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History of Ethanol

Ethanol has become a hot topic today, but its controversial history actually dates back to the 1800s.

BY MIMI ABEBE

Americans listened carefully as President Franklin Delano Roosevelt gave the famous speech that marked the U.S. entry into World War II.

“With confidence in our armed forces — with the unbounded determination of our people — we will gain the inevitable triumph — so help us God.”

Loren Schmit, a future Nebraska state senator, was 12 years old and living on his family farm in Bellwood, when he heard Roosevelt speak those historic words. Schmit was one of many Americans who believed the U.S. would win the war.

“The first time I heard of ethanol was during the 1940s in World War II,” Schmit said. “The war effort never suffered for want of fuel. I don’t know how they got it done, but they did it. They kept those planes flying.”

By the time the U.S. entered the war, the Standard Oil Co. had made a deal with Germany to cut off the supply of petroleum to the U.S., a key element in making rubber. Uneasy and anxious, the country looked elsewhere for a solution to the petroleum shortage.



ILLUSTRATION COURTESY NATIONAL AGRICULTURE LIBRARY ARCHIVES

The “muse of biofuels” illustration comes from a printed program of the Congress des Applications de L’Alcool Denature, Dec. 16-23, 1902, by the Automobile Club de France. Racing cars ran on alcohol because they had less knock in high compression engines, a quality that was later called “octane.” The image is a synthesis of the harmony between agriculture and industry.

It wasn’t long before the media were turning out images of ethanol-burning cars and slogans like, “Let’s make more rubber!” said Bill Kovarik, an ethanol historian and professor of communications at Radford University in Maryland.

So American farmers quickly began to divert their energies to growing corn for ethanol-based synthetic rubber. The industry grew, and in no time, three-fourths of U.S. rubber was a product of ethanol — not petroleum, Kovarik said.

In fact, about 600 million gallons of corn-based ethanol was produced during World War II, according to a July 2006 Metro Times article in Detroit.

“It’s no exaggeration to say that without the effort that took place here in the Midwest in the 1940s, that the war effort would have been delayed by about a year,” Kovarik said.

According to Schmit, now 78, the ethanol business did more than just create a better source of synthetic rubber for the U.S. It also created a better market for farmers to sell their corn.

That’s why Schmit decided to sell his crop to the ethanol industry. When an ethanol plant opened in Columbus in the 1990s just 14 miles from Schmit’s farm, he was one of the first to start selling his corn to the plant.

World War II wasn’t the first time America saw ethanol. The ethanol industry has a foundation that goes much further back.

Because it was clean and odorless, alcohol fuel made of grain — usually corn — began to replace whale oil in lamps in the mid-1800s.

During the 1850s, the use of whale oil for lamps was declining. Before the Civil War, about 90 million gallons of grain alcohol was used as liquid fuel for lamps, Kovarik said. The best-selling lamp fuel was camphene, made of turpentine, grain-alcohol and camphor oil. It sold for 50 cents a gallon, making it cheaper than whale oil and lard oil.

PHOTOGRAPH COURTESY NEBRASKA STATE HISTORICAL SOCIETY

This photo, taken in April 1933, shows a Lincoln, Neb., gas station of the Earl Coryell Co. selling "Corn Alcohol gasoline." The test marketing of ethanol blends was common in the Midwest at this time, but didn't succeed because the market was dominated by the major oil companies.

In 1862, Congress imposed a \$2-a-gallon tax on all alcohol to help finance the Civil War.

"It was not necessarily meant to be part of the industrial alcohol tax," Kovarik said. "It was really meant to be applied to beverage alcohol."

But because of the temperance movement, said John Carter, senior research associate at the Nebraska State Historical Society, some argued that people would find a way to drink alcohol made for fuel. Moonshiners were a concern.

After the alcohol tax was passed, the alcohol lamp-fuel business disappeared, and kerosene came into the picture. Grain alcohol — usually made from corn — was the major source of lamp fuel before kerosene took over.

The future of grain alcohol — or ethanol — would lie largely in its use as a transportation fuel.

In 1826, Samuel Morey invented the first internal combustion engine that was built to run on alcohol — probably made from grain. Later, Henry Ford championed alcohol fuels made from grain, potatoes or cellulose. In the 1880s, he designed one of the earliest automobiles to burn alcohol.

Meanwhile, Germany had a thriving industry using potatoes and sugar beets to make alcohol for household appliances. Soon the U.S. followed the example of using crops for fuel. In 1906, President Teddy Roosevelt lifted the alcohol tax to give American farmers a chance at a new market.

This meant that alcohol plants could be built for the first time, Kovarik said. At this point, grain alcohol was used to power stoves, coffee roasters and irons and also to fuel cars.

In 1933, Earl Coryell, a gasoline and oil dealer, opened a corn-alcohol gasoline station in Lincoln, Neb., and enthusiasm for ethanol continued to grow.



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Bill Kovarik

Ethanol historian

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In the 1950s and 1960s, few cars other than racing cars burned alcohol — typically, methanol derived from natural gas.

But after a serious accident in 1964, a number of racetracks switched to a mixture of alcohol and additives that had higher octane and allowed for safer performance.

“The alcohol octane is a hundred and ten, so it’s better for racing cars,” Kovarik said.

Recently, racing cars at the Indianapolis Speedway switched to pure ethanol made from corn.

In the early 1970s, rising gasoline prices, coupled with the continuing search for new markets for agricultural products, sparked a renewed interest in ethanol production for fuel.

Gasohol was the term that was coined in Nebraska in the 1970s. Used in the United States, the term refers to a blend of 10 percent corn-based alcohol (ethanol) and 90 percent gasoline.

In the 1970s, the concentration of oil power shifted from the United States and its close allies to the Middle East, Kovarik said. The Organization of Petroleum Exporting Countries, OPEC, created an oil embargo about the time of the 1973 Arab-Israeli War.

Almost immediately, the idea of blending ethanol with gasoline to boost octane caught on in a lot of places, especially in the Midwest.

“Seemed to a lot of us in Washington that to rely more on the ingenuity of ordinary Americans from the Heartland was perhaps a route that we ought to take,” Kovarik said.

In essence, the oil industry responded by grabbing the market. Overproduction was the reason for the oil glut in the 1980s and the price drop to \$10 a barrel for oil, Kovarik said. Consequently, the ethanol industry couldn’t compete.

“We were talking about a crisis situation in the Middle East, where there would be a third of the

PHOTOGRAPH BY KOSUKE KOIWAI

The Nebraska Corn Board set up a 1930s mockup ethanol or “gasohol” station at the Nebraska State Fair in Lincoln, Neb., on Aug. 29, 2007.





world's oil at least would be gone, would not be on the market anymore," Kovarik said. "And what would that do? Not just [to] the prices, but to the availability of emergency services to police and fire trucks to, you know, the lifeblood of the American economy."

Jimmy Carter called for larger quantities of alcohol fuel in 1978.

"He wasn't trying to help the farmers. He was thinking about what might happen in the Middle East. And I think we might need to remember that that still is a possibility today," Kovarik said. Throughout the 1980s, the price of oil was consistently low, hovering near \$20 a barrel. Ahmed Zaki Yamani, former oil minister of Saudi Arabia, used oil overproduction as a way to keep prices low and to keep investments away from alternatives to oil. This strategy took a toll on the Midwest. The economy and the farming community suffered.

Then came the Clean Air Act of 1990.

This act aimed to get rid of the toxins in gasoline — especially benzene, toluene and zylene — and replace them with a cleaner, safer octane booster.

The need for a better octane booster resulted in an increase of ethanol production. The ethanol industry exploded from about 500 to 700 hundred million gallons per year in the 1980s to 2 to 3 billion gallons in the 1990s. The boom was a boost for corn farmers like Loren Schmit.

"When I was a kid, we produced 400 million bushels annually," said Schmit, the former senator who is now an ethanol lobbyist. "This year (2007), we produced 1.4 billion. One billion more!" 🍯

PHOTOGRAPH BY KOSUKE KOIWAI

A tractor pulls grain on a field near Adams, Neb., in early November 2007. In the background is the E Energy Adams, LLC ethanol plant. The plant began operation in October 2007, using approximately 55,000 bushels of corn to produce 150,000 gallons of ethanol daily, according to the Nebraska Public Power District.

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