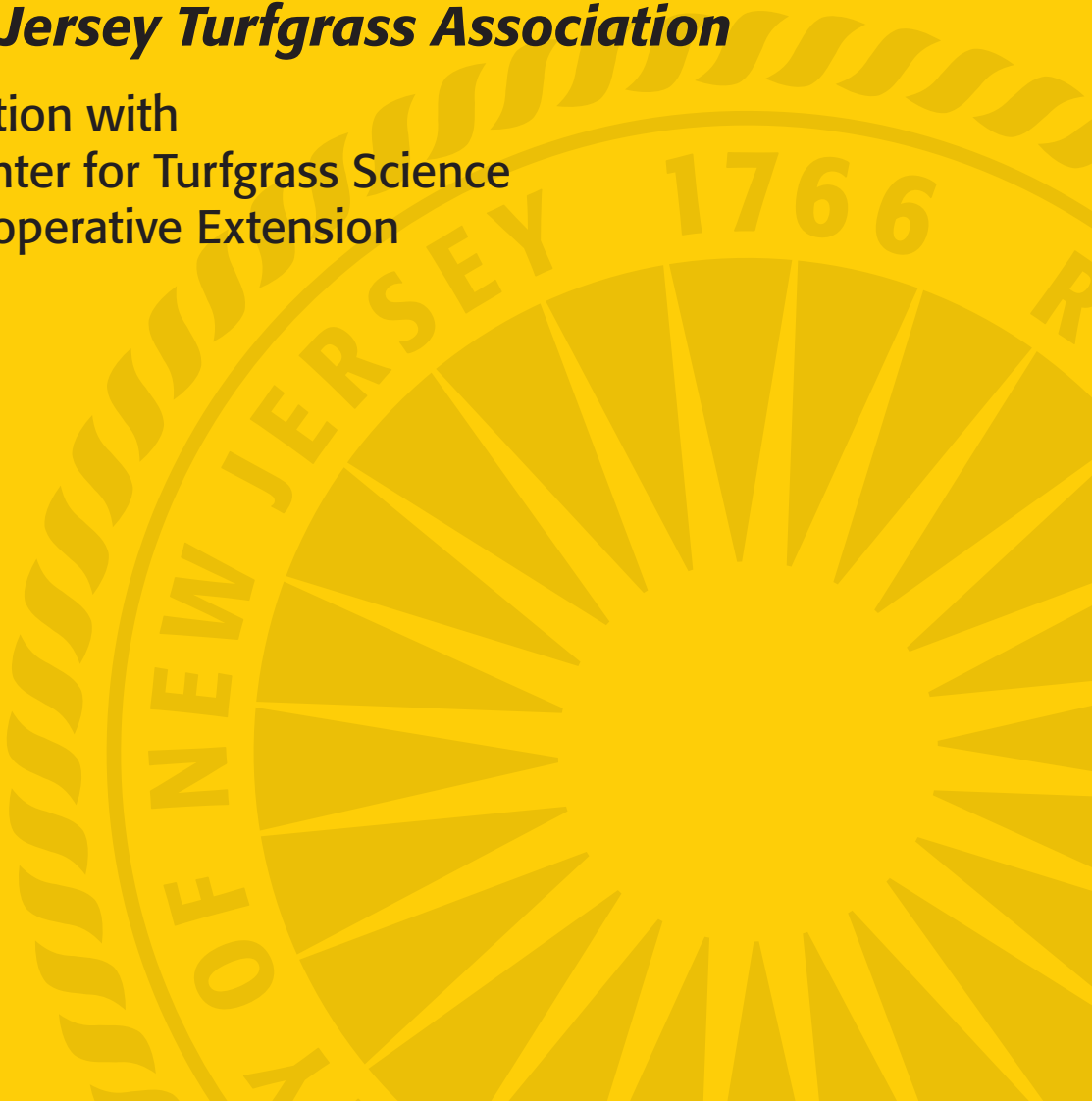
RUTGERS
New Jersey Agricultural
Experiment Station

2017
Turfgrass Proceedings

The New Jersey Turfgrass Association

In Cooperation with
Rutgers Center for Turfgrass Science
Rutgers Cooperative Extension



2017 RUTGERS TURFGRASS PROCEEDINGS

of the

GREEN EXPO Turf and Landscape Conference
December 5-7, 2017
Borgata Hotel
Atlantic City, New Jersey

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.

Special thanks are given to those who have submitted papers for this proceedings, to the New Jersey Turfgrass Association for financial assistance, and to Barbara Fitzgerald and Anne Diglio for administrative and secretarial support.

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

POST-EMERGENCE WHITE CLOVER AND SMOOTH CRABGRASS CONTROL WITH EXPERIMENTAL SCOTTS HERBICIDES, 2017

Matthew T. Elmore and Daniel P. Tuck[1]

The objective of this experiment was to evaluate various Scotts herbicides for post-emergence white clover (*Trifolium repens*) and smooth crabgrass (*Digitaria ischaemum*) control.

MATERIALS AND METHODS

This experiment was conducted at the Rutgers Horticultural Farm II in North Brunswick, NJ on a simulated lawn in two separate locations. Both sites had a sandy loam soil.

One site was a mature stand of white clover and 'Baron' Kentucky bluegrass (*Poa pratensis*). Clover cover averaged 57 to 65% for each treatment when the trial began. This site was mowed at 2 inches weekly with a reel mower and irrigated as needed to prevent wilt. Nitrogen fertilizer (1 lb N per 1000 ft^2) was applied in April 2017, and fungicides were applied as needed to prevent Pythium blight in July and August 2017.

The crabgrass site was a mature, but poor, stand of perennial ryegrass (*Lolium perenne*). Crabgrass cover was uniform and averaged 80% across the trial site on the day treatments were applied. This site was mowed at 1.5 inches weekly with a reel mower and irrigated as needed to prevent wilt. No fertilizers or plant protectants were applied in 2017.

Treatments (Table 1) were arranged in a randomized block design and replicated four times. The treatments were applied to 4 x 7-ft plots using a CO_2-powered sprayer calibrated to apply 44 GPA through a single 9504EVS nozzle at 44 PSI on 4 August 2017. A 12-inch wide, non-treated buffer strip was maintained between each plot providing a 3 x 7-ft treated area.

Weed cover and injury and turfgrass injury was evaluated visually on a 0 (no injury or control) to 100% (complete control) scale relative to the non-treated control. Percent bleaching was evaluated on crabgrass at 7 and 14 days after treatment (DAT) on a 0 (no bleaching) to 100% (complete bleaching) scale. Although necrosis or other injury was not considered a component of the bleaching rating, both bleaching and necrosis were components of the injury rating. Percent weed cover was evaluated on the day of treatment application and at 28 and 56 DAT. Data were analyzed subjected to ANOVA in ARM (v2017) 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).

White Clover

At 1, 4, and 7 DAT, white clover injury from all treatments was similar and greater than the non-treated control (Table 2). At 14 DAT, Exp 174, 175, and 176 caused more injury (≥97%) than all other treatments. Other treatments caused between 85 and 91% injury at 14 DAT.

By 28 DAT, clover cover was 0% in plots treated with Exp 174, 175, and 176, Roundup for Lawns, and Spectracide Weed Stop + Crab (Table 3). Clover cover was greater (statistically) in plots treated

[1]Assistant Extension Specialist in Weed Science and Field Researcher IV, respectively, New Jersey Agricultural Experiment Station, School of Environmental and Biological Sciences, Rutgers, The State University of New Jersey, New Brunswick, NJ 08901-8520.

with Exp 171, 172 and 173, but still measured <1% at 28 DAT. At 56 DAT, clover cover in all treated plots was (≤1%). Cover in plots treated with Exp 171, 172, and 173 was statically higher than in plots treated with Exp 174, 175, and 176, Roundup for Lawns, and Spectracide Weed Stop + Crab (0%), but this difference may not be biologically significant.

Smooth Crabgrass

Crabgrass injury was observed as soon as 4 DAT (Table 4). Roundup for Lawns caused more injury than most treatments at 4 and 7 DAT. Injury caused by other treatments was generally similar at 4 and 7 DAT. Injury caused by all treatments was generally similar at 14 DAT. Treatments Exp 171, 172, and 173 caused more bleaching than other treatments at 7 and 14 DAT (16 to 30%).

Crabgrass cover was lower in plots treated with all Exp treatments than Roundup for Lawns and Spectracide Weed Stop + Crab at 28 and 56 DAT (Table 5). Cover was similar in all experimental treatments at 28 and 56 DAT. Crabgrass cover ranged from 35 to 40% in treated plots at 56 DAT.

Table 1. Herbicide treatments applied singly at the Rutgers Horticultural Research Farm II, North Brunswick, NJ to a stand of white clover (*Trifolium repens*) and smooth crabgrass (*Digitaria ischaemum*). Treatments were applied on 4 August 2017.

Treatment	Product	Product Rate (fl oz per 1000 ft^2)
1	Non-treated	–
2	Scotts Exp 171	–
3	Scotts Exp 172	–
4	Scotts Exp 173	–
5	Scotts Exp 174	–
6	Scotts Exp 175	–
7	Scotts Exp 176	–
8	Roundup for Lawns	6.4
9	Spectracide Weed Stop + Crab	6.4

Table 2. White clover injury following herbicide treatments applied singly on 4 August 2017 in North Brunswick, NJ.

Treatment	White Clover Injury (%)[1]			
	5 Aug. 1 DAT[2]	8 Aug. 4 DAT	11 Aug. 7 DAT	17 Aug. 14 DAT
Non-treated	0 b	0 b	0 b	0 d
Scotts Exp 171	10 a	16 a	34 a	91 b
Scotts Exp 172	13 a	16 a	31 a	91 b
Scotts Exp 173	13 a	16 a	28 a	87 bc
Scotts Exp 174	11 a	19 a	43 a	98 a
Scotts Exp 175	13 a	20 a	34 a	99 a
Scotts Exp 176	10 a	18 a	32 a	98 a
Roundup for Lawns	11 a	19 a	33 a	87 bc
Spectracide Weed Stop + Crab	13 a	18 a	38 a	85 c
LSD at 5% =	4	4	19	5

[1] White clover injury evaluated on a scale of 0 to 100%, where 0 = no injury and 100% = complete necrosis. 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 3. White clover cover following herbicide treatments applied singly on 4 August 2017 at North Brunswick, NJ.

Treatment	White Clover Cover (%)[1]		
	4 Aug. 0 DAT[2]	5 Sept. 28 DAT	5 Oct. 56 DAT
Non-treated	63	60 a	84 q
Scotts Exp 171	65	0.7 b	1 b
Scotts Exp 172	57	0.4 b	0.4 cd
Scotts Exp 173	59	0.4 b	0.7 bc
Scotts Exp 174	59	0 c	0 e
Scotts Exp 175	60	0 c	0 e
Scotts Exp 176	60	0 c	0 e
Roundup for Lawns	64	0 c	0 e
Spectracide Weed Stop + Crab	61	0 c	0.2 de
LSD at 5% =	NS	0.6-18	0.4-22

[1] Clover cover evaluated on a scale of 0 to 100%, where 0 = no cover and 100 = complete cover. 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 injury and bleaching following herbicide treatments applied singly on 4 August 2017 at North Brunswick, NJ.

	Smooth Crabgrass Injury and Bleaching (%)[1,2]					
	Injury			Bleaching	Injury	Bleaching
Treatment	5 Aug. 1 DAT[3]	8 Aug. 4 DAT	11 Aug. 7 DAT	11 Aug. 7 DAT	17 Aug. 14 DAT	17 Aug. 14 DAT
Non-treated	0	0 e	0 d	0 d	0 d	0 c
Scotts Exp 171	0	11 d	30 bc	30 a	54 a	24 a
Scotts Exp 172	0	19 c	26 c	22 ab	48 abc	22 a
Scotts Exp 173	0	21 c	30 bc	16 b	51 ab	18 a
Scotts Exp 174	0	20 c	24 c	1 cd	55 a	2 bc
Scotts Exp 175	0	24 bc	23 c	2 c	45 bc	3 b
Scotts Exp 176	0	28 ab	31 bc	2 c	51 ab	1 c
Roundup for Lawns	0	31 a	44 a	0 d	45 bc	0 c
Spectracide Weed Stop + Crab	0	24 bc	39 ab	0 d	43 c	0 c
LSD at 5% =	NS	5	12	3-11	8	2-7

[1] Crabgrass injury and bleaching was evaluated on a 0 to 100% scale, where 0 = no injury or bleaching and 100% = complete necrosis or bleaching. On dates where bleaching was observed, it was considered a component of overall injury. For example, if 25% bleaching and 25% injury were observed on the same date, then all of the injury was attributed to bleaching. If 25% bleaching and 60% injury were observed, then the remaining 35% of the injury was attributed to necrosis

[2] Means followed by the same letter are not sigificantly different according to Fisher's Protected LSD test ($p \leq 0.05$)

[3] DAT = days after treatment

Table 5. Smooth crabgrass cover following herbicide treatments applied singly on 4 August 2017 at North Brunswick, NJ.

	Crabgrass Cover (%)[1]		
	4 Aug.	5 Sept.	5 Oct.
Treatment	0 DAT[2]	28 DAT	56 DAT
Non-treated	80	81 a	72 a
Scotts Exp 171	80	17 c	35 b
Scotts Exp 172	80	20 c	38 b
Scotts Exp 173	80	21 c	40 b
Scotts Exp 174	80	14 c	35 b
Scotts Exp 175	80	19 c	39 b
Scotts Exp 176	80	18 c	38 b
Roundup for Lawns	80	34 b	57 a
Spectracide Weed Stop + Crab	80	35 b	56 a
LSD at 5% =	NS	8-16	12-18

[1] Smooth crabgrass cover evaluated on a 0 to 100% scale, where 0 = no cover and 100 = complete cover.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