Oregon State University OSU Extension Service

# Ergot Alert Newsletter

Vol. III, Issue 1

May 09, 2017

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Welcome to the first issue of the 2017 Ergot Alert Newsletter, brought to you by Oregon State University and USDA-ARS, and sponsored by the Washington Turfgrass Seed Commission, the Oregon Seed Council, the Columbia Basin Grass Seed Growers, the Jefferson County Seed Growers Association, and the Union County Grass Seed Growers Association. The goal of this newsletter is to provide information about ergot spore production in the Columbia Basin, the Grande Ronde Valley, and Central Oregon in an effort to aid in decisions related to ergot management during the course of the 2017 growing season.

## Epidemiology of Ergot in Grass Seed Crops

Ergot is a seed replacement disease of grasses caused by fungi in the genus *Claviceps*. *Claviceps purpurea* has a wide host range that includes hundreds of grass species, including important crops and weeds. The fungus overwinters as sclerotia on or near the soil surface (Fig. 2). Primary inoculum consists of airborne spores called ascospores which are produced in the spring and infect unfertilized flowers. Infected flowers exude honeydew (Fig. 2), a sticky combination of plant sap and asexual spores called conidia. Honeydew can be splash-, contact-, or insect-dispersed. The disease cycle is completed when sclerotia are returned to the field at harvest.

## 2017 Ergot Research Projects

We have several new and ongoing research projects at various locations in Oregon and Washington:

- Fungicide screening for ergot control (Madras, Hermiston, and La Grande)
- Kentucky bluegrass cultivar evaluations for ergot escape/resistance (Madras and La Grande)
- Screening biocontrol products (Hermiston)
- Forecasting model evaluation, refinement, and validation (Oregon and Washington)
- Investigate the use of micronutrients to improve pollination and reduce ergot (Madras)

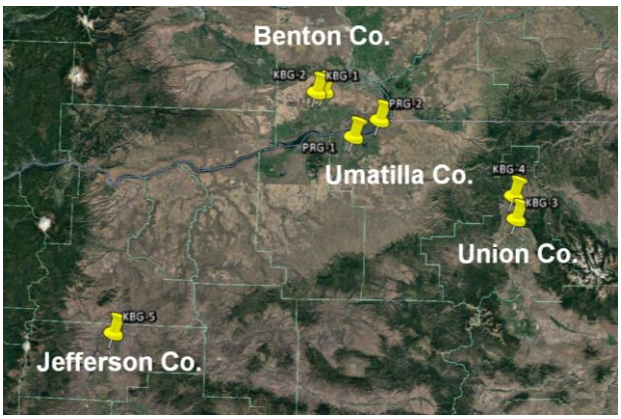


**Fig. 1.** Location of spore traps in the Columbia Basin (Umatilla Co., OR and Benton Co., WA), the Grande Ronde Valley (Union Co., OR), and central Oregon (Jefferson Co., OR).

## 2017 Spore Trap Sites

This year we have seven spore traps deployed in three grass seed production areas: the Columbia Basin (Umatilla Co., OR and Benton Co., WA), the Grande Ronde Valley (Union Co., OR), and central Oregon (Jefferson Co., OR) (Fig. 1). These data will be used to refine and validate regional models and inform growers of spore production through the season.

## Join us in congratulating Dr. Navneet Kaur!

Dr. Navneet Kaur, Postdoctoral Scholar with the ergot research project since 2014, recently began a Postdoctoral fellowship with the University of Idaho. Based at the USDA-ARS near Wapato WA, Navneet is studying the effect of ergot alkaloids associated with *Ipomoea* species on potato psyllid development and survival. *Congratulations Navneet!*

## Welcome Dr. Qunkang (Ken) Cheng!

Please join us in welcoming Dr. Qunkang (Ken) Cheng to the ergot research project. Ken started on May 1st and will be coordinating and conducting research on ergot epidemiology and management. Ken earned his M.S. and Ph.D. in plant pathology from the University of Tennessee. *Welcome Ken!*

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**Figure 2.** Ergot sclerotia (left) and honeydew (right, indicated by an arrow). *Photos: J. Dung and N. Kaur.*

## A Predictive Model for Ergot

A predictive model for ergot ascospores was recently developed for the Columbia Basin of Oregon. The model uses accumulated degree days (beginning January 1, with a base temperature of 50°F and upper threshold temperature of 77°F) to forecast when ascospores are likely to be present. According to the model, most ascospores are produced when accumulated degree days are between 414 and 727.

When tested against data from 2008 through 2016, the model was able to predict between 76 and 96% of the total ascospores trapped during the grass seed production season (Table 1). On average, this degree day period corresponded to a 23 day period from May 14 to June 6, but started as early as May 1 or as late as May 25 and ended as early as May 24 or as late as June 17 (Table 1). This model should help estimate ergot risk potential and assist growers in making informed decisions regarding fungicide application timing.

Please keep in mind that some ascospores are produced outside of this degree day period, so be sure to watch for spore trapping updates in future editions of this newsletter. It is also important to note that this model was developed using data collected from the Columbia Basin, so model performance may vary among the different production regions. No model is ever perfect, so model testing, refinement, and validation will continue in the Columbia Basin and other production regions during the 2017 season. We will also be testing and comparing model-, scouting- and calendar-based programs in Kentucky bluegrass production systems.

**Accumulated Degree Days:**

| Region | April 24 | May 1 | May 8 |
|---|---|---|---|
| Columbia Basin | 173 | 203 | 276 |
| Central Oregon | 96 | 109 | 159 |
| Grand Ronde Valley | 83 | 92 | 140 |

**Table. 1.** Number of *Claviceps purpurea* ascospores trapped when accumulated degree-days were between 414 and 727 compared to the total number of ascospores trapped during the cool-season grass seed production season at 11 study sites, Umatilla County, OR, 2008–2016

| Year | Start date | End date | Days | Ascospores (% total) |
|---|---|---|---|---|
| 2008 | May 25 | June 17 | 23 | 82% |
| 2009 | May 24 | June 9 | 16 | 84% |
| 2010 | May 18 | June 17 | 30 | 90% |
| 2012 | May 19 | June 14 | 26 | 87% |
| 2013 | May 11 | June 7 | 27 | 96% |
| 2014 | May 12 | June 2 | 21 | 76% |
| 2015 | May 4 | May 26 | 22 | 94% |
| 2016 | May 1 | May 24 | 23 | 85% |
| **Average** | **May 14** | **June 6** | **23.5** | **93%** |

Do you have questions, comments or observations about ergot that you would like to share? If so, we welcome your thoughts and insights! Please contact:

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