

2005 Michigan Grass Variety Trials Report

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Comments on the 2005 Growing Season

Winter injury was apparent across the state due to periods of low temperatures and little snow cover. The greatest effect of the winter conditions was evident in perennial ryegrass which had stands that were completely injured. Obvious differences in cultivars prompted winter injury ratings in all locations. These visual ratings, taken prior to the first harvest, are an average score of two assessors using a scale of 1 (no injury) to 10 (greater than 90 % of the stand showing injury) for East Lansing (EL) and Lake City (LC) 2003 trial, and scale of 1 (no injury) to 5 (greater than 80% injured) for Chatham, Lake City 2001 trial, and Hickory Corners. “Injury” rather than “kill” is being used because some of the plants recovered from the damage and produced yield in later cuttings. Palatability ratings (a visual rating of preference based on consumption by beef cattle) are reported for Lake City and Hickory Corners on a scale of 1 to 5 (5= >80% of plot consumed). Rainfall data is presented by 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: 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 (LC 2003, EL 2003 & 2004) are harvested when leaf lengths of 12+ inches or just prior to boot stage, and grazing trials are harvested at 8+inches using Holstein steers (Hickory Corners), Simmental cows (LC) and Holstein heifers (Chatham). Grazing trials plots are mowed following grazing events. Nitrogen is applied in the form of urea or ammonium sulfate at a rate of 50 lbs of actual N/acre at green-up and following each harvest.

Chatham in the Upper Peninsula

A perennial grass grazing trial was seeded in 2001 at Chatham (location 1) in the Upper Peninsula at the Michigan State University Upper Peninsula Experiment Station. Chatham is 300 miles north of East Lansing and has colder winters than Lake City, but with more snow. Winterhardiness and persistence are important at Chatham. Trials are normally seeded in the spring, and are usually cut three times per year from May 15 to

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October 1. Two-year dry-matter yields and ratings for the grazing trial seeded in 2001 are given table 2.

Lake City in Central Northern Lower Michigan

Lake City (location 2) is 130 miles north of East Lansing and has colder winters than East Lansing and less snow than Chatham. Trials are usually seeded in the fall when soil temperatures are higher and rainfall amounts are greater. Trials at Lake City are usually cut three to four times per year. Yield data for 2001 and 2003 seedings at Lake City are reported in tables 3 and 4.

East Lansing in Southern Lower Michigan

Three hay grass variety trials (2 perennial & 1 annual) were harvested at East Lansing in southern lower-Michigan (location 3). These trials are located on the Crop and Soil Sciences Agronomy Farm. Four or five cuttings are typical for the perennial grass trials at this location. Grass plots are blocked by species to allow harvest of only those that are ready; therefore, yield values in the same “cut” column may have been harvested on a different day. Yield data is reported in tables 5 and 6 for perennial trials and table 7 for the annual ryegrass trial.

Hickory Corners in Southwestern Lower Michigan

One grass grazing variety trial was established in 2001 at the Kellogg Biological Station (KBS) in Hickory Corners, Kalamazoo Co. (location 4). Four to five cuttings are typical at this site but mid to late summer drought is common. The 2005 growing season was below-normal for precipitation and yield data is presented in Table 7.

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.
2005 Precipitation (inches) (*30 yr. average)

	Chatham			East Lansing			Lake City		
	Normal*	2005	dev	Normal*	2005	dev	Normal*	2005	dev
Apr	2.46	2.37	-0.09	2.81	1.19	-1.62	2.88	1.04	-1.84
May	3.15	1.93	-1.22	2.73	1.88	-0.85	2.67	2.58	-0.09
June	3.61	1.11	-2.50	3.54	4.47	0.93	3.09	2.05	-1.04
July	3.56	3.22	-0.34	3.02	6.42	3.40	3.26	3.69	0.43
Aug	3.55	1.92	-1.63	3.12	1.09	-2.03	3.01	4.48	1.47
Sept	4.16	4.14	-0.02	2.50	3.83	1.33	3.25	4.06	0.81
Oct	3.24	3.29	0.05	2.20	0.24	-1.96	2.65	0.72	-1.93
Total	23.73	17.98	-5.75	19.92	19.12	-0.80	20.81	18.62	-2.19

Table 2.

2001 UPES Perennial Grass Variety Trial**Alger Co.**

Sown Aug 2001

Non-irrigated

<i>Species/Marketer</i>	Variety	Winter Injury*	DM tons/acre							
			1- Jun	10- Jul	23- Aug	29- Sep	2005 Total Yield	2004 Total Yield	2003 Total Yield	3-yr. Total Yield
<i>Festulolium</i>										
DLF- Jenks	Hykor	1.0	0.79	0.56	0.87	0.79	3.01	3.90	2.15	9.06
AMPAC Seed Co.	Duo	4.3	0.64	0.47	0.45	0.65	2.21	3.23	1.25	6.69
<i>Orchardgrass</i>										
DLF-Jenks	Amba	2.0	1.05	0.37	0.46	0.60	2.48	3.58	1.85	7.91
AMPAC Seeds Co.	Tekapo	3.0	0.72	0.64	0.60	0.77	2.73	3.85	1.55	8.13
DLF-Jenks	Sparta	1.3	1.01	0.56	0.63	0.54	2.74	3.51	1.57	7.82
DLF-Jenks	Niva	1.7	0.97	0.67	0.70	0.57	2.91	3.33	1.59	7.83
<i>P. Ryegrass</i>										
Barenbrug	Mara (2n)	4.0	0.58	0.36	0.62	0.55	2.11	4.51	1.51	8.13
DLF-Jenks	Calibra (4n)	3.3	0.58	0.58	0.51	0.86	2.53	3.65	0.93	7.11
AMPAC Seed Co.	Tonga (4n)	4.0	0.61	0.43	0.48	0.54	2.06	3.29	1.10	6.45
AMPAC Seed Co.	Aries (2n)	5.0	0.09	0.32	0.00	0.15	0.56	2.29	1.04	3.89
AMPAC Seed Co.	Quartet (4n)	5.0	0.15	0.33	0.11	0.43	1.02	3.02	0.62	4.66
AMPAC Seed Co.	Maverick Gold (4n)	5.0	0.00	0.38	0.00	0.28	0.66	2.04	0.93	3.63
<i>Tall Fescue</i>										
AMPAC Seed Co.	Bronson	1.3	0.65	0.65	0.92	0.71	2.93	3.84	2.06	8.83
Barenbrug	Barolex	2.3	0.78	0.62	0.84	0.81	3.05	4.25	1.41	8.71
AMPAC Seed Co.	K5666V	2.8	0.32	0.51	0.72	0.74	2.29	3.66	1.42	7.37
Mean		3.1	0.60	0.48	0.53	0.61	2.22	3.46	1.39	7.08
LSD (0.05)		0.8	0.23	0.36	0.21	0.23	0.56	0.86		

Location: Upper Pen. Experiment Station, Chatham

Design: RCB, plot size 6' x 15'

Seeded: August 2001

Soil Type: Eben Very Cobbly Sandy Loam

Fertilizer: 50 lbs/acre of actual N at green-up and after each harvest

*Visual Rating of Winter Injury (1-5 scale; 1=least injury)

Table 3.

2001 Lake City Perennial Grass Variety Trial
Missaukee Co., Michigan
 Sown Aug 2001
 Non-irrigated

Species/Marketer	Variety	Winter Injury*					2005	2004	2003	2002	4-yr.
			23- May	7- Jul	9- Aug	2- Oct	Total Yield	Total Yield	Total Yield	Total Yield	Total Yield
DM tons/acre											
<i>Festulolium</i>											
DLF- Jenks	Hykor	1.0	0.55	0.87	0.89	0.60	2.90	2.86	3.93	2.77	12.46
AMPAC Seed Co.	Duo	2.0	0.36	0.44	0.44	0.37	1.61	2.26	2.28	2.99	9.14
<i>Orchardgrass</i>											
DLF-Jenks	Sparta	1.3	0.61	0.52	0.51	0.62	2.26	3.20	3.11	2.29	10.86
AMPAC Seeds Co.	Tekapo	2.7	0.18	0.56	0.27	0.54	1.55	2.70	2.80	2.20	9.25
DLF-Jenks	Niva	2.0	0.46	0.39	0.51	0.64	1.99	2.61	2.72	2.26	9.58
DLF-Jenks	Amba	1.3	0.57	0.47	0.24	0.45	1.72	2.54	2.42	2.12	8.80
<i>P. Ryegrass</i>											
Barenbrug	Mara (2n)	4.3	0.18	0.47	0.37	0.70	1.72	2.38	2.98	3.05	10.13
DLF-Jenks	Calibra (4n)	2.7	0.23	0.54	0.33	0.55	1.65	2.03	1.88	2.75	8.31
Barenbrug	Barfort (4n)	3.0	0.20	0.48	0.28	0.50	1.46	2.55	1.71	2.25	7.97
AMPAC Seed Co.	Tonga (4n)	3.0	0.43	0.47	0.32	0.53	1.75	1.50	1.98	2.19	7.42
AMPAC Seed Co.	Aries (2n)	4.3	0.35	0.33	0.25	0.32	1.24	1.93	1.52	2.19	6.88
AMPAC Seed Co.	Quartet (4n)	3.7	0.33	0.34	0.43	0.53	1.63	2.01	1.20	2.40	7.24
AMPAC Seed Co.	Maverick Gold (4n)	3.7	0.69	0.35	0.42	0.45	1.91	1.44	1.64	1.62	6.61
<i>Tall Fescue</i>											
AMPAC Seed Co.	Bronson	1.0	0.47	0.52	0.46	0.66	2.12	3.30	3.45	2.63	11.50
AMPAC Seed Co.	K5666V	1.3	0.71	0.53	0.43	0.69	2.35	3.34	3.22	2.41	11.32
Barenbrug	Barolex	2.5	0.64	0.50	0.74	0.96	2.85	2.73	3.32	0.35	9.25
Mean		2.5	0.44	0.49	0.43	0.57	1.92	2.56	2.55	2.36	9.17
LSD (0.05)		1.3	0.40	0.34	0.34	0.33	0.66	1.30	0.65	0.61	1.50

Location: Lake City Experiment Station, Missaukee Co.

Design: RCB, plot size 6' x 15'

Seeded: 8/14/01

Soil Type: Nester Sandy Loam

Fertilizer: 50 lbs/acre of actual N at green-up and after each harvest

*Visual Rating of Winter Injury (1-5 scale; 1=least injury)

Table 4.

2003 Lake City Perennial Grass Variety Trial
Missaukee Co., Michigan
 Sown Aug 2003
 Non-irrigated

<i>Species/Marketer</i>	Cultivar	23- May	14- Jul	9- Aug	7- Oct	2005	2004	2-yr	Palatability 1 to 5**	Winter Injury 1 to 10†
						Total	Total	Total		
<i>Orchardgrass</i>										
Seed Research of Oregon/Radix/Columbia Seeds	Harvestar*	1.05	1.53	0.46	0.49	3.03	1.48	4.51	2.8	1.5
Barenbrug USA	Intensiv	0.78	1.73	0.50	0.40	3.01	1.34	4.35	2.8	1.1
Mountain View Seeds	Rushmore	0.76	1.57	0.55	0.32	2.88	1.45	4.33	2.8	1.0
Seed Research of Oregon	Command*	0.83	1.59	0.51	0.44	2.92	1.24	4.16	2.3	1.3
Mountain View Seeds	Lidacta	0.74	1.47	0.49	0.52	2.70	1.35	4.05	3	1.6
Mountain View Seeds	Alpine	0.80	1.05	0.42	0.35	2.26	0.98	3.24	3	2.6
<i>Perennial Ryegrass</i>										
Latvia Univ.	Spidola (4n)	0.33	0.68	.	0.31	1.00	1.74	2.74	4.5	3.3
Mountain View Seeds	MTV1 (4n)	0.33	0.49	.	0.36	0.82	1.61	2.43	4.5	5.4
AMPAC	Calibra (4n)	0.26	0.46	.	0.25	0.72	1.51	2.23	5	2.9
<i>Intermediate Ryegrass (hybrid)</i>										
Smith Seed	Bestfor Plus (2n)	0.04	0.64	.	0.12	0.68	1.87	2.55	2.5	8.0
<i>Tall fescue</i>										
Mountain View Seed	Teton	0.81	1.26	0.34	0.38	2.41	1.23	3.64	2	1.4
Pennington Seed	Jesup Max Q	0.60	0.99	0.38	0.32	1.97	1.14	3.11	2.5	2.5
<i>Festulolium</i>										
DLF International Seed	Fojtan	0.53	1.03	0.49	0.27	2.05	1.68	3.73	2.5	2.0
Mean		0.60	1.11	0.32	0.34	2.36	1.43	3.47	3.1	2.7
CV%						16	22	11	14	27
LSD (0.05)‡						0.66	0.36	0.75	0.6	1

Location: Lake City Experiment Station
 Design: RCB, plot size 6 x 24'
 Seeded: 6-Aug-03
 Soil Type: Nester Sandy loam
 Fertilizer: 120 lbs/a 46-0-0 at green up, 200 lbs/a 34-0-0 after cuts 1 & 2
 Cutting: two harvests in 2004

*Cultivar seeded from experimental seed

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

†Visual Rating 1-10 with 10= >90% injury

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

Table 5.

2003 East Lansing Perennial Grass Variety Trial

Ingham Co., Michigan

Sown Aug 2003

Non-irrigated

<i>Species/Marketer</i>	Cultivar	Winter Injury 1 to 10**	Cut				2005	2004	2-yr.
			1	2	3	4	Total	Total	Total
			DM tons/acre						
<i>Orchardgrass</i>									
Seed Research of Oregon/Radix/Columbia Seeds	Harvestar*	1	1.21	0.78	1.30	0.88	4.16	7.47	11.63
Mountain View Seeds	Lidacta	1	1.70	0.92	1.00	0.63	4.25	7.03	11.28
Mountain View Seeds Seed Research of Oregon	Rushmore	1	1.18	0.76	1.00	0.81	3.74	7.07	10.81
Mountain View Seeds	Command*	1	1.36	0.73	0.94	0.77	3.81	6.51	10.32
	Alpine	3.9	0.46	0.60	0.88	0.80	2.74	4.92	7.66
<i>Perennial Ryegrass</i>									
Latvia Univ.	Spidola (4n)	1.1	1.12	0.87	0.30	0.51	2.81	6.55	9.36
Mountain View Seeds	MTV1 (4n)	1.8	1.67	0.52	0.30	0.35	2.83	6.53	9.36
Cropmark	Matrix (2x)	5	0.21	0.64	0.55	0.48	1.88	5.10	6.98
<i>Intermediate Ryegrass (hybird)</i>									
Smith Seed	Bestfor Plus (4n)	5	0.34	1.00	0.54	0.41	2.28	8.21	10.49
<i>Tall fescue</i>									
Pennington Seed	Jesup Max Q	1	1.34	1.27	0.46	0.53	3.59	5.67	9.26
Mountain View Seed	Teton	1	1.58	1.02	0.34	0.57	3.51	5.71	9.22
Mean		2.1	1.11	0.83	0.69	0.61	3.23	6.43	9.67
LSD (0.05)†		0.73	0.47	0.18	0.36	0.34	0.78	1.44	1.94

Location: Mich. State Univ. Exp. Station, East Lansing
 Design: RCB, plot size 3 x 24 (3 x 21 harvested)
 Seeded: 5-Aug-03
 Soil Type: Capac loam, tile drainage
 Fertilizer: 120 lbs/a 46-0-0 at green up, 200 lbs/a 34-0-0 after cut 1 and 2

*Cultivar seeded with experimental seed

**Visual Rating 10= 90% of stand injured

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

Table 6.

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

<i>Species/Marketer</i>	Cultivar	cut	cut	cut	2005	2004	2-yr	winter
		1	2	3	Total	Total	Total	injury
		DM tons/acre						1 to 10*
<i>Kentucky Bluegrass</i>								
Jacklin Seed/JR Simplot Co.	Troy II	1.21	1.44	1.00	3.65	1.65	5.30	1
Public	Common	1.60	1.30	0.88	3.78	1.63	5.41	1
<i>Orchardgrass</i>								
Proseeds Marketing, Inc.	Shiloh II	1.92	0.93	0.85	3.70	4.13	7.83	1
Seed Research/Columbia Seeds	Harvestar	1.19	0.97	0.73	2.89	4.02	6.91	1
DLF International Seeds	Ambassador	1.86	0.90	0.66	3.42	3.91	7.33	1
Seed Res. of Oregon/Mich. State Seed	Impuls	1.62	0.97	0.67	3.26	3.90	7.16	1
<i>Perennial Ryegrass</i>								
Seed Res. of Oregon/Mich. State Seed	Altius (4n)	1.57	1.23	0.83	3.64	4.52	8.16	2.2
Seed Res. of Oregon/Mich. State Seed	Herbie (2n)	1.32	1.01	1.00	3.33	4.45	7.78	2.6
Columbia Seeds	Full Throttle II (2n)	1.69	0.47	0.80	2.96	3.92	6.88	4.8
<i>Tall fescue</i>								
AgResearch Limited	AGRFA111	2.19	1.92	1.87	5.97	4.44	10.41	1
Pickseed West	Festival	1.97	1.88	1.90	5.76	4.35	10.11	1
<i>Timothy</i>								
DLF International Seeds	Dolina	2.58	1.63	0.38	4.59	3.37	7.96	1
DLF International Seeds	Tundra	2.39	1.50	0.43	4.32	3.10	7.42	1
Mean		1.78	1.24	0.92	3.94	3.65	7.59	1.3
LSD (0.05)†					0.72	0.60	0.79	1.5

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)

*Visual Rating 1-10 with 10= >90% injury

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

Table 7.

2005 Annual Ryegrass Variety Trial
Ingham Co., MI
 Sown April 2005
 Non-irrigated

Entry	Breeder/Marketer	20-	20-	23-	5-	2005	CP%	ADF%	NDF%
		Jun	Jul	Aug	Oct	Total			
		DM tons/acre					average*		
Jeanne	DLF-International	1.24	1.67	0.73	0.83	4.48	20.4	24.2	37.2
Zorro	DLF-International	1.15	1.80	0.63	0.89	4.46	20.2	25.2	40.1
King	Lewis Seed	1.22	0.98	0.20	0.13	2.53	18.9	26.2	41.5
Double Barrel	DLF- International	1.33	0.84	.	.	2.17	21.2	25.9	38.7
Angus 1	DLF- International	1.28	0.78	.	.	2.06	20.5	26.0	39.0
Mean		1.24	1.21	0.52	0.62	3.14	20.2	25.5	39.3
CV%		14	16	22	33	9	12	13	9
LSD (0.05)†		NS	0.29	0.2	0.35	0.60	NS	NS	2.8

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

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

Seeded: 19-Apr

Soil Type: Capac, tile drainage

Fertility: 150 lbs/A of actual N (50 lbs/A N following cuts 1-3)

*no cutting by treatment interaction

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

Table 8.

2001 KBS Perennial Grass Variety Trial
Kalamazoo Co.
 Sown Aug 2001
 Non-irrigated

Species/Marketer	Variety	Winter Injury*	DM tons/acre				2005	2004	2-yr	Palatability 1 to 5**
			4- May	14- Jun	2- Aug	13- Oct	Total Yield	Total Yield	Total Yield	
<i>Festulolium</i>										
DLF- Jenks	Hykor	1.0	1.16	0.56	0.51	0.30	2.53	3.34	5.87	1.4
AMPAC Seed Co.	Duo	1.0	0.41	0.16	0.32	0.13	1.01	2.59	3.60	2.8
<i>Orchardgrass</i>										
DLF-Jenks	Sparta	1.0	0.91	0.55	0.49	0.30	2.25	3.28	5.53	1.4
DLF-Jenks	Niva	1.0	0.84	0.54	0.40	0.28	2.06	3.08	5.14	1.3
AMPAC Seeds Co.	Tekapo	1.0	0.60	0.73	0.50	0.27	2.10	2.96	5.06	1.2
DLF-Jenks	Amba	1.0	0.88	0.33	0.39	0.22	1.82	2.78	4.60	1.6
<i>P. Ryegrass</i>										
AMPAC Seed Co.	Maverick Gold (4n)	1.8	0.63	0.38	0.37	0.21	1.59	2.82	4.41	2.4
AMPAC Seed Co.	Aries (2n)	1.6	0.83	0.38	0.34	0.26	1.81	3.12	4.93	2.6
Barenbrug	Mara (2n)	1.0	0.74	0.44	0.37	0.53	1.98	2.49	4.47	2.1
AMPAC Seed Co.	Tonga (4n)	1.0	0.82	0.23	0.25	0.20	1.50	2.17	3.67	3.1
DLF-Jenks	Calibra (4n)	1.0	0.64	0.47	0.25	0.22	1.59	2.65	4.24	2.7
AMPAC Seed Co.	Quartet (4n)	1.0	0.69	0.69	0.35	0.26	1.99	1.67	3.66	
<i>Tall Fescue</i>										
Barenbrug	Barolex	1.0	0.68	0.38	0.55	0.30	1.90	3.96	5.86	1.4
AMPAC Seed Co.	Bronson	1.0	0.86	0.65	0.78	0.47	2.77	3.60	6.37	1.2
AMPAC Seed Co.	K5666V	1.0	0.59	0.29	0.30	0.22	1.39	3.06	4.45	1.6
Mean		1.1	0.75	0.45	0.41	0.28	1.89	2.90	4.79	
LSD (0.05)		0.17	0.60	0.30	0.21	0.16	0.84	1.40		0.73

Location: Kellogg Biological Station, Hickory Corners

Design: RCB, plot size 6' x 15'

Seeded: August 2001

Soil Type: Kalamazoo loam

Fertilizer: 50 lbs/acre of actual N at green-up and after each harvest

*Visual Rating of Winter Injury (1-5 scale; 1=least injury)

**Palatability average :1-5 scale with 5 being most palatable, average of 5 visual ratings of forage consumed following each grazing event