



Your local link to MU for ag extension and research information

<http://aqebb.missouri.edu/aqconnection>

For more information please contact your MU Extension Center:

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The Basics of Wind Energy Leases

Wind energy, a form of renewable energy, has been growing throughout Missouri. The first wind farm went online in 2007. The state's wind generation capacity increased from 1,196 megawatts (MW) in 2020 to 2,228 MW in 2021, according to the U.S. Energy Information Administration. This was about five percent of Missouri's net electricity generation capacity (defined as the amount of electricity generated minus electricity used during generation). Missouri was ranked 18th in statewide utility-scale wind capacity in 2021.

Land requirements for wind turbines vary according to the site and equipment specifications. It takes about 130 wind turbines to produce each additional 300 MW of wind capacity, according to published estimates for Missouri. Ameren's High Prairie Renewable Energy Center in Adair and Schuyler counties has 175 turbines with a combined capacity of 400 MW across 50,000 acres.

Land use agreements for wind energy can include language for a land lease, easement or a combination of leases and easements. The agreements are often called "wind leases" or "wind agreements". Each lease situation is unique, and individuals should seek the advice of experienced and qualified professionals (e.g., attorneys, accountants) to understand how the terms and conditions of wind lease proposals could affect farmland, farming operation, family, and community if considering a wind lease.

Economic Considerations: Landowners may find wind energy agreements to be attractive income sources. Row crops and other agricultural production can usually continue around wind turbines, and lease payments often far exceed cash rental rates for farmland. However, signing a wind energy agreement has potential implications for business planning, farm financial management and land use.

1. Business planning helps landowners think about where the business is today and where it is headed in the future. Wind energy leases may impact business planning in at least two ways: a) Wind agreement payments and changes to the landowner's property tax expense are two common ways a wind energy lease impacts landowner income and expenses and b) wind energy leases could potentially impact land availability and access for different business purposes.
2. Farm financial management: the payments from a wind energy agreement create new cash flow for the landowner. Income from the agreement usually includes annual lease and/or easement payments. In addition, there may be one-time payments for the use of the land.
3. Land use includes turbines being widely spaced apart. Exact spacing varies by project. The U.S. Department of Energy estimates one to three acres of permanent land use per turbine with 25 to 125 additional acres needed between turbines.

Equipment removal should be specified in the agreement and state the energy company's responsibility for removing the wind turbine and any additional equipment. The wind energy agreements usually last 20 or more years but it is important to understand each party's responsibilities. This could be accomplished with a removal bond requirement in the lease.

There are many legal considerations for farmland owners considering wind energy agreements.

A *land lease* provides someone other than the landowner the right to possess and use the land. The landowner receives a lease payment in exchange for letting another party use the land to construct and operate the wind turbine. *Land easements* allow someone besides the landowner to use or access the land for a particular purpose. Transmission line easements and wind easements are common in wind agreements. *Options* provide the wind company or energy developer with the right (option) to do something. Common options in wind energy agreements are the option to lease and/or develop the land, the option to operate on the land, and the option to extend the agreement for a certain period of time.

Land owners must have a good (or "clean") title to the land to negotiate a wind energy agreement. Another consideration is wind turbines and equipment are taxable commercial property. The wind agreements usually specify the wind turbine operator is responsible for paying the tax.

Liability is another consideration. The following questions are commonly addressed in wind energy agreements: What happens if land use laws or local zoning regulations change after wind turbines are constructed? What is the liability exposure from the presence of wind turbines on the land? Who is liable for accidents that could occur during constructions and maintenance? What about issues with endangered species (ex. birds and bats)?

A wind energy agreement will affect how leased land is treated in government programs. Consult USDA to determine impacts.

There are social and environmental issues to consider as well. There could be local opposition from neighbors. There could be environmental and wildlife concerns.

Many farms in Missouri are multiple generations. Family succession plans should be considered when looking at a long-term agreement. Each generation of the family may have different goals. Retirement and farm expansion are two areas that could be challenging within the family.

Wind energy is growing in Missouri. Development of

additional utility-scale wind energy farms could offer new opportunities for Missouri landowners. It is very important to have proposed wind energy agreements reviewed by qualified professionals and understand the implications for land use, finances and liability. It is also important that landowners be attentive to community, environmental and family impacts.

Resource: MU guide *Introduction to Wind Energy Leases*
<https://extension.missouri.edu/publications/g432>

Source: *Mary Sobba, ag business specialist*



Growing Lavendar in Missouri

A team of MU Extension Field Specialists received a Missouri Department of Agriculture Specialty Crops Block grant in January 2021, to fund a lavender research project at three sites in Missouri: Kirksville, Springfield and Ste. Genevieve. The purpose of the project is to learn which cultivars of lavender are best suited for each site based on flower production, winter hardiness, drought hardiness and overall vigor of the plant, and provide this information to producers and home gardeners.

The project started in Kirksville in May of 2021. Over 120 lavender plants, 13 cultivars, were planted in seven raised rows with drip irrigation laid down the length of each row to provide water to plants during dry periods throughout the summer. Data was collected every two weeks from the first week of June 2021 through the end of October 2021. Data collected included height and width of the plants, vigor and in bloom/not in bloom. Based on data collected last fall, the cultivars 'Super', 'Phenomenal', 'Grosso', 'Melissa' and 'Provence' performed the best.



Plants were covered in late December with row cover for winter protection. Garden staples were used to keep the covers in place. The covers were removed on March 29, and pruning was done in April to remove dead growth and shape the plants. The plants started blooming in late May with the first flower harvest of 2022 on June 3. Flower stems for each cultivar were measured, with 'Grosso' and 'Provence' having the longest stems. The flowers were weighed and weights recorded for each harvest. In 2022, the same cultivars, 'Super', 'Phenomenal', 'Grosso', 'Melissa' and 'Provence', again out-performed all the other cultivars. All these, with the exception of 'Melissa', had 14-21 inch stems. Stem length is important for floral arranging. 'Grosso' was the biggest producer of flowers. 'Melissa' is a white flowered cultivar, with shorter stems, but it is very pretty when arranged in bouquets with the purple cultivars.

This information has been presented at workshops, programs and through newsletters. Already, a local producer has made the decision to incorporate lavender into her existing operation. She has 400 plants in the ground with another 400 that will be planted this spring. Her plans are to develop value-added lavender products like soap, infused honey, candles, sachets, and much more.

Home gardeners should consider growing lavender. It makes a beautiful addition to a garden, and there are several benefits to growing it. Apart from its beautiful color, lavender is known for its soothing scent. It has a relaxing effect and helps relieve stress. Lavender oil is a commonly used ingredient in shampoos, soaps, air fresheners, candles and scented sachets. Fresh lavender plants will keep a garden fragrant as well as attract a variety of pollinators like bees, butterflies, praying mantis and others. In urban settings where the population of natural pollinators, including bees and butterflies, is on a decline, lavender plants offer an invaluable attraction to these species.

Some insects like fleas, flies, and mosquitos do not like lavender. Hence, growing a lavender plant in a garden may be a way to deter these unwanted insect pests. The use of lavender products on skin can serve the purpose of mosquito repellent without damaging your skin.

Lavender plants prefer full sun and a sandy-loam, well-drained soil. Water-logged or soil that is always moist or wet will cause root rot in the plants and may kill them. For more information on growing lavender, contact the MU Extension Center in Adair County at 660-665-9866 or email schutterjl@missouri.edu.

Source: *Jennifer Schutter, horticulture specialist*



Updates from the Northern Missouri Research, Extension and Education Center

Field Notes:

Students from the University of Missouri College of Veterinary Medicine traveled to the Cornett Farm in Linneus to perform routine herd health on the fall herd.

Each year vet students from all over the U.S. come to the Cornett Farm as part of their clinical rotations.

Lysimeters:

With the help of Nichole Miller, Dr. Gurbir Singh and Rodney Freeman are installing lysimeters (soil water solution samplers) into a field-based trial that will be planted to corn next year at Greenley. The trial is

looking at how to best optimize fall and spring-applied nitrogen with or without a nitrification inhibitor by measuring nitrogen use through plant removals and loss mechanisms. The lysimeters allow us to sample water that moves through the soil profile to account for the leaching losses. The suction cup of the lysimeter is buried ~18 inches and two lengths of tubing are left above ground to be able to pump air out of the black tube and collect water from the tubing for analysis at our water quality lab being built on site. There is also a partnership with Dr. Morgan Davis (School of Natural Resources) to measure nitrogen loss through denitrification using blue rings buried into the plot and a portable gas analyzer.

Industrial Hemp:

Two members of our Plant Sciences team at Greenley, Nichole Miller and Rodney Freeman finished up biomass harvest for their industrial hemp variety trial. The group is testing collaborator-developed industrial hemp varieties for their ability to perform in northeast Missouri through maturity, biomass, and seed production. Five late maturing varieties did not produce seed but can instead be evaluated for overall biomass produced. Hemp biomass is used for fiber production to be used for rope making as an example. The crew cut 16' of a row, weighed the bundle, and then subsampled the bundle to determine the moisture correction for further data analysis.

Research Highlight

Drainage and Nitrogen Management Affects Soil Health and Soil Properties

Harpreet Kaur, Kelly A. Nelson, and Gurpreet Kaur Subsurface tile drainage is used extensively throughout the Midwest U.S. and utilization in claypan soils could increase potential for nitrogen (N) leaching losses with tile drainage. To improve the nutrient use efficiency and sustainable crop production, best management practices such as a 4R nutrient stewardship framework are being implemented. The objective of this 5-yr study was to evaluate the impacts of N management systems on soil health indicators in drained and non-drained claypan soils. Drainage treatments included no drainage (ND), free drainage (FD), and N fertilizer treatments include a non-treated control (NTC), fall applied anhydrous ammonia (AA) with nitrapyrin (fall AA + Ns), enhanced pre-plant AA (spring AA), and advanced top-dress (42 kg ha⁻¹ SuperU and 126 kg ha⁻¹ ESN top-dress as a 25:75% granular blend) (TD). Soil samples were collected at 0-10 cm, 10-20 cm, 20-40 cm, and 40-60 cm soil depth from 2015-2021 and were analyzed for soil pH, cations, cation exchange capacity (CEC), nitrate-N (NO₃-N), phosphorus (P), organic matter (OM), organic carbon (OC), and soil texture. Drainage and N fertilizer management impacted movement of cations in the soil profile, increased OM, pH, Bray-I P, OC, and total N content in soil. Advanced TD N application in tile-drained soils had more pronounced effect on soil properties with an increase in Ca²⁺, Mg²⁺, K⁺, Bray-I P, OM, TOC, and TN. However, significant depth and year

effects showed significant seasonal variability between N management systems.

Submitted by: *Jeff Case, NMREEC Director*



PPAT Schedule

The following list is for in-person training. Pre-registration is required with limited seating. To register call the county extension center. Additional sites will be in the February newsletter.

For questions call Valerie Tate (660)-985-5123.

Adair County- Jan. 24 @ 10 a.m., or 2 p.m. MU Extension Center

Carroll County- Feb. 15 @ 10 a.m. or 2 p.m. Carrollton Public Library

Chariton County- Jan. 30 @ 10 a.m. Chariton County Courtroom

Grundy County- Jan. 31 @ 10 a.m. or 2 p.m., NCMC Barton Farm

Linn County- Feb. 9 @ 2 p.m. or 6 p.m. Forage Systems Research Center 660-895-5123

Livingston County- Feb. 8 @ 10 a.m. Mildred Litton Community Building

Macon County- Jan. 26 @ 10 a.m. or 2 p.m. MU Extension office

Mercer County- Feb. 8 @ 2 p.m. MU Extension office

Putnam County- Feb. 2 @ 2 p.m. 4-H Building at the Park

Randolph County- Jan. 30 @ 2 p.m. MU Extension Office

Schuyler County- Feb. 7 @ 10 a.m. or 2 p.m. Assembly Room, Courthouse basement

Sullivan County- Feb. 2 @ 10 a.m. City Hall Community Room