

Evaluation of fungicides for control of ergot on Kentucky bluegrass in Oregon, 2017

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Introduction

Fungicides are an important component of an ergot integrated pest management program. However, in many cases multiple fungicide applications do not reduce ergot to acceptable levels at harvest. Additionally, current fungicides labeled for ergot control have similar modes of action (FRAC 3 and/or FRAC 11). Repeated applications of fungicides with similar modes of action may increase the potential for fungicide resistance to develop. The same or similar fungicides may be used for powdery mildew and/or rust in grass seed crops, further increasing the potential for fungicide resistance development in pathogens of grass seed crops. Since only two active ingredients are labeled for ergot control in grass grown for seed, novel fungicide chemistries need to be tested for their ability to protect flowers from infection during anthesis. The objective of this research is to screen novel, unlabeled fungicide chemistries for the ergot control during flowering.

Materials and Methods

A fungicide trial was established at the Central Oregon Agricultural Research Center. Plots (26-ft long by 5-ft wide with 3-ft spacing) of Kentucky bluegrass cultivar ‘Shamrock’ were established (5 lb seed/A) on August 12, 2016. Plots were artificially infested with *Claviceps purpurea* sclerotia on October 20, 2016. Treatments consisted of a non-treated control and nine fungicide treatments, including an industry standard (Table 1). Fungicides were applied on May 26, 2017 at the beginning of flowering (Feekes stage 10.51) using CO₂-charged spray boom. The boom was outfitted with three TP8002VS flat fan nozzles spaced 18-in. apart and delivered 20 gal/A at 15 psi. The experimental design was a randomized complete block with four replicates.

Random samples of 50 seed-heads were collected from each plot at the end of growing season (July 18, 2017), from which ergot incidence and severity were measured based on the number of seed heads containing sclerotia and the number of sclerotia present in each seed head. An ergot disease index (EDI) was calculated by multiplying incidence and severity. Data were subjected to analysis of variance and treatment means were compared using Tukey’s honest significant difference test.

Results and Discussion

Ergot incidence and severity was low among all plots in the trial, limiting the ability to detect significant differences among treatments (Table 1). However, Priaxor[®] reduced ergot severity in Kentucky bluegrass by over 50% and significantly reduced overall disease ($P = 0.03$). Adepidyn[®], Approach[®], Trivapro[®], and Luna Privilege[®] also provided similar ergot control compared to the industry standard, Quilt Xcel[®] (Table 1). Data collected from field trials over three years suggest Priaxor[®] is effective at reducing ergot in perennial ryegrass and Kentucky bluegrass seed crops (Kaur et al. 2015).

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References

Kaur, N., Alderman, S.C., Walenta, D.L., Frost, K.E., Dung, J.K.S., and Hamm, P.B. 2015. Evaluation of new fungicide chemistries and application strategies to reduce ergot in grass seed production systems. Pages 23-26 in: 2015 Seed Production Research at Oregon State University USDA-ARS Cooperating. N. Anderson, A. Hulting, D. Walenta, M. Flowers, and C. Sullivan, eds. Oregon State University, Ext/CrS 152.

Tables

Table 1. Ergot incidence, ergot severity, and ergot disease index (EDI) following treatments with fungicides during anthesis

Treatment and rate (oz/A)^z	Incidence (%)^y	Severity^y	EDI^y
Control	14.0 a	11.3 a	1.60 ab
Aprovia[®] EC, 7.7	16.0 a	13.8 a	2.23 a
Propulse[®] SC, 14.0	13.0 a	9.5 a	1.28 ab
Approach[®] 2.08 SC, 12.0	10.0 a	8.0 a	1.04 ab
Luna Privilege[®] SC 500, 6.8	11.5 a	7.5 a	0.88 ab
Quilt Xcel[®] SE, 14.0	10.5 a	7.8 a	0.85 ab
Approach[®] 2.08 SC, 9.0	8.0 a	7.5 a	0.83 ab
Trivapro[®] SE, 27.4	9.0 a	5.3 a	0.67 ab
Adepidyn[®], 3.8	7.0 a	7.3 a	0.60 ab
Priaxor[®] SC, 6.0	10.5 a	5.3 a	0.37 b
<i>P</i>-value	0.08	0.16	0.03

^z All products were applied with Induce[®], a nonionic surfactant, at 0.25% v/v.

^y Column means followed by the same letter are not significantly different at $\alpha=0.05$ as determined by Tukey's honest significant difference test.