Timely Autumn Seeding of Annual Ryegrass Is Essential for High Yield

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Timely autumn seeding of annual ryegrass is essential for high yield

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Introduction

The use of annual ryegrass (*Lolium multiflorum* Lam.) as a winter cover crop and grazing option in the Southeast United States has become a common practice. Recent research evaluating the effects of seeding time on seed yield in Canada determined autumn seeding produces the most desired results relative spring seeding, but indicated that varied autumn seeding rates would further their findings (Coulman *et al.* 2013). A University of Arkansas study utilized cool season annuals, wheat (*Triticum aestivum* L.) and annual ryegrass, to evaluate animal performance and seeding date effects. This research indicated that seeding cool-season annuals in early September may result in greater autumn forage production relative late October seeding. (Coffey *et al.* 2013). While current recommendations in the Southeast United States are to plant annual ryegrass in early autumn, differences among dates and locations have not been evaluated to maximize yield and provide the best forage utilization for producers. The objective of the study is to develop extension recommendations for autumn date seeding of annual ryegrass for maximum seasonal yield potential.

Method

Replicated (Randomized Complete Block design, replications=4) small-plot trials were established at locations in central and north Alabama on 6 consecutive seeding dates, spaced at 2-wk intervals, beginning the first week of September 2008 and 2010 respectively, at a standard seeding rate of 22 kg/ha. Two established cultivars, Marshall and Gulf, the Japanese early-maturing cultivar Shiwasuaoba, and an experimental cultivar C2DMY from the 2nd author's breeding program were used. Plots were harvested with a flail-type harvester whenever the average forage height reached 15 cm. Thus, harvest dates differed depending on location and seeding date. Dry matter yield was calculated on a per hectare basis. Data were analyzed using mixed models methodology as implemented in SAS Proc Mixed.

Results and Discussion

This study shows that in central Alabama (Tallassee) seeding after October 1 resulted in much lower ($P<0.05$) autumn yield than seeding in September (Table 1). Seeding in late October rather than the optimum time of 18-30 September resulted a 25-51% loss in overall yield or 4000 – 9000 kg/ha ($P<0.05$). Not only did early seeding dates produce the highest autumn yield but they also produced harvestable yield by mid-winter of over 2000 kg/ha by 1 January, compared to none for the late October seeding ($P<0.05$).

A similar pattern emerged for Crossville in northern Alabama, although total autumn yields were 67–98% lower ($P<0.05$), which is a function of the generally lower temperatures at that location. Whereas at Tallassee in central Alabama, harvestable yield was produced by the earliest three or four seeding dates, the northern Alabama location at Crossville produced harvestable yield from the first two seeding dates and in one out of three years, also from the third seeding date.

Conclusions

Early autumn seeding of annual ryegrass provides maximum yield in Alabama relative to late autumn seeding. Guiding seeding dates toward the second week of September at Crossville in north Alabama can potentially generate maximum annual ryegrass yields as well as provide early season harvest potential before January 31. Seeding by the first week of October at Tallassee in central Alabama produces the greatest overall and early season autumn yields.

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Table 1. Total seasonal dry matter yield and dry matter accumulated by January 31 the year following autumn seeding of annual ryegrass seeded at 22 kg/ha established at six seeding dates for three consecutive years Tallassee in central Alabama and Crossville in northern Alabama.

Tallassee, Alabama					Crossville, Alabama				
Crop year & Seeding date	Yield for the season		Yield Before January 31		Crop year & Seeding date	Yield for the season		Yield Before January 31	
2008/9	------------- kg DM ha^{-1} --------------				**2010/11**	------------- kg DM ha^{-1} --------------			
4-Sep	14,701	ab†	5,444	a†	1-Sep	4,159	b†	419	b†
18-Sep	17,324	a	5,137	a	15-Sep	5,379	a	600	
2-Oct	13,950	b	2,912	b	29-Sep	3,533	c	0‡	
16-Oct	10,472	c	0‡		13-Oct	3,084	cd	0‡	
30-Oct	8,568	c	0‡		27-Oct	3,133	c	0‡	
13-Nov	9,182	c	0‡		10-Nov	2,594	d	0‡	
Std. Error	625		355		Std. Error	124		31	
2009/10					**2011/12**				
3-Sep	14,573	bc	1,639	a	1-Sep	4,351	cd	1,328	b
17-Sep	16,145	ab	1,935	a	15-Sep	5,457	a	1,994	a
1-Oct	18,871	a	2,044	a	29-Sep	5,203	ab	863	c
15-Oct	13,085	bcd	0‡		13-Oct	4,822	bc	0‡	
29-Oct	12,096	cd	0‡		27-Oct	3,936	d	0‡	
12-Nov	10,590	d	0‡		10-Nov	Trial not seeded due to heavy rain			
Std. Error	771		242		Std. Error	143		176	
2010/11					**2012/13**				
2-Sep	23,167	c	914	b	4-Sep	1202#	a	580	
16-Sep	28,719	b	1,700	ab	18-Sep	1044#	a	442	
30-Sep	33,457	a	2,327	a	2-Oct	256#	b	0‡	
14-Oct	16,143	d	2,323	a	16-Oct	95#	b	0‡	
28-Oct	18,943	cd	0‡		30-Oct	59#	b	0‡	
11-Nov	7,027	e	0‡		13-Nov	0#		0‡	
Std. Error	1,085		275		Std. Error			52	

† Means with year x column followed by the same letter are not significantly different at $P = 0.05$.

‡ No harvestable yield for these seeding dates by January 31.

Total yield as of 13 March, 2013. Total seasonal yield not yet available.