A New Active Ingredient Called Acibenzolar for Disease Control on a Golf Green

Researchers: Chicago District Golf Assoc. - Derek Settle, Tim Sibicky, and Nick DeVries

Goal: Test New/Experimental Fungicides for Golf Green Dollar Spot and Brown Patch Control

Location: Sunshine Course's 1 green in play – Lemont, Illinois

Background: Dollar spot (*Sclerotinia homoeocarpa*) is the most persistent fungal disease that negatively affects golf courses each season. As such it requires more input than any other pest. Annually, the use of fungicides and associated cost is high. Alternative products for dollar spot control exist, but their efficacy has been found to be poor in Chicago's environment. In the past (2008-10) we have tested products such as Rhapsody and Ecoguard (both contain *Bacillus* spp.) as well as Dew Cure and nitrogen by urea. Only DewCure reduced dollar spot on creeping bentgrass, but the product caused phytotoxicity that resulted in unacceptable quality at times.

This year we investigated an active ingredient called acibenzolar-S-methyl. It has been researched on creeping bentgrass at green height for at least a decade now. For example, a K-State 2002 field day research stop title said, *Dollar spot and brown patch incidence in creeping bentgrass as affected by a plant defense activator.* On 18 August a press release introduced acibenzolar to golf course superintendents for the first time (similar to salicylic acid or Aspirin). "New Daconil Action fungicide from Syngenta provides the proven disease control of Daconil fungicide with a protein boost from acibenzolar-S-methyl (also known as acibenzolar) for golf course superintendents and professional turfgrass managers. Acibenzolar provides a boost of pathogenesis-related proteins that activate the turf's natural defense mechanisms and help it combat stress resulting from environmental, mechanical and disease pressures."

Brief Material and Methods: Sunshine Course's number 1 green used a randomized complete block design with 3 replications. Individual plot size was 4 ft by 6 ft. The USGA-constructed green is creeping bentgrass seeded in 2002 to Penn G2 plus L93. It is maintained at 0.150 inch. Dollar spot existed (1-5%) when first applications were made on 1 June. All applications used a CO_2-powered backpack sprayer with flat fan nozzles at 40 psi in water 2 gal/M. Eleven treatments occurred in this fungicide study every 14 days (Table 1). Data collected included; dollar spot number, dollar spot percent, and brown patch percent. NDVI and visual quality (1-9 scale with 6= acceptable) assessed plant health/phytotoxicity. No phytotoxic effects occurred.

Table 1. Treatments for disease control on 1 green at Sunshine Course, Lemont, IL in 2011.

i.d.	Treatment	Rate per 1000 ft^2	1 Jun 13 Jun	13 Jun 27 Jun	11 Jul 25 Jul	8 Aug 22 Aug	5 Sep 19 Sep
1	Untreated	---	x	x	x	x	x
2	Renown	4.5 fl oz	x	x	x	x	x
3	Confidential 3[2]	---	x	x	x	x	x
4	Daconil Action	3.6 fl oz	x	x	x	x	x
5	Confidential 5 rotate Daconil Action	--- 3.6 fl oz	x	x	x	x	x
6	Condidential 6 rotate Daconil Action	--- 3.6 fl oz	x	x	x	x	x
7	Confidential 7	---	x	x	x	x	x
8	Confidential 8	---	x	x	x	x	x
9	Confidential 9	---	x	x	x	x	x
10	Confidential 10[3]	---	x	x	x	x	x
11	Confidential 11	---	x	x	x	x	x

[1]Dates of application began 1 June then were on a 14 day fungicide interval as indicated above.
[2]Confidential 3 contains a green pigment.
[3]All products tested were liquid formulations except Confidential 10.

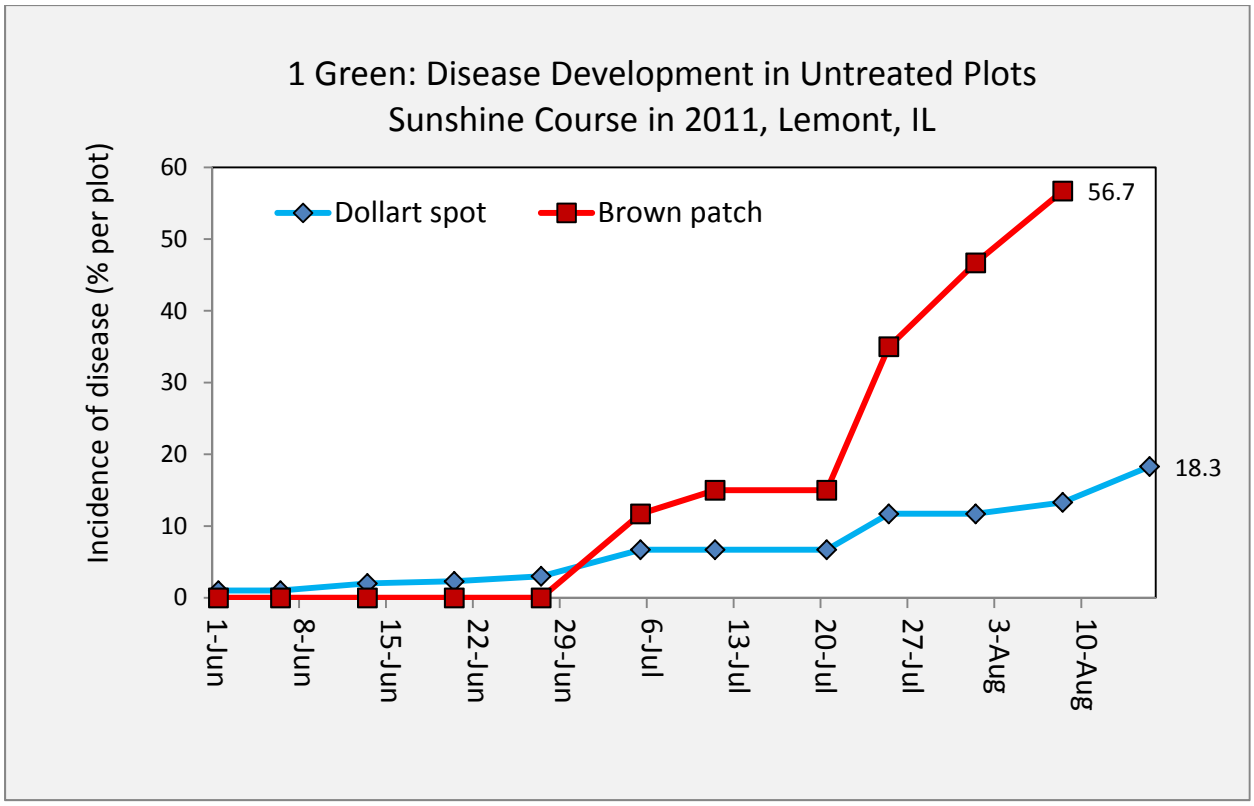

Figure 1. Disease development in untreated plots on 1 green, Sunshine Course, Lemont, IL. It was perhaps the greatest amount of brown patch pressure in a given season. The flooding that occurred on 23 July triggered saturated soil conditions and set a Chicago record for the all-time wettest July in 144 years.

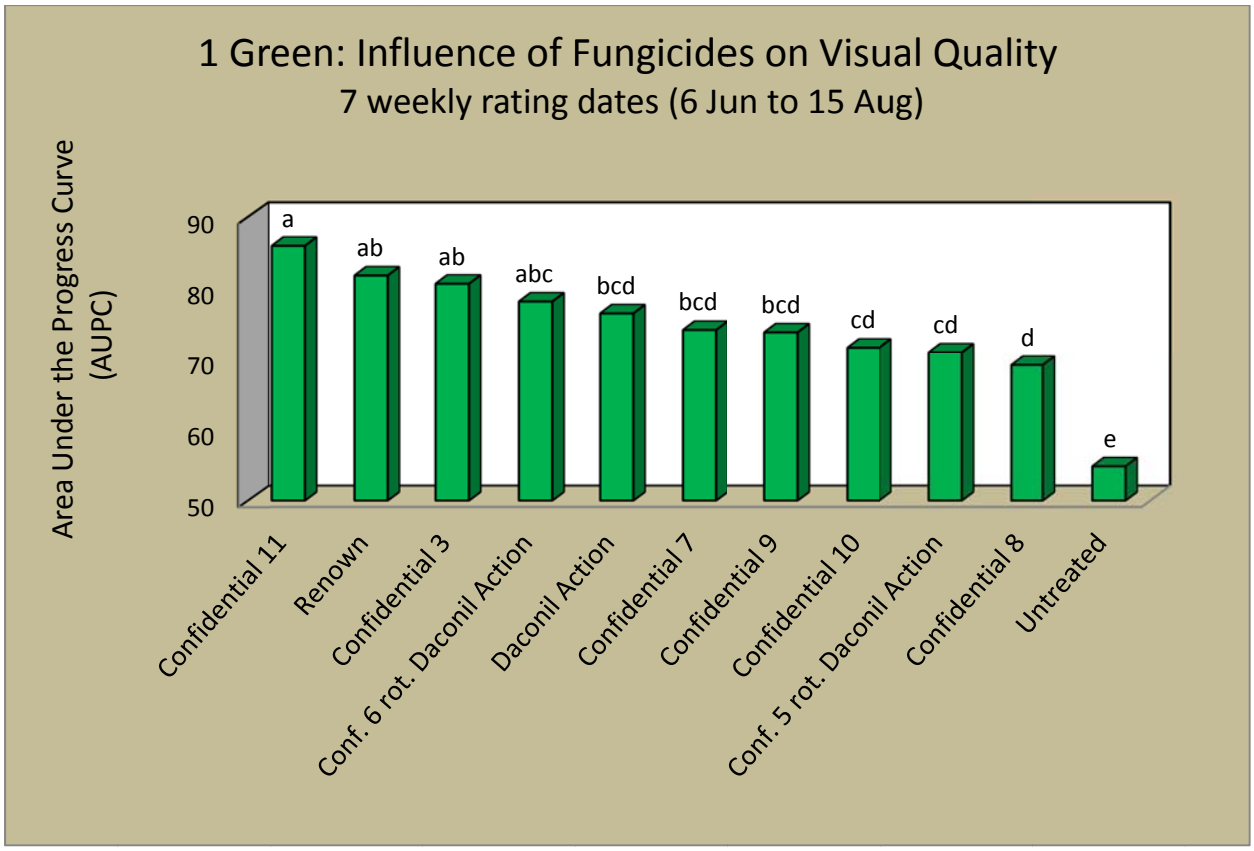

Figure 2. Visual Quality: Compared to untreated plots, all fungicides improved visual quality. Disease suppression trends: Best quality was associated with Renown (azoxystrobin + chlorothalonil) and certain experimentals such as Confidential 3 which contained a green pigment. Daconil Action (acibenzolar + chlorothalonil) provided intermediate visual quality. Worst visual quality was associated with Confidential 8 due to breakthrough of both brown patch and dollar spot. Bars with same letter are not significantly different ($P<0.05$) according to Fisher's Protected LSD. Green 1 fungicide trial, Sunshine Course, Lemont IL in 2011.

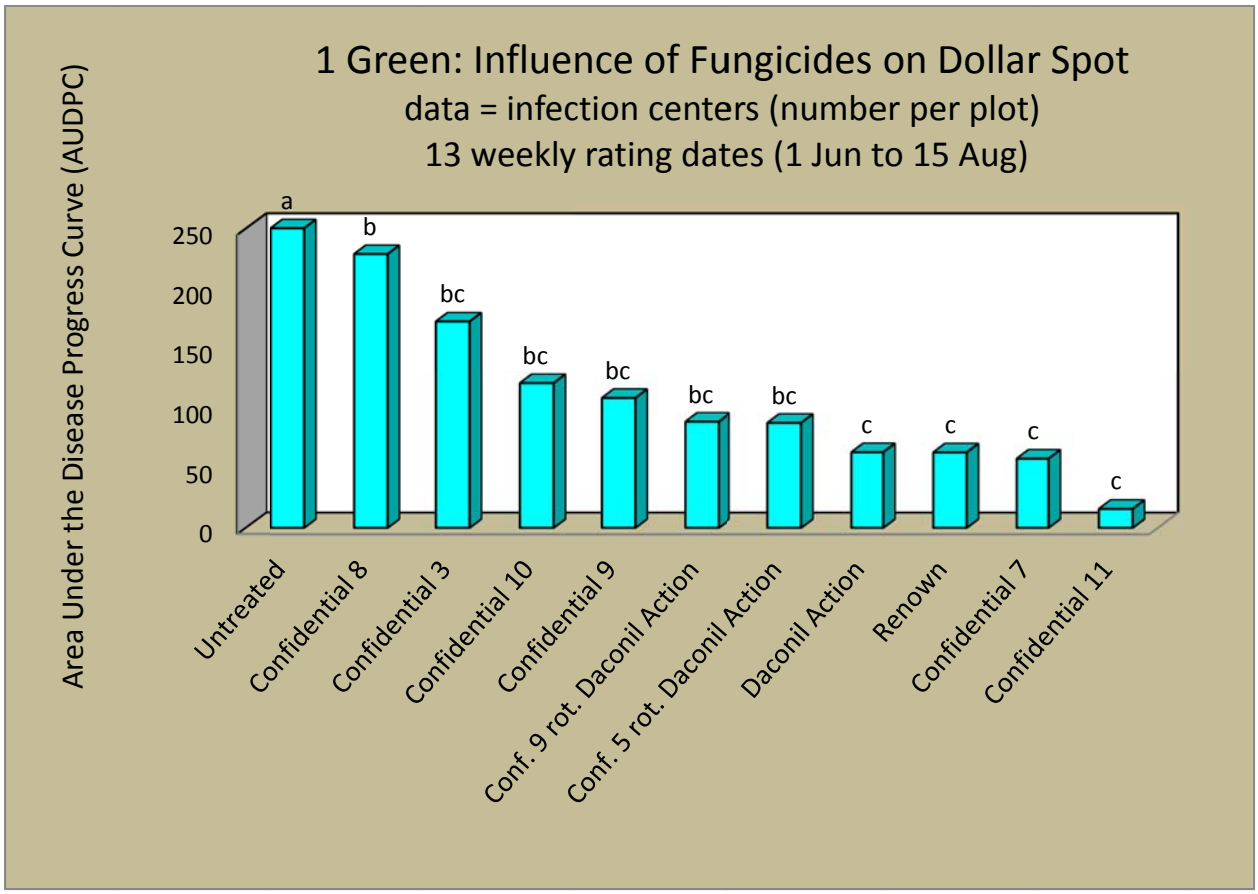

Figure 3. Compared to untreated, all treatments controlled dollar spot given high disease pressure. A new fungicide introduced August, 2011 called Daconil Action (acibenzolar + chlorothalonil) performed well and was similar to Renown (azoxystrobin + chlorothalonil). Trends of dollar spot suppression: Confidential 8 provided intermediate control and Confidential 11 provided best control. Bars with same letter are not significantly different ($P<0.05$) according to Fisher's Protected LSD. Green 1 fungicide trial, Sunshine Course, Lemont IL in 2011.

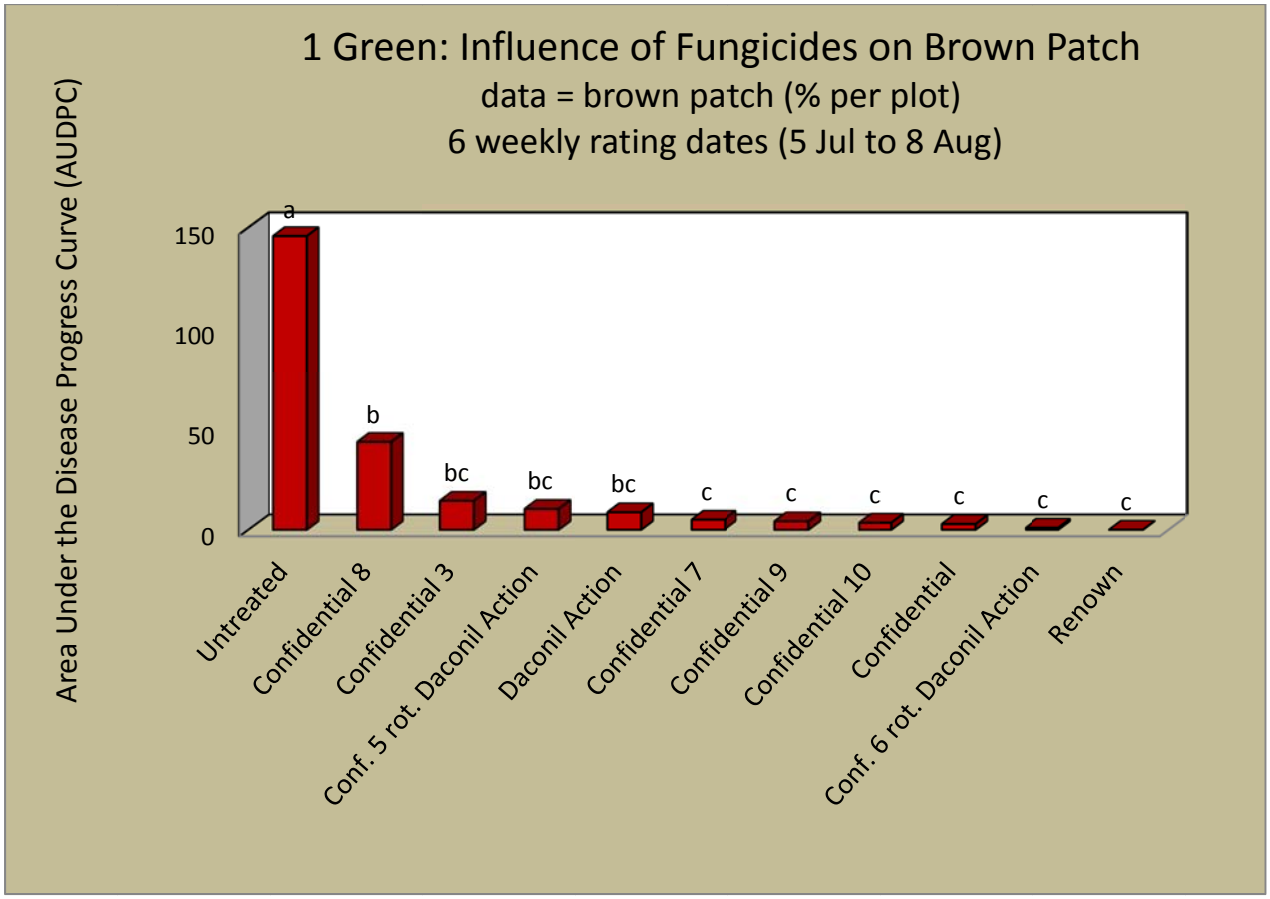

Figure 4. Compared to untreated, all treatments controlled brown patch given high disease pressure. A new fungicide introduced August, 2011 called Daconil Action (acibenzolar + chlorothalonil) performed well and was similar to Renown (azoxystrobin + chlorothalonil). Trends of brown patch suppression: Confidential 8 provided intermediate control and all others were similar to best control by Renown. Bars with same letter are not significantly different ($P<0.05$) according to Fisher's Protected LSD. Green 1 fungicide trial, Sunshine Course, Lemont IL in 2011.

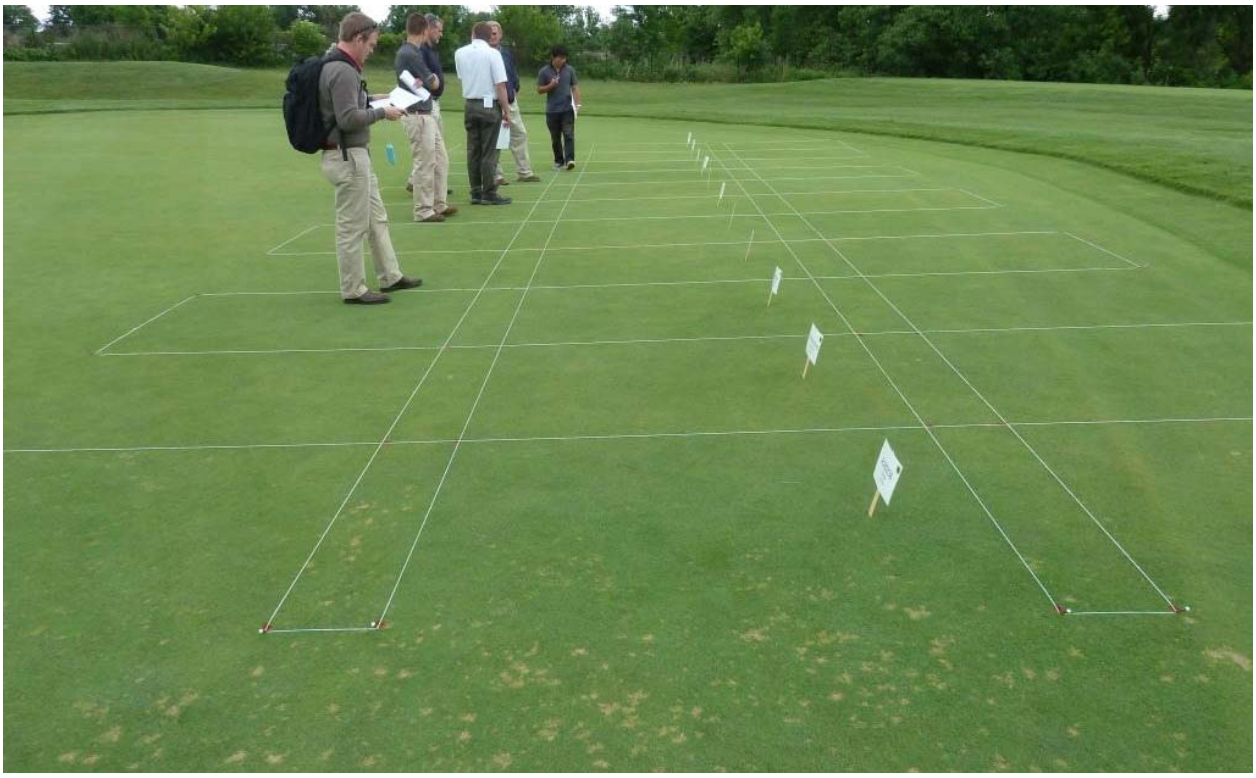

Image 1. In late June number 1 green was with good health and dollar spot had begun to develop. Sunshine Course, Lemont, IL. *Settle 6-24-11*

Image 2. By early August brown patch had peaked. For example, in one untreated plot we estimated 70% blight by brown patch. Sunshine Course, Lemont, IL. *Settle 8-1-11*

Image 3. We saw rapid development of dollar spot in untreated plots during the first weeks of August when air temperatures cooled to 80s/60s. Sunshine Course, Lemont, IL. *Settle 8-22-11*