

Management Strategies for Yellow Tuft of Zoysiagrass

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Introduction

Yellow tuft is an emerging disease problem of zoysiagrass (*Zoysia* spp.) in central United States (Figure 1). Unlike the very common disease large patch, caused by *Rhizoctonia solani*, yellow tuft is not well described, lacks best management strategies, and therefore creates a challenging situation for turfgrass managers.



Figure 1. *Yellow tuft stand symptoms on zoysiagrass.*

Disease Description

Yellow tuft, also known as downy mildew, is caused by a water-loving oomycete known as *Sclerophthora macrospora*. This obligate parasite infects the plant during spring green-up, the

disease then wanes during the summer heat, and symptoms reappear in the cooler days of fall. It is notable that symptoms severely flare up with heavy rain showers. The pathogen produces zoospores and oospores that swim with the flow of water and therefore the stand symptoms of this disease appear as irregular yellowing of turfgrass that often follows water movement (Figure 2). The disease often affects large acreages of turfgrass. The pathogen causes dense clusters of yellowed tillers stemming from a single node, also referred to as witches' broom symptoms, and a poorly developed root system (Figure 3). Leaf **yellowing**/chlorosis, and excessive tillering/**tufting** makes the name yellow tuft.



Figure 2. *Yellow tuft symptoms following water movement.*

The disease seldom causes major problems but has the potential to weaken the grass over time making it more susceptible to biotic and abiotic stresses, which may eventually result in dead grass. The yellowing of leaves causes discernibly poor turf aesthetics, whereas excessive tillering may lead to playability issues on turf surfaces. The water mold *S. macrospora* causes the disease when an infection is facilitated by constantly wet field conditions resulting from poor drainage, high traffic, high clay-to-silt ratio, or over-irrigation. The pathogen has been associated with yellow tuft disease in various cool-season grasses like fescues (*Festuca* spp.), bentgrasses (*Agrostis* spp.), bluegrasses (*Poa* spp.), and ryegrasses (*Lolium* spp.), but it can also be found in the warm-season grass, zoysiagrass.

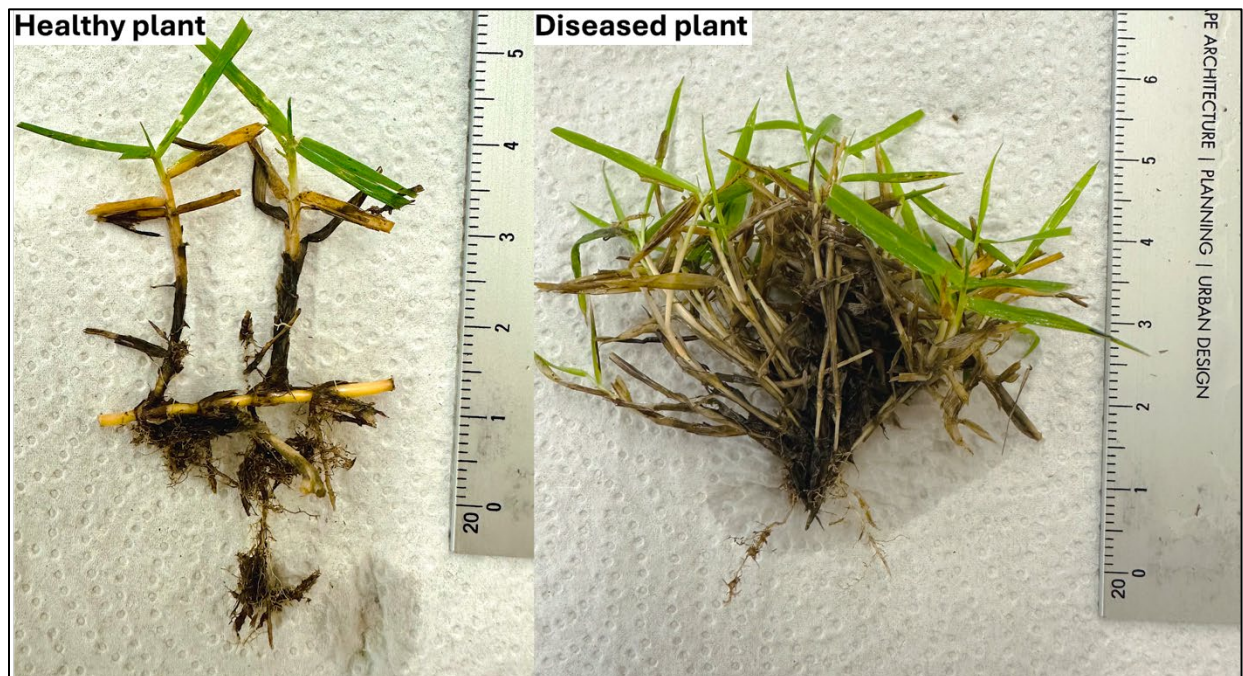


Figure 3. Excessive tillering/witches' broom and poorly developed roots caused by yellow tuft.

Disease Management

The University of Arkansas Turf Team is working on chemical management strategies for yellow tuft on zoysiagrass. We are evaluating various fungicides and plant growth regulators (PGRs), along with various application timings, to suppress yellow tuft on zoysiagrass (see Table 1 for treatment list). The trial was conducted on ‘El Toro’ zoysiagrass severely affected by yellow tuft near Little Rock, AR from 15 Feb 2024 through 1 July 2024. The fungicides and PGRs were applied at 2- and 4-week intervals, respectively, with various application initiation dates to determine both the optimal timing and product selection for yellow tuft suppression in zoysiagrass. All treatments were applied with a CO₂-pressurized backpack sprayer at a carrier volume of 2 gallons/1000 ft². Percent disease cover and percent phytotoxicity were measured every two weeks.

Trade name	Active ingredient	Rate (fl. oz./1000 ft ²)
Anuew WG	Prohexadione-Ca	0.55
Primo Maxx ME	Trinexapac-ethyl	0.125
Daconil WeatherStik SC	Chlorothalonil	5.5
Insignia SC	Pyraclostrobin	0.7
Segway SC	Cyazofamid	0.9
Signature XTRA WG	Aluminum tris (O-ethyle phosphonate)	6
Subdue Maxx ME	Mefenoxam	1

Table 1. *Fungicides and PGRs used in yellow tuft management trials*

The data suggest that the preventive three-application program (15 Feb, 01 Mar, 15 Mar) of Subdue Maxx reduces disease by 88% compared to the nontreated control (Figure 4). Similarly, the curative application (15 Apr, 06 May, 20 May) of Subdue Maxx performed best among all fungicides and reduced disease by 67%. However, the monthly application of PGRs, Primo Maxx and Anuew, outperformed all fungicides with a disease reduction of 100% (Figure 4).

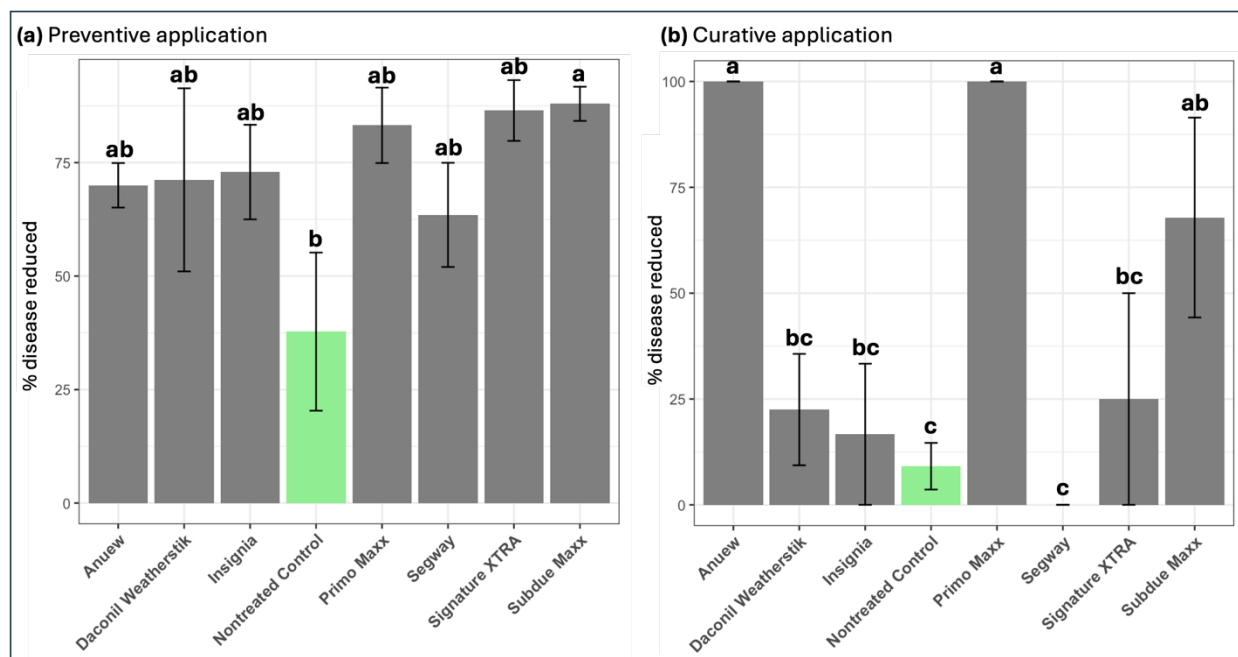


Figure 4. Percent yellow tuft reduction from preventive and curative fungicides and PGR programs on zoysiagrass fairway in Spring 2024 near Little Rock, AR ($p < 0.05$).

Monthly application of Primo Maxx reduced the disease by 95% with a reasonable tradeoff of phytotoxicity and delayed spring greenup until mid-March. On the other hand, Anuew caused extreme phytotoxicity until first week of May, resulted in healthy grass for the following 6 weeks after it recovered out of phytotoxicity, and again phytotoxicity resumed during the hot days of mid-June (Figure 5). Despite the phytotoxicity, the PGRs Primo Maxx and Anuew highly suppressed yellow tuft, while mefenoxam outperformed all fungicides for both preventive and curative treatments.

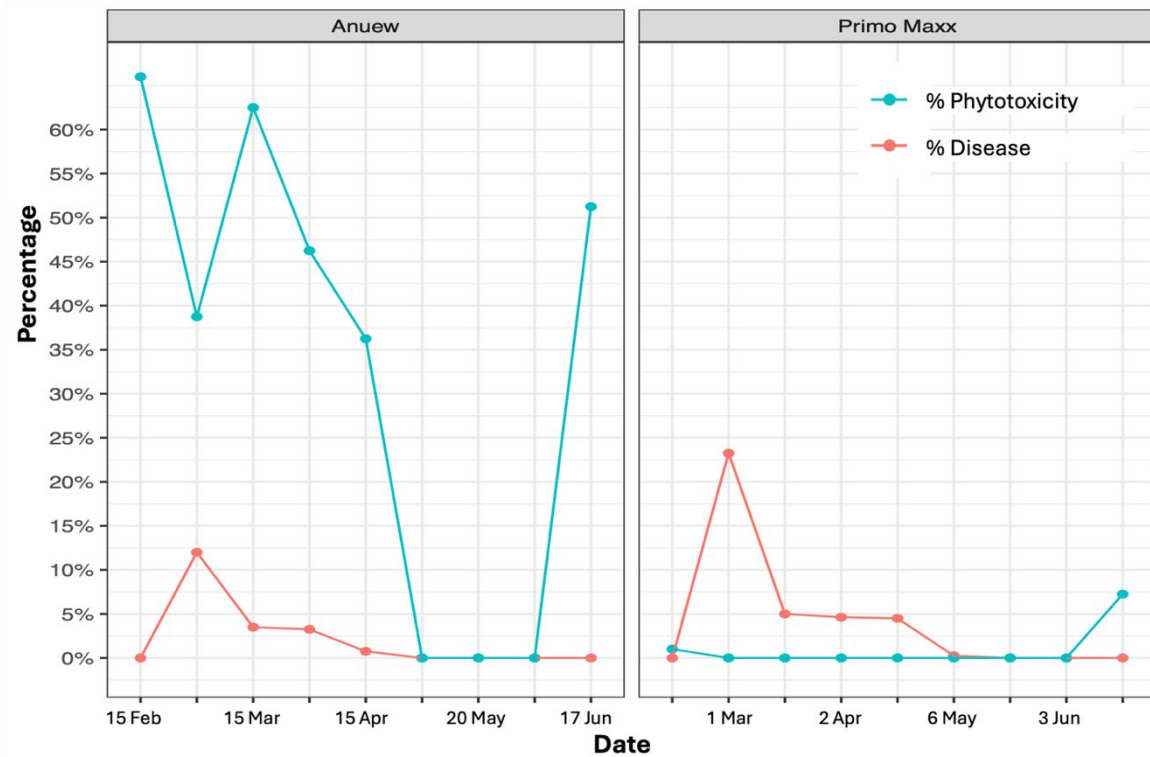


Figure 5. Percent phytotoxicity and disease resulting from monthly applications (starting 15 Feb) of PGRs (Anuew and Primo Maxx) in zoysiagrass fairway in Spring 2024 near Little Rock, AR. Data collected every 2 weeks. % Phytotoxicity and % Disease differ significantly among the PGRs ($p < 0.001$).

Our findings indicate that Subdue Maxx (mefenoxam) and the PGR program (Primo Maxx) may be the most effective chemical options for suppressing yellow tuft, without causing excessive phytotoxicity. Since *S. macrospora* disrupts the gibberellic acid balance in host plants, PGRs that modulate gibberellic acid production could also be beneficial in managing this disease. Interestingly, the performance of the PGRs exceeded our expectations.

Later this year, we plan to test chemical management strategies for the disease during the fall season using various fungicides, PGRs, and pigments. Additionally, we will test various

cultural practices for yellow tuft control in zoysiagrass, particularly focused on water management and cultivation strategies such as verticutting.

Stay tuned for future research updates from our turf pathology lab on the biology, epidemiology, and management of yellow tuft in zoysiagrass. We hope this article was helpful, and if you have any questions, you can always reach us via email (schahal@uark.edu AND wendellh@uark.edu) or direct message on Twitter ([@FarmerChahal](https://twitter.com/FarmerChahal) AND [@HutchensWendell](https://twitter.com/HutchensWendell)).