

# **SPECIES SPECIFIC OF CLOVER AND KENTUCKY BLUEGRASS WITH ROUNDUP PROMAX, 2008**

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### **SUMMARY**

Glyphosate is commonly used as a non-selective herbicide during the renovation of inadequate or poorly conditioned turf areas. Applications may be made 1 to 2 weeks prior to renovation in order to suppress weed species that can compete with new seedlings. The objective of this study was to evaluate four new formulations of glyphosate (Roundup®) for their ability to control a dense stand of clover and Kentucky bluegrass.

### **MATERIALS & METHODS**

This study was initiated at the University of Connecticut Plant Science Research Facility located in Storrs, CT. Prior to treatment initiation, the study area was established to 'Langara' Kentucky bluegrass (*Poa pratensis*) in October 2006. In 2008, a natural infestation of white clover was observed in the study area. All treatments are listed in the data tables.

Plots measured 3 ft x 6 ft and were arranged in a randomized complete block with 4 replications. All treatments were applied with a CO<sub>2</sub> pressurized (40 psi) backpack sprayer equipped with a flat-fan nozzle and calibrated to deliver 2.0 gal water per 1000 ft<sup>2</sup>. Treatments were applied on 26 Jun. At the time of application, air and soil temperatures were 79°F and 75°F, respectively. Plots were rated for injury to the clover and Kentucky bluegrass, percent plot area exhibiting phytotoxic symptoms and percent turfgrass and weed species living in each plot. Descriptions of all evaluations are outlined in the footnotes of each data table.

### **RESULTS AND DISCUSSION**

Injury to all weed and grass species within treated plots was first observed within 24 hours of application. Within 4 days, clover and bluegrass within plots were severely injured (Table 1). On 30 Jun (4 days after application), plots treated with MON76207 and MON773607 exhibiting the greatest level of injury to the white clover. Severe injury was observed within other treated plots. Injury to the Kentucky bluegrass was slower to manifest and moderate injury was observed from all treatments within 4 days of application. Injury to the clover and Kentucky bluegrass quickly progressed and by 2 Jul (7 days after application), severe phytotoxicity was observed in all plots treated with glyphosate. Percent of the plot area exhibiting severe phytotoxic symptoms from the glyphosate ranged from 28 to 40% and 53 to 65% on 30 Jun and 2 Jul, respectively (Table 2). When plots were rated for Percent cover on 20 Jul, all treatments had resulted in a near complete elimination of both clover and Kentucky bluegrass. Increases in percent cover within the plot area after the complete kill was attributed to the exposure of bareground and subsequent rapid germination and tillering of crabgrass within plots.

Based on the results of this field study, MON 76207 and MON 773607 resulted in the most rapid and effective suppression of white clover and Kentucky bluegrass. In situations where a rapid kill is required prior to establishment, these compounds offer a slight benefit during the initial days following application. In situations where rapid death occurs, however, it would be prudent to rapidly prepare and establish the new seeding and also utilize a preemergent crabgrass herbicide in the seedbed such as Tenacity or Tupersan. Due to variation in the rates applied from the various products, future work may seek to evaluate the impact of rate for controlling various hard to suppress weed species or titrations to determine the lowest effective rate for suppressing various weeds and grasses.

Table 1. Species specific control of clover and Kentucky Bluegrass with Roundup PROMAX, 2008.

Treatment and rate <sup>z</sup>	Clover injury <sup>y</sup>		Bluegrass injury <sup>x</sup>	
	30 Jun	2 Jul	30 Jun	2 Jul
MON 76207 4.67 qt/a.....	4.0 a <sup>w</sup>	4.3 a	2.3 ab	3.8 a
MON 77360 7 qt/a .....	3.8 a	4.3 a	2.5 a	3.8 a
MON 54154 7 qt/a .....	3.0 b	4.0 a	2.0 ab	3.3 a
MON 54155 7 qt/a .....	3.0 b	3.8 a	1.8 b	3.5 a
Untreated.....	0.0 c	0.0 b	0.0 c	0.0 b
Untreated.....	0.0 c	0.0 b	0.0 c	0.0 b

<sup>z</sup> Treatments were applied on 26 Jun.

<sup>y</sup> Clover injury was rated on a 0 to 5 scale where 0 = no injury visible and 5 = entire plot brown or dead.

<sup>x</sup> Kentucky bluegrass injury was rated on a 0 to 5 scale where 0 = no injury visible and 5 = entire plot brown or dead.

<sup>w</sup> Means in a column followed by the same letter are not significantly different at  $P \leq 0.05$  level according to the Fisher's protected least significant difference t-test.

Tables 2. Phytotoxicity and percent plot area covered with plant material following the application of various glyphosate formulations to a mixed stand of clover and Kentucky bluegrass 2008.

Treatment and rate <sup>z</sup>	Phytotoxicity <sup>y</sup>		Percent cover <sup>x</sup>		
	30 Jun	2 Jul	20 Jul	1 Aug	15 Aug
MON 76207 4.67 qt/a.....	40 a <sup>w</sup>	65 a	6 b	25 b	66 b
MON 77360 7 qt/a .....	41 a	64 a	4 c	20 b	75 b
MON 54154 7 qt/a .....	29 b	53 a	5 bc	26 b	73 b
MON 54155 7 qt/a .....	28 b	54 a	4 bc	14 b	67 b
Untreated.....	0 c	0 b	100 a	100 a	100 a
Untreated.....	0 c	0 b	100 a	100 a	100 a

<sup>z</sup> Treatments were applied on 26 Jun.

<sup>y</sup> Percent of the plot area exhibiting phytotoxic symptoms was visually rated on a 0 to 100 scale where 0 = no injury present and 100 = entire plot covered exhibiting signs of phytotoxicity.

<sup>x</sup> Percent of the plot area covered with living turf and weeds was visually rated on a 0 to 100 scale where 0 = no living ground cover present or 100 = entire plot covered with living plant material. Percent cover in the later rating dates is representative of emerging crabgrass into bare plots.

<sup>w</sup> Means in a column followed by the same letter are not significantly different at  $P \leq 0.05$  level according to the Fisher's protected least significant difference t-test.