

11-29-82
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FACT SHEET

ON-FARM FUEL STORAGE

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An improperly protected 300-gallon gasoline tank may lose as much as 10 gallons per month. With today's high fuel prices, reducing unnecessary losses can produce a substantial savings. When analyzing your farming operation to locate places where fuel is wasted, remember the fuel storage facility.

Gasoline Storage Losses

Major factors which contribute to gasoline storage losses are fuel leaks and evaporation. Check for fuel leaks by examining all connections between the tank outlet and hose as well as the hose itself. Also, check the ground beneath the hose. If any connections are

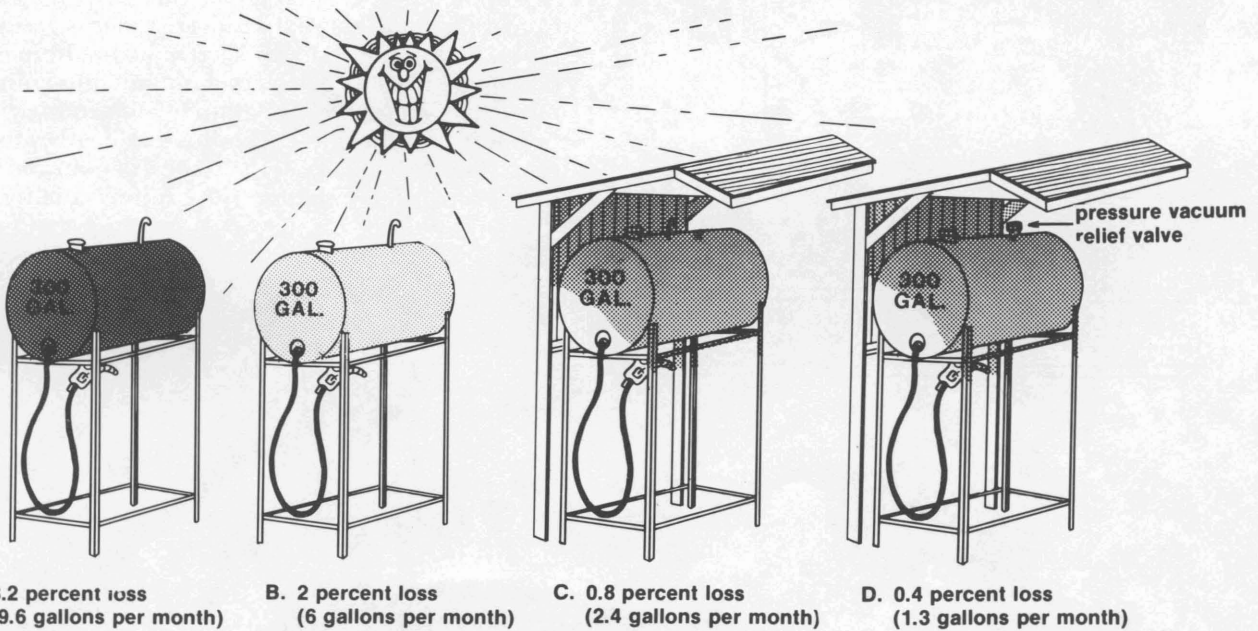
moist or caked with dust, or if the ground shows indications of fuel leakage, both fuel and money are being wasted. A fire hazard also exists.

Evaporation loss from above-ground tanks is important because of loss in both quantity and quality of fuel. Storage tanks need to "breathe" in and out as temperature changes cause fuel to expand and contract. This "breathing" is necessary to equalize atmospheric pressure with that in the tank. The less the tank breathes, the less gasoline is lost and the less impurities (mostly water) enter the tank.

Evaporation losses are affected by tank color, location and type of filler cap. Losses can be substantial if the tank is exposed to direct sunlight and if vapors are free to pass through an open vent. A study by agricultural engineers indicated that the lowest loss to be expected during the summer months in the southern United States from a dark-colored, open-vent storage tank without shade is 14 percent of the

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Figure 1. Several factors affect evaporation loss.



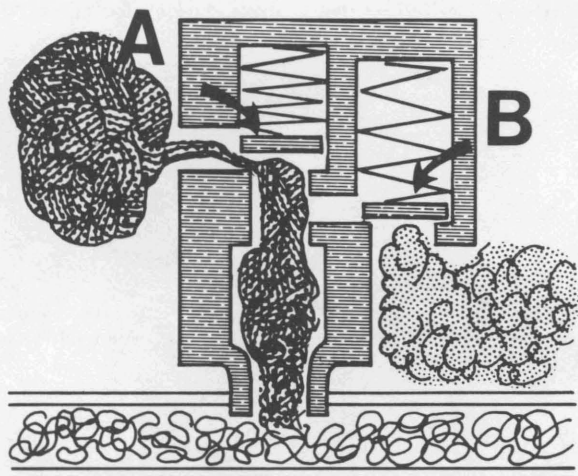
- A. Substantial evaporation loss occurs in red or rust-colored tanks exposed to the sun's heat.
- B. Cut evaporation loss by one-third by painting the tank with white or aluminum paint.
- C. Shade fuel tanks to reduce evaporation loss. Color of tank has little effect when the tank is completely shaded.
- D. Use a pressure-vacuum relief filler cap to further reduce evaporation loss. The tank must be air tight for the cap to work. Cost of the caps, which are available from farm supply and hardware stores, usually can be recovered during the first year.

stored quantity. Figure 1 indicates summer evaporation loss from a 300-gallon tank during 4 weeks with usage of 75 gallons per week. The study was conducted in Missouri. Evaporation is especially rapid at temperatures higher than 90°F. Evaporation loss from underground tanks is minor because temperature of the stored fuel remains low and relatively constant.

Gasoline Quality

Quantity losses are only one aspect to consider. Gasoline quality decreases along with a loss of gallons. Fuel suppliers provide different gasoline blends depending on the season of the year. Winter grade gasoline vaporizes more readily. This aids in starting and warm-up during cold weather. The more volatile or "lighter" components are also easier to evaporate during fuel storage. As a result, winter evaporation losses may be about the same as those in summer. Evaporation of the lighter components may change winter grade gasoline to the equivalent of summer grade, resulting in harder engine starts in cold weather.

Figure 2. A pressure-vacuum relief valve decreases fuel evaporation losses. The spring-loaded valve restricts air movement in and out of the tank. A rise in tank pressure raises the spring-loaded disc-valve (A), allowing air to escape. When storage tanks cool or when fuel is withdrawn, the inlet valve (B) raises and allows outside air to enter.



Gasoline quality may deteriorate when fuel is stored for more than 30 days. Gum content increases with long-term storage. Gum formation is less of a problem with underground tanks because fuel remains cool and less chemical activity occurs.

Diesel Fuel Storage

Evaporation during storage of diesel fuel usually is not rapid enough to be of major concern. What evaporation does occur has little effect on fuel quality. To maintain diesel fuel quality, keep it free of dirt and water and avoid gum deposits.

The fuel injection system on a diesel engine is fitted with parts that are manufactured with very close tolerances. Very fine soil particles cause wear and result in expensive repairs. Water causes corrosion and reduces lubrication, which can ruin the precision parts of the fuel pump and injectors. Manufacturers of diesel engines emphasize the importance of quality fuel free of dirt and water.

Dirt particles may come from several different sources. Some may be present in the fuel when it is delivered by the supplier, but most come from carelessness or improper storage and handling on the farm. Water and sediment settle out of diesel fuel and accumulate at the bottom of the tank. Where a fuel pump is used, keep the suction pipe 3 to 4 inches from the bottom, out of water and sediment. Remove water and sediment periodically and flush the tank with clean fuel, using a valve at the bottom of a tank or a hand pump. Collect contaminated fuel and use for cleaning parts and other shop uses. Install a fuel filter on storage tanks as additional protection against dirt and moisture.

To minimize gum- and varnish-forming tendencies in an above-ground diesel tank, keep it shaded from direct sunlight in the same manner as gasoline tanks. Shading also helps keep moisture from condensing in the tank. Diesel fuel contains gum inhibitors which retard the formation of gum and varnish; however, storing diesel fuel for periods beyond 6 months greatly increases the chance of gum and varnish formation, with a decrease in fuel quality.

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