



Ag Connection

Your local link to MU for ag extension and research information

<http://agebb.missouri.edu/agconnection>

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Solar Energy Development Land Leases

Missouri continues to see interest for utility development (solar and wind farms). Renewable energy developers have been seeking leases with landowners near some transmission lines and substations.

Solar energy land leasing opportunities arise from the development of utility-scale photovoltaic (PV) solar energy systems typically designed to generate more than five megawatts (MW) of electricity. Projects typically cover at least 25 acres. A rough rule of thumb is five acres per megawatt.

There are economic issues for landowners to consider before entering solar energy proposals:

- ▶ Land availability – it is common for solar energy land leases to be written for 20 years or more, with options to renew. This creates a long-term land use constraint that could impact multiple generations. Consider how a lease might complement or conflict with farm goals.
- ▶ Land impacts – construction of the project may require site access and need road construction and land grading to accommodate concrete trucks, semi-trailers with supplies, and heavy equipment. Construction may cause subsurface compaction and potentially impact surface and subsurface drainage. There is minimal land disturbance after construction. The lease should specify how the solar equipment will be removed at the end of the lease. It is important the lease contain the solar energy developer's responsibility for equipment removal and land renovation. The lease should also specify how equipment removal and land renovation are legally assured if the solar energy company fails to perform or ceases business.
- ▶ Financial considerations -
 - ⇒ A utility-scale solar lease could have both positive and negative impacts of farm profitability. The returns per acre from the lease may exceed farm enterprise returns, which could create greater cash flow. On the other hand, removing land from production can require finding additional grazing land or crop acres.
 - ⇒ A solar energy lease may have positive or negative impacts on a farm's borrowing capacity and relationship with ag lenders. Lenders may view increased cash flows from solar energy leases as potentially improving debt repayment capacity. On the other hand, lenders may be unwilling to accept land leased for solar energy development as loan collateral. It is important to communicate with your lender.

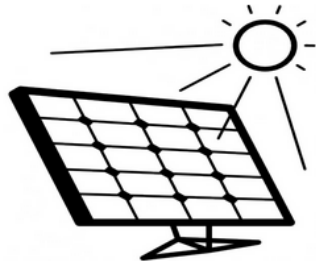
There are several legal considerations including land title and ownership. The energy developers typically request landowners to sign multiple documents. The

three most common are:

- ▶ Letter of intent – commonly limits the landowner's right to negotiate with other developers, the letter may or may not be legally binding.
- ▶ Option to lease – is a legally binding agreement in which the landowner grants the developer the right to lease the land. The time period should be specified and may include the payment terms on an annual per acre rate, liability and tax responsibilities, renewal terms, removal bond and more.
- ▶ The actual lease or purchase agreement.

Each document should be signed only when all terms and conditions are fully understood.

University of Missouri Extension recently released a publication titled "Leasing Land for Solar Energy Development" (G431) with details and considerations for landowners. The publication is available online at <https://extension.missouri.edu/publications/g431> or contact your local county extension office.



Source: *Mary Sobba, ag business specialist*

Grow Your Own Nitrogen Fertilizer

Fertilizer expense can account for half of the cost of producing forages. One way to reduce the commercial fertilizer requirement is to add legumes such as clover, alfalfa, birdsfoot trefoil or lespedeza to pastures and hay fields. Legumes have the ability to produce as much as 300 pounds of nitrogen annually. This happens when a nitrogen fixing bacteria infests the roots of legume plants. The plant provides the bacteria a home and nutrients, and the bacteria provides nitrogen to the plant.

Legumes use the fixed nitrogen for their own growth, but release approximately 20 percent into the soil which can be utilized by grass that is growing with the legume. Generally, a stand with at least 30 percent legume will produce enough nitrogen to eliminate the need for additional nitrogen fertilizer.

The key to successful legume establishment is starting with an adequate fertility level for the legume that is going to be planted. Alfalfa requires high phosphorus and potassium levels and soil pH of 6.5. Clover does best in a soil with medium to high phosphorus and potassium levels and a soil pH of 6.0. Birdsfoot trefoil and lespedeza can tolerate lower fertility levels and lower soil pH. Choose the legume that best suits the current soil conditions or plan to add the fertilizer and lime needed to maintain the legume that is planted.

Most legumes can be planted in the autumn. Lespedeza should only be planted in the spring since it is an annual plant. Birdsfoot trefoil and the clovers (red, white and alsike) can be seeded in late summer or early fall. The best time for fall seeding of alfalfa is September.

It is important to inoculate the seed at planting time with the proper bacteria to ensure the legume plant will produce nitrogen. The strain of rhizobium bacteria needed is different for each species of legume. Because the bacteria are living organisms, care should be taken to keep the bacteria from getting too warm. Store in a cool place until ready to plant, and keep it in a cooler if temperatures are warm on planting day.

The optimum seeding depth for most legumes is one quarter inch. Drilling too shallow is better than drilling too deep. Recommended seeding rates when interseeding into an established cool season grass stand are four pounds per acre for red clover, six pounds per acre for birdsfoot trefoil and 10 pounds per acre for alfalfa. Do not apply nitrogen fertilizer when seeding legumes, as this gives the grass plants a competitive advantage increasing the risk of failure of the legume seeding.

In addition to reducing the need for commercial nitrogen fertilizer, adding legumes to a cool season grass pasture will improve feed quality since they are generally higher in protein. If the companion grass is endophyte infected tall fescue, adding legumes help dilute the toxic endophyte level in the animal's diet. Because legumes begin growing later in the spring and continue to grow later in summer than cool season grasses, a mixed grass/legume pasture will provide forage later in the spring and early summer.

For additional information refer to MU Guide 4652 Seeding Dates, Rates and Depths for Common Missouri Forages <https://extension.missouri.edu/publications/g4652> or contact your local University of Missouri Extension office.

Source: *Valerie Tate, agronomy specialist*

Moving the MOAES Forward

Restructured experiment station centers focused on sharing agricultural advances with Missouri farmers and ranchers

By Logan Jackson, MU CAFNR News Strategist

The Missouri Agricultural Experiment Station (MOAES) includes research farms throughout the state and enjoys a storied history of major impacts by advancing the science in agriculture, food and natural resources — on a local, national and global stage. These University of Missouri College of Agriculture, Food and Natural Resources (CAFNR) outdoor laboratories provide research faculty with a wide variety of real-world conditions to test and develop strategies for advancing agricultural production and technologies, based on the geographical and climatic differences in Missouri.

To allow the MOAES to build on its successes, the CAFNR leadership team spent more than two years studying the needs and challenges facing the research farms in an effort to improve all of the operations and functions of the MOAES.

“We collected information from internal and external stakeholders, including critical feedback from an external review committee of research center leaders and others,” said Shibu Jose, CAFNR associate dean for research and director of the MOAES.

A task force, led by Marshall Stewart, vice chancellor for Extension and engagement at Mizzou, considered the collected information and put together a series of recommendations in a report titled, *Moving AES Forward*. The CAFNR leadership team began implementing those recommendations last August. As of May 1, the restructured experiment station network is complete. The new system better aligns the MOAES with the strategic priorities of CAFNR and MU, as well as creating financial flexibility for investments to keep MOAES at the forefront of basic, applied and translational research.

The most important change was the consolidation of the research farms into four Research, Extension and Education Centers (REECs), each with its own director. The Research Center moniker has been dropped, with two former Centers turned into REECs — the Southwest REEC and the T.E. “Jake” Fisher Delta REEC. The Lee Greenley Jr. Memorial Research Farm, Cornett Research Farm (formerly Forage Systems) and Thompson Research Farm make up the Northern Missouri REEC. Multiple central Missouri properties, including Baskett Forest; Bradford Research Farm; Beef Farm; Foremost Dairy; Horticulture and Agroforestry Research Farm; Land of the Osages Research Farm; Sanborn Field; and South Farm, are now part of the Central Missouri REEC.

Four properties — Graves-Chapple, Hundley-Whaley, Wurdack, and Jefferson Farm and Garden — have been

reclassified as Extension and Education Centers and are now operated by MU Extension.

“Our main focus is moving forward as a unified MOAES,” Jose said. “Like with any change, there is going to be a period of fine-tuning. However, one thing remains unchanged; we will be driven by our mission, which is to conduct unbiased agricultural research and share that knowledge with our stakeholders.”

Jay Chism, Aaron Brandt and Jeff Case serve as directors of the Southwest REEC, Fisher Delta REEC and Northern Missouri REEC, respectively. Dusty Walter is the director of the Central Missouri REEC, and is joined by three assistant directors due to the size and complexity of the REEC. Tim Reinbott is assistant director for natural resources, Andrew Biggs serves as assistant director for crops and Bryon Wiegand is interim assistant director for livestock.

“It’s great to have the leadership team in place,” Jose said. “There is a bit of a different leadership philosophy and expectation with our four directors. We really want them to be visionary leaders who will help drive the MOAES to distinction.”

The individual farms still have on-site leadership as well, in the form of farm managers or senior farm managers, who handle the day-to-day operations. Also, while each research farm continues to have an advisory board, the individual REECs have also developed their own advisory boards.

Jose added that a major focus of the REECs and their leaders will be on making meaningful connections with the communities in their specific regions. In addition to a newly launched monthly newsletter for each REEC, they will continue to offer field days, farm tours, workshops and career exploration days. Each REEC will also have an active presence on social media.

Traditional field days will continue, too. For example, the Fisher Delta REEC hosted its appreciation breakfast, tour and lunch on Friday, Aug. 26. The Northern Missouri REEC Field Day was at the Greenley Research Farm on Tuesday, Aug. 30. The Missouri Chestnut Roast will be held on Saturday, Oct. 1, at the Horticulture and Agroforestry Research Farm.

“We are planning most of the traditional field days again this year, but there is still much discussion taking place on the best ways for each REEC to connect with its stakeholders,” Jose said. “We’re looking at providing multiple workshops, as well as more topic-specific field day offerings. We’re early in the process and still working through our plan, but I’m very excited for the future of the MOAES.”

Trivia: *The Missouri Ag Experiment Station is a result of the Hatch Act of 1887, which established Agricultural Experiment Stations across the country, William Hatch was a U.S. Representative from Missouri.*

National Farm Safety and Health Week

Sept. 18 – 24

Daily Focus

Mon., Sept. 19 - Tractor Safety & Rural Roadway Safety

Tues., Sept. 20 - Overall Farmer Health

Wed., Sept. 21 - Safety & Health for Youth in Agriculture

Thurs., Sept. 22 - Confined Spaces

Fri., Sept. 23 - Safety & Health for Women in Agriculture

<https://www.necasag.org/nationalfarmsafetyandhealthweek/>



CAUTION
Farm Safety Involves Everyone

