

## Training Module: Silo Fires

**Objective:** To be able to recognize the safety hazards that cause silo fires.

**Trainer's Note:** Knowing the correct silo maintenance and filling procedures can prevent silo fires.

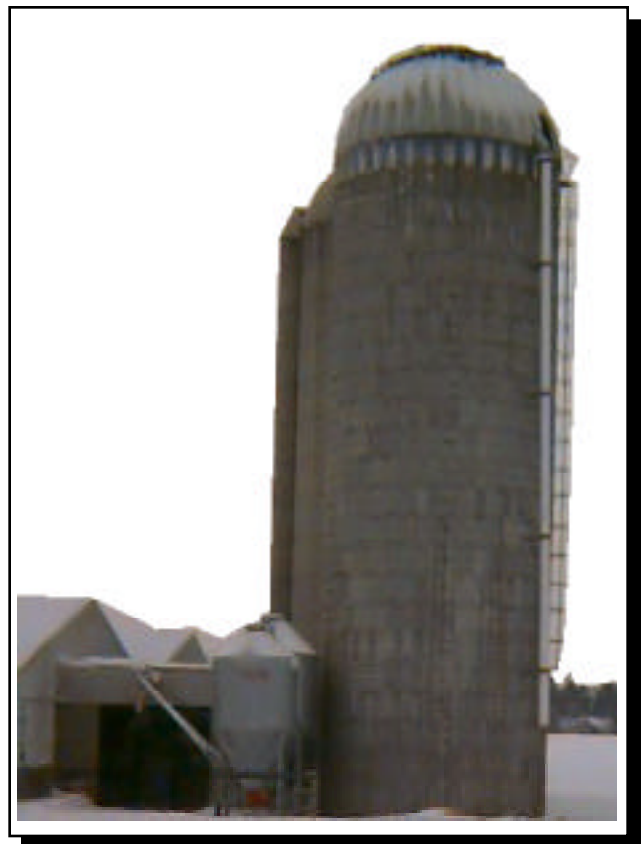
### Background

The critical stage of the ensiling procedure begins with cutting the silage crop while it continues to breathe. This respiration produces enough heat to make the silage hot to the touch for up to a week after being stored, causing the silage to ferment. The silage product should be between 45 and 65 percent moisture when it is put into the silo. When silage is very moist, the moist product conducts heat to the silo walls and spontaneous combustion will not take place.

There is a greater risk for storage problems in a drier season than in a normal growing season. Farmers must remember that if they start filling silo in the morning at the correct moisture temperature, by the afternoon, conditions may become too dry to safely continue. The key to a silo fire not occurring is proper silo management.

Spraying water on already stored, dry silage, or piling wet silage on top of too-dry silage does not increase the moisture content of the product. If the material is dry, below 20 percent moisture content, microorganism will be relatively dormant, so little heat will be produced and spontaneous combustion will not occur. The problem occurs when a crop's moisture level stays between 20 and 40 percent. The temperature inside the silo rises too quickly for sufficient heat dissipation. When the temperature continues to climb, the silage will ignite with the presence of oxygen. A fire may be sustained by an undetected air pocket and camouflaged for weeks by surrounding layers of silage.

Most fires start in the top eight to ten feet of silage where most of the oxygen is trapped.



## **The following recommendations can prevent silo fires:**

### Crop Condition Before Storage

- Cut grass between 45-65 percent moisture.
- Chop grass between 1/4 to 1/2 inch long for closely packed silage.
- Continually check moisture content of silage materials throughout the day.

### Silo Maintenance

- Keep all doors, walls and seals in proper working condition.
- Minimize airflow in conventional and sealed silos.
- Use a silo distributor to uniformly spread silage.

### Storage Procedures

- Empty silos every two years regardless of usage.
- Follow silo builder's recommendations for storage.

If smoke is pouring out of the silo or silo chute, or hot embers are falling down the chute, the farm operator **should not** enter the silo chute to examine the fire. **Call the fire department immediately.** After the fire department is notified, the farm operator should attempt to close the bottom of the silo chute to prevent air movement through the chute. The operator should protect against dangerous gases that are likely to be present. The use of a face respirator is recommended. In the conventional silo fire, dangerous gases will be less of a concern than with a sealed silo fire, where toxic gases are always present.

## **Review The Following Points**

- Seek help from the fire department immediately after detecting a silo fire.
- Do not enter a silo that is on fire.
- Toxic gases are always present with a sealed silo fire.
- Maintaining silos prevents fires. Keep doors, walls and seals in proper working condition.
- Monitoring the moisture content of silage materials can prevent silo fires.
- Providing for the close packing of silage will prevent silo fires.

## **True or False Answer Key**

1. T, 2. T 3. T, 4. F, 5. T

## Silo Fires Quiz

**True or False**

**Name** \_\_\_\_\_

- |   |   |   |
|---|---|---|
| 1. The critical stage of the ensiling procedure begins immediately after cutting the plants.                      | T | F |
| 2. Seek help from the fire department immediately when a silo fire is detected.                                   | T | F |
| 3. Materials put into the silo should be cut between 1/4 and 1/2 inch for better packing.                         | T | F |
| 4. The use of a silo distributor will does not help pack the silage.  | T | F |
| 5. Keep all doors, walls, and seals in proper working condition to help prevent silo fires by eliminating oxygen. | T | F |