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For Immediate Release

Agrivoltaics!

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Can food production occur in concert with solar power generation? Recent advancements and interest in solar generated power has some asking "will large solar panel projects decrease available land for crop production?" . Some of these proposed solar farms can cover 80 acres and more and as power needs continuing to grow, tens of thousands of currently cropped acres could be taken out of production. This question of producing both food and electrical power is currently being addressed by Colorado State University (CSU) researchers. Drs. Jennifer Bousselot and Mark Uchanski, CSU researchers located in the Department of Horticulture and Landscape Architecture are currently leading a group of CSU Extension researchers and interns investigating agricultural production underneath solar panels. Dr. Bousselot's specialty is rooftop Agrivoltaics and Dr. Uchanksi's specialty is vegetable Agrivoltaics in field applications. The research team consists of Horticulturalists and Agronomists working to address cropping questions. In addition, CSU Extension and the College of Agriculture are funding two summer interns to this project. These students are not only assisting with labor activities, but learning early science applications in the field of Agrivoltaics. The CSU internship program is extremely competitive with college applicants far exceeding the available spots. For the Agrivoltaic project the two interns for the 2021 season are Blake Gornick and Chris Hayes. In addition, Dr. Bousselot has graduate students also involved who are collecting research data. Although there is potential for finding a crop that will thrive under solar panels, early research is trying to determine what the best strategies are. The first issue is whatever crop is grown, it needs to be shade tolerant, or at least partial shade tolerant as panels are intercepting much of the solar radiation. Other challenges include planting and harvesting activities. Solar panels may need to be raised higher off the ground to accommodate these activities. One advantage is that people working on crops under the panels are also working in shade. Irrigation delivery can also pose challenges, but drip irrigation designs can be placed under solar panels and seem to function adequately.

During the summer of 2020, a rooftop Agrivoltaics pilot study and crop screening was performed under the solar panels at the CSU Foothills Campus and the adjacent full sun area in green roof modules. The agricultural blend Rooflite^{TM} green roof substrate was used and select vegetable crops (lettuce, bush beans,

cilantro) and native plant species (*Allium cernuum*, *Penstemon strictus*, *Monarda fistulosa*, and *Scrophularia macrantha*) were evaluated for their viability in these applications. Irrigation was provided daily (2x a day for the first few weeks) and still most of the crops and native plants died in the full sun area while most survived under the solar panel. The cause of death in the full sun treatment was likely due to high heat and grasshoppers. The substrate was very dark in color and thermal imaging was used to confirm the high temperatures at midday, about 160ºF/71ºC. Both of these stressors were reduced in the shade and therefore did not cause the death of plants at all or at least the mortality that occurred did so much later in the season. In future, substrate materials that are lighter in color will be used for the substrate to prevent the heat stress.

The photo shows an early design regarding a cropping site below panels.

As this science progresses, scientists are confident that solar power can be generated in concert with agricultural activities.

The photo shows CSU researchers, graduate students, and interns discussing Agrivoltaic design.