

Primo-treated Sod: Harvest, Establishment, and Transplant (Field Validation)

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Summary: Primo applied in combination with Sprint 330 to sod 48 hours prior to harvest provided consistently high quality turf and reduced clipping yields for two weeks following planting. The reduction in foliar growth prevented scalping of the newly planted turf during the first mowing when non-treated areas scalped. The benefit of reduced foliar growth is realized during establishment of newly sodded areas by prevention of damage caused by scalping and the ability to delay the first mowing. In addition to improved turfgrass quality by prevention of scalping, root length and root mass were equivalent in the Primo treated and non-treated areas.

In order to extend the reduced foliar growth advantage provided by pre-harvest Primo treatment beyond two weeks, the sodded areas need to be re-treated with Primo. Sod that was not treated prior to harvest but was later treated with Primo demonstrated reduced clipping yields but quality was slightly reduced compared to the non-treated and pre-harvest Primo treated areas. The optimum performance of sodded areas were the pre-harvest treated followed by a post-plant treatment four weeks after initial pre-harvest treatment. Primo improves early sod establishment by reducing the need to mow thereby preventing scalping problems that frequently occur during establishment of sod on new golf course greens. Moreover, turf quality and rooting are not reduced by the Primo treatments.

Background: One of the problems encountered during establishment of sod on a golf course green is balancing the time before the first mowing against the sod roots pegging into the soil. The longer the duration between sodding and the first mowing, the greater the likelihood that roots will grow

deeply into the soil and hold the sod firmly in place. Plant growth regulators, such as Primo, seem to provide a solution to this problem by reducing growth of the foliage thereby reducing the need to mow the new sod before roots are able to secure the sod to the soil. The advantage of treating sod with Primo would only be realized if the rooting depth and root mass was not reduced by the Primo treatment. This experiment was designed to reveal whether Primo treatment allows sod to be established without damage to root growth while reducing the need for early mowing.

Materials and Methods: Sod was treated on 9/27/95 by applying 0.2 oz/1000 sq ft Primo in tank mix with 2.0 oz/1000 sq ft Sprint 330 in 1.0 gal water/1000 sq ft using a CO₂ backpack sprayer (8004 teejet flat fan nozzles, 12 inch spacing, 30 psi at the boom, 3 mph). Crenshaw-variety sod production, harvest and planting was conducted by West Coast Turf. Sod was mowed, harvested, and washed on 10/2/95. Sod was hydro-cooled after washing to prevent damage during shipping. Sod was planted on 10/3/95 at Big Canyon Country Club.

Five rolls of pre-harvest Primo-treated sod (approximately 500 sq ft) were planted inside the collar area for each of the three replicates. Two replicates were placed on opposite sides of green #2 and the third replicate was placed on green #3. Non-treated areas used for comparison were approximately 20 feet from the treated sod.

A second application of Primo, 0.25 oz/1000 sq ft, was applied on 10/26/95 to sub-plots within the previous Primo-treated and non-treated areas to evaluate the efficacy of a second Primo treatment.

Sod was mowed periodically but mowing was withheld for 48 hours prior to mowing for clipping yield evaluation. Mowing areas were 22 inches wide with four 20 foot long strips (147 sq ft) per replicate being combined into a single ziploc bag to prevent water loss prior to weighing to the nearest gram. Clippings were collected from 22 inch wide and two 20 ft long strips (73 sq ft) on 11/9/95 due to a modification of the experiment. Root length and biomass were evaluated by collecting 2 inch diameter 12 inch deep cores in acetate tubes. Soil was carefully washed from the roots and root length was measured with a ruler to the nearest 1 mm. Roots were cut from the bottom of the thatch layer and any remaining sand was gently washed from the roots. Roots were dried at 80 C for 24 hrs and weighed using a Metler AE 166 analytical balance. All statistical analyses were conducted using Systat 5.0 for Windows.

Results and Discussion

Turfgrass quality: Turfgrass quality was high and comparable in all Primo treated and non-treated areas. Pre-harvest Primo treated sod areas demonstrated slightly but consistently improved color throughout the trial. Density of the turf was also slightly improved within the pre-harvest Primo treated areas. The post-plant Primo treatment on 10/26/95 slightly reduced the color of previously non-treated areas but had no effect on quality of pre-harvest Primo treated areas. The quality of all sodded areas was excellent and differences in Primo-treated and non-treated areas was visible but not sufficiently different to rate. The only cases where sod quality was highly different was in the areas where the non-treated sod had scalped during mowing (Photos 12-14). Scalping was never observed in the Primo-treated areas.

Clipping yields: Primo treated sod provided a significant reduction (66%) in clipping yield at 2 weeks after initial treatment (WAIT) but not at 3 WAIT (Table 1, Photo 15). When the Primo treated sod was re-treated at 4 WAIT, the re-treated areas reported a 38% reduction in clipping yield compared to the non-treated areas (Table 2). Primo treated sod that was not re-treated following planting resulted in clipping yields that were significantly greater

than the non-treated sod indicating a release from Primo growth regulation.

Table 1. Clipping yield fresh weight comparison. Values followed by the same letter are not significantly different (F test, $p < 0.05$). Statistical analysis only applies to data collected on the same rating date. Note that at 3 WAIT and 6 WAIT the clipping yields are higher than the non-treated areas. The clipping yields on 2 and 3 WAIT were collected from 147 sq ft of area. Clippings collected on 11/9/95 were collected from 73 sq ft of area.

Rating Date	Clippings (g fresh weight)	
	Treated	Non-treated
10/12/95		
2 WAIT	258.3 a	762.7 b
10/19/95		
3 WAIT	481.0 a	395.7 a
11/9/95		
6 WAIT	106.3 b	64.0 a

Table 2. Clipping yield fresh weight comparison of Primo pre-harvest treatment only, Primo pre-harvest treatment and a second treatment on 10/26/95 (4 WAIT), Primo post-plant treatment on 10/26/95, and non-treated. Values followed by the same letter are not significantly different (Fisher's LSD, $p < 0.05$).

11/9/95 Rating	Clippings (g fresh wt)
Primo pre-harvest only	106.3 c
Primo pre harvest and post plant	39.7 a
Primo post plant only	40.3 ab
Non-treated	64.0 b

Root length: There was no significant difference in root length measurements for Primo treated or non-treated areas (Tables 3 and 4). These results suggest that Primo treated plant root length is not reduced even though foliar fresh weight values are lower compared to non-treated areas.

Root mass: There was no significant difference in root mass measurements for Primo treated or non-treated areas (Tables 5 and 6). These results suggest that Primo treated plant root mass is not reduced even though foliar fresh weight values are lower compared to non-treated areas.

Table 3. Root length measurements. Values are not significantly different (F test, $p < 0.05$). Statistical analysis only applies to data collected on the same rating date.

Rating Date	Root Length (mm)		Rating Date	Root Mass (g)	
	Treated	Non-treated		Treated	Non-treated
10/12/95			10/12/95		
2 WAIT	43.0	47.2	2 WAIT	0.030	0.036
10/19/95			10/19/95		
3 WAIT	67.1	66.6	3 WAIT	0.058	0.042
10/26/95			10/26/95		
4 WAIT	102.7	97.6	4 WAIT	0.060	0.088
11/9/95			11/9/95		
6 WAIT	92.8	103.3	6 WAIT	0.055	0.058

Table 5. Root mass comparison. Values are not significantly different (F test, $p < 0.05$). Statistical analysis only applies to data collected on the same rating date.

Table 4. Root length comparison of Primo pre-harvest treatment only, Primo pre-harvest treatment and a second treatment on 10/26/95 (4 WAIT), Primo post-plant treatment on 10/26/95, and non-treated. Values are not significantly different (Fisher's LSD, $p < 0.05$).

11/9/95 Rating	Root Length (mm)
Primo pre-harvest only	92.8
Primo pre harvest and post plant	92.4
Primo post plant only	88.7
Non-treated	101.3

Table 6. Root mass comparison of Primo pre-harvest treatment only, Primo pre-harvest treatment and a second treatment on 10/26/95 (4 WAIT), Primo post-plant treatment on 10/26/95, and non-treated. Values are not significantly different (Fisher's LSD, $p < 0.05$).

11/9/95 Rating	Root Mass (g)
Primo pre-harvest only	0.055
Primo pre harvest and post plant	0.080
Primo post plant only	0.081
Non-treated	0.058