

Perennial Forage Grass Response to Soil Residues and Postemergence Application of Olympus and Plateau.

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A field study was initiated near Scottsbluff, Nebraska to compare the response of nine forage grasses to herbicides applied before and after planting. The experimental design was a randomized complete block with four replications. Plots were 11 feet wide by 60 feet long and were located on a sandy loam soil with a pH of 8.2 and organic matter content of 1.2%. The nine grasses were planted in individual 6 ft wide strips perpendicular to herbicide treatments. Therefore in each 11 ft by 60 ft herbicide plot, there were nine 6 ft wide strips of grass. Herbicides were applied at different timings: 120, 90, or 30 days before planting, at planting, or 32 and 221 days after planting (Table 1). Grasses were planted into wheat stubble that had been sprayed with glyphosate during the summer to control weeds. Grass were seeded 1 inch deep with a Tye drill on August 24, 2007. The plot area was irrigated with an overhead irrigation system on an as-needed basis to enhance grass seed germination. Herbicides were applied with a backpack sprayer calibrated to deliver 20 gallons of water per acre at 32-psi pressure with Spraying Systems 11002 VS nozzles. Environmental conditions at the time of spraying are presented in Table 1.

Forage grasses were evaluated for injury on September 25, October 3, and October 10 in 2007 and on April 15, 2008. Grass vigor, height, and color in herbicide treated areas was compared to grass in the nontreated to estimate injury on a scale from 0 equal to no injury to 100 equal to death of the plant. Grass biomass was recorded on May 14, 2008 by clipping the grass in a 1 square foot area in the center of each plot and then drying the forage.

Applications of Olympus at 0.053 lb/acre or Plateau at 0.093 lb/acre 120 and 90 days before planting did not cause significant visual injury to any of the grasses (Table 2). Olympus applied 30 days before planting caused minor visual injury to crested wheatgrass, western wheatgrass, intermediate wheatgrass, green needlegrass, Lincoln smooth brome grass, and Bozoi sky Russian wildrye. Both Olympus and Plateau severely injury grasses when applied preemergence after planting. Evaluation of grass injury from Olympus and Plateau applied 32 days after planting, to grasses in the 2 to 4 leaf growth stage, showed that all grasses were injured.

Treating established grasses in the spring of 2008 with Olympus caused minor injury to green needlegrass, Bozoisky Russian wildrye, Azay sheep fescue, and Orchardgrass.

In addition to visual injury ratings, grasses were harvested in mid May and forage biomass was measured in each treatment (Table 2 and Figures 1, 2, 3, and 4). The greatest biomass of forage was produced by Lincoln smooth brome and the smallest amount by Sandburg bluegrass (Figure 1). Olympus applied 30 days before planting in 2007 reduced the biomass of western wheatgrass, intermediate wheatgrass, green needlegrass, smooth brome, Russian wildrye, sheep fescue, and orchardgrass the following spring (Figure 2). Plateau applied 30 days before planting reduced the biomass of western wheatgrass and sheep fescue.

Olympus applied 32 days after grass planting did not reduce the biomass of Sandburg bluegrass but did reduce the biomass of the other grasses (Figure 3). Plateau at this timing reduced the biomass of all grasses and Plateau caused more injury than Olympus. Treating grass the following spring 217 days after planting still resulted in injury to some grasses (Figure 4). Again Sandburg bluegrass was not injured by Olympus but other grasses were injured and Plateau injured all grasses.

The results of this study show that applications of Olympus or Plateau 60 days ahead of grass seeding should not have an effect on perennial grasses.

Table 1. Environmental conditions at the time of herbicide application.

Date	Air temperature (F)	Humidity (%)	Wind speed & direction (mph)	Time of day	Time of application	Perennial grass
April 27, 2007	56	30	2 NE	1:00 pm	120 DBP	not planted
May 24, 2007	61	35	2 SE	10:00 am	90 DBP	not planted
July 24, 2007	72	71	3 SE	9:00 am	30 DBP	not planted
August 24, 2007	PERENNIAL GRASSES PLANTED					
August 24, 2007	78	53	3 SE	3:00 pm		after planting
September 25, 2007	51	70	3 SW	10:00 am	32 DAP	2 to 4 leaves
March 28, 2008	35	28	7 NW	9:00 am	217 DAP	1 to 6 inches tall

Table 2. Perennial Forage Grass Response to Olympus and Plateau.

Crested Wheatgrass

Herbicide treatment	Rate (lb/acre)	Time of application	Visual injury				Forage yield 5/14/08 (dry wt lbs/acre)
			9/25/07	10/3/07	10/10/07	4/15/08	
			----- (%) -----				
Nontreated	—	—	0	0	0	0	2480
Olympus	0.053	120 DBP	0	0	0	0	2864
Plateau	0.093	120 DBP	0	0	0	0	2384
Olympus	0.053	90 DBP	0	0	0	0	3735
Plateau	0.093	90 DBP	0	0	0	4	3301
Olympus	0.053	30 DBP	13	13	4	3	3536
Plateau	0.093	30 DBP	4	4	0	3	4532
Olympus	0.053	at planting	83	83	80	75	1015
Plateau	0.093	at planting	64	64	48	43	3404
Olympus	0.053	32 DAP	0	23	54	65	780
Plateau	0.093	32 DAP	0	25	39	80	465
Olympus + Sencor	0.053 + 0.14	32 DAP	0	46	84	79	597
Olympus	0.053	217 DAP	0	0	0	12	1726
Plateau	0.093	217 DAP	0	0	0	2	1471
Olympus + Sencor	0.053 + 0.14	217 DAP	0	0	0	14	1798
LSD at 5%	—	—	8	10	15	14	1529

Western Wheatgrass

Herbicide treatment	Rate (lb/acre)	Time of application	Visual injury				Forage yield 5/14/08 (dry wt lbs/acre)
			9/25/07	10/3/07	10/10/07	4/15/08	
			----- (%) -----				
Nontreated	—	—	0	0	0	0	1752
Olympus	0.053	120 DBP	0	0	0	8	1896
Plateau	0.093	120 DBP	0	0	0	3	1695
Olympus	0.053	90 DBP	0	0	0	8	1853
Plateau	0.093	90 DBP	0	0	0	4	2758
Olympus	0.053	30 DBP	13	15	4	14	1301
Plateau	0.093	30 DBP	4	8	0	14	1118
Olympus	0.053	at planting	83	80	80	76	316
Plateau	0.093	at planting	64	65	48	45	907
Olympus	0.053	32 DAP	0	21	54	63	530
Plateau	0.093	32 DAP	0	21	39	86	295
Olympus + Sencor	0.053 + 0.14	32 DAP	0	41	84	86	72
Olympus	0.053	217 DAP	0	0	0	12	1255
Plateau	0.093	217 DAP	0	0	0	13	1294
Olympus + Sencor	0.053 + 0.14	217 DAP	0	0	0	20	1406
LSD at 5%	—	—	8	14	17	17	870

Intermediate wheatgrass

Herbicide treatment	Rate (lb/acre)	Time of application	Visual injury				Forage yield 5/14/08 (dry wt lbs/acre)
			9/25/07	10/3/07	10/10/07	4/15/08	
Nontreated	—	—	0	0	0	0	2828
Olympus	0.053	120 DBP	0	0	0	3	2076
Plateau	0.093	120 DBP	0	0	0	0	2691
Olympus	0.053	90 DBP	0	0	0	2	3068
Plateau	0.093	90 DBP	0	0	0	0	3306
Olympus	0.053	30 DBP	3	13	4	3	2280
Plateau	0.093	30 DBP	5	4	0	2	2801
Olympus	0.053	at planting	63	83	80	46	1433
Plateau	0.093	at planting	64	64	48	44	1793
Olympus	0.053	32 DAP	0	23	54	13	1927
Plateau	0.093	32 DAP	0	25	39	93	74
Olympus + Sencor	0.053 + 0.14	32 DAP	0	46	84	55	696
Olympus	0.053	217 DAP	0	0	0	7	2283
Plateau	0.093	217 DAP	0	0	0	3	950
Olympus + Sencor	0.053 + 0.14	217 DAP	0	0	0	4	1949
LSD at 5%	—	—	11	10	11	13	1108

Green needlegrass

Herbicide treatment	Rate (lb/acre)	Time of application	Visual injury				Forage yield 5/14/08 (dry wt lbs/acre)
			9/25/07	10/3/07	10/10/07	4/15/08	
Nontreated	—	—	0	0	0	0	567
Olympus	0.053	120 DBP	0	0	0	3	365
Plateau	0.093	120 DBP	0	0	0	0	663
Olympus	0.053	90 DBP	0	0	0	7	355
Plateau	0.093	90 DBP	0	0	0	0	624
Olympus	0.053	30 DBP	5	5	14	32	371
Plateau	0.093	30 DBP	5	5	0	4	624
Olympus	0.053	at planting	80	80	78	90	77
Plateau	0.093	at planting	63	63	58	73	576
Olympus	0.053	32 DAP	0	8	20	69	224
Plateau	0.093	32 DAP	0	28	48	93	38
Olympus + Sencor	0.053 + 0.14	32 DAP	0	18	66	85	122
Olympus	0.053	217 DAP	0	0	0	29	336
Plateau	0.093	217 DAP	0	0	0	12	77
Olympus + Sencor	0.053 + 0.14	217 DAP	0	0	0	10	403
LSD at 5%	—	—	11	14	17	25	213

Sandburg bluegrass

Herbicide treatment	Rate (lb/acre)	Time of application	Visual injury				Forage yield 5/14/08 (dry wt lbs/acre)
			9/25/07	10/3/07	10/10/07	4/15/08	
Nontreated	—	—	0	0	0	0	466
Olympus	0.053	120 DBP	0	0	0	5	557
Plateau	0.093	120 DBP	0	0	3	0	521
Olympus	0.053	90 DBP	0	0	0	15	783
Plateau	0.093	90 DBP	0	0	0	2	982
Olympus	0.053	30 DBP	0	0	0	19	459
Plateau	0.093	30 DBP	0	0	6	18	771
Olympus	0.053	at planting	0	0	73	54	286
Plateau	0.093	at planting	0	0	48	35	358
Olympus	0.053	32 DAP	0	14	46	38	526
Plateau	0.093	32 DAP	0	10	49	70	312
Olympus + Sencor	0.053 + 0.14	32 DAP	0	43	81	90	101
Olympus	0.053	217 DAP	0	0	0	23	776
Plateau	0.093	217 DAP	0	0	0	22	329
Olympus + Sencor	0.053 + 0.14	217 DAP	0	0	0	12	373
LSD at 5%	—	—	NS	11	21	27	469

Lincoln smooth bromegrass

Herbicide treatment	Rate (lb/acre)	Time of application	Visual injury				Forage yield 5/14/08 (dry wt lbs/acre)
			9/25/07	10/3/07	10/10/07	4/15/08	
Nontreated	—	—	0	0	0	0	3681
Olympus	0.053	120 DBP	0	0	0	3	3366
Plateau	0.093	120 DBP	0	0	0	2	3558
Olympus	0.053	90 DBP	0	0	0	0	2639
Plateau	0.093	90 DBP	0	0	0	0	3366
Olympus	0.053	30 DBP	13	13	4	7	3205
Plateau	0.093	30 DBP	3	3	1	2	3810
Olympus	0.053	at planting	91	91	84	72	1092
Plateau	0.093	at planting	74	74	58	47	2533
Olympus	0.053	32 DAP	0	16	38	69	756
Plateau	0.093	32 DAP	0	20	43	93	65
Olympus + Sencor	0.053 + 0.14	32 DAP	0	44	73	84	156
Olympus	0.053	217 DAP	0	0	0	9	1148
Plateau	0.093	217 DAP	0	0	0	5	1575
Olympus + Sencor	0.053 + 0.14	217 DAP	0	0	0	12	903
LSD at 5%	—	—	9	10	13	12	1115

Bozoisky Russian wildrye

Herbicide treatment	Rate (lb/acre)	Time of application	Visual injury				Forage yield 5/14/08 (dry wt lbs/acre)
			9/25/07	10/3/07	10/10/07	4/15/08	
Nontreated	—	—	0	0	0	0	1222
Olympus	0.053	120 DBP	0	0	0	5	1018
Plateau	0.093	120 DBP	0	0	0	2	1309
Olympus	0.053	90 DBP	0	0	0	7	929
Plateau	0.093	90 DBP	0	0	0	2	1745
Olympus	0.053	30 DBP	15	15	6	18	1020
Plateau	0.093	30 DBP	1	1	3	0	1490
Olympus	0.053	at planting	90	90	89	89	180
Plateau	0.093	at planting	45	45	44	43	1390
Olympus	0.053	32 DAP	0	19	55	78	173
Plateau	0.093	32 DAP	0	38	55	94	0
Olympus + Sencor	0.053 + 0.14	32 DAP	0	56	85	94	1222
Olympus	0.053	217 DAP	0	0	0	27	190
Plateau	0.093	217 DAP	0	0	0	18	238
Olympus + Sencor	0.053 + 0.14	217 DAP	0	0	0	27	483
LSD at 5%	—	—	11	14	16	17	558

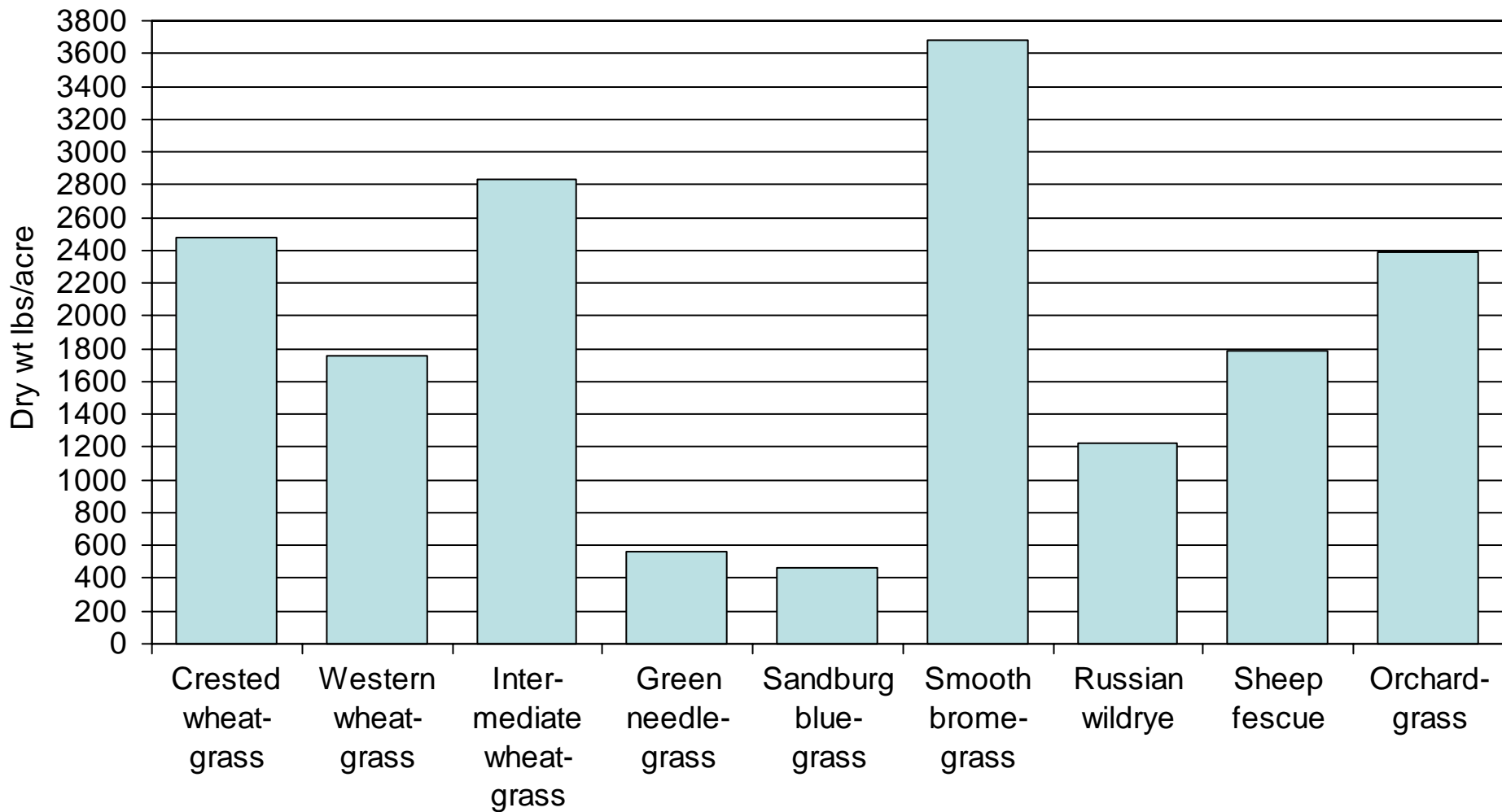
Azay sheep fescue

Herbicide treatment	Rate (lb/acre)	Time of application	Visual injury				Forage yield 5/14/08 (dry wt lbs/acre)
			9/25/07	10/3/07	10/10/07	4/15/08	
Nontreated	—	—	0	0	0	0	1786
Olympus	0.053	120 DBP	0	0	0	2	1088
Plateau	0.093	120 DBP	0	0	0	0	831
Olympus	0.053	90 DBP	0	0	0	0	1366
Plateau	0.093	90 DBP	0	0	0	0	1032
Olympus	0.053	30 DBP	5	5	4	3	939
Plateau	0.093	30 DBP	4	4	0	0	1056
Olympus	0.053	at planting	58	58	66	32	992
Plateau	0.093	at planting	58	58	48	24	660
Olympus	0.053	32 DAP	0	9	19	22	718
Plateau	0.093	32 DAP	0	21	36	83	72
Olympus + Sencor	0.053 + 0.14	32 DAP	0	24	65	74	216
Olympus	0.053	217 DAP	0	0	0	3	1049
Plateau	0.093	217 DAP	0	0	0	9	375
Olympus + Sencor	0.053 + 0.14	217 DAP	0	0	0	4	2334
LSD at 5%	—	—	9	13	16	10	639

Orchardgrass

Herbicide treatment	Rate (lb/acre)	Time of application	Visual injury				Forage yield 5/14/08 (dry wt lbs/acre)
			9/25/07	10/3/07	10/10/07	4/15/08	
			----- (%) -----				
Nontreated	—	—	0	0	0	0	2391
Olympus	0.053	120 DBP	0	0	0	3	1894
Plateau	0.093	120 DBP	0	0	0	0	3013
Olympus	0.053	90 DBP	0	0	0	0	2010
Plateau	0.093	90 DBP	0	0	0	0	2350
Olympus	0.053	30 DBP	8	8	13	8	1909
Plateau	0.093	30 DBP	1	1	3	2	2374
Olympus	0.053	at planting	78	78	80	55	898
Plateau	0.093	at planting	53	53	43	28	2257
Olympus	0.053	32 DAP	0	16	28	45	1205
Plateau	0.093	32 DAP	0	13	21	79	375
Olympus + Sencor	0.053 + 0.14	32 DAP	0	40	59	53	420
Olympus	0.053	217 DAP	0	0	0	12	1709
Plateau	0.093	217 DAP	0	0	0	8	1486
Olympus + Sencor	0.053 + 0.14	217 DAP	0	0	0	13	1520
LSD at 5%	—	—	8	10	16	11	1139

Figure 1. Forage Grass Production at Scottsbluff, Nebraska during the 2008 Growing Season



Perennial grasses planted on August 24, 2007
Perennial grasses harvested on May 14, 2008

Figure 2. Perennial Forage Grass Response to Residues of Olympus and Plateau Applied 30 Days Before Planting

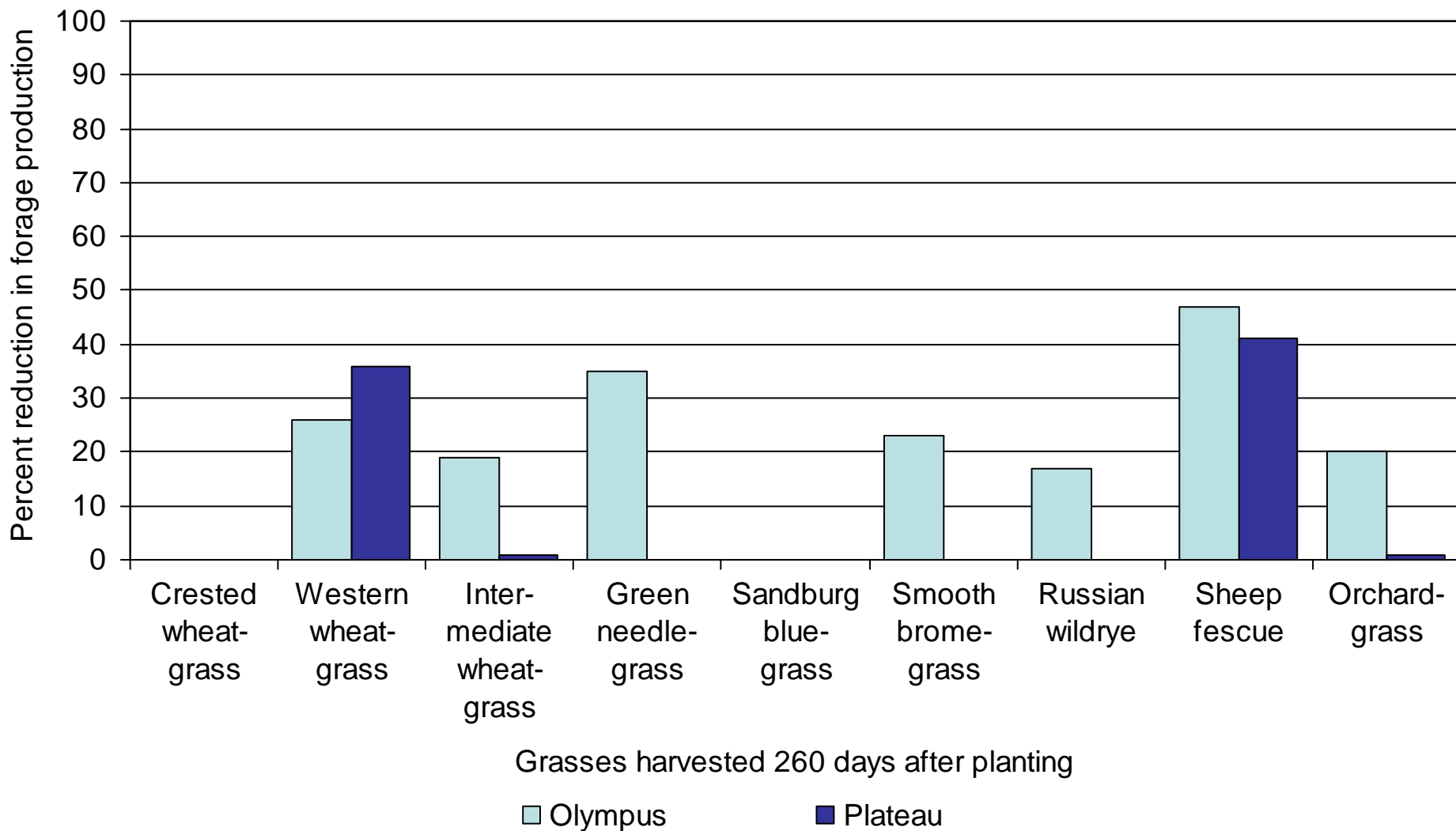


Figure 3. Seedling Perennial Forage Grass Response to Postemergence Applications of Olympus or Plateau Applied 32 Days After Planting

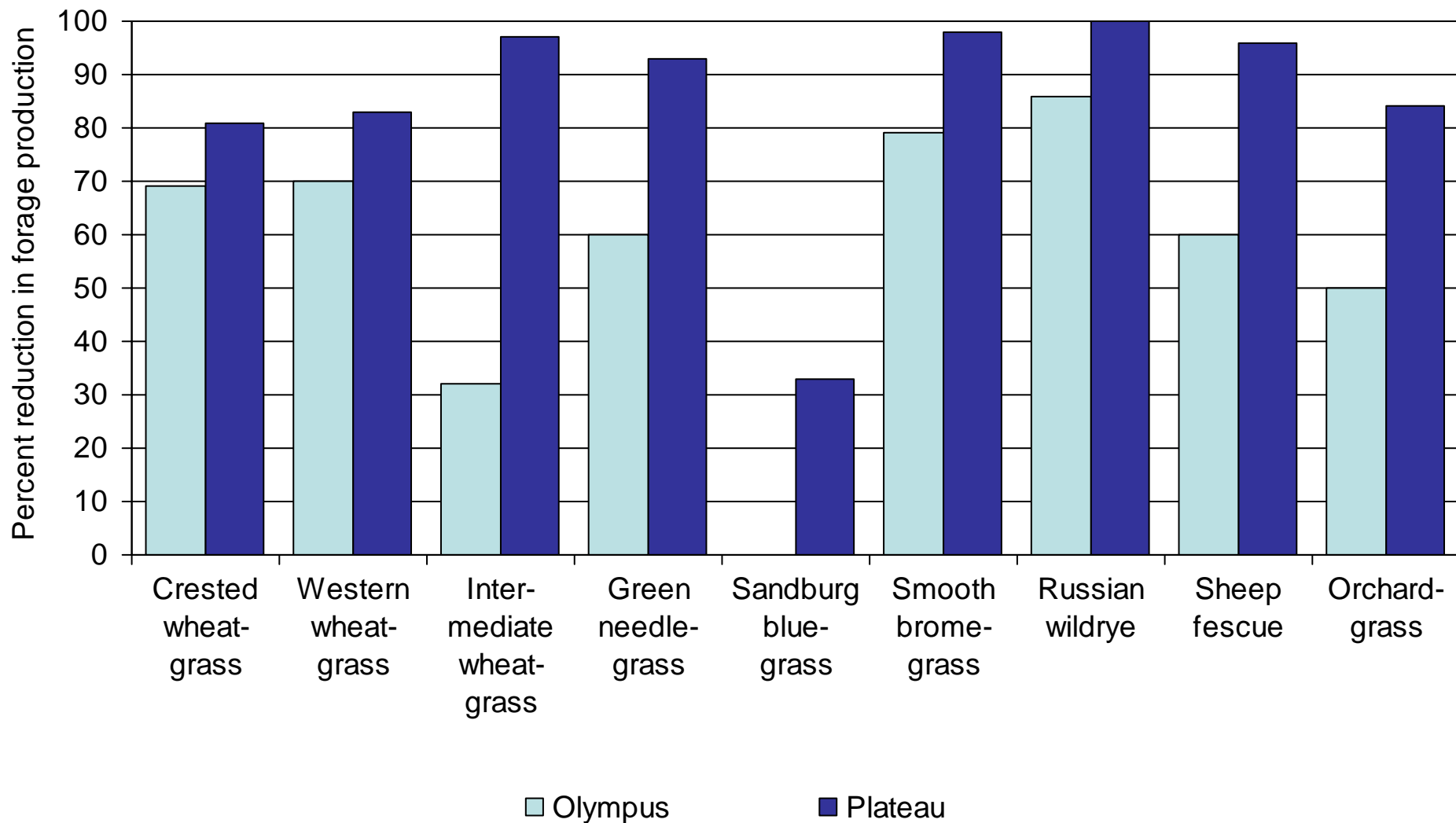


Figure 4. Perennial Forage Grass Response to Postemergence Applications of Olympus or Plateau Applied 217 Days After Planting

