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The New Jersey Turfgrass Association

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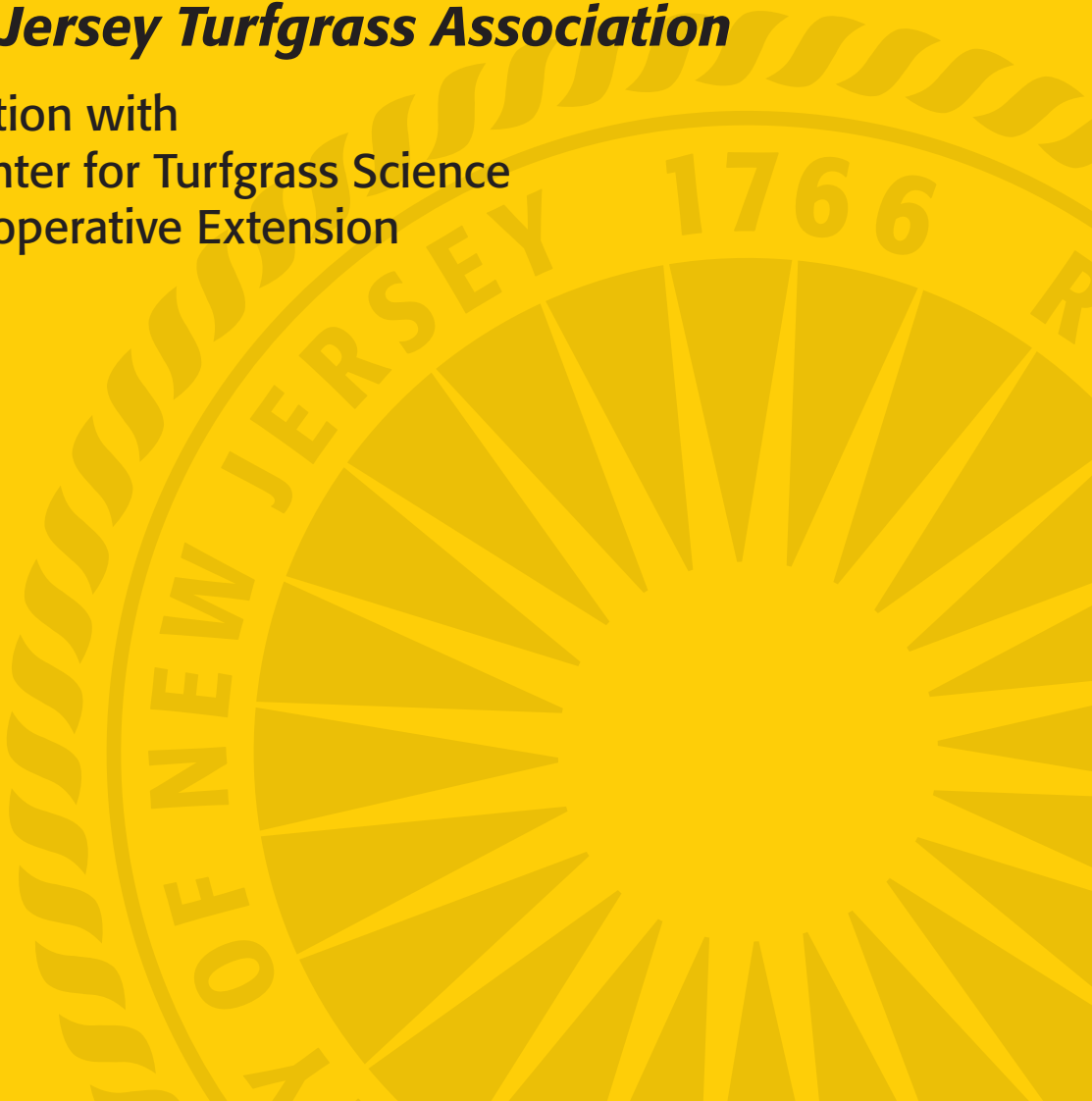

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The Rutgers Turfgrass Proceedings is published yearly by the Rutgers Center for Turfgrass Science, Rutgers Cooperative Extension, and the New Jersey Agricultural Experiment Station, School of Environmental and Biological Sciences, Rutgers, The State University of New Jersey in cooperation with the New Jersey Turfgrass Association. The purpose of this document is to provide a forum for the dissemination of information and the exchange of ideas and knowledge. The proceedings provide turfgrass managers, research scientists, extension specialists, and industry personnel with opportunities to communicate with co-workers. Through this forum, these professionals also reach a more general audience, which includes the public.

This publication includes lecture notes of papers presented at the 2017 GREEN EXPO Turf and Landscape Conference. Publication of these lectures provides a readily available source of information covering a wide range of topics and includes technical and popular presentations of importance to the turfgrass industry.

This proceedings also includes research papers that contain original research findings and reviews of selected subjects in turfgrass science. These papers are presented primarily to facilitate the timely dissemination of original turfgrass research for use by the turfgrass industry.

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Dr. Ann Brooks Gould, Editor
Dr. Bruce B. Clarke, Coordinator

POST-EMERGENCE CRABGRASS CONTROL WITH PRE-PACKAGED MIXTURES CONTAINING QUINCLORAC OR FENOXAPROP, 2016

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The objective of this experiment was to evaluate smooth crabgrass (*Digitaria ischaemum*) control provided by commercially available products that contain quinclorac or fenoxaprop-ethyl.

MATERIALS AND METHODS

This experiment was conducted at the Rutgers Horticultural Research Farm II, North Brunswick, NJ to a mature stand of Kentucky bluegrass (*Poa pratensis*) infested with smooth crabgrass. The test, on a loam soil with a pH of 5.81, was mowed 2 to 3 times per week with a reel mower at 1.5 inches. Smooth crabgrass was naturally present across the experiment site; the test was irrigated weekly to promote crabgrass development and avoid turfgrass drought.

Treatments (Table 1) were arranged in a randomized block design and replicated four times. A non-treated control was included for comparison. The treatments were applied to 3 x 10-ft plots using a CO_2-powered sprayer calibrated to apply 40 GPA through a single AI9506EVS nozzle at 40 PSI on 6 July 2016. Weather conditions three days prior to and six days after the application are provided in Table 2.

Smooth crabgrass cover was visually evaluated in each plot (excluding a 6-inch border around the plot edge) prior to the first treatment application and 6 weeks after application. Smooth crabgrass percent cover was evaluated on a 0 (no cover) to 100% (complete cover) scale at 0, 14, 21, 28, and 42 days after treatment (DAT). Smooth crabgrass and Kentucky bluegrass injury was evaluated on a 1 (complete injury) to 9 (no injury) scale at 0, 14, 21, 28, and 42 DAT. Percent control of smooth crabgrass was determined by taking percent smooth crabgrass cover in each plot and comparing it to cover in the non-treated control within each replication. Smooth crabgrass cover ranged from 24 to 39% in each plot at the beginning of the experiment. Smooth crabgrass cover was 71% in the non-treated control 28 days after treatment.

Data were subjected to ANOVA in ARM (v2016.4), and Fisher's Protected LSD ($p \leq 0.05$) was used to separate means.

RESULTS

No turfgrass injury was observed at any time during the experiment (data not presented).

Smooth Crabgrass Injury

Treatments containing fenoxaprop caused more smooth crabgrass injury than other treatments at 3 days after application (DAA) (Table 3). By 7 DAA, Last Call + non-ionic surfactant (NIS) caused more crabgrass injury than Acclaim Extra. Treatments containing fenoxaprop caused more smooth crabgrass injury than Q4 at 7 DAA.

Smooth Crabgrass Control

Treatments containing fenoxaprop controlled crabgrass similarly and provided more control than quinclorac-containing treatments on all rating dates (Table 4). These treatments provided >90% smooth crabgrass control at 14 and 22 days DAA. By 43 DAA, crabgrass regrowth was evident as fenoxaprop-containing treatments provided 72 to 79% control. The tank-mixture of Last Call + NIS did not improve control compared to Last Call applied alone.

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Table 1. Herbicide treatments applied at the Rutgers Horticultural Research Farm II, North Brunswick, NJ to a mature stand of Kentucky bluegrass (*Poa pratensis*) infested with smooth crabgrass (*Digitaria ischaemum*).

Treatment	Product	Active Ingredient	Product Rate (per acre)	Active Ingredient Rate (lb per acre)
1	Non-treated	–	–	–
2	Last Call	fenoxaprop + fluroxypyr + dicamba	4 pt	0.125 + 0.125 + 0.125
3	Quincept	2,4-D + quinclorac + dicamba	8 pt	1.0 + 0.75 + 0.125
4	Q4	quinclorac + sulfentrazone + 2,4-D + dicamba	8 pt	0.75 + 0.06 + 0.9 + 0.1
5	Last Call[1]	fenoxaprop + fluroxypyr + dicamba	4 pt	0.125
6	Acclaim[1]	fenoxaprop	28 fl oz	0.125

[1] Applied with non-ionic surfactant (NIS) at 0.25% v/v

Table 2. Twenty four-hour low and high air temperatures (°F) and average percent relative humidity (RH%) recorded in New Brunswick, NJ, three days prior to and six days after the herbicide application. The application date is bolded. Weather data provided by weatherunderground.com.

24-hr Air Temperature (°F) and Percent Relative Humidity (RH%)			
Date	High	Low	RH%
3 July	81	62	48
4 July	84	65	61
5 July	88	68	72
→ **6 July**	**93**	**73**	**83**
7 July	93	76	61
8 July	89	69	73
9 July	70	65	89
10 July	81	66	70
11 July	83	63	81
12 July	83	65	88

Table 3. Smooth crabgrass injury after treatments were applied on 6 July 2016 in North Brunswick, NJ.

		Smooth Crabgrass Injury (%)[1]		
		9 July	13 July	20 July
Treatment	Product	3 DAT[2]	7 DAT	14 DAT
1	Non-treated	9.0 a	9.0 a	9.0 a
2	Last Call	7.8 b	3.8 e	8.0 a
3	Quincept	6.5 c	5.3 cd	7.0 a
4	Q4	6.5 c	6.3 bc	6.5 a
5	Last Call + NIS	8.3 b	4.3 de	8.3 a
6	Acclaim + NIS	8.3 b	5 d	6.3 a
	LSD at 5% =	0.8	1.1	2.4

[1] Smooth crabgrass injury evaluated on a scale of 1 to 9, where 1 = complete injury or death to 9 = no injury, relative to the non-treated control. Means followed by the same letter are not sigificantly different according to Fisher's Protected LSD test ($p \leq 0.05$)

[2] DAT = days after treatment

Table 4. Smooth crabgrass control after treatments were applied on 6 July 2016 in North Brunswick, NJ.

		Smooth Crabgrass Control (%)[1]			
		20 July	28 July	4 Aug.	18 Aug.
Treatment	Product	14 DAT[2]	22 DAT	29 DAT	43 DAT
1	Non-treated	0 d	0 c	0 c	0 c
2	Last Call	98 a	90 a	87 a	72 a
3	Quincept	64 b	49 b	50 b	24 b
4	Q4	59 b	49 b	48 b	29 b
5	Last Call + NIS	98 a	92 a	92 a	79 a
6	Acclaim + NIS	94 a	94 a	91 a	74 a
	LSD at 5% =	18	10	12	12

[1] Smooth crabgrass control evaluated on a 0 to 100% scale, where 0 = no control and 100 = complete control. Crabgrass control was calculated by evaluating crabgrass cover in each plot and calculating control based on crabgrass cover in the non-treated control plot in the same replication. Means followed by the same letter are not sigificantly different according to Fisher's Protected LSD test ($p \leq 0.05$)

[2] DAT = days after treatment