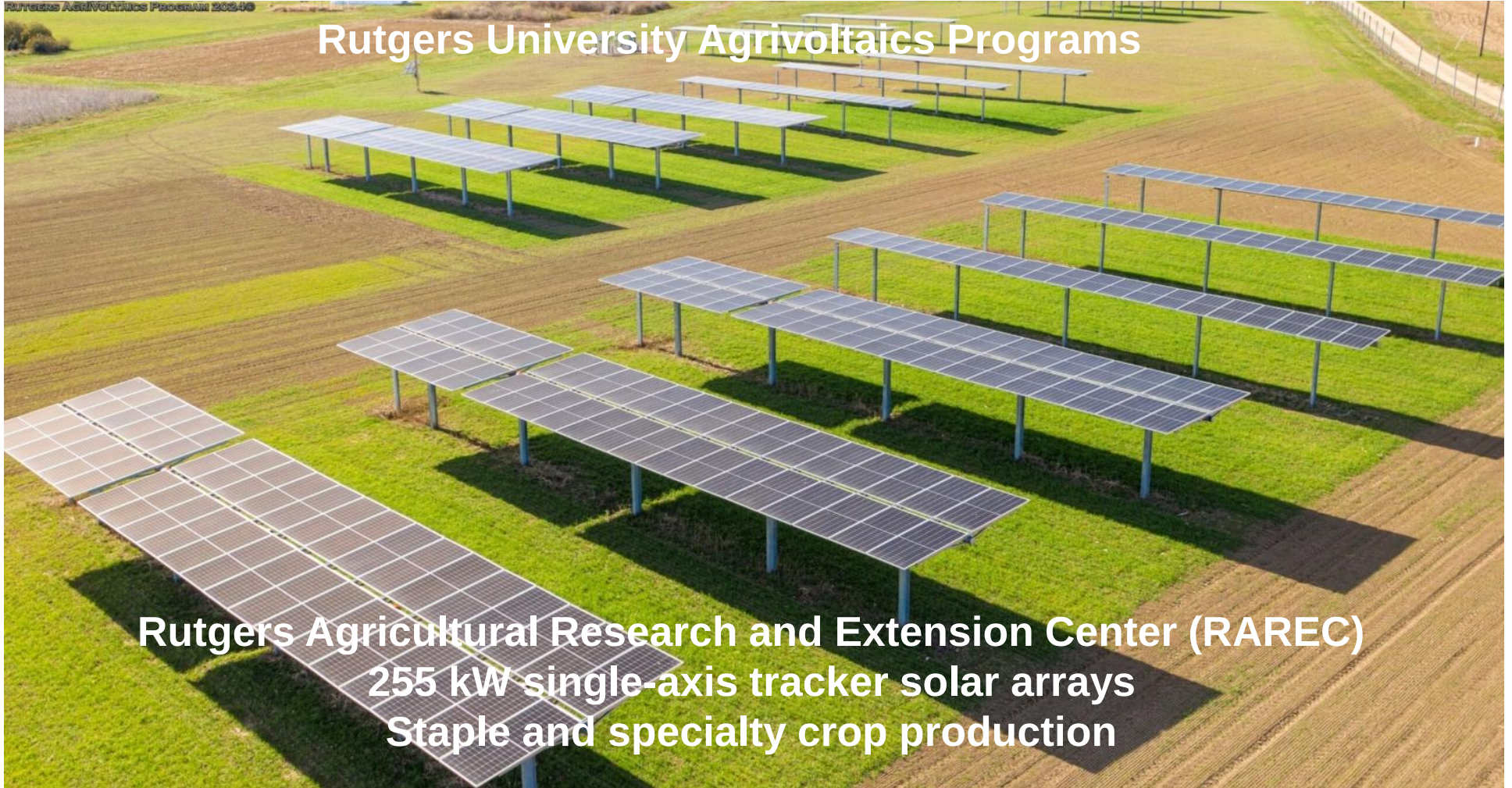


Cook College Animal Farm
170 kW vertical bifacial solar arrays
Large animal grazing and forage production

Rutgers Agrivoltaics Program 2024-25

Rutgers University Agrivoltaics Programs

Rutgers Agricultural Research and Extension Center (RAREC)
255 kW single-axis tracker solar arrays
Staple and specialty crop production



RUTGERS AGRIVOLTAICS PROGRAM 2024-25

Rutgers University Agrivoltaics Programs



Snyder Research and Extension Farm
95 kW single-axis tracker solar arrays
Hay production

Benefits of agrivoltaics



- Joint renewable E & food production
- Symbiotic dual use of farmland
- Promoting land use efficiency
- Enhancing E security & independence
- Mitigating climate change
- Creating cool & moist micro-environ.
- Boosting agricultural sustainability against extreme weathers
- Improving local economy

Challenges of agrivoltaics



- ❑ Not suitable for areas with low sunlight or crops preferring high direct sunlight
- ❑ Agrivoltaic installation is more costly due to special settings & specifications
- ❑ May incur inconvenience to crop cultivation & damages to panels
- ❑ May compromise both solar energy and crop productivity
- ❑ May cause compaction, alter soil hydrology, & degrade soil health

