

Research You Can Use

Astron® Can Reduce the Level of Growth Suppression Provided by Primo MAXX® in Creeping Bentgrass

A study indicates a possible useful interaction between two turf products.

BY P. H. DERNOEDEN AND J. E. KAMINSKI

In the Mid-Atlantic Region and elsewhere, golf course superintendents routinely apply Primo MAXX® (trinexapac-ethyl, Syngenta Crop Protection, Greensboro, N.C.) to greens to suppress clippings and improve green speed. Astron® (Floratine Products Group, Inc., Collierville, Tenn.) also is used on greens, presumably for the purpose of improving turf vigor in the summer. Astron contains some micro-nutrients and an unspecified amount and source of gibberellic acid (i.e., there is no mention of gibberellic acid on the label). Primo MAXX inhibits growth by suppressing gibberellic acid synthesis in plants. As previously noted, Astron may contain a source of gibberellic acid, which technically could reverse the effects of Primo MAXX. There are different types of gibberellic acid and biostimulants, and it was unknown if Astron would interfere with the growth-regulating effects of Primo MAXX. Since many golf course superintendents use both products on greens during the summer, it seemed prudent to assess any potential interactions between Primo MAXX and Astron.

Primo MAXX and Astron were applied to Providence creeping bentgrass. The bentgrass was seeded in September 1999 and grown on a USGA-specified greens mix and



University of Maryland researchers investigated the question, "Can the effects of a growth regulator be reversed by applying a biostimulant?"

mowed to a height of 0.20 inch. Clipping weights were monitored as a measure of growth suppression and/or enhancement.

RESULTS

Seven days following the first application, bentgrass foliar growth in plots treated with Primo MAXX alone was

suppressed more (47%) than turf growth in plots treated with Primo MAXX tank-mixed with Astron (29-31%) (Table 1). Except on June 30, Astron reduced the effectiveness of Primo MAXX in the Primo MAXX + Astron tank mix between June 21 and July 28. On July 6, there was no growth suppression (i.e., +4%) in plots treated

with Primo MAXX tank mixed with Astron. All 14-day treatments were applied last on July 13. The bentgrass in plots treated with Primo MAXX alone or Primo MAXX + Astron on a 14-day interval incurred post-inhibition growth stimulation (i.e., turf was growing more rapidly in Primo MAXX-treated plots versus the untreated control) by August 11 and 25, respectively. Post-inhibition growth stimulation is a phenomenon associated with most plant growth regulators.

Bentgrass treated with Primo MAXX weekly + Astron on a 14-day interval exhibited less foliar growth inhibition when compared to plots treated with Primo MAXX alone on June 21 and July 13 and 20. However, on August 4 and 11, growth suppression was improved with Primo MAXX weekly + Astron on a 14-day interval, when compared to Primo MAXX alone. Improved growth suppression on the aforementioned dates was likely due to applying Primo MAXX six times on a weekly schedule (last applied July 20) and Astron four times, whereas Primo MAXX alone was applied only three times (last applied July 13).

Between June 21 and August 4, the average reduction of clippings as a percent of the control was 43%, 23%, and 41% for plots treated with Primo

MAXX alone (3 applications), Primo MAXX + Astron on the 14-day interval (3 applications), and Primo MAXX weekly (6 applications) + Astron (4 applications) on a 14-day interval, respectively. Astron applied alone resulted in increased clipping weights on two dates (i.e., July 6 and 20). In summary, tank mixing Primo MAXX with Astron on the 14-day interval reduced the ability of Primo MAXX to suppress foliar growth by about 47% (i.e., 23% versus 43%), when data were averaged (i.e., June 21 to August 4). Furthermore, the growth suppression effectiveness accorded by applying Primo MAXX weekly and Astron on a 14-day interval was partially offset by Astron on three dates, when compared to Primo MAXX alone. It appears that the nutrients or possibly unspecified amounts of gibberellic acid in Astron reduced the effectiveness of Primo MAXX. In any case, these data should help to answer the question, "Can the effects of a growth regulator be reversed or partially reversed by applying a biostimulant that apparently contains gibberellic acid?" The results of this test appear to say yes.

CONCLUSIONS

Before any definitive conclusions are drawn, this study should be repeated to

corroborate the results. The data, however, strongly indicated that Astron can reduce the ability of Primo MAXX to suppress the foliar growth of creeping bentgrass. There are many products claiming to be biostimulants or having some attribute(s) (i.e., thatch or disease control) that will benefit turf. The fact is that most of these types of products have not been field tested on turf. Several of the companies selling these products are unwilling to provide financial support to test their compounds, but they seem to have plenty of money for advertisements.

For this study, we were grateful for the funding provided by Syngenta on behalf of Primo MAXX. The Astron was donated by a local superintendent. Universities do not provide budgets to support product testing. Funds must come from industry, and those companies willing to support research will get first priority. Golf course superintendents can help their cause by insisting that manufacturers provide field test data on their products. Test results should be supported by studies conducted in two or more states by different turfgrass scientists.

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Table 1.
Creeping Bentgrass Clipping Weight as a Percent of the Untreated Control as Influenced by Primo MAXX (Primo) and Astron

Treatment	Rate (oz. product/ 1,000 sq. ft.)	Spray Interval (Days)	Clipping Weight									
			June 21	June 30	July 6	July 13	July 20	July 28	Aug. 4	Aug. 11	Aug. 21	Aug. 25
----- (% of the control) -----												
*Primo	0.10	14	-47c ¹	-36bc	-36c	-39c	-64e	-53c	-23b	16a	16a	16a
*Astron	0.75	14	-2a	2a	23a	7a	9a	1a	-6a	-1bc	-4c	-5c
*Primo + Astron	0.10 + 0.75	14	-29b	-20b	4b	-23b	-19c	-39b	-35c	-1bc	9ab	14a
*Primo + Astron	0.10 + 0.75	7 + 14	-31b	-45c	-46c	-16b	-45d	-52c	-50d	-16c	6abc	10ab
Untreated	—	—	0a	0a	0b	0a	0b	0a	0a	0b	0bc	0bc

¹Treatments were applied June 14 and 30 and July 13, 2000.

*Primo MAXX was applied weekly on June 14, 21, and 30, and July 6, 13, and 20, whereas Astron was applied June 14 and 21 and July 6 and 20, 2000.

²Means in a column followed by the same letter are not significantly different at P = 0.05 according to the least significant difference test.