Forage News

MISSISSIPPI STATE UNIVERSITY EXTENSION
Center for Forage Management and Environmental Stewardship

Average Annual Ryegrass Long-term Performance

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There are over 60 varieties of annual ryegrass commercially available that are grouped in two different types based on their number of chromosomes (ploidy level). These two types include diploid and tetraploid varieties. Diploid varieties have to set of chromosomes (2n = 14) in each cell, their cells are smaller in size with lower water (moisture) content, plant structures (leaves and seed size) are smaller, and the plant tend to produce more tillers. Higher tiller density can provide a denser stand and be more competitive with weeds, sustain production in lower fertility and wetter soils. Diploids also tend to have more a prostrate growth (horizontal) which allows the stand to be more persistent in heavy grazing scenarios. On the other hand, tetraploid varieties have four set of chromosomes (4n = 28) in each cell with larger cell size, larger (wider) leaves, larger seed size, greater content of soluble carbohydrates (sugar and starch) and less fiber content. Tetraploid varieties are developed by treating germinating seed with specific compounds that cause a mutation in the chromosome number. Tetraploids tend to have higher water content in their cells and therefore animals can fill up faster and reduce dry matter intake. Tetraploids have a slower recovery after grazing than diploids because they do not tiller as aggressively and they can also be susceptible to overgrazing because of higher palatability which can lead to overgrazing. Since tetraploids do not tiller vigorously as diploids, they could be good candidates for mixtures with clovers and reduce species competition. In general, tetraploids tend to mature later than some diploids. Although these differences between annual ryegrass types may not be obvious early in the season, they can become more apparent as the season progresses and grazing pressure is implemented.

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. 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 from year to year. Data summarized in **Table 1**, provides a better assessment of annual ryegrass production across three locations in the state. An average yield of annual ryegrass yield ranges from 5,630 pounds per acre in Starkville, MS to 6,332 pounds per acre in Poplarville, MS. The state average dry matter yield was 5,956 pounds per acre. The overall yield potential of annual ryegrass was below the state average for Starkville and Newton, while the largest increase in yield potential has been observed in Poplarville. Performance of varieties across the state also indicated that 25% of the diploid and tetraploid varieties had a relative lower yield (RY) compared to the state average production. For more information on Mississippi State Forage Variety Trial visit http://mafes.msstate.edu/variety-trials/forage.asp

Table 1. Annual Ryegrass Performance in Mississippi: Seasonal Yield Summary

Variety	Years	Ploidy Level	Starkville	Newton	Poplarville	State Avg.	RY (%)
Bulldog Grazer	3	Diploid	5041	5032	5799	**5291**	-11.3
Ed	2	Diploid	4611	6237	5897	**5581**	-6.4
Flying A	9	Diploid	5416	5770	6615	**5934**	-0.5
Fria	9	Diploid	5318	5862	6346	**5842**	-2.1
Jackson	9	Diploid	5750	5256	5937	**5648**	-5.3
Lonestar	9	Diploid	5721	5737	6562	**6006**	0.7
Marshall	9	Diploid	6280	6338	6261	**6293**	5.5
Passarel Plus	4	Diploid	6719	6990	5676	**6462**	8.3
Winterhawk	9	Diploid	6071	5654	6747	**6157**	3.2
Attain	7	Tetraploid	5933	6321	6549	**6268**	5.1
Big Boss	6	Tetraploid	5975	5910	6059	**5981**	0.3
Diamond T	9	Tetraploid	5852	5599	6411	**5954**	-0.2
Earlyploid	3	Tetraploid	7639	7635	5600	**6958**	16.6
Jumbo	7	Tetraploid	5136	5401	6523	**5687**	-4.7
Maximus	6	Tetraploid	5601	5686	6693	**5993**	0.5
Meroa	2	Tetraploid	4944	5343	6552	**5613**	-5.9
Nelson	9	Tetraploid	5690	5544	7082	**6105**	2.3
Prine	4	Tetraploid	4774	7226	6418	**6139**	2.9
TAMTBO	9	Tetraploid	5285	5448	6707	**5813**	-2.6
Tetrastar	9	Tetraploid	4839	5709	6205	**5585**	-6.4
Location Avg.			**5630**	**5935**	**6332**	5965	--
Relative Yield (%)			**-5.6**	**-0.5**	**6.1**	--	--

Note: This summary contains commercial varieties that have been tested in the performance trials for a minimum of two years across all locations from fall of 2011 to spring of 2019 and 2021.

Ploidy level refers to the number of chromosome sets in a biological cell and is often used in characterizing ryegrass varieties as either diploid (2x) or tetraploid (4x). Whether ploidy level is advantageous to a specific variety in regards to performance is more dependent on location.

Relative Yield (RY) is the potential of annual ryegrass to perform well at a specific location when compared to the overall state average biomass production. Relative yield (RY) was calculated as the percent increase in yield when comparing the average state performance of a variety to the overall state average, RY = ((Agv. Var - Avg. State)/Avg. State)*100

Citation: White et al.. 2011-2021. Cool-season Annual Forage Variety Trials. Mississippi State University Agricultural and Forestry Experiment Station.

Upcoming Events

Sheep and Goat Production Webinar Series (6:00 PM to 7:00 PM CST)
Registrsation Required

September 21, 2021— Basic Principles to Start a Sheep and Goat Enterprise
Registration at ***https://bit.ly/2021_Sep21SGPW***

October 5, 2021— Choosing the right forages: Understanding Forage Systems for Goat and Sheep Production
Registration at ***https://bit.ly/2021_Oct5SGPW***

October 19, 2021— Pregnancy Detection: Proper Use of Ultrasound Technology and Blood Testing
Registration at ***https://bit.ly/2021_Oct19SGPW***

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

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