CORNELL UNIVERSITY TURFGRASS TIMES

CUTT

2008 Issue 4 • Volume 19 • Number 4

Does Late Season Potassium Increase Snow Mold?

This study was conducted from June 28, 2007 to April 1, 2008. Except for August, monthly precipitation was above normal. Precipitation was such that supplemental irrigation was not required on a regular basis.

Experimental plots were established at the Cornell University Turfgrass and Landscape Research and Education Center in Ithaca, NY on a mixed stand of creeping bentgrass (70%) annual bluegrass (30%) (*Agrostis palustris/Poa annua*) sand-based putting green (avg. pH = 6.9).

The research area was maintained to championship conditions, with light frequent sand topdressing applied every one to two weeks depending on growth and performance.

Fertilizer treatments were made on a weekly basis, starting June 28 (Table 1). The final fertilizer treatments were made on November 21 (Table 2).

Applications were made with a handheld CO2 sprayer at 40 psi fitted with TeeJet XR8015 nozzles calibrated to deliver 2 gallons of water per 1,000 ft2.

Data were collected for turf quality, dollar spot occurrence, soil nutrients during the growing season and snow mold incidence and clipping yield in Spring 2008.

Results

Soil Analysis

Soil samples were taken on November 19 (2/plot, 6/treatment, combined for a total of 15 composite samples), to a depth of approximately 4 inches. Analysis was performed by Brookside Laboratories; results in Table 3.

The soil nutrient analysis indicates that most of the plots are well below the recommended sufficiency range published in the literature for both creeping bentgrass and annual bluegrass. There were significant differences for potassium levels but only at the 6 lb. annual rate.

Turf Quality (2007 Season)

Turf quality was assessed on seven occasions using a scale of 1 to 9; where 1 = poor quality, 9 = excellent quality, and 6 = acceptable quality. With the exception of 20-Aug, there were no significant differences in turf quality among the treatments (Table 4).

In spite of the low potassium levels measured in the treatments there was no effect of potassium fertilizer applications on turfgrass quality ratings during the growing season. The lack of effect on turfgrass quality is consistent with previous potassium research conducted at Cornell University. This continues to suggest

continued on page 4

This Times

1. **Does Late Season Potassium Increase Snow Mold?**
2. **Clippings**
   PGMS Star Award
   Baker Athletic Field
   DeBuck Named NYFVI Producer of the Year
7. **Searching for Annual Bluegrass Weevil Resistant Poa Annual**
11. **Calendar of Events**
12. **Healthy Ecosystem**
    Improving Soil Test Recommendations

CUTT, "Cornell University Turfgrass Times" is published four times per year by the Turfgrass Science Program at Cornell University, Ithaca, New York 14853. Address correspondence to: Cornell University Turfgrass Times, 20 Plant Science Building, Cornell University, Ithaca, NY 14853; phone: (607) 255-1629; email: fsr3@cornell.edu.

Editor: Frank S. Rossi, Ph.D.

Design & Production: NYS Turfgrass Assn. Latham, NY

CUTT

Feature Story

continued from page 1

The soil nutrient analysis indicates that most of the plots are well below the recommended sufficiency range published in the literature for both creeping bentgrass and annual bluegrass. There were significant differences for potassium levels but only at the 6 lb. annual rate.

Table 1. Annual fertilizer rates for the treatments applied in weekly intervals during the season.

Trt#	N Rate	K Rate	Interval
1	3	0	7d
2	3	0	7d
3	3	0	7d
4	3	0.75	7d
5	3	0.75	7d
6	3	0.75	7d
7	3	1.5	7d
8	3	1.5	7d
9	3	1.5	7d
10	3	3	7d
11	3	3	7d
12	3	3	7d
13	3	6	7d
14	3	6	7d
15	3	6	7d

the inefficiency associated with regular potassium fertilizer applications.

Table 2. Late season fertilizer treatments applied November 21.

Trt#	N Rate	K Rate
1	0.5	0
2	0.5	0.125
3	0.5	0.25
4	0.5	0
5	0.5	0.25
6	0.5	0.5
7	0.5	0
8	0.5	0.5
9	0.5	1
10	0.5	0
11	0.5	1
12	0.5	2
13	0.5	0
14	0.5	2
15	0.5	4

with potassium treatment. However there appeared to a trend of increasing dollar spot as potassium was added.

Dollar Spot

Dollar spot infestation was assessed twice during the study by counting the number of spots per plot. There were no significant differences among treatments on either date, nor when averaged over both dates. (Table 5). The two infestations of dollar spot did not appear to be associated

Snow Mold

Gray and pink snow mold infestation was assessed twice during spring 2008 by estimating the percent area per plot infected. As observed in previous seasons, the incidence of snow mold was increased at increasing potassium application rates. In fact there was a significant effect of the

Table 3. End of growing season soil nutrient analysis.

Trt	pH	%OM	P ppm	Ca ppm	Mg ppm	K ppm	Na ppm	B ppm	Fe ppm	Mn ppm	Cu ppm	Zn ppm	Al ppm
1	7.1	2.11	83	1494	127	**62**	37	0.25	178	38	1.22	2.93	704
2	6.8	2.13	95	2054	135	**72**	34	0.35	186	33	1.10	6.33	688
3	7.1	2.07	83	1442	119	**64**	30	0.28	189	33	1.15	2.61	629
4	6.9	2.13	87	1895	122	**63**	33	0.34	197	37	1.07	6.67	645
5	7.1	2.03	81	1402	116	**69**	31	0.25	180	35	0.98	7.05	610
6	6.8	2.04	84	1572	119	**65**	34	0.33	201	39	0.98	2.95	692
7	7.2	2.23	80	1550	127	**82**	32	0.30	184	33	1.05	6.18	602
8	6.9	2.07	89	1445	123	**74**	32	0.29	185	31	0.97	4.46	658
9	7.2	2.18	85	1462	122	**75**	30	0.31	187	33	1.15	5.15	633
10	6.9	2.24	86	1693	126	**79**	36	0.78	178	34	1.05	13.40	636
11	7.1	1.89	83	1457	128	**78**	41	0.42	175	31	0.87	5.95	646
12	6.8	1.93	90	1206	102	**76**	21	0.29	190	36	0.85	4.97	663
13	7.3	2.15	83	1928	113	**106**	19	0.29	195	43	1.15	5.04	666
14	7.0	2.38	97	1713	121	**122**	25	0.26	192	38	1.16	10.86	625
15	7.2	2.02	75	1351	121	**107**	33	0.28	181	34	0.96	5.39	627

Table 4. Effect of nitrogen/potassium fertility on turf quality.

Seasonal Rates		Late Season Rates		Turfgrass Quality Ratings						
N	K	N	K	5-Jul	17-Jul	6-Aug	20-Aug	30-Aug	8-Sept	27-Sept
3	0	0.5	0	6.7	6.8	6.7	6.2	7.2	7.0	6.2
3	0	0.5	0.125	6.6	6.8	6.7	6.6	7.3	7.0	6.5
3	0	0.5	0.25	6.9	7.0	6.9	6.5	7.2	7.0	6.5
3	0.75	0.5	0	6.8	6.9	6.7	6.2	7.3	7.0	6.3
3	0.75	0.5	0.25	6.8	6.5	6.4	5.9	7.2	7.0	6.1
3	0.75	0.5	0.5	7.0	6.8	6.8	6.5	7.3	6.9	6.2
3	1.5	0.5	0	6.4	6.6	6.2	6.0	7.5	6.9	5.7
3	1.5	0.5	0.5	6.4	6.7	6.3	5.9	7.1	6.7	5.6
3	1.5	0.5	1	7.1	6.9	7.1	6.4	7.3	6.9	6.3
3	3	0.5	0	6.6	6.7	6.6	6.0	7.1	6.8	5.4
3	3	0.5	1	6.4	6.7	6.5	5.8	7.1	6.9	5.8
3	3	0.5	2	6.7	6.9	6.7	5.9	7.3	6.9	6.3
3	6	0.5	0	7.0	6.8	6.9	6.1	7.2	6.9	6.5
3	6	0.5	2	6.3	6.7	6.8	6.3	7.1	6.8	5.6
3	6	0.5	4	6.3	6.8	6.9	5.8	7.4	6.9	5.9
			LSD (0.05)	NS	NS	NS	NS	NS	NS	NS

late season potassium rate on snow mold incidence, i.e., as late season rate increased snow mold incidence increased. There was also an obvious reduction in recovery associated with high seasonal and late season potassium applications.

Clippings

Clippings were collected on April 21, 2008. Fresh weights and dry weights were recorded. Dry weight data are presented here. There were no significant differences among the treatments (Table 7).

The lack of effect on clipping yield was not expected as there appeared to be much less recovery on plots treated with higher rates of seasonal and late season potassium. It is possible that areas that were not infected were able to produce significant

Table 5. Effect of nitrogen/potassium fertility on dollar spot incidence.

Seasonal Rates		Late Season Rates		# Dollar Spots/ Plot	
N	K	N	K	12-Sept	27-Sept
3	0	0.5	0	6.3	12.0
3	0	0.5	0.125	4.3	7.3
3	0	0.5	0.25	2.0	6.3
3	0.75	0.5	0	2.3	11.3
3	0.75	0.5	0.25	4.0	15.0
3	0.75	0.5	0.5	7.7	13.7
3	1.5	0.5	0	5.0	16.0
3	1.5	0.5	0.5	7.3	21.3
3	1.5	0.5	1	4.7	12.3
3	3	0.5	0	5.7	21.3
3	3	0.5	1	4.3	14.7
3	3	0.5	2	4.7	14.0
3	6	0.5	0	3.7	9.0
3	6	0.5	2	5.0	16.0
3	6	0.5	4	5.3	17.0

Table 6. Effect of nitrogen/potassium fertility on snow mold incidence.

Seasonal Rates		Late Season Rates		% plot infected with Snow Mold	
N	K	N	K	30-March	15-April
3	0	0.5	0	0	0
3	0	0.5	0.125	0	0
3	0	0.5	0.25	5	0
3	0.75	0.5	0	5	1
3	0.75	0.5	0.25	12	5
3	0.75	0.5	0.5	17	7
3	1.5	0.5	0	5	0
3	1.5	0.5	0.5	10	2
3	1.5	0.5	1	12	7
3	3	0.5	0	10	10
3	3	0.5	1	15	12
3	3	0.5	2	20	14
3	6	0.5	0	12	10
3	6	0.5	2	30	15
3	6	0.5	4	40	22
			LSD (0.05)	4.5	3.2

continued on page 6

The lack of effect on turfgrass quality is consistent with previous potassium research conducted at Cornell University. This continues to suggest the inefficiency associated with regular potassium fertilizer applications.

The two infestations of dollar spot did not appear to be associated with potassium treatment. However there appeared to a trend of increasing dollar spot as potassium was added.

The first year of this three year study has confirmed some initial observations associated with increased potassium fertilization from previous potassium research at Cornell University.

CUTT

In fact there was a significant effect of the late season potassium rate on snow mold incidence, i.e., as late season rate increased snow mold incidence increased. There was also an obvious reduction in recovery associated with high seasonal and late season potassium applications.

Feature Story

continued from page 5

amounts of top growth that might have confounded the data.

Summary

The first year of this three year study has confirmed some initial observations associated with increased potassium fertilization from previous potassium research at Cornell University. There continues to be a lack of a significant effect from regular potassium fertilization and in some cases increased incidence of snow mold.

One previous observation that was not confirmed is the reduced spring growth associated with elevated potassium application rates. There could have been an early reduction that our data collected in April did not detect. We are currently conducting several basic studies attempting to further understand the relationship among potassium fertilization, potassium uptake and snow mold.

Frank S. Rossi, Ph.D. and
Mary C. Thurn

Table 7. Effect of nitrogen/potassium on clipping dry weights.

Treatment	Dry Wt. grams
	21-Apr
1	9.7
2	9.4
3	10.7
4	10.5
5	8.5
6	8.0
7	9.8
8	8.6
9	8.3
10	9.6
11	9.0
12	7.7
13	9.6
14	9.6
15	7.7
LSD (p=0.05)	NS