

Research Snapshots From The University of Maryland

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Two, three year field research projects recently were completed at the University of Maryland Paint Branch Turfgrass Research Facility. These projects were partially supported by the Mid-Atlantic Association of Golf Course Superintendents (MAAGCS) and by Syngenta Crop Protection. If not for the support provided by the MAAGCS and industry, these projects and many others would not have been possible. Thanks for your continued support!

Irrigation Practice Impacts Dollar Spot and Gray Leaf Spot Severity

The most commonly grown turfgrass species on fairways in the mid-Atlantic region of the United States are creeping bentgrass (*Agrostis stolonifera* L. var *palustris* (Huds.) Farw.) and perennial ryegrass (*Lolium perenne* L.). Among the most intractable diseases in the region are dollar spot (*Sclerotinia homoeocarpa* F. T. Bennett) in creeping bentgrass and gray leaf spot (*Pyricularia grisea* (Cooke) Sacc.) in perennial ryegrass. This field study assessed the influence of two irrigation regimes (light and frequent versus deep and infrequent) on dollar spot and gray leaf severity over a three year period on fairway height turf. Within each irrigation regime, seven chemical treatments also were evaluated. The chemical treatments included: chlorothalonil (Daconil Ultrex 82.5 WDG); paclobutrazol (Trimmit 2SC); wetting agent (Primer Select®); Daconil Ultrex + Trimmit; Daconil Ultrex + Primer Select; Daconil Ultrex + Trimmit + Primer Select; and an untreated control. Daconil Ultrex was applied at 3.2 oz per 1000ft² in 2002 and 2003, but the rate was reduced to 1.8 oz per 1000ft² in 2004. Trimmit was applied at 0.18 fl. oz per 1000ft² (a low rate commonly used on putting greens) while Primer Select was applied at 2.0 fl. oz per 1000ft². All chemical treatments were applied to creeping bentgrass on a fourteen day interval. In 2002 and 2003, the perennial ryegrass was treated on a fourteen day interval, however, in 2004 Daconil Ultrex treatments were applied to the ryegrass on an eight day interval. Data revealed that dollar spot became more severe in mid-to-late summer in creeping bentgrass that received infrequent irrigation, when compared to frequent irrigation in 2002 and 2004. Daconil Ultrex generally provided an acceptable level of dollar spot control, even at a reduced rate in 2004. Trimmit suppressed dollar spot 40 to 60% and Primer Select suppressed dollar spot 30 to 50% on several rating dates over the three seasons. On several rating dates, tank-mixing Daconil Ultrex with Trimmit resulted in better dollar spot control versus Daconil Ultrex-alone. There was, however, no benefit in terms of dollar spot control by tank-mixing Daconil Ultrex with Primer Select. On numerous rating dates in 2004, the chemical treatments provided better dollar spot suppression in frequently irrigated versus infrequently irrigated turf. Data showed that dollar spot intensified most in late summer in infrequently irrigated blocks. Hence, this study revealed that increasing soil moisture in late summer when dollar spot pressure is severe will help reduce disease severity and improve the level of control provided by plant protection materials. Spring and early summer outbreaks of dollar spot, however, were unaffected by irrigation regime.

Gray leaf spot was severe in 2002 and 2004, but the disease did not develop in 2003. In 2002, gray leaf spot rapidly and severely damaged even the fungicide-treated plots, and no significant irrigation effects or Daconil Ultrex treatment differences were observed. Gray leaf spot was more severe in frequently irrigated blocks, when compared to infrequently irrigated blocks in 2004. Daconil Ultrex provided effective gray leaf spot control in 2004, but only in the infrequently irrigated blocks where disease pressure was less. Neither Trimmit or Primer Select had any effect on gray leaf spot, and no benefit was observed from tank-mixing Daconil Ultrex with either Trimmit or Primer Select. Hence, unlike dollar spot, data showed that it is best to keep soils as dry as possible in late summer to reduce gray leaf spot severity in perennial ryegrass and thus improve the performance of fungicides. This study also showed that gray leaf spot was very destructive under periods of very high disease pressure and an ineffective fungicide application interval (i.e. 14- days), regardless of soil moisture level. Daconil Ultrex, however, effectively controlled gray leaf spot when applied on an eight-day rather than a fourteen-day spray interval, but only in infrequently irrigated blocks in 2004. Data showed that there were no negative effects of using Trimmit or Primer Select when gray leaf spot is active. This information will help golf course superintendents better manage dollar spot and gray leaf spot by adjusting their irrigation practices and by using plant protection chemicals more effectively.

The Influence of Fungicide Spray Volume and Application Timing on Dollar Spot Control

Dollar spot can be a difficult disease to control in creeping bentgrass. To maximize fungicide performance, more information is needed regarding proper delivery timing and water dilution or spray volume. In these field studies, a contact (chlorothalonil, Daconil Ultrex 82.5 WDG) and a penetrant (propiconazole, Banner MAXX) fungicide were evaluated. The objectives of this field study were to: (1) assess the influence of two spray volumes (50 versus 109 gallons of water per acre); and (2) evaluate the impact of the presence or absence of dew at the time of application on the ability of the aforementioned fungicides to control dollar spot in fairway height creeping bentgrass. Only Daconil Ultrex (3.2 oz per 1000ft²) was assessed in 2002, but Daconil Ultrex (1.8 oz per 1000ft²), Banner MAXX (0.5 to 1.0 oz per 1000ft²), and a tank-mix of Daconil Ultrex (1.8 oz per 1000ft²) + Banner MAXX (0.5 to 1.0 oz per 1000ft²) were evaluated in 2003 and 2004. Treatments were applied in two spray volumes with dew present or displaced in the AM or in the PM to a dry canopy. Daconil Ultrex generally provided better dollar spot control when applied in 50 versus 109 gallons water per acre. There were no dates when the higher spray volume improved the ability of Daconil Ultrex or Banner MAXX to control dollar spot. During the three study years, PM applications resulted in better dollar spot control versus AM application with Daconil Ultrex-alone. In 2004 only, Daconil Ultrex gave better dollar spot control on several dates in plots where dew was displaced, when compared to plots treated with dew present. Few differences in spray volume and application timing were observed with Banner MAXX and the tank mix treatments. The tank-mix, however, generally provided a longer duration and higher level of dollar spot control, when compared to Banner MAXX-alone. Dew levels on the bentgrass were quantified and averaged between 100 and 272 gallons of water per acre. Evidentially, Daconil Ultrex performance was reduced as a result of being diluted or washed from foliar surfaces in the higher spray volume or diluted by dew; whereas, the penetrant Banner MAXX was able to effectively penetrate tissue without loss of effectiveness. Since both fungicides perform well when applied in 50 gallons water per acre, golf course managers can use the lower spray volume when targeting dollar spot to save time, labor and fuel.