

# EFFECT OF THE LEVEL OF ERGOT INFESTED SEED ON DISEASE INCIDENCE

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## Abstract

Ergot sclerotia are the primary means of survival and source of inoculum for infection of grass flowers. To determine if there is a direct correlation between the number of sclerotia present in seed at planting and incidence of the disease in following years, 'Coventry' Kentucky bluegrass seed was infested with 0, 0.1, 1, 4, 7, and 10 percent ergot sclerotia by weight. One hundred panicle samples were harvested from each plot and evaluated for panicles with sclerotia, average sclerotia per panicle, and total sclerotia per sample. There were no significant differences in the number of sclerotia present at harvest for the various levels of infestation.

## Introduction

Ergot, *Calvicpes purpurea*, is an important flower-infecting pathogen that is particularly damaging to Kentucky bluegrass seed production. The pathogen produces an elongated, black sclerotia that replaces seed in infected florets and causes a reduction in yield. These sclerotia are the primary means of survival and source of inoculum. In the spring, during flowering, spores from the sclerotia infect the grass flower and produce secondary spores within an exudate (honeydew), which can make harvest difficult. Secondary spores may also be splashed or carried to new florets to infect. The objective of this study is to determine if there is a direct correlation between the number of sclerotia present in seed at planting and incidence of the disease in following years.

## Methods and Materials

'Coventry' Kentucky bluegrass seed was infested with 0, 0.1, 1, 4, 7, and 10 percent ergot sclerotia by weight. This seed was planted September 21, 1994 in 10 ft x 10 ft plots replicated four times at the Central Oregon Agricultural Research Center, Powell Butte location. Plots were separated by 10 foot borders planted with 'Stevens' wheat to provide isolation and prevent movement of secondary spores by wind and insects between plots.

One hundred panicle samples were harvested from each plot on July 1, 1995. Samples were evaluated for percent of panicles with sclerotia, average sclerotia per panicle, and total sclerotia per 100 panicle sample.

## Results and Discussion

There were no differences in the number of sclerotia present at harvest between the different levels of ergot-infested seed at planting (Table 1). Possible explanations would include that much of the inoculum came from outside the plots as either ascospores or as secondary spores associated with insect movement. The 10 foot borders of wheat may not have been sufficient to

prevent cross contamination between plots, or alternately, spores could have come from well outside the trial area. With the plots being sprinkler-irrigated twice a week prior to harvest, it appeared that a moist, high-humidity microclimate developed in the protected pockets of grass surrounded by the three-foot high wheat. This would have provided near optimum conditions for ergot infection during flowering. Further, secondary infection may have been highly favored under these conditions, which could have been initiated by relatively few ascospores. This might account for the relatively low percentage of panicles that were highly infected.

Compared to the untreated plots in related fungicide evaluations for ergot control at the same location, the number of panicles infected with sclerotia were nearly double the average of those in this study. In 1993 the number of panicles with sclerotia in untreated fungicide plots were 70 with a total of 466 sclerotia per 100 panicle sample. The number of panicles with sclerotia in 1994 were 92 with a total of 858 sclerotia per 100 panicle sample. The range of panicles with sclerotia for this study were 38 to 52, with total sclerotia per sample of 801 to 1125.

Because there appeared to be a high level of ergot sclerotia throughout the plots at harvest, a second planting was established at the Central Oregon Agricultural Research Center, Madras location, with an upper infestation rate of 3 percent, rather than the 0 percent in the current study. Both sets of plots will be evaluated during the 1996 harvest.

Table 1. Evaluation of the effect of various levels of ergot-infested seed on incidence of the disease at the Central Oregon Agricultural Research Center, Powell Butte location, during 1994-1995.

Level of Infestation	Panicles with Sclerotia	Sclerotia per panicle	Sclerotia per sample
(percent) -----		(number per 100 panicles)-----	
0	40	7.8	801
0.1	38	8.8	931
1	46	10.7	1125
4	44	9.8	1030
7	52	10.6	1110
10	38	8.4	876
	n.s. <sup>1</sup>	n.s.	n.s.

Non-significant separation of means with the T-method at P 0.05