

# Nelson Annual Ryegrass

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‘Nelson’ is a forage-type annual ryegrass (*Lolium multiflorum* Lam.) developed by the Texas AgriLife Research. Nelson is a tetraploid where  $2n = 4x = 28$  chromosomes. This line has been evaluated in forage trials at Overton, College Station and Beaumont for the past four years. It has also been evaluated in Mississippi, Oklahoma and Florida in official state experiment station forage trials.

## Main Attributes

- Large plant stature compared to diploid cultivars provides high forage yield potential
- Good crown rust resistance
- Wide range in adaptability across southern USA
- Has wider leaves than TAM 90 and Gulf, but is similar to TAMTBO

## Description of Line

Nelson was developed for high forage production in the Deep South and Mid South of the USA. It can be over-seeded on warm season perennial pastures or drilled into prepared seedbeds in the autumn. This contrasts with TAES releases such as ‘Gulf’ (Weihing, 1963) and ‘TAM 90’ (Nelson et al., 1992) which are diploid cultivars; however, Nelson is related to ‘TAMTBO’ (Nelson et al., 2007) a tetraploid cultivar released in 2006. Nelson was the second tetraploid ryegrass cultivar released by Texas AgriLife Research.

Plant stature (Table 1) of Nelson was 124 cm and is larger and taller than Gulf (96 cm), but similar to tetraploid cultivars TAMTBO and Jumbo (Prine et al., 2002) which were 125 and 128 cm, respectively. Flag leaf length (Table 1) of Nelson was less ( $p > 0.05$ ) than Jumbo, Prine (Ball and Blount, 2002) and TAMTBO, but longer than Gulf. Nelson had a mean number of 31 spikelets/spike (Table 1) compared to 37 for Jumbo and Prine, 38 for TAMTBO, and only 25 for Gulf. In regard to length of 10 seed, Nelson was similar to Jumbo, Prine, and TAMTBO; however, Nelson differed from other cultivars for length of 10 seed (Table 1), where Nelson was

6 mm shorter than ‘Tetrapro’ and 6 mm longer than Gulf. Nelson also had a slightly higher 1000 seed weight compared to Jumbo, TAMTBO, and Gulf (Table 1). Freeze damage has not occurred on Nelson over the past four years at Overton when a low temperature of 11°F occurred in 2010. Nelson is not infected with the fungal endophyte. The fluorescence level of Nelson according to the Oregon State Seed Testing Laboratory is 99.49%. The ploidy level is 100% tetraploid.

### **Breeding History Of Nelson**

Nelson is a 3-way cross from ryegrass breeding lines TXR2000-T2, TXR2002-T17, and the cultivar Jumbo (Prine et al., 2002). Jumbo is a tetraploid cultivar released by the University of Florida. The 3-way cross was made by growing adjacent rows (replicated) of TXR2000-T2, TXR2002-T17, and Jumbo. Any plants not exhibiting good forage potential (large plants with wide leaves and high tiller number) were removed from the population prior to cross-pollinating. Seed was harvested from individual plants and bulked. In 2002-2003, and in 2003-2004 this seed was grown in a space planting (500 plants) at Beaumont, Texas. Best plants were selected and produced seed each year. In 2004-2005, seed was increased in Oregon, returned to Overton and designated TXR2006-T22, which was later named Nelson.

### **Performance Of Nelson**

#### **Texas Trials**

Nelson produced excellent forage yields over the past 4 years at Overton, College Station and Beaumont, Texas. Table 2 provides the ryegrass forage yields at Overton for 2009-2010 and 3-year means. Nelson had a total season yield of 6381 lb/ac; however, it's 3-year mean yield of 9556 lb/ac was second in yield. This indicates Nelson has high forage yielding potential in Northeast Texas. Table 3 provides the forage yield of Nelson in the 2009-2010, and 3-year mean in the ryegrass forage trial at College Station. Nelson produced a total season yield of 12,517 lb/ac which led the trial for that year. Nelson 3-year mean (including two previous years at Beaumont) was 7160 lb/ac which was the second highest yielding cultivar over that 3-year period.

**RESULTS FROM FORMER YEARS:** Table 4 lists the forage yields at Overton of all ryegrass varieties tested in 2007-2008 as well as a 3-year mean of those varieties tested over that period. Nelson had the highest numerical forage yield for the 2007-2008 growing season; however, several other varieties were not statistically different. Nelson was significantly ( $p>0.05$ ) higher yielding compared to Jumbo, Prine, TAM 90, and other entries. In comparing the 3-year mean, Nelson and TAMTBO had the two highest yields at Overton. Forage yields at Beaumont (Table 5) indicated that Nelson had the second highest forage yield for the season total as well as for the three year mean. The total season yield of 5325 lb/ac was significantly higher than all cultivars other than Tetrapro and Big Boss. In growing season 2006-2007 (Table 6) at Overton, Nelson produced an average yield compared to other entries. At Beaumont in 2006-2007 (Table 7), Nelson produced the 5<sup>th</sup> highest yield which was not significantly lower than the top numerical forage yield. Forage yields for 2005-2006 at Overton (Table 8) indicated Nelson produced a total season yield of 7316 lb/ac and was ranked 2<sup>nd</sup> in the trial and not significantly different than TAMTBO. At Beaumont in 2005-2006 (Table 9), Nelson produced the 4<sup>th</sup> highest yield indicating high forage production in Gulf Coast Region of Texas.

### **Results from Other States**

In 2007-2008 Nelson was tested by the Mississippi Agricultural and Forestry Experiment Station at Newton and Starkville, Mississippi, and by the Noble Foundation at Ardmore, Oklahoma. In both the Starkville (Table 10) and Newton (Table 11) trials for total season forage yield, Nelson was in the top third of entries for each test and not significantly different from the highest yielding entry. In the Noble Foundation trial (Table 12) Nelson had a forage yield of 7420 which was the highest yielding entry in the experiment. These data indicate that Nelson has high forage yielding potential and good winter hardiness in Oklahoma which is in the northern region of the ryegrass growing belt. In the previous year or **2006-2007** in Mississippi (Table 13) at Newton, Nelson was only average; however, there was a very high LSD value in that experiment. At Starkville, Nelson produced an above average yield and its yield was not significantly different from the top yielding entry in the trial. In the Noble Foundation trial (Table 14) Nelson did not produce a good forage yield. Nelson was also tested at Gainesville, Florida in 2006-2007 (Table 15), where it ranked 6<sup>th</sup> in the trial and was not different from the highest yielding entry. From

the data presented in these trials, it appears that Nelson has very good forage yielding potential for all of the southern region of the USA.

### **Disease Data**

**Crown rust** (*Puccinia coronata* Corda) data are shown for Beaumont in 3 years (Tables 5, 7, and 9). In these replicated trials Nelson demonstrated good crown rust resistance Marshall is a susceptible cultivar and it was rated fairly high or susceptible each year. In crown rust ratings in a crown rust nursery conducted by Dr. G. M. Prine at Gainesville, Florida, (a location where crown rust epidemics are very severe most years) shows that Nelson had relatively good tolerance to this disease (Table 16). Nelson was similar to Jumbo, TAM 90, and TAMTBO in crown rust ratings and more resistant than Marshall. Dr. Prine also rated the ryegrass nursery for gray leaf spot (*Pyricularia grisea*) at Gainesville, Florida (Table 15). These data indicate that Nelson had good to average tolerance to gray leaf spot and was similar to Jumbo and TAMTBO, but more tolerant than TAM 90 or Gulf. Gray leaf spot has not been reported on ryegrass in Texas during the past 30 years.

### **Literature Cited**

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Arnold, B. L., C. E. Watson, Jr. and N. C. Edwards, Jr. 1981. Registration of 'Marshall' annual ryegrass. *Crop Sci.* 21:474.

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Table 1. Plant characters of Nelson which differed from other varieties in Plant Variety Protection Nursery at Overton, Texas in 2008.

Genotype	Plant Height cm	Flag leaf Length cm	Spikelets Per spike No.	Length 10 seed mm	1000 Seed Wt mg	Heading Date Of Year	Anthesis Date Of Year
Nelson	124 a	66 bc	31 b	60 bc	3280 ab	119	120
Tetrapro	127 a	78 a	36 a	66 a	3450 a	117	121
Jumbo	128 a	77 a	37 a	65 ab	3100 b	121	122
Prine	124 a	79 a	37 a	60 bc	3290 ab	113	118
TAMTBO	125 a	73 ab	38 a	65 ab	2690 c	118	121
Gulf	96 b	60 cd	25 c	54 d	1860 d	118	120
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Mean	121	71	34	62	2945	117.7	120.3
cv	7.2	8.5	8.4	6.3	7.3	--	--
lsd (0.05)	4.3	2.8	3.7	5.2	320	--	--

Table 2. Annual ryegrass forage variety trial at Overton, TX for 2009-10 and 3-year means.

Variety	Harvest	Harvest	Harvest	Harvest	Total	3-year
	1	2	3	4	Season	Mean
	Jan 27	Mar 18	Apr 20	May 24	Yield	Yields
-----lbs of dry matter/acre-----						
RIO	472	1083	5088	545	7188	- <sup>b</sup>
Flying "A"	461	1000	4990	526	6977	9157
CHIPOLA2009	684	1662	4174	399	6919	8429
TXR2008-T3 <sup>a</sup>	325	930	4771	835	6861	-
M/FLX2009 (4X) ER <sup>a</sup>	543	1571	4065	671	6850	-
Gulf	602	1052	4552	635	6841	8310
FLX2009Red 4X Late <sup>a</sup>	425	1008	4543	853	6829	-
Tam 90	413	1136	4767	454	6770	8676
Passeral Plus	507	1078	4557	563	6705	9169
TAMTBO	366	1131	4465	708	6670	9832
FLXSH2009 (2X) ME <sup>a</sup>	673	1457	4023	345	6498	-
Prine	413	911	4356	762	6442	9274
Nelson	366	1005	4302	708	6381	9556
07-WW <sup>a</sup>	313	1028	4617	417	6375	8725
Jackson	136	653	5037	526	6352	8131
Marshall	272	719	4790	562	6343	8628
ME 4 <sup>a</sup>	212	662	4794	653	6321	8989
Tetrapro	437	962	4297	545	6241	9133
Winter Hawk	219	804	4646	526	6195	8965
07-EW <sup>a</sup>	295	808	4414	671	6188	9024
SHFL2009 (2X) <sup>a</sup>	614	1323	3737	490	6164	-
Diamond T	401	934	3977	671	5983	8674
07-ME <sup>a</sup>	342	762	4536	327	5967	8830
Jumbo	295	698	4087	835	5915	8890
FLX2009 (PE-2X) LRCT <sup>a</sup>	213	673	4326	581	5793	-
ME 94 <sup>a</sup>	313	674	4444	345	5776	8744
Maximus	307	733	3974	671	5685	8379
B-8.1441 <sup>a</sup>	77	388	4284	562	5311	-
Go Saen	342	748	3547	327	4964	-
Suxyl	319	949	3374	182	4824	-
PPER2 <sup>a</sup>	77	361	3762	454	4654	-
Adrenalin	360	634	2238	1289	4521	-
PS-Lm-09-2 <sup>a</sup>	165	490	2695	290	3640	-
Mean	362	910	4249	573	6094	8876
C.V.	47	28	14	73	15	-
LSD (0.05)	196	306	697	496	1091	-

<sup>a</sup> Experimental line, seed not commercially available.

<sup>b</sup> Entry not tested over last 3 years.

Planted on 30 Sept. 2009. Fertilization: Pre-plant 52 lbs N, 28 lbs P<sub>2</sub>O<sub>5</sub> and 108 lbs K<sub>2</sub>O/ac. Topdress 40 lbs N/ac on 9 Nov. 2009, 26 lbs N/ac on 11 Dec. 2009, 40 lbs N/ac on 4 Mar. 2010 and 50 lbs N/ac on 29 Mar. 2010. Herbicide applied: Weedmaster at recommended rate on 9 Nov. 2009.

Table 3. Annual ryegrass forage variety trial at College Station, TX for 2009-10 and 3-year means using Beaumont location data for 2007-08 and 2008-09.

Variety	Harvest 1 Jan 26	Harvest 2 Mar 12	Harvest 3 Apr 22	Harvest 4 May 25	Total Season Yield	3-year Mean Yields
-----lbs of dry matter/acre-----						
Nelson	1712	2164	7506	1135	12517	7160
Maximus	1880	2069	7108	908	11965	6340
Adrenalin	2160	2052	6118	1165	11495	- <sup>b</sup>
Winter Hawk	2429	2308	6118	635	11490	6463
PS-Lm-09-2 <sup>a</sup>	2160	1398	6939	938	11435	-
Tetrapro	1768	1877	6866	665	11176	7291
Diamond T	2429	2005	5672	923	11029	6356
07-EW <sup>a</sup>	2227	1941	6239	544	10951	6096
07-WW <sup>a</sup>	2205	1909	6203	590	10907	6416
TXR2008-CB-2 <sup>a</sup>	1891	2004	5998	938	10831	-
Marshall	2339	1932	5889	665	10825	5639
TAMTBO	1880	1797	5877	1029	10583	6174
Prine	1399	1629	6625	923	10576	6401
B-8.1441 <sup>a</sup>	1052	1270	7699	544	10565	-
Jackson	1869	1597	6142	590	10198	5959
ME 4 <sup>a</sup>	1063	1661	6697	726	10147	5612
Jumbo	1030	1765	6468	847	10110	6155
TAM 90	2059	1845	5696	469	10069	5901
RIO	2071	2021	5442	529	10063	-
Gulf	2619	1613	5080	666	9978	5596
PPER2 <sup>a</sup>	750	1258	7120	666	9794	-
TXR2008-T3 <sup>a</sup>	951	1645	6046	862	9504	-
Passeral Plus	1869	1661	5442	340	9312	5606
FLX2009Red 4X Late <sup>a</sup>	929	1749	5780	817	9275	-
07-ME <sup>a</sup>	1735	1254	5732	484	9205	5662
M/FLX2009 (4X) ER <sup>a</sup>	1511	2348	4598	545	9002	-
ME 94 <sup>a</sup>	1220	1613	5430	650	8913	5524
Flying "A"	1724	1605	4754	469	8552	5775
Suxyl	1477	1513	4712	741	8443	-
Go Saen	1623	1166	4742	726	8257	-
FLX2009 (PE-2X) LRCT <sup>a</sup>	571	1773	5273	590	8207	-
FLXSH2009 (2X) ME <sup>a</sup>	1981	1989	3873	348	8191	-
CHIPOLA2009 (2X) <sup>a</sup>	2160	2044	3560	333	8097	-
SHFL2009 (2X) <sup>a</sup>	1925	1821	3536	499	7781	-
Mean	1705	1773	5794	691	9963	6125
C.V.	32	16	20	17	16	-
LSD (0.05)	753	398	1603	168	2190	-

<sup>a</sup> Experimental line, seed not commercially available.

<sup>b</sup> Entry not tested over last 3 years.

Planted on 20 Oct. 2009. Fertilizer Application: Topdressed on 13 Nov. 2009 with 50 lbs N/ac and on 22 Feb. 2010 with 40 lbs N/ac. Herbicide applied: Weedmaster at recommended rate on 13 Nov. 2009.

Table 4. Ryegrass forage variety test at Overton, Texas for 2007-08 and 3-year means.

Variety	Harvest 1	Harvest 2	Harvest 3	Harvest 4	Harvest 5	Harvest 6	Total DMY	3-Year Mean
	Dec 20	Feb 18	Mar 14	Apr 7	May 5	May 27		
	-----pounds of dry matter per acre-----							
<b>Nelson</b>	<b>1367</b>	<b>2458</b>	<b>2166</b>	<b>2275</b>	<b>3063</b>	<b>1273</b>	<b>12602</b>	<b>9365</b>
Big Boss	1424	2117	1893	2423	2792	1132	11781	9045
Passeral Plus	1350	2027	1950	2756	2683	818	11584	--
Tetrapro	770	1997	2082	2441	2858	1207	11355	8968
Attain	1250	1920	2145	2357	2633	1000	11305	8997
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TAMTBO	1314	1958	1917	2258	2555	1223	11225	9375
Ed	1390	1781	1956	2589	2593	876	11185	8798
Marshall	1539	1924	1792	2562	2502	711	11030	8870
Jumbo	1294	1843	1846	2264	2738	1008	10993	8935
Diamond T	1343	1655	1946	2152	2808	1082	10986	8083
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Pasture Sweetner Mix	1367	1839	1656	2390	2586	918	10756	--
Flying A	1834	1688	1268	2001	3155	785	10731	7811
Verdure	1207	1795	1648	2586	2418	975	10629	8198
Maximus	1102	1625	1693	2271	2645	1198	10534	8449
Prine	891	1700	1710	2014	2702	1107	10124	8798
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TAM 90	1245	1640	1782	2114	2578	752	10111	8379
Dynagain	1818	1789	1613	2167	2034	645	10066	8079
Jackson	907	1507	1654	2234	2569	785	9656	7880
Gulf	865	1559	1375	2600	2553	702	9654	7920
WD-40	1153	1677	1422	2093	2027	702	9074	7360
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Shiwasuaoba	1498	1751	1258	2164	1884	372	8927	7343
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Mean	1282	1821	1751	2319	2589	918	10681	8455
CV	27	26	16	14	16	21	11	
LSD (0.05)	471	644	392	467	590	262	1605	

Planted on 19 October 2007. Fertilizer preplant 76 lb/ac of N, 36 lb P<sub>2</sub>O<sub>5</sub> and 76 lb K<sub>2</sub>O/ac, respectively. Topdressed with 50 lb N/ac on 21 January, 40 lb N/ac on 20 February, and 50 lb N/ac on 9 April 2008 (as urea).

Herbicide applied Weedmaster at recommended rate on 24 March 2008.



Table 5. Ryegrass forage variety test at Beaumont, Texas for 2007-08 and 3-year mean yields.

Variety	Harvest 1 Dec 18	Harvest 2 Jan 8	Harvest 3 Feb 28	Harvest 4 Apr 29	Season Total	3-Year Means	Crown Rust Rating 0-9
	-----pounds of dry matter per acre-----						
Tetrapro	452	716	535	4392	6095	6061	0.0 <sup>b</sup>
Nelson	466	718	343	3798	5325	5819	0.7
Big Boss	410	813	502	3255	4980	5597	0.3
Attain	391	704	293	3266	4655	5593	0.3
Prine	287	543	443	3352	4625	5124	0.7
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TAMTBO	260	580	312	3400	4552	5064	0.3
Jumbo	112	289	342	3679	4423	5178	0.0
Flying A	317	812	618	2676	4423	5071	0.3
4X	417	893	315	2785	4410	5208	1.7
Ed	294	634	502	2928	4358	4732	0.0
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TAM 90	201	597	467	3030	4296	5037	0.3
Diamond T	533	959	379	2332	4203	5595	1.0
Jackson	405	500	398	2799	4102	4576	2.0
Passeral Plus	287	531	365	2854	4036	-- <sup>a</sup>	0.0
Verdure	374	686	416	2510	3985	5620	1.7
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WD-40	445	713	557	2242	3957	5275	0.0
Maximus	161	459	464	2867	3951	5337	1.0
Dynagain	398	766	398	2359	3922	5241	0.0
Gulf	252	507	346	2600	3705	4452	0.3
Marshall	501	527	273	1913	3214	3825	3.7
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Shiwasuaoba	487	706	529	800	2522	4644	2.3
Pasture Sweetner Mix	241	377	163	1244	2026	--	1.3
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Mean	350	638	407	2776	4171	5143	1.1
CV	35	18	27	13	11	--	11.2
LSD (0.05)	260	261	213	288	564	--	2.1

Experiment planted on 4 October 2007. Fertilizer application was 48 lb/ac of N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O on 10 October 2007. Topdressed with 108 lb N/ac on 18 December and 36 lb N/ac on 13 March 2008.

<sup>b</sup>Crown rust ratings were recorded on 13 March 2008 and were on a 0-9 scale where 0 = no disease and 9 = most severe.

Table 6. Ryegrass forage variety test at Overton, Texas for 2006-07.

Variety	Harvest	Harvest	Harvest	Harvest	Harvest	Harvest	Total DMY
	1 12 Dec	2 7 Feb	3 6 Mar	4 23 Mar	5 19 Apr	6 14 May	
	-----pounds of dry matter per acre-----						
	-----						
Marshall	1742	831	1325	1536	3060	1000	9494
TAMTBO	1480	577	1646	1639	2791	1224	9357
Prine	1713	775	1385	1318	2717	1198	9106
Tetrapro	1048	468	1472	1578	2949	1267	8782
Surrey II	1499	890	1441	1440	2591	914	8775
	-----						
Attain	1231	763	1506	1191	2762	1207	8660
Jumbo	1243	715	1537	1272	2686	1207	8660
Ed	1306	815	1548	1290	2616	974	8549
Dynagain	1041	706	1544	1506	2793	948	8538
Passerel Plus	1376	611	1310	1309	2957	888	8451
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WD-40	1464	1062	1431	1295	2501	698	8451
Big Boss	1037	713	1467	1336	2819	974	8346
Jackson	1102	1135	1590	1357	2362	785	8331
<b>Nelson</b>	<b>918</b>	<b>705</b>	<b>1594</b>	<b>1307</b>	<b>2439</b>	<b>1215</b>	<b>8178</b>
Maximus	1124	693	1308	1281	2643	1069	8118
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Flying A	912	764	1495	1459	2490	940	8060
Gulf	703	663	1306	1431	2867	983	7953
TAM 90	964	753	1398	1456	2530	802	7903
Shwasuaoba	1361	1085	1310	1311	2035	759	7861
Diamond T	896	639	1286	922	2562	1095	7400
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Hercules	686	500	1402	1081	2506	1112	7287
Verdue	698	673	1171	1299	2372	922	7135
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Mean*	1044	706	1434	1389	2696	994	8262
cv	44	44	15	19	11	17	10
LSD (0.05)	638	434	303	362	433	242	1210

Planted on 21 September 2006. Fertilization: Preplant 60 lb N, 20 lb P<sub>2</sub>O<sub>5</sub> and 120 lb K<sub>2</sub>O/ac. Topdressed with 50 lb N on 3 October; 52 lb N on 11 January, 50 lb N on 12 February and 40 lb N on 23 March as ammonium nitrate.

\*Means include yields of several experimental lines not shown.

Herbicide application: Applied Weedmaster at recommended rate on 5 October 2006.

Table 7. Ryegrass forage yields at Beaumont, Texas for 2006-2007.

Variety	Harvest 1 12 Dec	Harvest 2 9 Jan	Harvest 3 1 Feb	Harvest 4 2 Mar	Harvest 5 10 Apr	Season Total	Crown Rust Rating (0-3)
-----pounds dry weights/acre-----							
Tetrapro	668	1019	1172	1371	2174	6404	0.3*
Diamond T	780	1197	1281	1324	1740	6321	0.7
Maximus	952	1225	1225	1131	1615	6149	0.3
Attain	853	987	1091	1250	1940	6121	0.0
<b>Nelson</b>	<b>888</b>	<b>972</b>	<b>1022</b>	<b>1108</b>	<b>1960</b>	<b>5950</b>	<b>0.3</b>
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Verdure	773	1108	1101	1169	1698	5848	0.7
Big Boss	823	988	1041	1164	1818	5834	0.0
Dynagain	832	1199	1139	1141	1510	5821	0.3
Jumbo	995	862	893	1058	1995	5803	0.0
WD-40	788	1361	1117	1076	1452	5794	0.0
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Prine	847	905	953	1027	1962	5694	0.0
TAMTBO	739	802	922	1086	1969	5519	0.0
4X	605	942	972	981	2002	5502	0.0
DH-3	644	1057	1111	1156	1457	5426	0.0
Ed	830	873	954	1138	1539	5333	0.3
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Flying A	739	1041	983	1021	1482	5265	0.3
TAM 90	682	1037	1070	1086	1344	5218	0.3
Hercules	440	1061	1110	1151	1438	5199	1.3
Shwasuaoba	837	1733	1068	1141	386	5164	0.0
Surrey II	877	665	730	927	1901	5100	0.3
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Jackson	541	613	834	1058	1883	4929	0.0
Passerel Plus	501	550	730	832	1904	4516	0.3
Marshall	724	536	626	641	1903	4431	1.3
Gulf	271	564	846	826	1785	4293	0.3
-----							
Mean **	619	879	966	1083	1667	5215	
LSD P = 0.05	272	365	210	221	324	491	

Planting date: 4 October. Fertilization: Applied 38 lb/ac of N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O on 25 October. Topdressed: 98 lb N/ac on 11 January 2007.

\*Crown rust ratings recorded on 9 April on a 0 to 3 scale where 0 = no rust and 3 = 20% leaf area rusted.

\*\*Means include yields for several experimental lines not shown.

Data collected by Mike Jund, TAMU at Beaumont.

Table 8. Total ryegrass forage yields at Overton, Texas for 2005-06.

Variety	Harvest 1 26 Jan	Harvest 2 8 Mar	Harvest 3 30 Mar	Harvest 4 26 Apr	Harvest 5 24 May	Total DMY
	-----pounds dry matter/acre-----					
TAMTBO	1082	1291	1698	2222	1251	7544
Nelson	816	1260	1638	2110	1492	7316
Prine	1264	1301	1297	2141	1162	7165
Jumbo	1095	1321	1111	2436	1189	7152
TAM 90	1216	1626	1543	2096	643	7124
-----	-----	-----	-----	-----	-----	-----
Attain	1142	1455	1187	2144	1097	7025
Big Boss	991	1581	1188	2105	1142	7007
Ed	991	1462	1122	2459	822	6856
Verdure	1289	1483	1170	2105	784	6831
FLX2002(New3)LRCT*	544	1397	1312	2782	792	6827
-----	-----	-----	-----	-----	-----	-----
Tetrapro	1013	1084	1367	2099	1204	6767
Maximus	1093	1502	1165	2123	811	6694
Passerel Plus	1096	1247	1197	2135	831	6506
Rio	1509	1377	1041	1474	882	6283
Gulf	1211	1509	1210	1430	793	6153
-----	-----	-----	-----	-----	-----	-----
Marshall	1094	1134	1383	1527	949	6087
Surrey II	1031	1389	1117	1534	967	6038
Diamond T	899	1347	1229	1438	950	5863
Jackson	1238	1336	999	1329	752	5654
4X*	788	1455	1204	1453	744	5644
-----	-----	-----	-----	-----	-----	-----
Dynagain	1019	1305	1161	1184	965	5634
Shiwasuaoba	1700	1558	613	967	402	5240
Brigadier	316	1060	989	1843	898	5106
Flying A	1047	476	1102	1278	740	4643
WD-40	1141	1274	1169	640	332	4556
-----	-----	-----	-----	-----	-----	-----
Mean*	967	1360	1217	1825	894	6264

cv	38	17	13	15	30	11
LSD (0.10)	335	213	147	242	242	647

Planted 3 October 2005. Preplant fertilizer: 60 lb N, 80 lb P<sub>2</sub>O<sub>5</sub> and 0 lb K<sub>2</sub>O per acre. Topdressed with 40 lb N/ac on 11 November 2005, 20 lb N/ac on 31 January 2006, 20 lb N/ac on 1 March and 45 lb N/ac on 22 March 2006, respectively.

\*Means shown include yields from several experimental lines not shown.

Table 9. Total ryegrass forage yields at Beaumont, Texas for 2005-2006.

Variety	Harvest 1 12 Dec	Harvest 2 9 Jan	Harvest 3 1 Feb	Harvest 4 2 Mar	Harvest 5 10 Apr	Season Total	Crown Rust Rating (0-3)
	-----pounds dry matter/acre-----						
Verdure	1370	1535	939	1221	1962	7028	1.0 <sup>a</sup>
Diamond T	1256	1421	749	1095	1739	6261	1.7
Shiwasuaoba	1057	1528	767	1049	1844	6245	2.0
<b>Nelson</b>	<b>724</b>	<b>1452</b>	<b>870</b>	<b>1293</b>	<b>1844</b>	<b>6183</b>	<b>0.0</b>
WD-40	1039	1410	815	1039	1771	6074	0.7
-----	-----	-----	-----	-----	-----	-----	-----
Attain	1106	1264	820	1167	1646	6003	0.0
Dynagain	1177	1342	752	1039	1670	5980	1.0
Big Boss	1116	1355	753	1069	1682	5976	0.3
Maximus	1022	1332	823	1025	1708	5910	1.3
4X*	1058	1296	695	1069	1593	5710	0.7
-----	-----	-----	-----	-----	-----	-----	-----
Tetrapro	556	1241	787	1497	1604	5685	0.0
TAM 90	801	1228	781	1197	1589	5596	0.7
Flying A	1310	1175	657	921	1462	5525	1.3
Gulf	1303	1195	617	789	1453	5357	0.7
Jumbo	1169	1153	626	938	1422	5307	0.3
-----	-----	-----	-----	-----	-----	-----	-----
TAMTBO	851	1109	663	1091	1407	5120	0.0
DN II	873	1234	625	848	1493	5074	1.7
Prine	1055	1126	589	907	1375	5053	0.7
Rio	719	1134	622	948	1403	4827	1.0
Jackson	952	1041	509	948	1248	4698	0.7
-----	-----	-----	-----	-----	-----	-----	-----
Ed	1052	934	507	859	1152	4504	0.7
Passeral Plus	1014	914	461	835	1104	4329	0.7
Surrey II	870	862	446	777	1048	4002	0.3
Marshall	947	810	402	696	974	3830	2.0
-----	-----	-----	-----	-----	-----	-----	-----
Mean *	860	1132	684	1077	1433	5164	
LSD P = 0.05	311	242	230	186	494		

Planted October 13, 2005. Fertilization was 45 lb of N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O per acre on November 10, 2005. Topdressed with 64 lb/ac on December 12, 2005 and 56 lb/ac on February 1, 2006.

<sup>a</sup>Crown rust ratings recorded on April 6, 2006. Values are the average of 3 replications.

\*Means include yields of several experimental lines not shown.



Table 10. Annual ryegrass at Starkville, Mississippi 2007-2008.

Variety	Harvest 1 20 Nov	Harvest 2 15 Jan	Harvest 3 6 Mar	Harvest 4 2 Apr	Harvest 5 6 May	Harvest 6 11 June	Total
	-----pounds dry matter/acre-----						
4X	1317	2044	1197	1948	3672	776	10955
Attain	1077	2023	1353	1825	3575	862	10716
Barextra	740	1565	1494	2483	4419	1183	11884
Big Boss	1693	2003	1392	1918	4200	775	11982
DH3	1079	2132	1114	1982	3894	821	11022
-----	-----	-----	-----	-----	-----	-----	-----
Diamond T	1020	1924	1701	2088	4172	1071	11977
DynaGain	1208	1989	1179	2193	3692	787	11048
Ed (L5-1-AR102)	1344	1945	1434	2041	3289	863	10916
FL/NE2006 (misc2x)LRCT	869	2043	1774	1959	3540	977	11162
FLX 2002 (LA 3) LRCT	1222	2079	1782	1874	3711	1028	11696
-----	-----	-----	-----	-----	-----	-----	-----
Flying A	1572	2190	1310	2235	4002	936	12245
Hercules	1130	1831	1689	2343	3953	1477	12423
Jackson	1218	1756	2075	2067	3631	872	11619
Jumbo	539	2137	1416	1996	3954	933	10974
Lonestar	1242	2057	1365	2146	3734	966	11512
-----	-----	-----	-----	-----	-----	-----	-----
Marshall	1223	1969	1644	1939	3636	878	11289
Maximus	1027	2085	1747	2318	4278	988	12443
ME4	1327	1486	1723	2095	3270	884	10786
ME94	1302	1873	1526	2044	3501	951	11196
Passerel Plus	1282	1938	1529	1942	3665	1177	11533
-----	-----	-----	-----	-----	-----	-----	-----
Pasture Sweet'ner Mix	530	1800	1213	2156	3208	917	9824
Prine Tetraploid	1063	1962	1418	1952	4814	880	12089
Rio	1445	1994	1341	2142	3310	825	11057
TAM 90	1050	1977	1341	1928	3673	748	10719
TAMTBO	830	2092	1434	1805	3497	927	10585
-----	-----	-----	-----	-----	-----	-----	-----
Tetrapro	877	1984	1448	1947	3746	1130	11132

Tetrastar Tetraploid	1278	2069	1352	2573	4222	743	12236
TXR2006T2	914	2112	1583	1799	3630	915	10953
Nelson	1332	2104	1390	1980	3954	954	11713
Verdure	1276	1882	1257	2077	3844	787	11123
-----	-----	-----	-----	-----	-----	-----	-----
WD40	1581	1734	1058	2155	3702	633	10863
WMN97	1222	1978	1364	1968	3772	1044	11347
-----	-----	-----	-----	-----	-----	-----	-----
LSD (P<0.05)	521	355	420	425	548	268	1230
CV	32.2	12.9	20.5	14.7	10.3	20.6	7.7
Mean	1151	1961	1458	2060	3786	928	11344

Planted: September 27, 2008. Soil: Savannah sandy loam. Fertilizer: 400 lb/ac 15-5-10 at planting and after each harvest. Herbicide: glyphosate at 1 qt/ac 2 weeks prior to planting.

Table 11. Annual ryegrass at Newton, Mississippi, 2007-2008.

Variety	Harvest 1 17 Dec	Harvest 2 18 Feb	Harvest 3 3 Apr	Harvest 4 14 May	Total
	-----pounds dry matter/acre-----				
4X	2390	2266	2748	2551	9954
Attain	2388	2544	2983	2612	10527
Barextra	1942	2368	2713	2285	9307
Big Boss	2520	2552	2737	2541	10349
DH3	2321	1932	2961	2607	9821
-----	-----	-----	-----	-----	-----
Diamond T	2337	2273	2744	2544	9898
DynaGain	2607	2159	3032	2302	10100
Ed (L5-1-AR102)	2004	2606	2965	2432	10007
FL/NE2006(misc2x)LRCT	1921	2403	3014	2625	9964
FLX 2002 (LA 3) LRCT	2236	2879	2677	2477	10270
-----	-----	-----	-----	-----	-----
Flying A	2670	2350	3179	2648	10847
Hercules	2019	1999	2975	2298	9291
Jackson	2464	2540	2873	2618	10496
Jumbo	1941	2029	2856	2412	9237
Lonestar	2236	2210	2658	2430	9534
-----	-----	-----	-----	-----	-----
Marshall	2536	2831	2966	2404	10737
Maximus	1950	2274	3104	2511	9839
ME4	2618	2688	2863	2409	10577
ME94	2516	2841	2944	2248	10549
Passeral Plus	2276	2736	3132	2417	10562
-----	-----	-----	-----	-----	-----
Pasture Sweet'ner Mix	1655	2005	2884	2434	8979
Prine Tetraploid	2366	2212	2924	2689	10191
Rio	2398	2465	3023	2505	10391
TAM 90	2202	2313	2783	2328	9625
TAMTBO	2146	2837	2750	2461	10193
-----	-----	-----	-----	-----	-----
Tetrapro	2051	2472	2912	2434	9869

Tetrastar Tetraploid	2244	1988	3054	2666	9952
TXR 2006 T2	2213	2212	2569	2406	9399
Nelson	2362	2578	2940	2616	10496
Verdure	2165	2406	2732	2400	9703
-----	-----	-----	-----	-----	-----
WD40	2671	1993	3021	2632	10318
WMN97	2506	2568	3373	2079	10526
-----	-----	-----	-----	-----	-----
LSD (P < 0.05)	361	488	413	424	893
CV	9.7	12.5	8.7	10.5	5.4
Mean	2277	2392	2909	2469	10047

Planted: September 28, 2008. Soil: Prentiss Fine Sandy Loam. Fertilizer: 500 lb/ac 13-13-13 on October 16, 2008 and 2000 lb/ac following each harvest. Herbicide: None.

Table 12. Dry matter forage yields of annual ryegrass cultivars at Ardmore, Oklahoma for 2008.

Variety	Harvest	Harvest	Harvest	Harvest	Harvest	Total
	1 4 Jan	2 14 Mar	3 31 Mar	4 29 Apr	5 3 June	
-----pounds dry matter/acre-----						
AM-4T	984	1171	1558	2039	536	6288
Attain	1107	1236	1662	1970	691	6666
Barextra	831	879	950	1856	1087	5605
Big Boss	1319	1277	1470	1875	751	6692
Diamond T	1215	1580	1249	1714	815	6573
-----						
Ed	1837	1863	1167	1386	622	6876
Fantastic	946	1728	1467	1827	976	6496
Florida 4N	961	1298	1434	1986	543	6223
Flying A	1392	1367	1341	1443	923	6467
Hercules	696	1167	1283	2113	569	5828
-----						
ISI-LWD4	169	625	1842	2458	1304	6398
Jackson	1104	1415	1321	1720	666	6228
Jumbo	104	971	1606	1939	1071	5691
Marshall	1200	1236	1458	2102	680	6678
ME4	1154	1425	1624	1595	1213	7011
-----						
ME94	1242	1189	1715	1835	865	6846
MO1	1019	751	1482	2000	706	5959
Surrey II	1258	1743	1345	1888	982	7216
TAM 90	741	1376	1401	1800	761	6079
TAMTBO	201	1147	1425	2153	1210	6137
-----						
Tetrapro	678	957	1321	1476	863	5295
Nelson	1293	1488	1501	2239	899	7420
Verdure	1136	1281	1435	2232	688	6772
WD-40	1565	1548	1296	1678	504	6593
WMN97	1141	1209	1089	1765	878	6083
-----						
Mean	1011	1277	1418	1884	832	6423
LSD	409	541	425	620	437	1397
P value	0.001	0.01	0.05	0.15	0.01	0.364
CV	25	25	18	20	32	13

Table 13. Total seasonal yield of annual ryegrass at Newton and Starkville, Mississippi, 2006-2007.

Variety	Newton	Starkville
	-----lb/acre-----	
Angus I	6681	6847
Attain	6951	6820
Barextra	7784	7957
Big Boss	6975	7259
Bulldog Grazer	6446	6942
-----	-----	-----
DH-3	7307	7102
Diamond T	7314	7217
Dyna-Gain	7569	6675
Ed	7524	7054
FL/Nex2006 MRSE 2xLRCT	7938	7251
-----	-----	-----
FLX2002(LA3)LRCT	7209	7248
FLX2004SM	6673	7036
FLX2006PE LRCT	7614	6831
Flying A	7262	6683
Graze-N-Gro	6983	6410
-----	-----	-----
Gulf	6915	6548
Hercules	6678	7581
Jackson	7157	7331
Jumbo	7582	7022
King	8028	7083
-----	-----	-----
M/FL20064XER	6217	5766
Marshall	8114	7050
Maximus	7129	7875
ME4	7852	7053
ME94	8018	7618
-----	-----	-----
Passerel	8459	7705
Prine	6794	7833
Rio	7063	7003
Striker	6913	7702
TAM 90	7282	6454
-----	-----	-----
TAMTBO	7122	7380
Nelson	6981	7338
TXR2105-T4-1	6928	6987
Verdue	6762	7174
WD 40	7073	7089
WMN97	7916	7720
-----	-----	-----
Mean	7256	7127
LSD (0.05)	1183	748
CV	10.0	7.5

Table 14. Dry matter forage yields of varieties and experimental entries of annual ryegrass at The Noble Foundation, Ardmore, Oklahoma for 2007.

Variety	Harvest	Harvest	Harvest	Harvest	Total
	1 23 Feb	2 26 Mar	3 9 Apr	4 14 May	
-----lb dry matter/acre-----					
5.0561 TA	963	1021	952	3424	6359
Angus	948	1232	457	3309	5946
Attain	1057	1070	819	3795	6741
Barextra	771	508	1004	3603	5886
Big Boss	877	1112	796	3940	6726
-----					
DH-3*	1347	1187	635	3530	6699
Diamond T	1115	929	898	3577	6519
Ed	1518	1223	851	3461	7052
FLX2006 LRCT	1543	1183	568	3516	6811
FL/NEX2006 (misc. 2X) LRCT	1015	1084	960	3388	6447
-----					
FLX2002 LRCT	1174	1175	825	4067	7241
FLX2003 SM	1104	1130	841	3673	6750
Flying A	1251	1010	489	3647	6396
Graze-N-Gro	1357	1051	498	3544	6450
Gulf	1500	1146	495	3571	6712
-----					
Hercules	826	857	1010	3569	6262
Jackson	895	1351	862	3643	6750
Jumbo	869	1023	855	3814	6562
King	1291	1646	651	3585	7175
M/FLX2006 (4X) ER	1101	1133	440	3097	5773
-----					
M/FLX2004 LRCT	1054	1172	810	3671	6708
Marshall	1377	1268	844	4306	7795
Maximus	1078	1047	810	3515	6450
ME4	1136	1280	1062	3629	7107
ME94	1168	1148	1139	3389	6845
-----					
Passeral Plus	1259	852	1026	3751	6886
Rio	1283	813	979	3189	6264
Shiwasuaoba	1307	959	94	3066	5425
Striker	1056	1064	923	3896	6939
Surrey II	779	1025	868	3626	6298
-----					
TAM 90	1464	1077	717	3536	6794
TXR2004-OP	632	1574	620	4028	6854
TXR2005-TBO	773	943	921	3691	6328
<b>Nelson</b>	<b>854</b>	<b>945</b>	<b>857</b>	<b>3271</b>	<b>5928</b>
Verdure	1214	1095	605	3370	6284
-----					
WD 40	1431	1183	503	3428	6544
WMN 97*	879	1082	1043	3632	6637
-----					
CV	26	22	21	11	9
LSD	458	387	264	620	967

\*Experimental entries, seed presently not available.

Table 15. Dry matter forage yields and gray leaf spot ratings of the 2006-2007 forage annual ryegrass cutting trial at Gainesville, Florida.

Variety	Harvest 1 19 Jan	Harvest 2 7 Mar	Harvest 3 20 Apr	Harvest 4 24 May	Season Total	Gray Leaf Spot 17 Jan
	-----lb dry matter per acre-----					
ME-4	2617	1822	3814	1557	9810	1.5
ME-94	3005	1438	3581	756	8780	2.6
Marshall	2746	1866	3269	722	8602	2
TAMTBO	2355	1478	3577	1078	8487	2.6
Attain	2296	1899	3341	742	8278	1.9
-----	-----	-----	-----	-----	-----	-----
<b>Nelson</b>	<b>2544</b>	<b>1875</b>	<b>3085</b>	<b>684</b>	<b>8188</b>	<b>2.8</b>
Jumbo	2641	1833	2914	750	8138	2.6
M/FLX2004 LRCT	1932	1580	3947	657	8114	2.9
Jackson	2285	1653	3403	632	7973	3.1
Striker	2661	2084	2681	506	7932	1.6
-----	-----	-----	-----	-----	-----	-----
MO1	2306	1541	3306	639	7793	3
Big Boss	1848	1915	3357	587	7707	3
FLX2002 LRCT	2205	1669	3232	552	7658	3
5.051 TA	1945	1644	3197	849	7634	3.1
FL/NEX2006	1791	1497	3259	910	7457	3.1
-----	-----	-----	-----	-----	-----	-----
FLX2006LRCT Late	1957	1602	3334	533	7425	2.8
Flying A	2923	1390	2520	408	7242	4.4
Surrey	2255	1550	2950	470	7225	3.5
FLX2006 ERCT	1946	1545	3228	463	7182	2.8
Stockaid	1763	1412	3514	458	7146	3.4
-----	-----	-----	-----	-----	-----	-----
Hercules	2048	1614	2786	596	7071	2.9
DH-3	2313	1532	2872	300	7017	3.9
Angus 1	2060	1914	2715	253	6941	3.1
Diamond-T	2414	1709	2394	396	6913	4.4
M/FLX2006 ER	2403	1655	2543	255	6857	2.4
-----	-----	-----	-----	-----	-----	-----
FLX2004 4XERLS	1883	1844	2806	241	6774	3.1
WMN97	2259	1204	2576	734	6772	3.1
Graze-N-Gro	2437	1521	2545	256	6754	5
TAM 90	2485	1430	2694	140	6748	4.8
Verdure	2387	1811	2357	165	6720	4
-----	-----	-----	-----	-----	-----	-----
Dynagain	2205	1287	2366	364	6222	4.6
Gulf	2336	1309	2370	185	6200	6.4
Maximus	1831	1350	2261	412	5853	4.8
-----	-----	-----	-----	-----	-----	-----
Average	2275	1621	2994	553	7442	3.3
LSD (0.05)	657	370	612	443	2879	0.9

\*Gray Leaf Spot Rating: 0-10, where 0 = no disease and 10 = 100% coverage or death.



Table 16. Disease ratings and maturity of 40 entries in the 2006-2007 annual ryegrass disease nursery at Gainesville, Florida.

Variety	Crown Rust*		Maturity‡
	15 May	23 May	
Surrey	1.3	1.5	9-Apr
Marshall	2.3	3.3	16-Apr
M/FLX2006 (4X) ER	1.0	1.8	2-Apr
FL/NEX2006 (misc 2X) LRCT	1.5	1.8	9-Apr
FL/2006 ERCT	0.5	1.3	26-Mar
-----			
FL/2006 LRCT	1.3	2.0	9-Apr
Striker (4X)	0.5	2.3	16-Apr
ME-94	2.3	2.3	13-Apr
Jackson	0.8	1.8	9-Apr
ME-4	4.3	4.3	16-Apr
-----			
WMN97	3.3	3.5	16-Apr
Flying-A	2.0	2.3	9-Apr
Diamond T	1.8	2.5	16-Apr
DH-3	2.3	2.3	9-Mar
Dynagain	2.8	2.8	5-Apr
-----			
5.051 TA	1.0	2.0	16-Apr
M/FLX2004 (4X) LRCT	1.0	1.8	2-Apr
TAM 90	1.3	1.8	5-Apr
TAMTBO	1.0	1.8	13-Apr
<b>Nelson</b>	<b>1.3</b>	<b>2.2</b>	<b>16-Apr</b>
-----			
TXR2004-OP	2.3	3.3	5-Apr
FLX2004(G)4XERLS	1.8	2.0	29-Mar
Jumbo	0.5	1.5	16-Apr
Maximus	1.5	2.3	16-Apr
Hercules	4.0	4.8	27-Apr
-----			
FLX2002 (LA3) LRCT	1.5	2.3	5-Apr
Verdure	0.8	2.5	5-Apr
Attain	0.5	2.0	16-Apr
Big Boss	1.0	2.8	9-Apr
Stockaid	1.3	1.5	13-Apr
-----			
MO1	4.0	3.8	19-Apr
Angus 1	1.0	1.3	2-Apr
Graze-N-Gro	1.5	1.8	5-Apr
Gulf	2.5	2.5	2-Apr
Florida 80	1.3	1.5	26-Mar
-----			
NE/FLX2006	1.0	2.8	16-Apr
FL/NEX2006	0.8	2.0	16-Apr
FLX2006 ER	1.0	2.0	2-Apr
FLX2006 LR	1.0	2.3	16-Apr
FLX2006 Red	1.8	2.3	26-Mar
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Average	1.6	2.3	
LSD (0.05)	1.4	1.4	

\*Crown rust rating: 0-10, where 0 = no disease and 10 = 100% coverage or death.

‡Maturity determined by the date of first anthesis on plants in the non-cut portion of the plot row.