

Kalo Fungicide/Adjuvant Trial

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Introduction

The objective was to compare the control of Dollar Spot caused by the fungi *Sclerotinia homeocarpa* on creeping bentgrass turf with seven commercial fungicides applied with and without Kalo's KA-9107 experimental adjuvant.

Materials and Methods

The trial was conducted at the Iowa State University Horticulture Research Station, Ames, Iowa. Plots were located on a mature stand of creeping bentgrass and were arranged in a randomized complete block design with three replications. Each plot measured 5 × 5 ft, for a total of 25 ft²/plot. Bentgrass was a mixed sward of '1019,' '1020,' and 'Penncross' maintained at 0.5 in. Soil at the site was a 1:1:1 mix of sand:peat:soil with a particle size of 13.7 percent sand, 56.9 percent silt, and 29.5 percent clay. Soil pH was 7.6 with soil P and K contents of 17 and 58 ppm, respectively. Soil type was a Nicollet clay-loam (fine-loamy, mixed, mesic, Typic Hapludoll).

The full list of treatments appears in Table 1. All products were applied through TeeJet 8002VS nozzles in a spray volume equivalent to 2 gallons/1,000 ft² powered by carbon dioxide supplying 40 lb/square in. The products were generally applied at 14-day intervals.

Results and Discussion

The two-week interval of application was too long to get satisfactory control of dollar spot with chlorothalonil (Table 2). The addition of

the KA-9107 to chlorothalonil provided numerically better control in most data collection dates. These differences were significant on September 2, September 24, and October 2, and for the mean of all dates. Fathom 14.3 MEC, Briskway, and Renown also provided less than desirable control. Control with Briskway was improved by KA-9107 on July 8 and July 27, as was the control with Renown. The control with Fathom 14.3 MEC was improved by the adjuvant on August 25. Emerald, Secure, and Velistra were the most effective controls of dollar spot. Although at most dates, there was a numerical advantage to adding KA-9107 to these materials, the control was so effective, that none of these differences were significant.

Overall means comparing fungicides with adjuvant and those without adjuvant were calculated and orthogonal contrasts were performed to compare the means (Table 2) (Figure 1). Significant improvement in activity of all fungicides that included KA-9107 were observed on July 8 and July 27. The mean of all treatments over all dates showed a decrease from 22 percent dollar spot to 18 percent dollar spot when KA-9107 was used as an additive. The level of significance for this difference was 0.08.

It is apparent that KA-9107 can boost the activity of some fungicides for the control of dollar spot on creeping bentgrass turf. Future studies could include the application of KA-9107 without a fungicide to determine if it provides any suppression on dollar spot development by itself. It would also make sense to test the most effective materials with and without the adjuvant at longer intervals between treatments to determine if KA-9107 extends the activity of these products.

Table 1. Treatments in the 2015 Kalo fungicide/adjuvant trial.

| Trt # | Treatment | Product rate (/1,000 ft ²) | Adjuvant rate (/1,000 ft ²) | Product (ml/25 ft ²) | Adjuvant rate (ml/25 ft ²) | Applic. interval |
|-------|--|--|---|----------------------------------|--|------------------|
| 1 | Control | - | - | - | - | |
| 2 | Chlorothalonil | 1.8 dry oz | - | 1.277 g | - | 14 days |
| 3 | Chlorothalonil + adj | 1.8 dry oz | 1.3 fl oz | 1.277 g | 0.96 ml | 14 days |
| 4 | Emerald | 0.13 dry oz | - | 0.092 g | - | 14 days |
| 5 | Emerald + adj | 0.13 dry oz | 1.3 fl oz | 0.092 g | 0.96 ml | 14 days |
| 6 | Secure (Fluazinam) | 0.5 fl oz | - | 0.37 ml | - | 14 days |
| 7 | Secure + adj | 0.5 fl oz | 1.3 fl oz | 0.37 ml | 0.96 ml | 14 days |
| 8 | Fathom 14.3 MEC (propinozole) | 0.5 fl oz | - | 0.37 ml | - | 14 days |
| 9 | (Fathom 14.3 MEC + adj | 0.5 fl oz | 1.3 fl oz | 0.37 ml | 0.96 ml | 14 days |
| 10 | Briskway (difenoconazole + azoxystrobin) | 0.5 fl oz | - | 0.37 ml | - | 14 days |
| 11 | Briskway + adj | 0.5 fl oz | 1.3 fl oz | 0.37 ml | 0.96 ml | 14 days |
| 12 | Renown (chlorothalonil + azoxystrobin) | 4.0 fl oz | - | 2.96 ml | - | 14 days |
| 13 | Renown + adj | 4.0 fl oz | 1.3 fl oz | 2.96 ml | 0.96 ml | 14 days |
| 14 | Velista (penthiopyrad) | 0.5 dry oz | - | 0.355 g | - | 14 days |
| 15 | Velista + adj | 0.5 dry oz | 1.3 fl oz | 0.355 | 0.96 ml | 14 days |

Table 2. Data from 2015 dollar spot trial.

| No. | Treatment | Dollar spot infestation (%) | | | | | | | | | Mean |
|---------------|----------------------|-----------------------------|--------|--------|-------|--------|--------|--------|---------|-------|------|
| | | Jul 8 | Jul 22 | Jul 27 | Aug 8 | Aug 14 | Aug 25 | Sept 2 | Sept 24 | Oct 2 | |
| 1 | Control | 68 | 68 | 85 | 49 | 38 | 32 | 19 | 42 | 24 | 47 |
| 2 | Chlorothalonil | 25 | 57 | 75 | 54 | 52 | 83 | 82 | 33 | 15 | 53 |
| 3 | Chlorothalonil + adj | 13 | 52 | 70 | 30 | 37 | 73 | 75 | 15 | 6 | 41 |
| 4 | Emerald | 1 | 6 | 1 | 0 | 0 | 3 | 11 | 4 | 2 | 3 |
| 5 | Emerald + adjuvant | 0 | 2 | 0 | 1 | 1 | 0 | 3 | 1 | 1 | 1 |
| 6 | Secure | 0 | 1 | 1 | 1 | 2 | 6 | 13 | 3 | 0 | 3 |
| 7 | Secure + adjuvant | 0 | 1 | 2 | 2 | 0 | 4 | 9 | 4 | 0 | 2 |
| 8 | Fathom 14.3 MEC | 8 | 38 | 28 | 12 | 12 | 53 | 70 | 27 | 9 | 29 |
| 9 | Fathom + adjuvant | 3 | 32 | 21 | 6 | 6 | 29 | 67 | 24 | 10 | 22 |
| 10 | Briskway | 28 | 57 | 29 | 12 | 7 | 27 | 84 | 15 | 3 | 29 |
| 11 | Briskway + adjuvant | 11 | 37 | 10 | 4 | 4 | 25 | 77 | 18 | 5 | 21 |
| 12 | Renown | 33 | 53 | 64 | 14 | 8 | 45 | 72 | 14 | 6 | 34 |
| 13 | Renown + adjuvant | 14 | 52 | 52 | 24 | 15 | 60 | 83 | 30 | 6 | 37 |
| 14 | Velista | 0 | 5 | 4 | 2 | 1 | 5 | 12 | 6 | 4 | 4 |
| 15 | Velista + adjuvant | 0 | 2 | 1 | 1 | 0 | 2 | 7 | 5 | 1 | 2 |
| LSD 0.05 | | 16 | 21 | 12 | 24 | 26 | 16 | 10 | 15 | 8 | 12 |
| Adj vs no adj | | 0.02* | 0.15 | 0.01** | 0.37 | 0.57 | 0.16 | 0.10 | 0.77 | 0.34 | 0.08 |
| Mean adj | | 6 | 25 | 22 | 10 | 9 | 28 | 46 | 14 | 4 | 18 |
| Mean no adj | | 14 | 31 | 29 | 14 | 12 | 32 | 49 | 15 | 6 | 22 |

* and ** denote statistical significance.

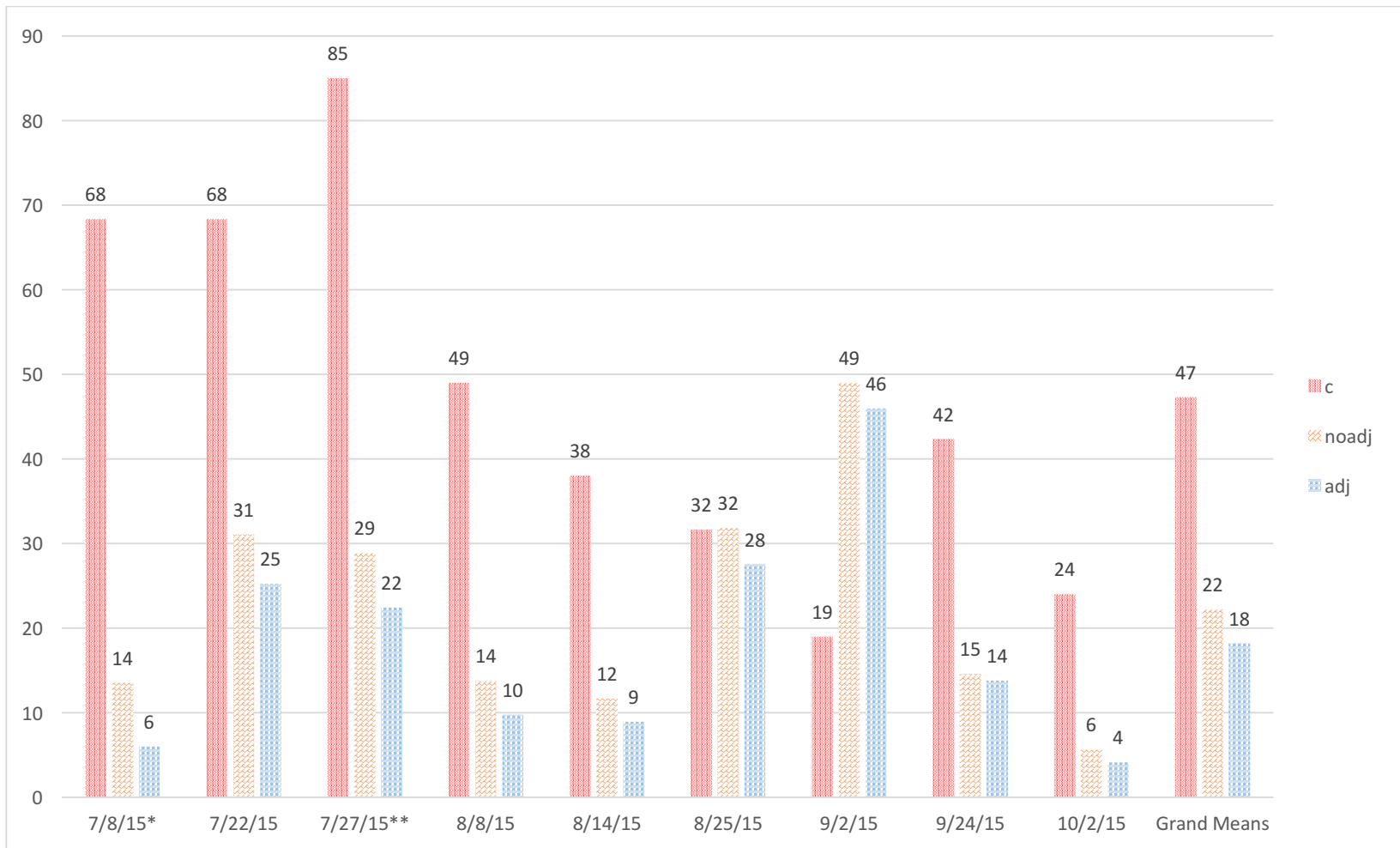


Figure 1. The comparison of the control to fungicide treatments with and without the adjuvant to turfgrass.