

REDUCED PESTICIDE APPROACHES TOWARDS THE CONTROL AND MANAGEMENT OF SUMMER DECLINE OF MIXED STANDS OF ANNUAL BLUEGRASS (*Poa annua* L.) AND BENTGRASS (*Agrostis* sp.) IN COASTAL CALIFORNIA GOLF COURSES 1995-1996

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Summer decline of mixed stands of annual bluegrass and bentgrass have been ascribed to many factors including nutrition, heat stress, genotype and disease. Under coastal California conditions the major summer disease of annual bluegrass is Anthracnose, caused by *Collectotrichum graminicola*, a fungus with global distribution that induces serious disease losses on recreational and amenity turf worldwide, including some species of bentgrass. Anthracnose can manifest itself in two distinct forms, basal rot (ABR) and foliar blight (AFB) on bluegrass. Both can be present at the same time although basal rot is more serious as it rapidly kills plants by destroying their crowns. Anthracnose infected stands are often also infected with Pythium, a potential root pathogen of many grass species. In our studies in California, we have consistently found Pythium species associated and inducing root damage to Anthracnose infected greens. Over the past three years, our group has studied the Anthracnose disease complex, and in this article report on the effectiveness of certain bio-rational approaches to the management of this devastating malady of recreational turf.

The first stage of this project assessed various non-conventional approaches to the management of the summer decline disease complex and we describe in this article some of the products and methods that have shown promise over the last three seasons. During the past three seasons we have determined that under our conditions, the threshold level of disease maintenance based on our assessment methods is in the range of one to 1.25 (+ / - 12 %). Above these levels, the visual impact of this disease becomes very obvious to patrons and generally once above these loss levels on playing greens, it is difficult to obtain sufficient re-growth in the necrotic patches during the rest of the summer. From a total of ninety-seven treatments, we have screened over the last three seasons, we report here on products that have resulted in disease ratings below 0.5 over the course of the season.

Mean Health Rating mid-July through mid-August

Product	1995
Untreated	1.16 c
Fore™ @ 240 mls per 1000 sq. ft. in 30 liters, 14 day interval	0.24 a
Daconil™ @ 150 mls per 1000 sq. ft. in 30 liters, 14 day intervals	0.26 a
Sustane 5-2-4 with Iron ¹ @ 20 lb. per 1000 sq. ft., 30 day intervals	0.37 ab
Sustane 5-2-4 Natural Organic ² @ 20 lb. per 1000 sq. ft., 30 day intervals	0.47 b
Sincocin ³ @ 300 mls per 1000 sq. ft. in 30 liters, 14 day intervals	0.45 b
Nutriphite ⁴ PK @ 150 mls per 1000 sq. ft. in 30 liters, 14 day intervals	0.32 ab
Nutriphite ⁴ + Sincocin ³ (as above)	0.37 ab
Greenex ⁵ @ 300 g per 1000 sq. ft. in 30 liters, 14 day intervals	0.37 ab

Values in the same column followed by the same letters do not differ significantly from one another according to Duncans multiple range test (P=0.05). Mean values in each season were compared.

¹Sustane 5-2-4 with Iron is enriched with Iron. The product has been previously shown to have a high microbial content and be suppressive to certain diseases

²Sustane 5-2-4 Natural Organic™ is an organic fertilizer derived from composted turkey litter. The material is aerobically composted and supplied in two grades (fines and medium)

³Sincocin™ is derived from the extracts of certain plant species that in their natural habitat exhibit tolerance to certain pathogens. The material has soil bio-stimulant properties and is believed to enhance the natural plant defense mechanisms

⁴Nutriphite™ is low salt index, high analysis (0-26-28) Phosphorus and Potassium containing foliar fertilizer that has rapid root and foliar absorption features. The material is patented, licensed product from the University of California. The material utilizes higher oxides of Phosphorus that have greater solubility's than phosphate and are less prone to soil fixation.

⁵Greenex™ is a product formulation based primarily on a strain *Bacillus subtilis*, a bacterium that is regarded in the literature as a biological control agent of certain pathogenic fungi and other bacteria. This material has also been used for the suppression of algae in water features and on greens.

Alternative Controls of Turf Anthracnose Study - U of California Riverside, Grech, et. al.

Conclusions from trials for Summer Decline / Turf Anthracnose on Bent-Poa putting greens:

- ❑ There were differences between treatments when turf was evaluated for visual plot health as rated by disease pressure, nutrition (color) and phytotoxicity. Sustane treatments rated highest in overall turf quality and color.
- ❑ The levels of anthracnose and pythium were uniform at the beginning of the trial. Differences in treatments were apparent halfway through the experiment. Generally conventional fungicides produced lower disease as compared to the biological treatments, Sustane treatments of 5-2-4 Natural Organic and Sustane 5-2-4+2 Fe Natural Base fertilizers were the exception. These products finished second and fourth respectively out of 24 treatments, with Daconil finishing at number 1 with only a slightly higher score for disease management. Sustane treatments were not significantly different than Daconil.