

Conservation land may be good for planting alternative energy crops

The search is on for the best energy source to heat our homes and power our vehicles in the future, and fuels from plants, also called biomass energy sources, are among the options researchers are studying.

Among the questions still to be answered, however, are what crops will work best and on what land they should be grown.

What Land to Use?

"Growing energy crops on prime agricultural land is not a sustainable option because it can compete with food production and increase concerns about land clearing," said Kansas State University soil scientist Humberto Blanco, based at Hays. "One of the most viable options for growing energy crops can be the use of marginal and abandoned lands. Lands currently enrolled in the U.S. Department of Agriculture's Conservation Reserve Program are potential candidates for growing cellulosic biomass that can be turned into fuel."

He and K-State agronomist Alan Schlegel, Tribune, have recently published information on the impact of converting reserve lands to grain crop production and "energy crops" may have on soil quality, soil carbon sequestration and water and wind erosion.

The conservation program was established in 1985 to reduce water and wind erosion of soil on marginal or degraded crop lands. Landowners voluntarily enroll their land for 10 to 15 years and receive annual payments as well as 50 percent cost-share for establishing standard conservation practices.

The largest concentration of reserved lands is in the Great Plains – about 45 percent of the total. About 8 percent of U.S. farmland is enrolled.

"The benefits of CRP for reducing water and wind erosion have been widely recognized,"

said Blanco, adding that studies also suggest that it has made soils a sink rather than a source of atmospheric carbon – an added bonus.

But wouldn't growing dedicated bioenergy crops on former conservation reserve land reverse the good accomplished in reducing erosion and sequestering carbon? Not necessarily, Blanco said, adding that it can depend on the crop grown and other factors.

Which Crop?

Corn stover – the leaves and stalks of the corn plant – is under consideration as one of the sources for producing cellulosic ethanol, Blanco said. But indiscriminate and large-scale removal of crop residues such as corn stover can harm the soil and the environment. In addition, corn is an annual crop.

For that reason, scientists are looking for alternatives that would not involve removing crop residue for biofuel production, he said.

"Unlike crop residue removal," he said, "growing perennial grasses and trees has the potential to provide many ecosystem services including water and wind erosion control, soil organic carbon sequestration, and improvement of soil properties which supplying feedstocks for cellulosic ethanol production."

The researcher said that growing perennial warm-season grasses on retired CRP lands for biofuel may be an alternative to converting them to grain production. Unlike conversion to grain crops under conventional tillage, growing perennial warm season grasses would maintain the benefits from the Conservation Reserve grasses, Blanco said.

He suggested two options for the management of these lands, which could result in a net increase in soil organic carbon sequestration, reduced greenhouse gas emissions, and improved soil and water quality.

"The first option is to intensively manage the existing CRP lands with proper biomass harvest frequency, cutting heights and additions of manure" Blanco said. "This would preserve the existing grass mixtures. Because returning CRP lands to crop production can be difficult, due to the large accumulation of plant residues on the soil surface... enhanced management for biomass production might be a better alternative...."

"The second option is to plant native warm-season grasses or monocultures of perennials into the existing CRP lands. Recropping CRP lands with grasses such as switchgrass is a possible option. Depending on the region and climate, short-rotation woody crops or fast-growing trees such as hybrid poplars and willow can also be grown on some CRP lands."

Studies have shown that ethanol yields from perennials grown on marginal lands can be greater than yields from corn stover, he added.

"Because of their greater effectiveness for controlling soil erosion than grain crops, perennials may allow application of larger amounts of manure without increasing risks of water pollution," Blanco said. "Growing dedicated energy crops (such as switchgrass) on former CRP lands under intensive management can provide biofuel feedstocks and sequester soil organic carbon while improving soil properties and reducing water and wind erosion."

He acknowledged that scientists are a long way from having definitive answers to the questions surrounding biomass energy production, including the type of land on which it should occur.

While there are many published studies assessing the impacts of cropland conversion to Conservation Reserve on soil and the environment, Blanco there are few assessing the impacts of converting reserve land to crops. The few that have been done indicate that reverting to crop production can harm the soil and environment, particularly if these lands are intensively plowed. Converting these lands to dedicated energy crops may thus be a potential option for study.

Keep a weather eye for farm equipment

As the wheat turns golden and harvest season begins, it's important that drivers exercise extra caution and patience around farm trucks, tractors and combines.

Every year there are numerous crashes between passenger vehicles and farm vehicles, many of which could have been prevented.

"Sharing the road with farm implements requires different precautions than sharing the road with passenger vehicles. The time, space, and differences in vehicle operations need to be understood in order for our farmers to be kept safe, as well as other motorists," Kansas Highway Patrol Superintendent Colonel Terry Maple said.

Most farm equipment doesn't travel at highway speeds, and may only go 15-25 miles per hour. Often wider than other vehicles, and sometimes wider than the lane of traffic, extra room should be allowed for it. Practice extra caution, especially on rural roads with unmarked intersections.

In 2008 in Kansas, there were 109 crashes involving farm equipment. Two people were killed, and 42 injured in these crashes.

Here are some safety tips to keep in mind when sharing Kansas roads with farmers:

- Don't assume the farmer knows you're there. Most of the operator's attention is on keeping equipment safely on the road and watching for oncoming traffic. Farm vehicles are also extremely loud, hindering the ability to hear your vehicle.

- Pass with extreme caution. Do not pass a farm implement unless you can see clearly ahead of the equipment you are passing. If there are curves or hills, wait to pass until you can see clearly. Remember not to pass in a "No Passing Zone," even if you are stuck behind a farm vehicle. Do not pass within 100 feet of any intersection, railroad grade crossing, bridge, elevated structure, or tunnel.
- Allow extra room when following farm equipment. Just because a farm vehicle pulls to the right does not mean it is turning right or allowing you to pass. Due to the size of some equipment, the farmer must make wide left turns, so allow it plenty of room and time to turn, and be alert to surroundings to see if there might be a driveway or field they are turning into.
- Be patient. Don't assume a farmer can move aside. Shoulders may be soft, wet, or steep, which can cause the farm vehicle to tip. The farmer understands you are being delayed and will move over at the first safe location available.
- Think of the slow-moving vehicle emblem as a warning to adjust your speed. When you see it, slow down. It is often difficult to judge the speed at which you are closing in, especially at night.
- Pay attention. Don't be distracted by the radio, cell phones, or anything else while driving.
- Always wear seatbelts and use child safety seats. This is the best defense against injury and death should you be involved in a crash.

“One of the most viable options for growing energy crops can be the use of marginal lands.”

Humberto Blanco, Kansas State University

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