

April 2014

CC270 Fuel Storage

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Shelton, David P. and Bashford, Leonard L., "CC270 Fuel Storage" (2014). *Historical Materials from University of Nebraska-Lincoln Extension*. 3108.

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JUN 17 1988

Farm Energy Tips



— USE ENERGY WISELY —

Fuel Storage

CC270

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As fuel supplies become scarcer and costs continue to rise we need to consider various practices which can reduce the amount of energy now being wasted. The wise manager can easily reduce fuel wastage.

One area you might overlook when analyzing your operation is fuel storage. The losses from one gasoline storage tank may cost you more than \$75 per year.

There are a number of factors which can contribute to fuel tank losses. The **first** is tank color—dark tanks generally have high evaporation losses. A **second** is tank location—shaded tanks lose 75 percent less fuel than tanks exposed to sunlight. A **third** factor is the filler cap—a tank equipped with a pressure-vacuum relief cap will lose half as much fuel as a tank with a conventional filler cap.

Fuel Leaks

Examine all connections between the tank outlet and the hose nozzle as well as the hose itself. Look at the ground under the hose and tank. Are any of the connections moist or caked with dust? Does the ground show indications of fuel leakage from the hose or tank? If any of these conditions exist, both fuel and money are being wasted.

If a fuel storage system leaks a drop every two minutes, chances are about 35 gallons (130 l) per year are being lost. That is enough fuel to plant 50 acres (20 ha) of corn.

Fuel leakage can often be corrected by simply tightening the connections. In more stubborn cases, you may need to disassemble the system and apply a thread sealant during re-assembly. Replace cracked or damaged fittings or hoses. See that the

fuel filter is clean and sealing properly.

Filler Caps

Very often, only the fuel supplier pays attention to the tank filler cap. You should take a critical look at the filler caps on your fuel tanks. This small item may cause a loss of 40 to 50 gallons (150 to 190 l) of gasoline per year if it is a conventional filler cap. The cost of a pressure-vacuum relief filler cap can usually be recovered during the first year. These caps can be purchased from some farm supply stores or from your fuel supplier. Generally, evaporation losses will be cut in half.

Tank Color

The dull red or old rusty fuel tanks visible on many farms waste fuel. You can cut evaporation losses by one-third by painting a dark tank white or aluminum. For example, a red gasoline tank located directly in the sun will lose about 10 gallons (38 l) per month, whereas a white tank in the same location will lose about 6 gallons (23 l). Cost of the paint can usually be recovered during the first year. (Gasoline containers which hold less than 60 gallons (225 l) must be painted vermillion red. However, tanks which hold more than 60 gallons (225 l) may be painted any color. White is best.)

Tank Location

Shade makes a substantial difference in the amount of evaporation loss. When a fuel tank is completely shaded, color has little effect on fuel losses. For example, a tank located directly in the sun will lose about four times as much gasoline as will a similar tank totally shaded. This is true regardless of the season of year. By installing a

pressure-vacuum relief filler cap, losses can be reduced still further.

Tank shading can be provided by a large tree, but in most instances, this tree will not provide much shade during the winter. Constructing an open-front shed over the tanks is the most effective means of shading them (Figure 1). The front of this shed should face away from the sun, and openings should be provided below the roof to prevent heated air from being trapped over the tanks.

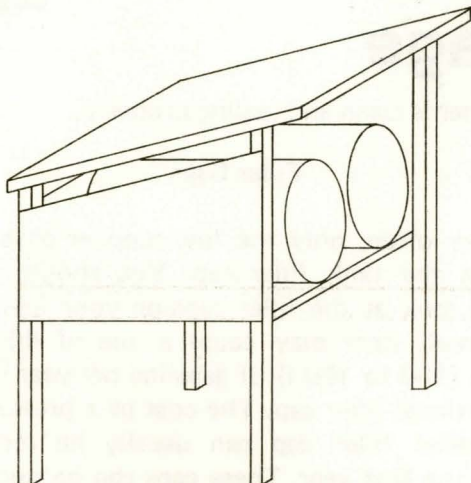


Figure 1. Good fuel storage shed.

Fuel Quality

Losses are only one aspect to consider when looking at evaporation. Nearly as important is the change in gasoline quality that occurs. Fuel varies in composition depending upon the season of the year. Winter-grade gasoline vaporizes more readily. This aids in easier starting and more rapid warm-up during cold weather. The more volatile or "lighter" components are also more easily evaporated during fuel storage. Under certain storage conditions, fuel delivered as a winter-grade gasoline will, through evaporation of the lighter components, change to the equivalent of a summer-grade gasoline. This change will make an engine start harder and require more choking.

As gasoline quality deteriorates there is an increase in the percent gum content. When gasoline with an excessive gum content is used, this gum will be deposited in the carburetor, in the intake manifold, and on the valves. Also, lacquer deposits will form on the pistons and cylinder walls. All of these deposits will cause unfavorable engine operation and excessive engine wear.

Fuel Loss Examples

Using the common 300 gallon (1140 l) tank as

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Table 1. Gasoline losses for a variety of tank situations.

Tank configuration	Representative gasoline losses	
	Gallons month	Liters month
Red tank in sun	9 to 10	(34 to 38)
White tank in sun	6	(23)
Red tank in sun with pressure vacuum relief valve	5.5	(21)
White tank in sun with pressure- vacuum relief valve	3.2	(12)
Tank in shade	2.4	(9)
Tank in shade with pressure-vacuum relief valve	1.3	(5)
Underground tank	less than 1	(3)

an example, some typical gasoline losses for a variety of tank situations are presented in Table 1.

Remember that poor connections or other leaks will increase these losses.

These figures may not appear very impressive. However, if each of the 68,000 farms in Nebraska had just one red 300 gallon (1140 l) tank in the sun, over eight million gallons (30 million liters) of gasoline per year would be lost to evaporation.

Recommendations

The following steps are recommended:

1. Paint fuel tanks white.
2. Install pressure-vacuum relief filler caps.
3. Provide suitable shade for fuel tanks.

Above all, take all necessary safety precautions when using, storing, or handling gasoline.

- Locate tanks at least 50 feet (15 m) from buildings, preferably both downwind and downhill from the buildings.

- Provide a sturdy tank support stand.

- Label each tank, in large letters as to contents: GASOLINE, DIESEL.

- Label each tank with the words: FLAMMABLE — KEEP FIRE AND FLAME AWAY.

- Keep the area around the tank free from weeds, high grass, debris, rubbish, and litter.

- Shut off engines when refueling.

- Do not smoke or light matches around fuel.

- Keep a dry chemical fire extinguisher handy at all times.

This material was prepared and printed by the University of Nebraska, Department of Agricultural Engineering, Institute of Agriculture and Natural Resources, under a cooperative agreement with the Federal Energy Administration and the states of Nebraska and Kansas.