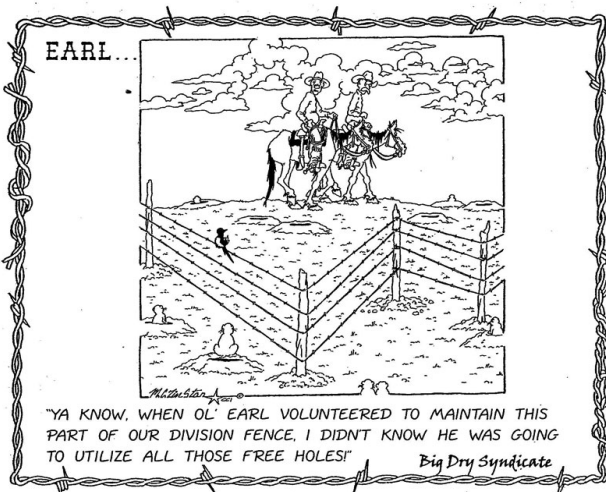




PHOTO: RITA BRHEL



The Right Stuff?

Ethanol Use in Antique Tractor Engines

BY RITA BRHEL
P&D Correspondent

Like classic cars, old tractors never go out of style — whether for antique machinery enthusiasts or still being put to work on the farm. They're the perfect size for acreages and backyard gardens, and they often have sentimental value to their owners.

"Legacy tractors are simple and durable. They've survived years and years. They were Grandpa's first tractor," said Ed Brokesh, agricultural engineering instructor at Kansas State University in Manhattan, Kan.

However, "the legacy engine is an engine that was made in the 1950s," he added. "They are designed for fuel in the 1950s. Even though they look the same, today's fuels are not the same as it was then."

The biggest difference through the years has been the addition of ethanol, but even gasoline fuels themselves have changed.

"Gasoline fuels are complex," Brokesh said. Gasoline itself has multiple molecules and additives, from ethanol as an oxygenator to detergents, anti-icers and fluidizer soils to corrosion inhibitors, anti-oxidants and metal deactivators.

Look how much gasoline fuels have evolved since the 1970s when the biggest changes to the fuel's composition began:

- 1896 — Henry Ford built the first automobile to run on pure ethanol
- World War I — ethanol blends were widely used
- 1919 — ethanol was replaced by other additives in gasoline due to the Prohibition
- 1933 — the Prohibition ended and ethanol blends were widely used during World War II, but after the war ended, so did the government contracts and farmers found it more profitable to sell grain to the export market
- 1970s — the United States placed embargoes on gasoline supplies from foreign countries, sparking renewed interest in ethanol; however, engines were not developed for ethanol compatibility
- 1975 — lead started being phased out of gasoline
- 1980s — Engines start to be built for ethanol tolerance
- 1995 — fuels no longer contained lead
- 1996 — ethanol was found to be an acceptable alternative to the MTBE additive
- 2000 — MTBE started being phased out
- 2006 — fuels no longer contained

MTBE and ethanol blends were widely used

Other major changes through the years include altering engine design from carburation to fuel injection and improving efficiency in refining consistency.

Today, all gasoline fuels contain some portion of ethanol. Not all states have a labeling requirement, so ethanol may only be used as an additive, but 70 percent of all gasoline sold are ethanol blends, Brokesh explains. There are three types of blends:

- E10 — 10-percent ethanol and 90-

ing is not very good on the life of your engine."

Older tractors that haven't been run regularly need to be started on a "richer mixture" — a lower ethanol blend — to increase fuel flow to prevent engine heating, he advises. Adjusting the needle valves for the main jets and keeping the tractor at "low idle" also helps with engine heating. In addition, the fuel should be shut off during tractor storage.

"If you use the vehicle more, you'll probably have less problems," Brokesh said.

The tractor can then be eased into the higher blends as damaged engine parts are replaced with ethanol-tolerant parts.

"You got a 40-year-old tractor," Brokesh said. "It has needs regardless of the fuel you've been putting in it. Fuel lines need replacing. Unused systems may be dirty and corroded. Seals may be deteriorated. If so, you need to replace these anyway. So then, use ethanol-tolerant parts."

Key parts in the carburetors include the seals, jets, floats and needle valve points. Also, watch for plugging in the ports. As far as filters, seals are particularly susceptible to damage and the filter medium needs to be checked for compatibility with ethanol. Filters should not have any rust, varnish or water traps. Sediment bowls should be cleaned regularly. Fuel tanks should be cleaned prior to refilling, and the inside of the tank should either be coated or replaced entirely if there is damage. Special attention should be given to the cap and vent, and fuel lines should be routinely inspected and replaced as needed.

Once engine parts have been replaced as needed, it is safe to use ethanol blends as freely as modern engines.

"Once clean, ethanol will keep it clean," Brokesh said. Ethanol is superior to gasoline in system cleaning, anti-knock, moisture control, and cooling properties.

But even with ethanol-tolerant engine parts, older engines are susceptible to vapor lock when using ethanol blends.

"Ethanol tends to vaporize more than gasoline," Brokesh said. "The end result is that pressure will not allow the fuel to flow through the fuel system. The only thing you can do is let the engine cool down."

"... the legacy engine is an engine that was made in the 1950s. They are designed for fuel in the 1950s. Even though they look the same, today's fuels are not the same as it was then."

ED BROKESH

percent gasoline, can be used in all engines

- E15 — 15-percent ethanol and 85-percent gasoline, can only be used in engines dating back to 2001 or newer
- E85 — 85-percent ethanol and 15-percent gasoline, can only be used in flex-fuel engines

"Gasoline will continue to evolve," Brokesh said. "Engines and refining adjustments are coming. We all love to breathe, so air quality demands will continue to evolve. Ethanol will continue to be in gasoline. More blends with greater ethanol content are coming."

Ethanol's major properties are that it's 100 octane, requires a lower combustion temperature and is a mild solvent, all of which are benefits over straight gasoline, Brokesh explains. And ethanol's energy content is not any different than that of gasoline, which means that fuel economy is similar between the two. The biggest difference is that ethanol is hygroscopic while gasoline is hydrophobic, meaning that gasoline repels water while ethanol attracts it.

Engines of antique tractors new to ethanol are likely to suffer some power loss as well as engine heating. Fortunately, one buffers against the other.

"A little power loss in these engines is a good thing," Brokesh said. "You don't want to run your engine at full power or you might damage it. You want to keep your engine running longer. Engine heat-

Extension: Overall Crop Budgets Down

BROOKINGS — A few weeks before harvest South Dakota overall crop budgets are showing lower returns for 2014, said Jack Davis, SDSU Extension Crops Business Management Field Specialist.

"With lower commodity prices and near constant costs compared to the past four years, returns to labor and management are projected below levels realized during that time," Davis said.

Davis said the projected prices used in the budgets are lower than 2013 projections. Projected prices per bushel are corn at \$4.50, soybeans at \$11.50, and wheat at \$6.50," Davis said.

Direct costs estimates per acre are corn at \$385, soybeans at \$195, and wheat at \$195. Direct costs as a percent of revenue are 57.6 percent for corn, 37.8 percent for soybeans, and 50 percent for wheat.

He explained that the two key costs for each crop are seed and fertilizer.

"Seed and fertilizer expense as a percent of revenue are at 36 percent for corn, 20 percent for soybeans, and 29 percent for wheat," Davis said. "As seed and fertilizer costs are a high percentage of revenue, management focus on these two items will pay good dividends. Land and machinery costs are also key cost items in each of the crops."

He explained that to achieve the greatest return on farming operations, management time should be spent on cost control and best management practices of key input items.

"Fertilizer costs were the most variable category from year to year and prices have trended lower for fertilizer during 2013," he said.

He added that corn on corn is not as profitable as the past few years.

"If a farm experiences yield drags with continuous corn, crop rotation may offer a profitable alternative. The price and yields used in these budgets favor soybeans also giving incentive to use crop rotation," he said.

To learn more, visit iGrow.org.

USDA Seeks Applicants For Funds To Assist Rural Microentrepreneurs

WASHINGTON — Agriculture Secretary Tom Vilsack has announced the availability of loan and grant funds to support rural microentrepreneurs and microenterprises.

"By supporting very small business enterprises through the Rural Microentrepreneur Assistance Program, USDA has been able to direct assistance to small firms that otherwise might not be able to obtain credit," said Vilsack. "This program has shown that even a modest investment of federal dollars can have a huge impact for the local economy in small towns across rural America."

Despite budget uncertainties, USDA remains focused on strengthening the rural economy.

USDA's Rural Microentrepreneur Assistance Program (RMAP) was established under the 2008 Farm Bill to support the development and ongoing success of rural microentrepreneurs and microenterprises, which are defined as rural businesses with 10 or fewer employees. About \$12.2 million will be provided to eligible applicants this year. Under the program, USDA may provide loans of up to \$500,000 to Microenterprise Development Organizations (MDOs). They, in turn, make microloans for business start-up or development to eligible microentrepreneurs who are unable to obtain conventional credit elsewhere. Grants of up to

\$30,000 are available for MDOs to provide technical assistance and training, particularly in rural areas that have experienced significant outmigration.

RMAP applications are due by Sept. 13, 2013. More information about how to apply is available in the Aug. 14, 2013 Federal Register. View it here: www.gpo.gov/fdsys/pkg/FR-2013-08-14/pdf/2013-19765.pdf, or by contacting any USDA Rural Development state office.

Since the program began, USDA has provided 97 loans totaling more than \$37 million and 124 grants totaling more than \$9.5 million to 110 MDOs. These organizations used the USDA funding to make more than 760 microloans to 712 rural microenterprises. This assistance to individual businesses has created or saved an estimated 2,700 jobs.

BROOKINGS — The South Dakota Sheep Growers will host their 76th annual Convention in Brookings Sept. 27-28. Make plans now to attend the 2-day event which will feature a broad range of activities for established and new sheep producers in the region.

The convention is headquartered at the Days Inn Hotel Convention Center. Activities begin each day at 8 a.m.

• Friday Sept. 27 — The day will kick-off with a bus tour to a large, progressive sheep operation near Watertown. In the afternoon, enjoy demonstration and interactive sessions at the SDSU Sheep Unit located in Brookings.

Sessions will include; sheep handling systems, use of working dogs, wool and fleece grading and lambing management tips.

Nationally recognized industry experts will lead the sessions. In the evening, at-

tendees will enjoy the Taste of Lamb event which will be held at Innovation Village in Brookings. During the event, local chefs will showcase their talents in preparing lamb product samples. The event will feature wine by J. Lohr and cheeses from South Dakota processors.

The fee for Friday's activities is \$10 per person or \$25 per family.

• Saturday, Sept. 28 — The morning agenda will kick off with representatives from the American Sheep Industry and the American Lamb Board who will provide industry insight on new programs being developed. This will be followed by a presentation by Kreg Leymaster on combating Ovine Progressive Pneumonia (OPP) in the sheep industry. Dennis Melchert, manager of the Faribault Woolen Mill — Faribault, MN will highlight innovations in wool product manufacturing.

The Master Lamb Producer Luncheon will spot-

light several outstanding producers from South Dakota with different types of sheep and wool production management systems.

Saturday afternoon will feature break-out educational program sessions where attendees may choose from a variety of topics. The program title choices will include; Developing a Flock of Highly Productive Ewes, Predator Control and Parasite Resistance, or New Producer segment. A business meeting will be held later in the afternoon and attendees are encouraged to take part. The evening will be capped off with a social hour and auction followed by the state finals of the Make It Yourself with Wool Contest and banquet.

• Trade show — A trade show will run during the two-day convention. And, a Fleece to Shawl will run Sept. 28 from 9 a.m.-5 p.m. during which time the contestants will complete a shawl from

South Dakota wool. The shawls will be auctioned prior to the banquet Saturday night. Saturday morning will also feature fun, hands-on wool activities.

Saturday's program is included in paid SDSGA membership dues or is \$10 per person or \$25 per family for non-members.

Pre-registration is encouraged for both days by Sept. 13. For more information contact Jeff Held at 605-690-7033, Lynn or Dianne Perry at 605-546-2190, Patty DeZeeuw at 605-690-5639 or Mary Held at 605-690-7032 or simply by email request a registration form: sdsheepgrowers@yahoo.com.

Thank You!

We wish to thank everyone for all the cards, well wishes and gifts we received for our 60th anniversary. A special thank you to our children and their families and Rev. Michael and Ann Hecht for our special get together at the Salem Reformed Church in Menno. God has blessed us with a wonderful family and good friends.

Don and Frances Herrboldt

Thank You

We wish to thank our children; Kevin & Vonnie, Brian & Diane, Brett & Kim and our grandchildren, our family and friends for the wonderful celebration of 50 years of marriage. We would also like to thank everyone who sent us cards.

Thank You & God Bless
Terry & Joyce Carda

KYNT
AM 1450
MORNING COFFEE
WEEKDAYS 7:40AM MONDAY THRU FRIDAY
Yankton's Home Team!