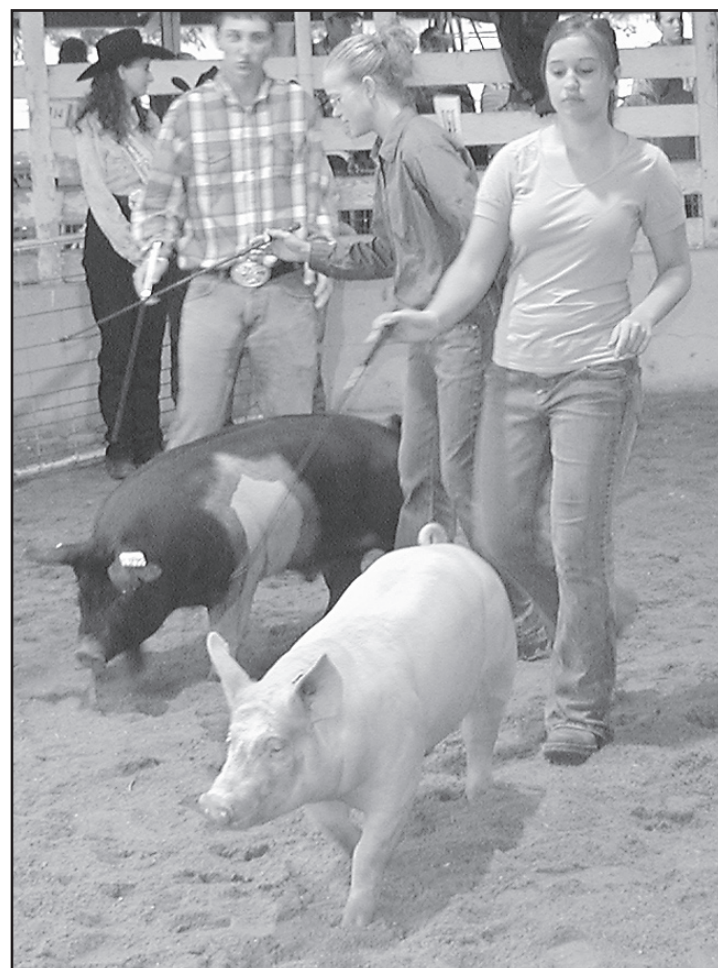


Looking good for judges



ANDY HEINTZ/Colby Free Press
Bailey Terrell (left) of Colby, Wyatt Werth (middle) and Rose Bear (right) of Brewster displayed their pigs for the judges during the 4-H Swine show on Wednesday at the fairgrounds.

Scientists searching for best fuel plants

MANHATTAN – In a field tucked into the northern side of this college town, just across from the Kansas State University football complex, grow some unusually tall plants, part of the university's research into promising biofuel feedstocks that may power vehicles of the future.

"We are studying sorghums and perennial grasses because we think these will be used in the nonirrigated acres in Kansas to produce biomass," said K-State Professor of Agronomy Scott Staggenborg. "On our irrigated acres, corn will remain the crop of choice (as a biofuel feedstock), but on our dryland acres – especially in extremely dry environments, perennial grasses may be the crop of choice. Plus, since sorghum has the ability to perform better than corn when it is hot and dry, it gives us options."

Staggenborg, a researcher with K-State Research and Extension, is working with a team of graduate students and other scientists in studying two types of forage sorghum and other potential feedstocks. They include a dual-purpose forage sorghum and photoperiod-sensitive forage sorghum.

"We believe that in this region, sorghums will be a better fit for our environment in many cases, than corn," he said. "We know a

lot about corn as an industry, but widespread knowledge about sorghum is somewhat limited.

"The reason that we like the dual-purpose forage sorghum is that it produces grain and stover and can do so at nearly the same rate as corn."

Stover includes leaves and stalks, the nongrain parts of the plant.

"The reason both grain and stover are important is that right now the ethanol industry is grain based and that will not change overnight," Staggenborg said. "If we have a crop that produces both, then we can help the industry evolve."

The advantage of photoperiod-sensitive forage sorghum is that in some climates, such as Manhattan, it does not produce any grain.

"I realize this is a bit of a contradiction, but as the industry specializes, the need for biomass is going to be complicated by separating the grain and the biomass in crops such as corn and dual-purpose forage sorghum," Staggenborg said. "Photoperiod-sensitive forage sorghum is a tropical plant that needs declining day lengths and just over a 12-hour day length to trigger flowering. In Manhattan, that occurs in early October, so all this thing does is produce stems

and leaves all summer long. As a result, it will fit anywhere."

In K-State's trials, the photoperiod sensitive forage sorghum has been one of the highest biomass producers, he added.

The scientists are also studying sweet sorghum, a plant that soars 8 to 12 feet at maturity and thrives in dry conditions. The crop has 16 to 22 percent sugar content.

"The first real advantage to sweet sorghum is that all you have to do is press the juice out of the stalks and you essentially have sugar water that is ready to ferment," Staggenborg said. "No pretreatment is needed as in grain or biomass to expose the sugars."

A drawback to sweet sorghum, however, is that, because it is tall and lanky, it tends to fall down.

The K-State team is working

with Texas A & M researcher Bill Rooney to improve sweet sorghums.

"We planted some of Bill's experimental hybrid sweet sorghums last year," Staggenborg said. "They were shorter plants and appeared to be very productive."

In addition to studying annuals such as the sorghums, the K-State scientists are studying perennial grasses, including big bluestem, switch grass and miscanthus.

When asked how long it might be before these crops might make their way into early commercial applications, Staggenborg said, "I would guess that it will be three years at a minimum before we get a feel for what the cellulosic (alcohol production) industry will look like. Obviously, this will affect the use of these crops."

Understanding terminology important in biofuel debate

MANHATTAN – Biofuels have been much written about and discussed in recent years, but some of the terminology can be confusing. Here are descriptions of several terms as defined by the Bioenergy Feedstock Information Network.

Bioenergy: Useful, renewable energy produced from organic matter; the conversion of complex carbohydrates in organic matter to energy. Organic matter may either be used directly as a fuel, processed into liquids and gasses

or be a residual of processing and conversion.

Biodiesel: Fuel derived from vegetable oils or animal fats to supplement or replace petroleum diesel fuel. It is produced when oil or fat is chemically reacted with an alcohol.

Biofuels: Fuels made from biomass resources, or their processing and conversion derivatives. Biofuels include ethanol, biodiesel and methanol.

Biogas: A combustible gas de-

rived from decomposing biological waste under anaerobic conditions. Biogas normally consists of 50 to 60 percent methane.

Biomass: Any organic matter that is available on a renewable or recurring basis, including agricultural crops and trees, wood and wood residues, plants (including aquatic plants), grasses, animal waste, municipal solid waste and other residue materials. Biomass is generally produced in a sustainable manner from water and

carbon dioxide by photosynthesis. There are three main categories of biomass – primary, secondary, and tertiary.

The Bioenergy Feedstock Information Network comprises the U.S. Department of Energy, Oak Ridge National Laboratory, the National Renewable Energy Laboratory and other research organizations. Its address on the Web is bioenergy.ornl.gov/main.aspx.

Source: Bioenergy Feedstock Information Network

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