

FIREFIGHTERS GUIDANCE NOTE # 6-31

ISSUE: **AGRICULTURAL SILOS**

Fire departments should identify the locations and types of agricultural silos in their response area in order to adequately pre-plan for emergency situations.

Firefighters may respond to locations in which there are fires in or around agricultural silos. Rescue situations may also cause safety issues (e.g. confined spaces) for responders.

There are three types of vertical silos used in agricultural areas in Ontario. Each can pose safety concerns to the firefighters in a fire or rescue situation.

Conventional Silo

These silos can be made of banded concrete slabs, poured concrete or steel plates. These silos unload from the top. Silo fires can result from malfunctioning unloader equipment, spontaneous combustion, crops put in too dry, or barn fires in close proximity. Rescues may be required for farm personnel who are required to enter silos to service un-loader equipment.

Oxygen-Limiting Silos

These silos are made of poured concrete or steel plates. Silos are unloaded from the bottom and fires usually are due to oxygen getting into the silo from leaking seams, un-loader areas, crops put in too dry, or barn fires in close proximity. Farm personnel do not need to enter the silo during unloading or when crops are in the silo as there is not enough oxygen to support life, but there have been cases where people have entered and have collapsed due to low oxygen or the gases produced by the crop preservation process.

Converted Oxygen-Limiting Silos

These silos are oxygen-limiting silos that have been converted to a conventional silo. Silos are unloaded from the top and may still make use of bottom unloaders. These may contain similar hazards to both Oxygen-Limiting and Conventional Silos.

Nitrogenous products in preserved crops give off toxic gases when burning. During an emergency, there is a potential exposure to toxic silo gases and a deficient oxygen atmosphere. Disturbance of grain dust (causing it to become airborne) and the potential presence of methane (microbial decomposition of organic products) can also be sources of fuel for an explosion. Firefighters should exercise extreme caution when responding to these incidents and should not enter into the structure to extinguish fires or conduct a rescue unless the identified hazards and associated risks are mitigated or removed.

Incident Command should identify the silo type, product, hazards and the extent and degree to which fire and heat are transferred within the silo and the surrounding feed rooms or buildings. If available, thermal imaging cameras should be used for this purpose.

An adequate water supply is to be established before commencing any suppression operations and, depending on products involved, firefighting foam may be a consideration. Explosions of both Conventional and Oxygen-Limiting silos during fires are possible.

In a Conventional Silo, apply only as much water or foam as necessary to ensure the containment of the fire. Large amounts of water in the structure may cause a collapse. Do not climb the chute or outside ladder as the system may fail due to heat damage. Until the structure is empty, a fire in a silo should not be considered to be extinguished.

In an Oxygen-Limiting or a Converted Oxygen-Limiting Silo, do not open any hatches, doors or spray water into structure. By introducing water and oxygen, an explosion may result. The silo manufacturer should be consulted for advice on proper procedures to extinguish these fires.

Rescues

Rescues from agricultural silos may require Technician Level rope rescue techniques as there are limited anchor points on these structures. Where the situation may involve confined spaces, refer to GN #6-5 Confined Space Rescue.

Note: Incidents involving industrial dust collectors, hoppers and bins may require different tactics and approaches from those described in this Guidance Note.

Reference:

GN # 6-4 Rope Rescue

GN # 6-5 Confined Space Rescue

GN # 6-16 Machinery/Electrical Lockout during Emergency Response

GN # 6-27 Fires in Industrial Dust Collectors, Hoppers and Bins

The Ministry of Agriculture, Food and Rural Affairs Fact Sheet: "Silo and Hay Mow Fires on Your Farm"

<http://www.omafra.gov.on.ca/english/engineer/facts/93-025.htm#Extinguishment%20Procedures>