



# Crop Science Report

RESEARCH/EXTENSION

ERGOT IN CEREAL GRAINS -  
CAUSE, HAZARDS, AND CONTROL

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## Introduction

Reports of ergot in harvested grain have been received from all parts of Oregon this year. The purpose of this report is to provide information on the disease, on the potential hazards of feeding ergoty grain, and on control measures.

What is ergot?

Ergot is a fungal organism (*Claviceps purpurea*) which replaces one or more of the kernels in a mature grain head with a hard, dark colored, horn-like mass called a sclerotia. This fungal mass may have the shape of the kernel that it has replaced or it may be two to four times the length of a normal kernel. Intact or broken sclerotia are easily seen in harvested grain. Ergot most easily attacks rye (a cross-pollinated grain), but it also can infect barley, wheat, oats, and other native and cultivated grasses including weeds such as quackgrass.

How does ergot grow and spread?

The fungus lives through the winter in the horn-like sclerotia. The sclerotia must be exposed to cold (36-37° F) for several weeks in order to germinate. In the spring, parts of the fungus within the sclerotia begin to grow and after breaking the sclerotia coating form one to several mushroom-like growths called stroma.



Stroma are light-yellow to red in color and are 1-2 mm in diameter. Wind-blown spores are released from the stroma and infect grains and grasses which are flowering (pollinating). Once infected, a grain flower is replaced by a sticky fungal mass called 'honey-dew' which contains millions of new fungal spores. These new spores are spread to other healthy kernels on the same grain head or to other heads by insects, wind or rain. As infected plants mature, the fungus develops into the hard sclerotia once again.

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The fungus is favored by cool, wet weather for sclerotia germination, dry conditions for initial spore spread, and cool weather, which prolongs the grain flowering period to allow honey-dew spread.

Why is the fungus harmful?

Yields are reduced by formation of the sclerotia. Grain containing 0.3% ergot (by weight) is graded as ergoty and is generally not salable. More importantly, ergot is poisonous and can cause serious losses if feed to livestock and poultry. Animals fed large quantities of ergot over an extended period of time develop a dry gangrene resulting in the loss of hooves, ears, tails, combs and wattles. Spontaneous abortion and loss of milk can occur in cows or sows fed even small amounts of ergot. The best recommendation is to not feed ergoty grain; however, if you must, watch animals closely for symptoms or unusual behavior, and consider the following:

- 1) Brood sows, bred and milking cows are most susceptible and should not be fed ergoty grain.
- 2) Cattle are more susceptible to ergotism than other livestock. The USDA Poisonous Plant Research Laboratory in Logan, Utah, suggests that cattle not be allowed to consume more than 1 ounce of sclerotia per head per day.
- 3) In general, for all animals, keep the percentage of sclerotia as low as possible. Run the grain through a cleaner to remove large sclerotia and/or mix ergoty grain with clean grain to reduce the amount present to 0.1% or less. Historically, ergoty grain was immersed in a 20% salt solution (40 lbs salt in 25 gals water) which caused the sclerotia to float and allowed the ergot to be skimmed off. The grain was then washed to remove the salt and dried. This procedure is still effective for small lots of grain.

How is ergot controlled?

- 1) Prevent its introduction into your field by using ergot-free seed grain.
- 2) If some ergot is present in seed grain, plant at a depth of 1-½ to 2 inches. Deep planting does not allow the sclerotia to develop spore producing bodies. Alternatively, store the grain for 2 years and then use as seed as sclerotia lose their viability with time.
- 3) If the field is already contaminated, bury the sclerotia by plowing, destroy weedy grasses in and around the field, and if possible rotate to a non-susceptible crop (alfalfa, clovers, potatoes, etc.). Burning of stubble, where possible, is also an effective control measure.
- 4) Pasture infected fields before seed heads begin to flower.
- 5) When harvesting an infected field, keep grain from outside rounds separate as it is likely to have the highest ergot content due to proximity to weedy grasses.