



TAMTBO Ryegrass

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TAMTBO is a forage-type annual ryegrass (*Lolium multiflorum* Lam.) developed by the Texas AgriLife Research. TAMTBO is a tetraploid where $4n = 4x = 28$ chromosomes. This variety was developed in the ryegrass breeding program at Overton and has been evaluated in forage trials at Overton and Beaumont. It has also been evaluated in Mississippi, Alabama, Georgia and Florida in official state experiment station forage trials. Plant variety protection has been applied for with this variety. Data were collected for PVP registration at Overton, Texas.

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

Description of Line

TAMTBO is a forage-type annual ryegrass developed for high forage production in East Texas, 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. TAMTBO is a tetraploid, which contrasts with TAES releases such as Gulf and TAM 90 which are diploid cultivars.

TAMTBO is the first tetraploid ryegrass released by Texas AgriLife Research. The Oregon State University Seed Laboratory has tested TAMTBO for ploidy level and reported it is 100% tetraploid. Plant stature of TAMTBO is larger and taller than Gulf, but similar to TAM 90 which is larger than most diploid cultivars. Leaf width for TAMTBO is not different than Jumbo and Prine, but is about 1 mm wider than TAM 90 and 2 mm wider than Gulf. Freeze damage has not been observed on TAMTBO over the past four years at Overton when a low temperature of 17 F (-8 C) occurred. However, no freeze injury occurred on any cultivars at this temperature. TAMTBO is not infected with the fungal endophyte. The fluorescence level of TBO according to the Oregon State Seed Testing Laboratory was 100 %.

BREEDING HISTORY OF TXR2005-TBO

TAMTBO is a 3-way cross from ryegrass breeding lines TXR2000-T2, TXR2002-T17, and the cultivar Jumbo. Jumbo is a tetraploid cultivar released by the University of Florida. Both of the above Texas AgriLife Research lines were derived from germplasm of TAM 90 which had been treated with colchicine to double the chromosome number from 14 to 28. The 3-way cross was made by growing adjacent rows 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, this seed was grown in a space planting (500 plants) at Beaumont, Texas. Thirty four plants exhibiting high forage potential were allowed to cross-pollinate and produced seed and seed was bulked. In 2003-2004, this seed was increased in Oregon by OreGro Seeds, Inc. This seed was returned to Overton and designated TXR2005-TBO and is the germplasm discussed in the proposal.

PERFORMANCE OF TXR2005-TBO

TAMTBO has produced excellent forage yields over the past three years at Overton. During the 2009-2009 growing season, TAMTBO had highest forage yield of any commercial cultivar (Table 1). It also has produced the highest mean total season forage yield at Overton over the past 3 years. TAMTBO has produced about 1000 more pounds dry matter per acre per year than TAM 90 or Marshall ryegrass. In the forage trial at Beaumont in 2008-2009 (Table 2),

TAMTBO produced an average forage yield, but was not significantly different than Jumbo, Prine, or TETRPRO (other good tetraploid varieties). Ryegrass variety trials in other states including Mississippi, Alabama and Georgia have shown that TAMTBO has usually ranked in the top fourth of the trials for forage production.

Disease Data: Crown rust (*Puccinia coronata* Corda) data are shown for Overton and Beaumont in 2008-2009 (Tables 1 & 2). In these replicated trials, TAMTBO demonstrated very good crown rust resistance. Marshall is a susceptible cultivar and it was rated 5.3 on a 0 to 9 scale (Table 1). TAM 90 is a moderately resistant cultivar and was rated 1.0. The resistance of TAM 90 has resulted in this cultivar never having any damaging crown rust epidemic in Texas since its release in 1990. This indicates that TAMTBO has good resistance to this important disease. 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 TAMTBO had relatively good tolerance to this disease. TAMTBO was similar to Jumbo in crown rust ratings and more resistant than Marshall, TAM 90, and Gulf. Dr. Prine also rated the ryegrass nursery for grey leaf spot (*Pyricularia grisea*) at Gainesville, Florida. Data indicated that TAMTBO had average tolerance to grey leaf spot and was similar to Jumbo and TAM 90, but more tolerant than Marshall. Grey leaf spot has not been reported on ryegrass in Texas during the past 30 years.

Seed Available from:

Northeast Texas Famers Coop.
Sulphur Springs, Texas
Phone: 903.885.3143

OreGro Seeds, Inc.
Albany, Oregon
Phone: 541.258.1001

Table 1. Annual Ryegrass forage variety trial at Overton, Texas for 2008-09 and 3-year means.

Entry	Harvest 1 21 Jan	Harvest 2 26 Feb	Harvest 3 1 Apr	Harvest 4 1 May	Harvest 5 27 May	Total Season Yields	3-Year Mean Yields	Crown Rust Rating 0-9 [‡]
-----lbs DM/ac-----								
TAMTBO	2492	2039	2935	2120	2015	11601	10728	0.5
Chuckwagon	2107	1976	3929	1900	1596	11508	10640	0.3
Prine	2218	2197	3017	2061	1762	11255	10162	0.3
Verdue	2031	1878	2710	1808	1652	10079	9281	1.0
Adrenalin	2395	1803	2476	1636	1677	9987	-	3.5
Winter Hawk	1620	2088	2837	1767	1534	9846	9327	0.8
TETRAPRO	1561	1918	2763	1742	1818	9802	9980	0.3
Flying A	2570	2017	1886	1864	1426	9763	9520	1.0
Jumbo	1776	1863	2379	2085	1660	9763	9805	0.0
TXR2006-T22 [†]	1888	1810	2525	1871	1591	9685	10155	0.3
Dynagain	1685	1801	2816	1775	1604	9681	9428	2.5
Big Boss	1603	2052	2521	1879	1597	9652	9926	0.3
Ed	1895	1916	2230	1809	1555	9405	9713	1.0
Passerel Plus	2147	1762	2435	1706	1169	9219	9751	1.5
TAM 90	1811	1621	2050	1809	1857	9148	9054	1.0
Attain	1773	1778	2099	1931	1476	9057	9674	0.0
Diamond T	1598	1762	2360	1708	1626	9054	9147	0.8
Beefbuilder III	1892	1717	2169	1594	1600	8972	-	0.5
Maximus	1687	1865	2075	1781	1509	8917	9190	1.5
Gainer	1562	1889	2005	1715	1674	8845	9290	0.8
Marshall	1552	1743	2069	1639	1507	8510	9678	5.3
Jackson	1443	1748	2119	1666	1410	8386	8791	1.0
WD-40	1587	1775	1770	1416	1121	7669	8398	1.5
Gulf	1366	1368	1921	1566	1275	7496	8434	2.0
Mean	1789	1806	2351	1792	1529	9267	-	1.2
C.V.	29	17	14	18	15	10	-	66
LSD (0.05)	602	366	393	377	268	1139	-	0.94

Planted on 9 Oct, 2008. Fertilization: Preplant 40 lbs N, 60 lbs K₂O/ac. Topdressed 50 lbs N on 18 Dec, 33 lbs N on 29 Jan, 50 lbs K₂O/ac on 29 Jan, 40 lbs N on 17 Mar, and 40 lbs N/ac on 27 April, 2009.

[†] Experimental line, seed not commercially available

Herbicide applied: Weedmaster at recommended rate on 3 March, 2009.

[‡] Crown rust rating recorded on 26 May, 2009 on a 0-9 scale where 9 = death of plants due to disease.

Table 2. Annual Ryegrass forage variety trial at Beaumont, Texas in 2008-09 and 3-year means.

Entry	Harvest 1 Mar 25	Harvest 2 May 12	Total Season Yields	3-Year Mean Yields	Crown Rust Rating 0-9 [†]
-----lbs DM/ac-----					
TETRAPRO	3686	915	4601	5700	1.7
Flying A	3773	575	4349	4674	3.3
Verdue	3487	843	4330	4721	3.7
WD-40	3651	567	4218	4656	2.7
Prine	2868	1132	4000	4773	1.3
Jumbo	2831	1100	3931	4719	1.0
Attain	2842	1045	3887	4888	1.3
Diamond T	3054	782	3836	4787	4.0
4X	3015	820	3835	4582	3.0
Beefbuilder III	2894	887	3781	-	1.3
Big Boss	2768	977	3745	4853	2.0
TXR2006-T22	2452	1187	3639	4971	1.0
Jackson	2789	789	3578	4203	3.0
Ed	2781	748	3528	4406	2.3
Winter Hawk	2698	821	3518	4149	1.7
Passerel Plus	2869	601	3470	4007	3.0
TAMTBO	2250	1136	3386	4486	1.3
TAM 90	2599	738	3337	4284	2.3
Gulf	2259	847	3106	3712	3.7
MAXIMUS	2452	653	3104	4401	3.0
Dynagain	2427	623	3049	4264	3.3
Marshall	2260	616	2877	3507	6.0
Gainer	1942	748	2690	3867	1.7
Chuckwagon	1886	773	2659	4455	2.0
Adrenalin	1871	712	2584	-	5.3
Mean	2276	802	3478	-	2.9
C.V.	33	15	26.1	-	25
LSD (0.05)	1219	163	1232	-	0.99

Planting Date: on 22 Oct, 2008. Fertilization: Preplant 23 lb/ac each N, P₂O₅ and K₂O. Topdressed with 18 lbs/ac each of N, P₂O₅ and K₂O, and 68 lbs N/ac on 27 Mar, 2009.

[†] Crown rust ratings were recorded on 16 April where 0 = no rust and 9 = dead plants.