

S

2007 Michigan Grass Variety Trials Report

Richard Leep¹ and Timothy Dietz²

December 1, 2007

Comments on the 2007 Growing Season

Michigan weather, once again, presented challenges to many producers. Hard frost in mid-April resulted in damage on newly emerged shoots and foliage in established stands and delayed planting activities for several crops statewide. This late frost resulted in lower first cutting yields for most forage producers in Michigan. The south-central portion of the state received excess rainfall in May and early-June, which resulted in increased levels root rot diseases, reduced effectiveness of herbicides, and stand loss in poorly drained areas. Most of the state experienced dry conditions beginning in July and continuing until mid-August. Northern areas of the state received below-average rainfall from late-April to September. The northwest region was the hardest-hit, where for some producers; a single cutting of hay was all that was obtained. Forage variety trial yields were lower than normal statewide. Growing season precipitation amounts are presented for each location in Table 1.

Grass variety trials are seeded with a Carter Nursery seeder in plot lengths of 15 ft. or more at a width of 3 or 6 ft into a conventionally prepared seedbed. Species evaluated include: brome, Perennial ryegrass, hybrid ryegrass, Italian ryegrass, festulolium, orchardgrass, timothy, Kentucky bluegrass and Tall fescue. Weeds are controlled with herbicide when necessary and soil tests are taken and amendments are made annually. Hay trials, both annual and perennial (East Lansing, location 2) are harvested when leaf lengths of 12+ inches or just prior to boot stage, and grazing trials (Lake City, location 1) are harvested at 8+inches using Angus steers. Grazing trials (plots are mowed following grazing events if grass residual heights are greater than 6 inches. Nitrogen is applied in the form of urea (early spring) or ammonium sulfate at a rate of 50 lbs of actual N/acre at green-up and following each harvest. Palatability ratings (a visual rating of preference based on consumption by beef cattle) are reported for Lake City on a scale of 1 to 5 (5= >80% of plot consumed). The 2007 annual ryegrass trial was seeded in East Lansing on Apr. 24 and the perennial grass trial was seeded on May 7. The Kentucky bluegrass block of the perennial variety trial was reseeded Oct. 5 due to poor stands.



Lake City (44.35°N) in Central Northern Lower Michigan

Lake City (location 1) is 130 miles north of East Lansing and has colder winters than East Lansing and less snow than Chatham. Trials here are managed as intensively grazed pastures with nitrogen fertilizer applications at green-up and following grazing events. Persistence under livestock hoof pressures and repeated, close-grazing events are monitored. Trials at Lake City

¹ Forage Agronomist, Crop and Soil Sciences, Michigan State Univ.

² Research Assistant, Crop and Soil Sciences, Michigan State Univ.

are usually grazed three to four times per year. Visual assessments of animal preference among the cultivars in the trials are made following grazing events are presented along with yield data in tables 2 and 3 for the 2005 and 2006 seedings.

East Lansing (42.72°N) in Southern Lower Michigan

Five hay grass variety trials (4 perennial & 1 annual) were harvested at East Lansing in southern lower-Michigan (location 2). East Lansing trials are located at the Crop and Soil Sciences Agronomy Farm. Four cuttings are normally obtained from the grass trials at this location. Grass plots are blocked by species and an entire block is harvested at the same time so maturity will vary; however, the goal is to harvest in the boot stage. The 2007 perennial trial was harvested three times (table 7) and annual variety trial was harvest four times (table 8). Yield data are reported in tables 4-6 for established perennial trials.

Statistics

Data are analyzed using PROC GLM or MIXED in SAS v. 8.2 software (Cary, NC). Means and Fischer’s Least Significant Difference (LSD) are reported at the bottom of each column. The LSD is used to compare values *within* a column and is the minimum difference between two values for a “real” difference to exist. The alpha level for the LSD in these trials was 0.05 or 5%, which means, we are 95% certain that values differing by more than the LSD are not due to chance.

Table 1.
2007 Precipitation (inches)

	Lake City			East Lansing		
	Normal*	2007	dev	Normal*	2007	dev
Apr	2.88	3.47	0.59	2.81	1.85	-0.96
May	2.67	2.22	-0.45	2.73	4.16	1.43
June	3.09	3.74	0.65	3.54	5.56	2.02
July	3.26	1.2	-2.06	3.02	0.52	-2.50
Aug	3.01	2.49	-0.52	3.12	5.20	2.08
Sept	3.25	1.88	-1.37	2.50	2.10	-0.40
Oct	2.65	2.45	-0.2	2.20	4.52	2.32
Total	20.81	17.45	-3.36	19.92	23.91	3.99

*30 yr ave.

Table 2.

2005 Lake City Perennial Grass Variety Trial
Missaukee Co., Michigan
 Sown Aug 2005
 Non-irrigated

<i>Species</i> /Marketer	Cultivar	1-Jun	28-Jun	13-Aug	2007	2006	2-yr	Preference 1 to 5**
					Total	Total	Total	
DM tons/acre								
<i>Brome</i>								
public	VNS	2.24	0.33	0.09	2.66	2.55	5.21	4.0
DLF International	AC Knowles	2.07	0.46	0.14	2.67	2.32	4.99	4.0
<i>Bentgrass</i>								
public turf-type	Putter	0.51	0.65	0.07	1.23	0.61	1.84	3.0
Rose-Agriseed, Inc	PST ORAF	0.01	0.63	0.19	0.83	0.64	1.47	2.0
<i>Perennial Ryegrass</i>								
Michigan State Seed Solutions	Sierra	1.84	0.49	.	2.33	3.81	6.14	3.8
Michigan State Seed Solutions	Herbie	0.92	0.74	.	1.66	3.55	5.21	3.3
<i>Tall fescue</i>								
Fraser Seeds	CNS26	2.73	0.43	0.18	3.34	2.95	6.29	3.8
Pennington Seed	Advance MaxQ	2.23	0.43	0.25	2.91	2.59	5.50	4.0
<i>Orchardgrass</i>								
FFR Cooperative	OG0001	3.20	0.49	0.30	3.99	3.36	7.35	4.0
Mean		1.69	0.54	0.19	2.40	2.49	4.89	3.5
CV%		16	18	51	13	13	11	9
LSD (0.05)‡		0.37	0.13	0.11	0.43	0.60	0.95	0.45

Location: Lake City Experiment Station
 Design: RCB, plot size 3 x 24'
 Seeded: 15-Aug-05
 Soil Type: Nester Sandy loam
 Fertilizer: 120 lbs/a 46-0-0 at green up, 200 lbs/a 34-0-0 after cuts 2 and 3
 **Visual Rating 1-5 with 5 = 80-100% of plot consumed, 4=60-80%, 3=40-60%, 2=20-40%, 1=0-20%
 ‡95% certain that values which are separated by a number greater than the LSD are statistically different

Table 3.

2006 Lake City Perennial Grass Variety Trial
Missaukee Co., Michigan
 Sown July 2006
 Non-irrigated

<i>Species/Marketer</i>	Cultivar	2007				2007 Total	Preference 1 to 5**
		1-Jun	28-Jun	13-Aug	22-Oct		
		DM tons/acre					
<i>Orchardgrass</i>							
Standish Milling	Bounty	2.67	1.06	0.42	0.75	4.90	3.8
American Grass Seed Producers	Ambrosia	2.44	1.09	0.51	0.81	4.85	3.8
Columbia Seed/Seed Res. of OR	Harvestar	2.36	1.12	0.46	0.82	4.76	3.8
Standish Milling	Extend	2.28	1.02	0.49	0.74	4.53	3.8
<i>Perennial Ryegrass</i>							
Columbia Seed	Verano	2.41	0.82	0.33	0.58	4.14	4.0
Michigan State Seed Solutions	Eurostar	2.95	0.57	0.21	0.38	4.11	4.0
<i>Reed canary</i>							
Standish Milling public	Marathon	2.06	1.16	0.55	0.55	4.32	3.0
	Chiefton	1.04	0.91	0.35	0.22	2.52	4.0
<i>Tall fescue</i>							
Standish Milling	Enhance	2.97	0.87	0.32	0.58	4.74	3.0
American Grass Seed Producers	Verdant	2.16	0.87	0.28	0.47	3.78	3.8
<i>Timothy</i>							
Allied Seed	Summit	2.84	0.71	0.25	.	3.80	4.0
Allied Seed	Crest	2.72	0.68	0.21	.	3.61	4.0
public	Climax	2.28	0.64	0.15	.	3.07	4.0
Mean		2.40	0.89	0.35	0.59	4.09	3.8
CV%		10	17	29	25	9	8
LSD (0.05)‡		0.32	0.21	0.14	0.22	0.57	0.4

Location: Lake City Experiment Station
 Design: RCB, plot size 3 x 24'
 Seeded: 24-Jul-06
 Soil Type: Nester Sandy loam
 Fertilizer: 120 lbs/a 46-0-0 at green up, 200 lbs/a 34-0-0 after cuts 2 and 3

**Visual Rating 1-5 with 5 = 80-100% of plot consumed, 4=60-80%, 3=40-60%, 2=20-40%, 1=0-20%

‡95% certain that values which are separated by a number greater than the LSD are statistically different

Table 4.

2004 East Lansing Perennial Grass Variety Trial
Ingham Co., Michigan
 Sown April 2004
 Non-irrigated

<i>Species /Marketer</i>	Cultivar	cut 1	cut 2	cut 3	2007	2006	2005	2004	4-yr
					Total	Total	Total	Total	Total
DM tons/acre									
<i>Kentucky Bluegrass</i>									
Public	Common	2.98	0.48	1.33	4.79	4.19	3.78	1.63	14.39
Jacklin Seed/JR Simplot Co.	Troy II	2.35	0.37	1.00	3.72	3.86	3.65	1.65	12.88
<i>Orchardgrass</i>									
Proseeds Marketing, Inc.	Shiloh II	2.23	0.78	1.71	4.72	6.55	3.70	4.13	19.10
DLF International Seeds	Ambassador	2.55	0.61	1.67	4.83	6.39	3.42	3.91	18.55
Seed Res. of Oregon/Mich. State Seed	Impuls	1.73	0.78	1.72	4.23	6.21	3.26	3.90	17.60
Seed Research of OR/Columbia Seeds	Harvestar	1.76	0.71	1.57	4.04	6.12	2.89	4.02	17.07
<i>Perennial Ryegrass</i>									
Seed Res. of Oregon/Mich. State Seed	Altius (4n)	1.90	0.80	1.24	3.94	6.05	3.64	4.52	18.15
Seed Res. of Oregon/Mich. State Seed	Herbie (2n)	1.86	0.62	1.42	3.90	5.38	3.33	4.45	17.06
Columbia Seeds	Full Throttle II (2n)	2.33	0.27	1.42	4.02	4.62	2.96	3.92	15.52
<i>Tall fescue</i>									
AgResearch Limited	AGRFA111	2.97	0.70	2.29	5.96	6.76	5.97	4.44	23.13
Pickseed West	Festival	2.51	0.60	2.24	5.35	6.36	5.76	4.35	21.82
<i>Timothy</i>									
DLF International Seeds	Dolina	2.45	0.36	0.78	3.59	4.73	4.59	3.37	16.28
DLF International Seeds	Tundra	2.34	0.43	0.74	3.51	4.34	4.32	3.10	15.27
	Mean	2.30	0.58	1.47	4.35	5.50	3.94	3.65	17.5
	CV%	20	28	14	15	10	14	14	10
	LSD (0.05)†	0.59	0.21	0.27	0.85	0.72	0.72	0.60	2.2

Location: Mich. State Univ. Exp. Station, East Lansing
 Design: RCB, plot size 3 x 24 (3 x 21 harvested)
 Seeded: 16-Apr-04
 Soil Type: Capac loam, tile drainage
 Fertilizer: 150 lbs of N/A (50 lbs/A following emergence, 50 lbs/A after cut 1 and 2)
 † 95% certain that values which are separated by a number greater than the LSD are statistically different

Table 5.

2005 East Lansing Perennial Grass Variety Trial
Ingham Co., Michigan
 Sown April 2005
 Non-irrigated

<i>Species/Marketer</i>	Cultivar	2007 2006 2-yr						
		cut 1	cut 2	cut 3	cut 4	Total	Total	Total
DM tons/acre								
<i>Bentgrass</i>								
Rose Agri-Seed, Inc. (turf-type)	PST-ORAF	0.72	1.1	1.02	0.15	2.99	1.95	4.94
	Putter	0.66	0.53	0.55	0.09	1.83	0.95	2.78
<i>Brome</i>								
Ampac Seed Company	RAD-BIX28	2.70	.	1.61	0.54	4.85	6.23	11.08
Columbia	RAD-BI29	2.83	.	1.44	0.46	4.73	6.16	10.89
Public	VNS	2.93	.	1.50	0.44	4.87	5.63	10.50
<i>Perennial Ryegrass</i>								
Columbia Seed/Seed Research of OR	Elgon (4n)	1.79	0.66	1.70	0.95	5.10	6.57	11.67
Seed Research of OR	Proton (4n)	1.99	0.67	1.38	0.96	5.00	6.29	11.29
DLF International Seed	Respect (2n)	2.72	0.32	1.44	0.88	5.36	5.86	11.22
Michigan State Seed Solutions	Herbie (2n)	1.86	0.71	1.23	1.05	4.85	5.90	10.75
Mich. State Seed/Lewis Seed Co.	Sierra (2n)	2.46	0.38	1.36	0.67	4.87	5.88	10.75
Seed Research of OR	Laguna (2n)	2.18	0.51	1.22	0.85	4.76	5.41	10.17
Seed Research of OR	Captain (2n)	1.89	0.83	1.38	0.70	4.80	5.21	10.01
<i>Tall fescue</i>								
Michigan State Seed Solutions	Fawn	3.01	1.13	1.39	0.91	6.44	8.90	15.34
Rose Agri-Seed, Inc.	PST-5NF	2.65	1.02	1.64	0.61	5.92	9.25	15.17
Fraser Seed	CNS26	2.60	0.78	1.54	0.75	5.67	8.25	13.92
<i>Timothy</i>								
Michigan State Seed Solutions	Talon	2.86	0.51	1.89	0.95	6.21	6.74	12.95
AMPAC Seed Company	Tuuka	2.31	0.30	1.12	0.36	4.09	4.55	8.64
	Mean	2.24	0.68	1.38	0.67	4.84	5.88	10.7
	CV%	13	33	18	25	10	9	7
	LSD (0.05)†	0.42	0.32	0.36	0.24	0.69	0.80	1.23

Location: Mich. State Univ. Exp. Station, East Lansing

Design: RCB, plot size 3 x 24 (3 x 21 harvested)

Seeded: 19-Apr-05

Soil Type: Capac loam, tile drainage

Fertilizer: 150 lbs of N/A (50 lbs/A prior to cut 1, and after cuts 1-3)

† 95% certain that values which are separated by a number greater than the LSD are statistically different

Table 6.

2006 East Lansing Perennial Grass Variety Trial
Ingham Co., Michigan
 Sown April 2006
 Non-irrigated

<i>Species/Marketer</i>	Cultivar	cut 1	cut 2	cut 3	cut 4	2007	2006	2-yr
						Total	Total	Total
		DM tons/acre						
<i>Orchardgrass</i>								
Standish Milling	Extend	2.67	0.76	2.17	0.93	6.53	1.89	8.42
Standish Milling	Bounty	2.74	0.60	1.94	0.93	6.21	2.11	8.32
Columbia Seed/Seed Res. of OR	Harvestar	2.18	0.71	2.46	1.02	6.37	1.88	8.25
DLF International Seed	IS-OG 39	2.27	0.61	2.24	1.00	6.12	1.94	8.06
American Grass Seed Producers	Ambrosia	2.21	0.60	2.14	0.96	5.91	1.76	7.67
Ag Research, LTD	AGR DG 101	0.61	0.35	1.51	1.03	3.50	1.82	5.32
<i>Perennial Ryegrass</i>								
Standish Milling	Boost (2n)	2.32	0.28	1.59	0.81	5.00	2.48	7.48
Lewis Seed	Quartermaster (4n)	1.76	0.28	1.71	0.93	4.68	2.66	7.34
Cropmark	LP2005GA (4n)	0.73	0.36	2.05	1.07	4.21	2.53	6.74
Michigan State Seed Solutions	Eurostar (2n)	1.70	0.20	1.91	0.93	4.74	2.00	6.74
Columbia Seed	Verano (4n)	1.13	0.40	1.93	1.07	4.53	2.01	6.54
<i>Tall fescue</i>								
Standish Milling	Enhance	3.18	0.57	1.79	1.01	6.55	3.37	9.92
American Grass Seed Producers	Verdant	2.10	0.60	2.37	1.04	6.11	3.00	9.11
Various sources	Fawn	2.19	0.52	2.10	0.97	5.78	3.05	8.83
<i>Reed Canary</i>								
Standish Milling	Marathon	2.42	0.45	1.90	0.81	5.58	3.28	8.86
Michigan State Seed Solutions	Chiefton	1.91	0.46	1.32	0.68	4.37	3.40	7.77
<i>Timothy</i>								
Allied Seed	Crest	3.70	0.24	1.99	0.83	6.76	1.82	8.58
Allied Seed	Summit	3.73	0.16	2.12	0.83	6.84	1.63	8.47
Michigan State Seed Solutions	Climax	2.60	0.53	1.81	0.78	5.72	1.18	6.90
Mean		2.22	0.46	1.95	0.93	5.55	2.31	7.86
CV%		23	30	13	15	13	12	10
LSD (0.05)†		0.74	0.19	0.37	0.2	1.01	0.46	1.1

Location: Mich. State Univ. Exp. Station, East Lansing
 Design: RCB, plot size 3 x 25 (3 x 22 harvested)
 Seeded: 21-Apr-06
 Soil Type: Capac loam, tile drainage
 Fertilizer: 150 lbs of N/A (50 lbs/A following emergence, 50 lbs/A after cuts 1-3)

† 95% certain that values which are separated by a number greater than the LSD are statistically different

**Table 7. 2007 East Lansing, MI Perennial Grass Variety Trial Yield (DM tons/a)
Sown May 2007, Non-irrigated**

<i>Species</i> /Marketer	Cultivar	cut 1	cut 2	cut 3	2007 Total
<i>Festulolium</i>					
Allied Seed	Gain	0.50	0.79	1.02	2.31
Rose Agri-Seed, Inc.	Spring Green, organic	0.22	0.67	1.02	1.91
<i>Orchardgrass</i>					
AMPAC Seed	AMOG4	0.42	0.74	1.12	2.28
Rose Agri-Seed, Inc.	Megabite	0.59	0.67	0.92	2.18
ProSeeds Marketing	Warrior II	0.36	0.88	0.92	2.16
Rose Agri-Seed, Inc.	Elsie	0.42	0.73	0.97	2.12
public	Potomac	0.30	0.91	0.81	2.02
Allied Seed	OG0203G	0.34	0.83	0.84	2.01
Columbia Seed/Seed Res. of OR	OG0204G	0.35	0.65	0.99	1.99
<i>Perennial Ryegrass</i>					
Cropmark Seeds	LP2006DA (4n)	0.32	1.00	1.19	2.51
Barenbrug	Barsprinter (2n)	0.25	0.68	1.34	2.27
AMPAC Seed	AMPOW4n (4n)	0.25	0.69	1.23	2.17
Czech Republic	Korok (4n)	0.21	0.79	1.02	2.02
Barenbrug	BG34 (blend)	0.24	0.76	1.01	2.01
AgResearch, LTD	KLp401 (4n)	0.15	0.69	1.13	1.97
Barenbrug	Remington (4n)	0.18	0.88	0.90	1.96
AgResearch, LTD	KLp507 (4n)	0.16	0.67	1.07	1.90
Cropmark Seeds	LP2005GA (4n)	0.12	0.80	0.86	1.78
<i>Tall fescue</i>					
ProSeeds Marketing	Noria	0.47	1.01	1.30	2.78
Rose Agri-Seed, Inc.	Cowgirl	0.47	0.98	1.11	2.56
Barenbrug	BarElite	0.37	0.77	1.21	2.35
Columbia Seed/Seed Res. of OR	TFO203G	0.47	0.81	1.01	2.29
<i>Meadow/hybrid brome</i>					
DLF International	AC Knowles	0.72	0.91	.	1.63
Columbia Seed/Seed Res. of OR	Montana	0.59	0.93	.	1.52
<i>Timothy</i>					
public	Climax	0.69	0.69	0.88	2.26
Barenbrug	Barpenta	0.64	0.64	0.83	2.11
Barenbrug	Barfleo	0.41	0.41	0.05	0.87
Mean		0.38	0.78	0.99	2.07
CV%		33	17	21	12
LSD (0.05)†		0.16	0.18	0.3	0.38

Location: Mich. State Univ. Exp. Station, East Lansing

Design: RCB, plot size 3 x 25 (3 x 22 harvested)

Seeded/Soil Type: 5/7/2007 / Capac loam, tile drainage

Fertilizer: 68 lbs of N/A PPI & 50 lbs N /A following cut 2

Kent. bluegrass was reseeded and Bentgrass was not harvested for yield due to low stand density

† 95% certain that values which are separated by a number greater than the LSD are statistically different

Table 8.

2007 Annual Ryegrass Variety Trial
East Lansing, MI
 Sown April 2007
 Non-irrigated

Breeder/Marketer	Entry	18-Jun	3-Jul	13-Sep	12-Nov	2007	CP%	ADF%	NDF%
						Total			
		DM tons/acre					average		
Cropmark	LM5005B (4n)	1.24	0.51	0.60	0.79	3.14	16.3	30.7	47.4
Allied Seed	Nibbio (2n)	1.45	0.40	0.60	0.53	2.98	16.0	29.2	49.1
Ampac Seed	AM4n (4n)	1.24	0.45	0.72	0.45	2.86	15.8	30.0	49.3
Allied Seed	DH-3 (2n)	1.38	0.22	0.65	0.47	2.72	16.0	30.0	51.1
DLF International	MO-1 (2n)	1.32	0.37	0.53	0.45	2.67	16.1	28.1	47.9
Allied Seed	Malmi (4n)	0.85	0.42	0.64	0.75	2.66	17.9	27.9	46.2
Allied Seed	Bellem (2n)	1.01	0.35	0.61	0.69	2.66	16.6	28.5	48.0
Vladimir Cernoch	Lotrando (4n)	1.21	0.35	0.54	0.53	2.63	16.6	30.4	48.6
Allied Seed	Livictory (4n)	0.93	0.21	0.49	0.78	2.41	16.5	28.7	46.2
American Grass Seed Producers	5.0561TA (4n)	0.92	0.27	0.48	0.44	2.11	15.3	28.8	47.8
American Grass Seed Producers	Ocala (2n)	1.04	0.27	0.45	0.35	2.11	16.1	29.6	50.8
Allied Seed	Ligrande (2n)	0.69	0.21	0.49	0.51	1.90	17.2	27.8	46.4
	Mean	1.11	0.34	0.57	0.56	2.57	16.4	29.1	48.2
	CV%	18	34	35	19	14	6	3	2
	LSD (0.05)†	0.28	0.16	0.28	0.15	0.52	1.7	1.4	1.4

Location: Mich. State Univ. Exp. Station, East Lansing

Design: RCB, plot size 3 x 25' (3 x 22' harvested)

Seeded: 24-Apr-07

Soil Type: Capac, tile drainage

Fertility: 68 lbs of N/A PPI & 50 lbs N/A following cut 2 & 3

† 95% certain that values which are separated by a number greater than the LSD are statistically different