



Annual Ryegrass Performance in Mississippi

Rocky Lemus & Joshua White

Volume 7, Issue 10 Extension Forage Specialist & Forage Variety Testing Manager

October 2014

Visit us at: <http://mississippiforages.com>

Annual ryegrass is an important cool-season grass that support the livestock industry across Mississippi and the southern USA. The number of ryegrass acres planted in Mississippi help to support both the cow/calf and the stocker cattle industry. Because of its high digestibility and palatability, annual ryegrass is a high valued forage crop for the forage/livestock industry. Due to the number of annual ryegrass types and varieties available in the market, there is some confusion among producers when it comes to choosing the ideal one for a grazing system. Mississippi State University Forage Variety Test Program evaluates a good portion of experimental and commercially available varieties every year to determine how they will perform across different locations. Entries into the variety trial program are submitted voluntarily into the program by seed companies and the number of varieties might vary from year to year.

Information from variety trials is used as a third party verification on variety performance that will allow livestock producers to make more informed decisions on what varieties might be more suitable for their area. When available, using data from multiple years as an average might provide a better assessment on varietal performance than a single year, due to changes in weather conditions, especially temperature and precipitation that could affect production form year to year. An example of this impact was evident during the winters of 2013 and 2014, where temperatures below normal from December to February affected the growth patterns of annual ryegrass.

Yield measurements from the variety trial are extremely important in determining the number of acres to plant, the amount of fertilization needed and the number of animals that grazing system can sustain. Knowing average yields will allow forage/livestock producers to better match nutrient applications to minimize costs, maximize fertilizer efficiency and reduce potential environmental problems. Yields

are also critical as a measuring tool to evaluate new varieties, improve management techniques and allow producers to make more informed decisions concerning feeding practices for their livestock. Knowing the estimated forage for winter grazing would allow producers to buy or sell forage at the time of the year that would be most financially feasible.

Table 1. Three-year average (2012-2014) biomass production of annual ryegrass varieties grown at four locations in Mississippi.

Variety	Ploidy Level	Holly Springs	Newton	Starkville	Poplarville	State Avg.	RY (%)
Fria	Diploid	4245	5607	5334	5993	5295	8.2
Marshall	Diploid	3615	5691	5304	6251	5215	6.6
Winterhawk	Diploid	4029	5437	5138	6222	5206	6.4
Lonestar	Diploid	4016	5273	4927	6204	5105	4.4
Bulldog	Diploid	4305	5032	5041	5799	5044	3.1
Grazer	Diploid	4172	5384	4673	5914	5036	3.0
Flying A	Diploid	4177	5246	4756	5511	4922	0.6
Jackson	Diploid	3534	4847	4974	5957	4828	-1.3
Nelson	Tetraploid	3560	5135	4348	5897	4735	-3.2
TAMTBO	Tetraploid	3710	4858	4608	5756	4733	-3.2
Diamond T	Tetraploid	3290	5292	4504	5819	4726	-3.4
Prine	Tetraploid	3594	4820	4633	5740	4697	-4.0
Maximus	Tetraploid	3473	4991	4295	5865	4656	-4.8
Jumbo	Tetraploid	3462	5323	4025	5600	4602	-5.9
Earlyploid	Tetraploid	3796	5076	4169	5226	4567	-6.6
Tetrastar	Tetraploid						
Avg.		3798	5201	4715	5850	4891	
Yield Potential (%)		-22.3	6.3	-3.6	19.6		

Note: Yield potential is the potential of annual ryegrass to perform above the state average at a specific location. Relative Yield (RY) was calculated as the percent yield when comparing the average state performance of a variety to the overall state average. In other words, RY is a percent of state average, $YIR = ((Avg.Yield_{Var} - Avg.Yield_{State}) / Avg.Yield_{State}) * 100$. **Source:** White et al., 2012-2014.

Data summarized in Table 1, provides a better assessment of annual ryegrass production across the state. A three-year yield mean of annual ryegrass yield range from 1.9 tons per acre in Holly Springs to 2.9 tons per acre in Poplarville. The

state average dry matter yield was 4891 tons per acre. This is sufficient to support a stocking rate of 5 steers per acre weighing 600 lbs during its growing season (January to mid-May). The overall yield potential of annual ryegrass has below the state average for Holly Springs and Starkville, while the largest increase in yield potential has been observed in Poplarville.



Across the state, diploid varieties have performed better than tetraploid varieties. It was observed that in Poplarville, tetraploid varieties might have a slight advantage in yield production, but that yield advantage might not be reflected as early grazing. Performance of varieties across the state also indicated that tetraploids may have negative relative yield (RY) when compared to diploid varieties.

Table 2. Forage quality of annual ryegrass grown in Mississippi. Values expressed on dry matter basis.

Variable	N	Mean	Maximum	Minimum	Range	Std. Dev
CP, %	400	17.89	27.56	10.15	17.41	4.34
ADF, %	400	31.32	41.45	19.30	22.15	4.31
NDF, %	400	49.60	62.50	38.43	24.07	5.48
WSC, %	400	7.67	16.41	0.47	15.94	2.67
TDN Est. (%)	400	59.33	73.16	47.68	25.48	4.95
RFQ	400	119.00	185.70	74.43	111.30	21.95
P, %	400	0.29	0.35	0.22	0.13	0.03
K, %	400	2.23	2.78	1.21	1.57	0.22
Ca, %	400	0.64	0.82	0.48	0.34	0.07
Mg, %	400	0.38	0.56	0.29	0.27	0.05

TDN = 95.35 - (ADF*1.15); DMI (% BW) = 120/NDF; RFQ = [(DMI, % BW) * TDN (% DM)]/1.23

Source: Lemus, 2014.

Data from the variety trial at Mississippi State has not reflected the yield advantage of tetraploids in Mississippi as it has been observed in other locations across the southern USA. Tetraploids might offer an advantage in forage production early in the spring season, but by March there is a balanced biomass production among the varieties. An interesting observation from the variety trials is that 'Lonestar' annual ryegrass has had much earlier growth and higher yields during the first harvest compared to the rest of the varieties, but that forage production was very similar with other varieties by the second harvest.

When planting annual ryegrass, do your homework. Select varieties that have been tested, adapted to your area and can optimize winter grazing opportunities. Consult the forage variety testing information closest to you area. Select varieties that has adequate winter hardiness, and has a good germination and purity percentages. Plant early, the ideal planting window is from September 15 to October 31. Using this window will allow approximately 30 to 45 days of growth before a hard freeze and provide some ground cover. Understanding planting methods can also impact establishment and production potential. Using a drill will increase seed to soil contact and will require lower seeding rates. On the hand, broadcasting the seed will require higher seeding rates. When over-seeding into existing perennial warm-season pastures such as bermudagrass or bahiagrass, it is recommended to use an early maturing variety to avoid possible delay in green up and effect in summer grazing potential or hay production. Keep in mind that the important agronomic characteristics of an annual ryegrass are winter hardiness, good rooting depth, uniform growth, and high yielding with good forage quality. Mississippi State University Forage Variety Trials information can be found at: <http://mafes.msstate.edu/variety-trials/forage.asp>

For upcoming forage related events visit:
<http://forages.pss.msstate.edu/events.html>

November 12-13, 2014— Mississippi ASA Chapter Annual Meeting, Grenada, MS
 November 14, 2014— Mississippi Forage & Grassland Annual Conference, Verona, MS.
 January 11-14, 2015— American Forage & Grassland Council Annual Meeting, St. Louis, MO

Cooperative Extension Service • Mississippi State University

Mississippi State University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation or group affiliation, age, disability, or veteran status.