A perspective on forage selection for High Returns

Devesh Singh

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What is your forage made of

ALFALFA		
PROTEIN	27%	
NDF	35%	
ASH	8%	
FAT	3%	
NFC	27%	100%

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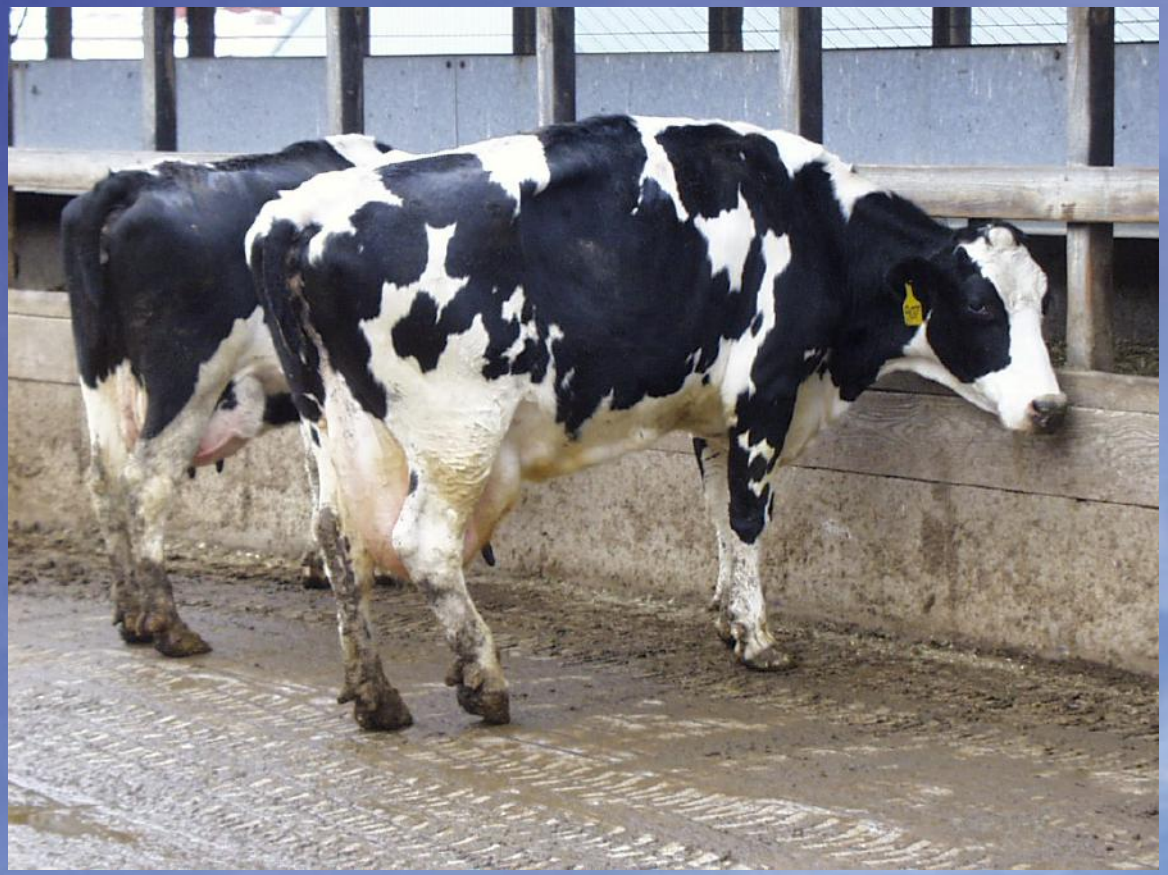
Lameness in Dairy Cattle

Midwest United States: *(Cook, Oetzel and Nordlund,2003)*

- Overall 20-25% of cows are mildly to seriously lame.
- Causes: 58 % due to disease or trauma, 42% due to nutrition (excessive grain/inadequate fiber)
- Severity: influenced by diet, stall design and bedding, stocking density, time in parlor holding area, etc.



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Subacute Ruminal Acidosis (SARA)

Depressed Butter Fat

Fiber	Less than 28% Neutral Detergent Fiber (NDF)
NFC	More than 40% NFC
Particle Size	Finely processed TMR, use of by-product feedstuffs
Segregation	Coarse forage, low TMR moisture
'Slug' feeding	Top dressing, overcrowding

Acidosis Triggered by too much NFC, and not enough Fiber

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Feeds used to add fiber/ lower NFC

	NDF	NDFD	NFC
	-------- % of DM --------		
Wheat straw	73	32	12
Corn gluten feed	35	82	31
Beet pulp	46	84	36
Soy hulls	60	90	18

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What is your forage made of

	ALFALFA	GRASS
PROTEIN	27%	16%
NDF	35%	43% to 70%
ASH	8%	8%
FAT	3%	3%
NFC	27%	18% to 30%
	100%	100%
NDFD	25-45%	25-60%

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Grass?

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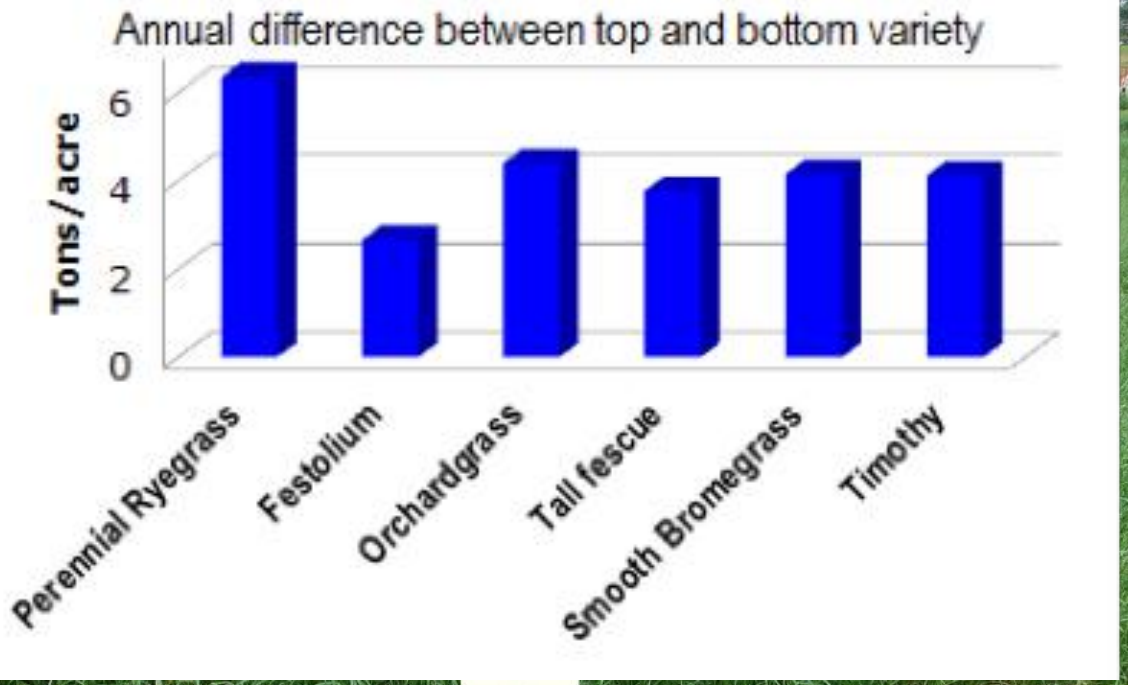
Genetic Variation



"Greater differences exist among grass varieties than among corn hybrids and soybean varieties"

Dr. Dan Undersander, Univ. WI

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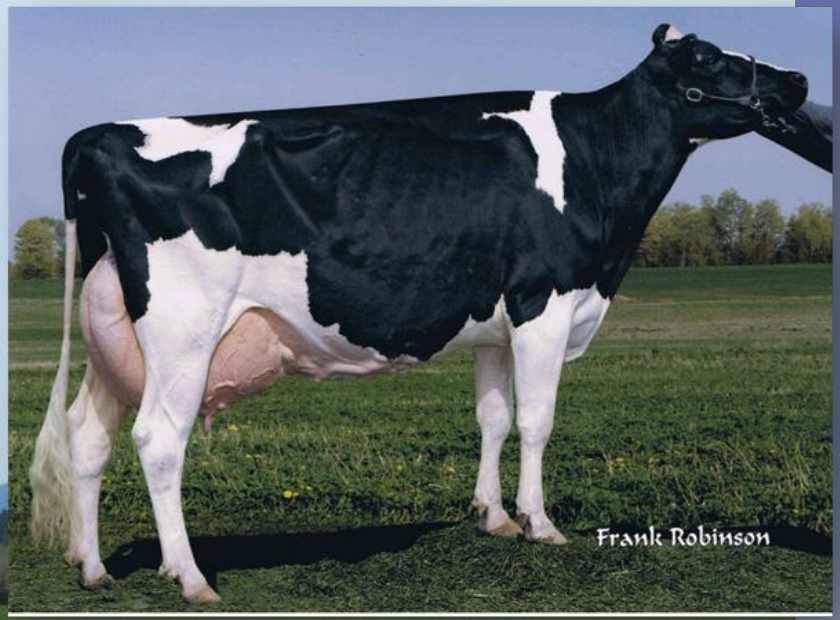
Progress in Agriculture



Then & now

1950's vs. 2015

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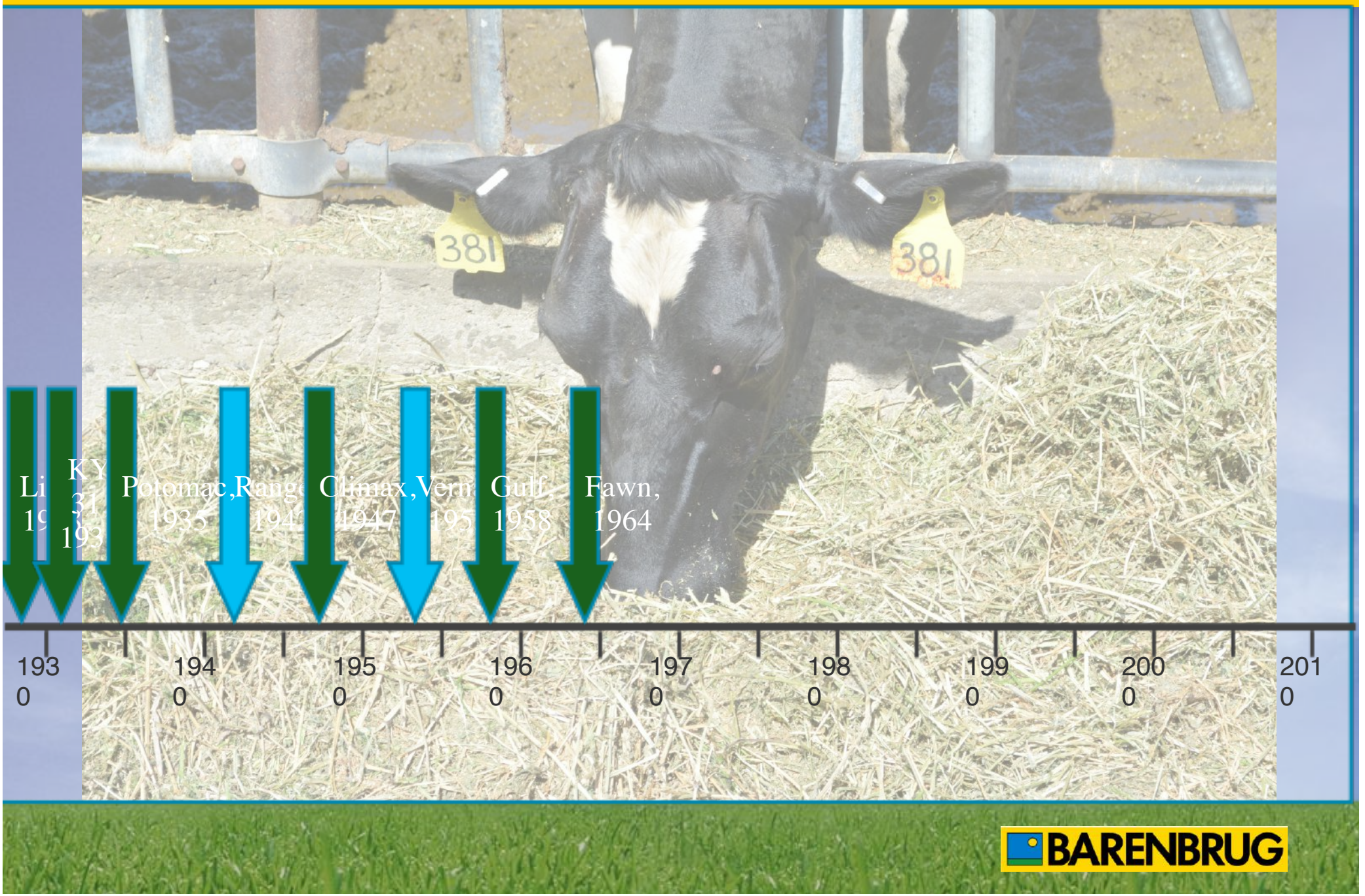
Grandfather's Grasses



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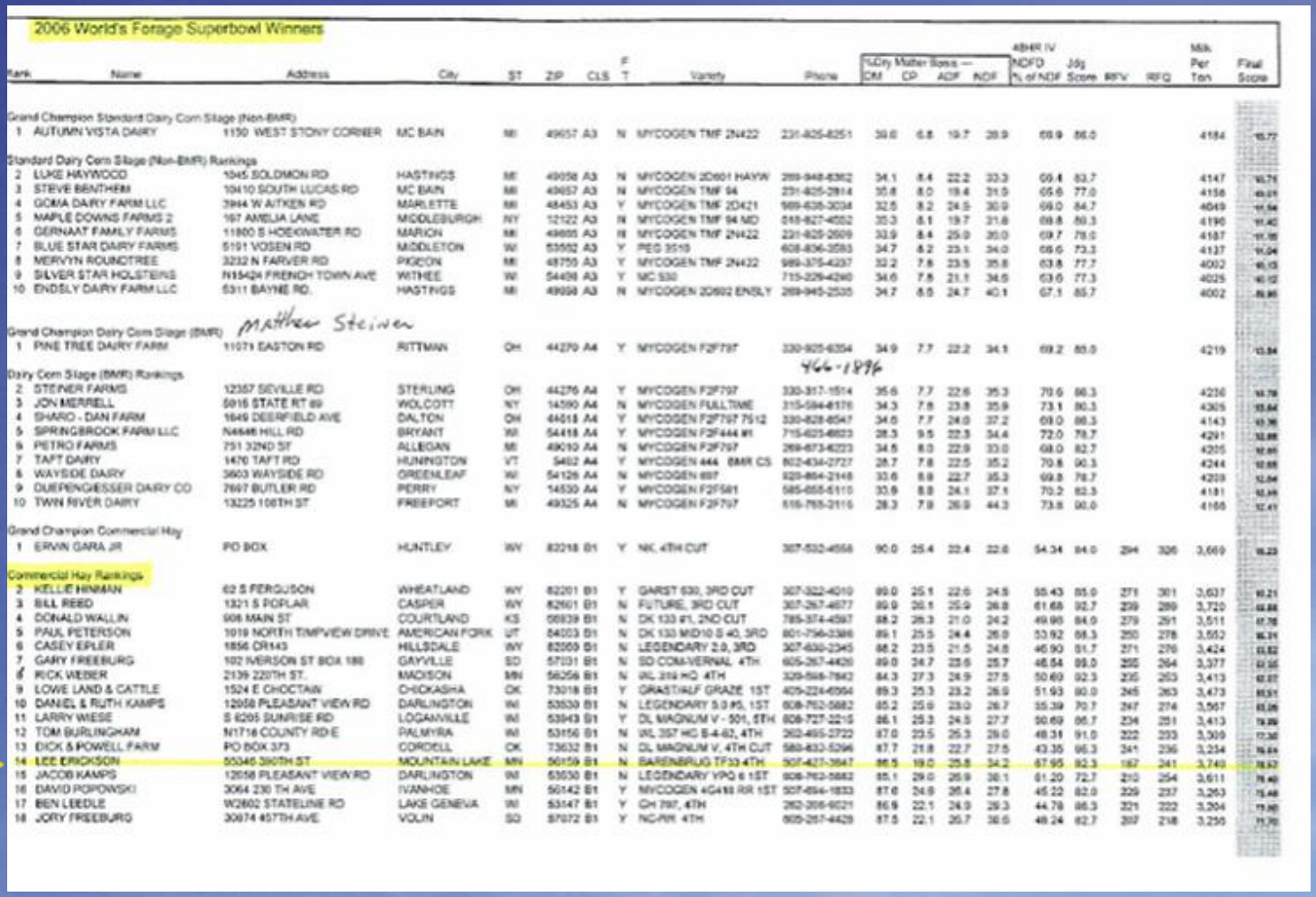
Barenbrug's Breeders

World Dairy Expo
2006 World's Forage Superbowl Winners



2006 World's Forage Superbowl Winners

Rank	Name	Address	City	ST	ZIP	CLS	F T	Variety	Phone	%Dry Matter Basis — CM	CP	ADF	NDF	48HR IV NDFD % of NDF	Jig Score	RFV	RFQ	Milk Per Ton	Final Score
Grand Champion Standard Dairy Corn Silage (Non-BMR)																			
1	AUTUMN VISTA DAIRY	1150 WEST STONY CORNER	MC BAIN	MI	49657	A3	N	MYCOGEN TMF 2N422	231-825-8251	39.0	6.8	19.7	28.9	69.9	86.0			4184	
Standard Dairy Corn Silage (Non-BMR) Rankings																			
2	LUKE HAYWOOD	1045 SOLOMON RD	HASTINGS	MI	49058	A3	N	MYCOGEN 2D601 HAYW	269-948-6362	34.1	8.4	22.2	33.3	69.4	83.7			4147	
3	STEVE BENTHEM	10610 SOUTH LUCAS RD	MC BAIN	MI	49657	A3	N	MYCOGEN TMF 94	231-825-2814	35.8	8.0	19.4	31.0	65.6	77.0			4158	
4	GOMA DAIRY FARM LLC	3944 W AITKEN RD	MARLETTE	MI	48453	A3	Y	MYCOGEN TMF 2D421	989-635-3034	32.5	8.2	24.9	30.9	69.0	84.7			4049	
5	MAPLE DOWNS FARMS 2	167 AMELIA LANE	MIDDLEBURGH	NY	12122	A3	N	MYCOGEN TMF 94 MD	518-827-4552	35.3	8.1	19.7	31.8	69.8	80.3			4196	
6	GERNAAT FAMILY FARMS	11800 S HOEKWATER RD	MARION	MI	49665	A3	N	MYCOGEN TMF 2N422	231-825-2609	33.9	8.4	25.0	30.0	69.7	78.0			4187	
7	BLUE STAR DAIRY FARMS	5191 VOSEN RD	MIDDLETON	WI	53562	A3	Y	PEG 3510	608-836-3583	34.7	8.2	23.1	34.0	66.6	73.3			4137	
8	MERVYN ROUNDTREE	3232 N FARVER RD	PIGEON	MI	48755	A3	Y	MYCOGEN TMF 2N422	989-375-4237	32.2	7.8	23.5	35.8	63.8	77.7			4002	
9	SILVER STAR HOLSTEINS	N15424 FRENCH TOWN AVE	WITHEE	WI	54498	A3	Y	MC 530	715-229-4260	34.6	7.8	21.1	34.5	63.6	77.3			4025	
10	ENDSLY DAIRY FARM LLC	5311 BAYNE RD.	HASTINGS	MI	49058	A3	N	MYCOGEN 2D602 ENSLY	269-945-2535	34.7	8.5	24.7	40.1	67.1	85.7			4002	
Grand Champion Dairy Corn Silage (BMR)																			
1	PINE TREE DAIRY FARM	11071 EASTON RD	RITTMAN	OH	44270	A4	Y	MYCOGEN F2F797	330-925-6354	34.9	7.7	22.2	34.1	69.2	85.0			4219	
Dairy Corn Silage (BMR) Rankings																			
2	STEINER FARMS	12357 SEVILLE RD	STERLING	OH	44276	A4	Y	MYCOGEN F2F797	330-317-1514	35.6	7.7	22.6	35.3	70.6	86.3			4236	
3	JON MERRELL	5915 STATE RT 89	WOLCOTT	NY	14590	A4	N	MYCOGEN FULLTIME	315-594-8176	34.3	7.8	23.8	35.9	73.1	80.3			4305	
4	SHARO - DAN FARM	1849 DEERFIELD AVE	DALTON	OH	44618	A4	Y	MYCOGEN F2F797 7512	330-828-8547	34.6	7.7	24.0	37.2	69.0	86.3			4143	
5	SPRINGBROOK FARM LLC	N4646 HILL RD	BRYANT	WI	54418	A4	Y	MYCOGEN F2F444 91	715-625-8603	38.3	9.5	22.3	34.4	72.0	78.7			4291	
6	PETRO FARMS	751 32ND ST	ALLEGAN	MI	49010	A4	N	MYCOGEN F2F797	269-673-8223	34.5	8.0	22.9	33.0	68.0	82.7			4205	
7	TAFT DAIRY	1470 TAFT RD	HUNNINGTON	VT	5462	A4	Y	MYCOGEN 444 BMR CS	802-434-2727	28.7	7.8	22.5	35.2	70.8	90.3			4244	
8	WAYSIDE DAIRY	3603 WAYSIDE RD	GREENLEAF	WI	54126	A4	N	MYCOGEN 697	920-864-2148	33.6	8.9	22.7	35.3	69.8	78.7			4209	
9	DUEPENGIESSER DAIRY CO	7697 BUTLER RD	PERRY	NY	14530	A4	Y	MYCOGEN F2F581	585-655-5110	30.9	8.8	24.1	37.1	70.2	82.3			4181	
10	TWIN RIVER DAIRY	13225 106TH ST	FREEPORT	MI	49325	A4	N	MYCOGEN F2F797	616-765-3116	28.3	7.9	26.9	44.3	73.8	90.0			4166	
Grand Champion Commercial Hay																			
1	ERVIN GARA JR	PO BOX	HUNTLEY	WY	82218	B1	Y	NK, 4TH CUT	307-532-4556	90.0	25.4	32.4	32.8	54.34	94.0	294	326	3,669	
Commercial Hay Rankings																			
2	KELLIE HINMAN	62 S FERGUSON	WHEATLAND	WY	82201	B1	Y	GARST 630, 3RD CUT	307-322-4010	89.0	25.1	22.6	24.5	55.43	85.0	271	301	3,637	
3	BILL REED	1321 S POPLAR	CASPER	WY	82601	B1	N	FUTURE, 3RD CUT	307-267-4677	89.9	26.1	25.9	26.8	61.68	92.7	239	289	3,720	
4	DONALD WALLIN	906 MAIN ST	COURTLAND	KS	66939	B1	N	DK 133 #1, 2ND CUT	785-374-4597	88.2	26.3	21.0	24.2	49.96	84.0	279	291	3,511	
5	PAUL PETERSON	1019 NORTH TIMPVIEW DRIVE	AMERICAN FORK	UT	84003	B1	N	DK 133 MID10 S 40, 3RD	801-756-3386	89.1	25.5	24.4	26.0	53.92	88.3	260	278	3,552	
6	CASEY EPLER	1856 CR143	HILLSDALE	WY	82069	B1	N	LEGENDARY 2.0, 3RD	307-630-2345	88.2	23.5	21.5	24.8	46.90	91.7	271	276	3,424	
7	GARY FREEBURG	102 IVERSON ST BOX 188	GAYVILLE	SD	57031	B1	N	SD CON-VERNAL 4TH	605-267-4426	89.0	24.7	23.6	25.7	48.54	89.0	265	264	3,377	
8	RICK WEBER	2139 220TH ST.	MADISON	MN	56256	B1	N	WL 319 HO, 4TH	320-598-7842	84.3	27.3	24.9	27.5	50.69	92.3	235	263	3,413	
9	LOWE LAND & CATTLE	1524 E CHOCTAW	CHICKASHA	OK	73018	B1	Y	GRASTHALF GRAZE 1ST	405-224-6564	89.3	25.3	23.2	26.9	51.93	90.0	245	263	3,473	
10	DANIEL & RUTH KAMPS	12058 PLEASANT VIEW RD	DARLINGTON	WI	53530	B1	N	LEGENDARY 3.0 #5, 1ST	608-762-5882	85.2	25.6	23.0	26.7	55.39	70.7	247	274	3,567	
11	LARRY WIESE	S 6205 SUNRISE RD	LOGANVILLE	WI	53943	B1	Y	DL MAGNUM V - 501, 5TH	608-727-2215	86.1	25.3	24.5	27.7	50.69	86.7	234	251	3,413	
12	TOM BURLINGHAM	N1716 COUNTY RD E	PALMYRA	WI	53156	B1	N	WL 357 HG S-4-62, 4TH	262-495-2722	87.0	23.5	25.3	29.0	48.31	91.0	222	233	3,309	
13	DICK & POWELL FARM	PO BOX 373	CORDELL	OK	73632	B1	N	DL MAGNUM V, 4TH CUT	580-832-5296	87.7	21.8	22.7	27.5	43.35	96.3	241	236	3,234	
14	LEE ERICKSON	55346 390TH ST	MOUNTAIN LAKE	MN	56159	B1	N	BARENBRUG TF33 4TH	507-427-3647	86.5	19.0	25.8	34.2	67.95	82.3	187	241	3,749	
15	JACOB KAMPS	12058 PLEASANT VIEW RD	DARLINGTON	WI	53530	B1	N	LEGENDARY VPQ 6 1ST	608-762-5882	85.1	29.0	26.9	30.1	61.20	72.7	210	254	3,611	
16	DAVID POPOWSKI	3064 230 TH AVE	IVANHOE	MN	56142	B1	Y	MYCOGEN 4G488 RR 1ST	507-694-1833	87.6	24.8	26.4	27.8	45.22	82.0	229	237	3,263	
17	BEN LEEDLE	W2802 STATELINE RD	LAKE GENEVA	WI	53147	B1	Y	GH 797, 4TH	262-206-6021	86.9	22.1	24.9	29.3	44.78	86.3	221	222	3,204	
18	JORY FREEBURG	30874 457TH AVE	VOLIN	SD	57072	B1	Y	NC-RR 4TH	605-267-4426	87.5	22.1	25.7	30.6	48.24	82.7	207	218	3,256	

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World Dairy Expo
2006 World's Forage Superbowl Winners

Ranking		CP	NDF	NDFd 48 hour	RFV	RFQ	Milk per Ton
1	Alfalfa-3rd cut	25.4	22.6	54.3	294	326	3699
14	Tall Fescue-4th cut	19.0	34.2	68.0	187	241	3740

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Prize winning

World Forage Analysis Superbowl

Champion in Quality Counts Hay/Haylage
1st place in the Haylage and Baleage Divisions
2nd place in the Grass Hay Division

BARENBRUG

Prize winning

World Forage Analysis Superbowl

Green Spirit

1st, 2nd, 13th, and 18th in the Haylage Division

- 42% dry matter
- 15.5% crude protein
- 24.3% ADF
- 39.5% NDF.
- RFQ 254, 4,040 lbs of milk predicted per ton

Also won the Quality Counts award for the Hay/Haylage category, surpassing all other entries in the Baleage, Commercial Hay, Dairy Hay, Grass Hay and Haylage Divisions

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Prize winning

World Forage Analysis Superbowl

Barenbrug soft leaf fescues

1st and 2nd in the Baleage Division

- 56.6% dry matter
- 15% crude protein
- 22.2% ADF
- 37.4% NDF
- RFQ 245 RFQ

2nd in Grass Hay Division with BarOptima PLUS E34®

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NutriFiber

POWER TO THE RATION

Highly Digestible Effective Fiber for Dairy Rations

NutriFiber

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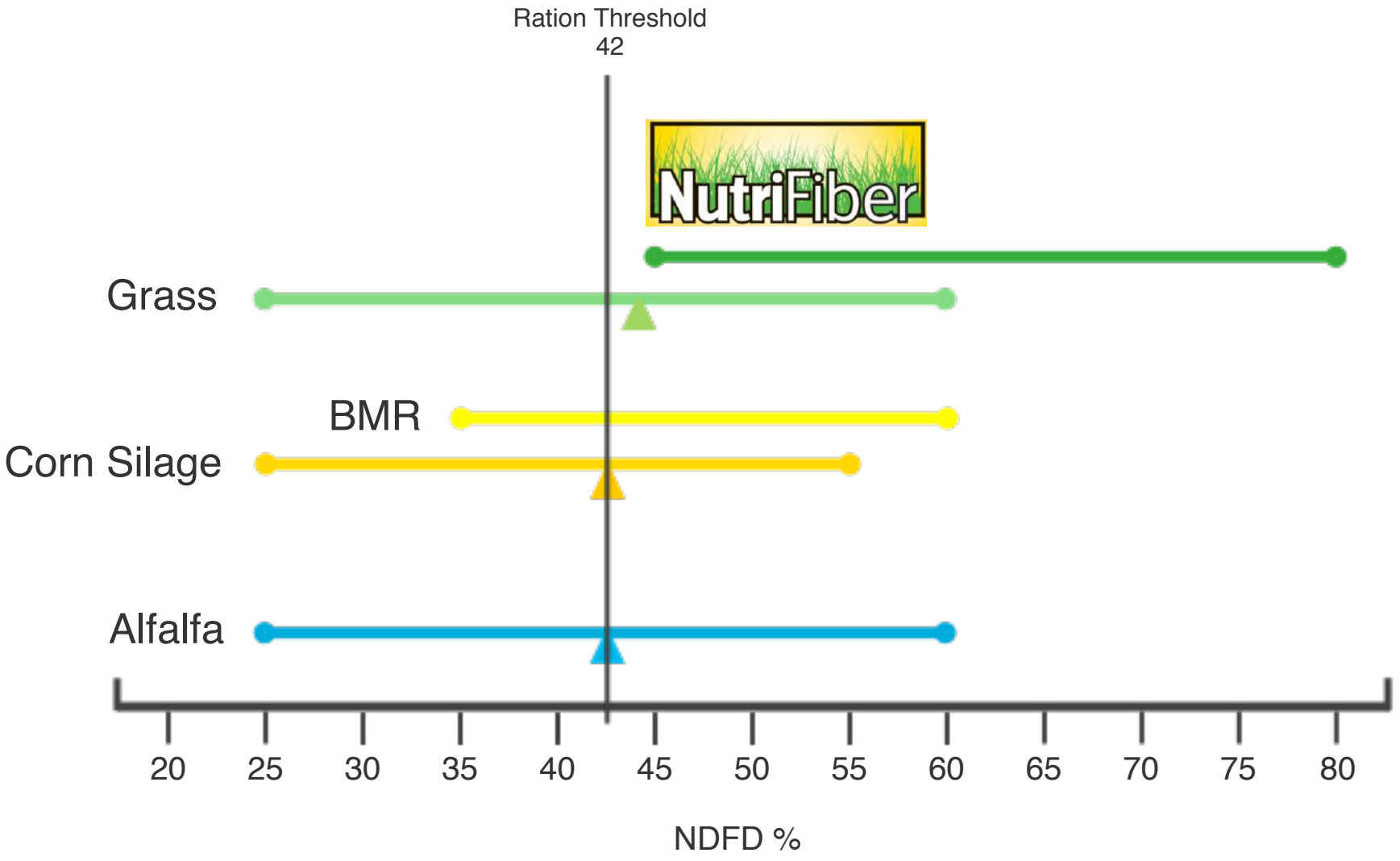
Fiber Digestibility Varies in Forages



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NutriFiber

Why fiber?

Why fiber?

Because fiber promotes a healthy rumen and improves butterfat test

Why high fiber digestibility?

Because a source of more digestible fiber promotes greater feed intake (less rumen fill) and more energy for milk production

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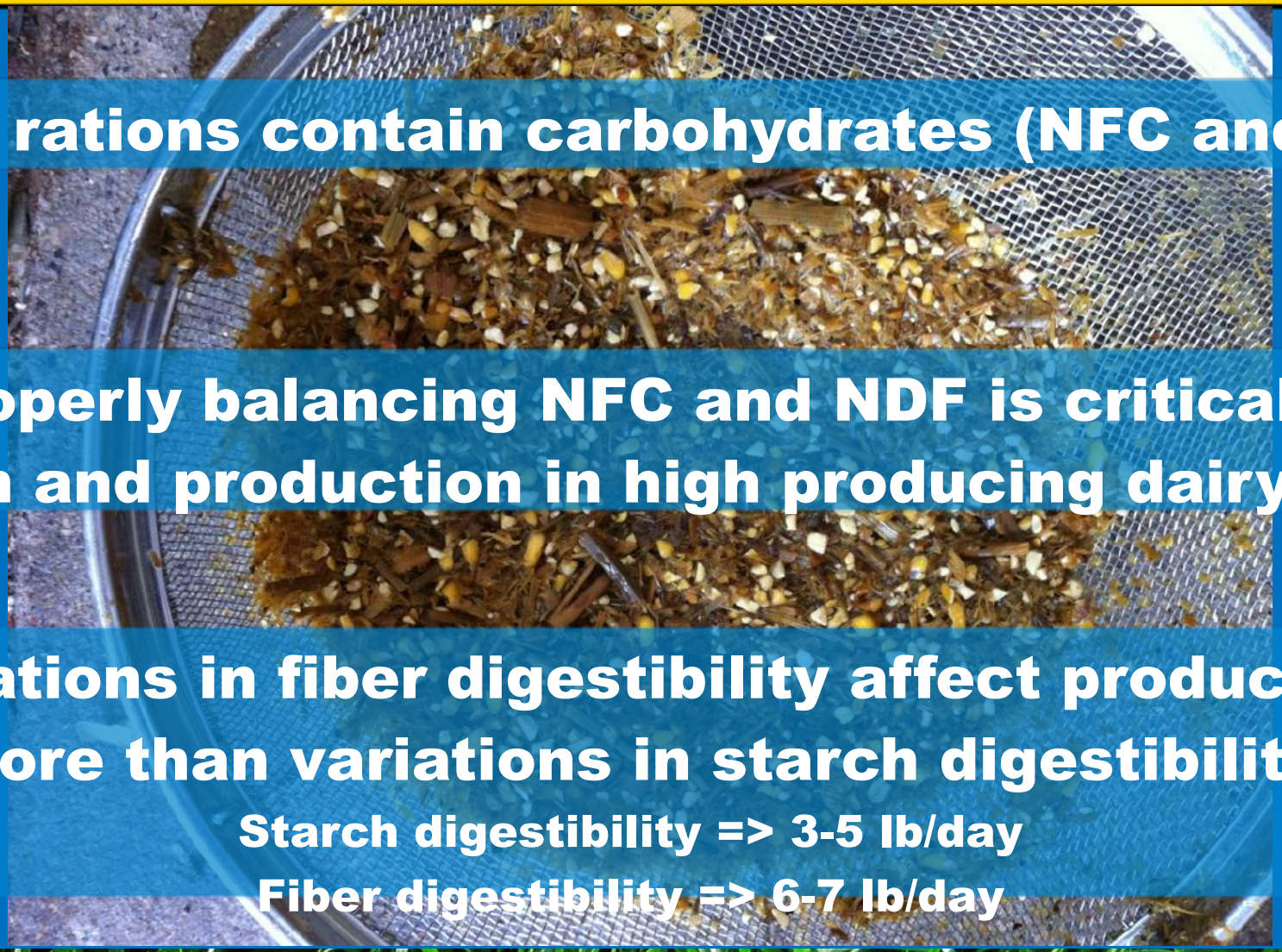
Carbohydrate Digestibility Affects Health & Production



Dairy rations contain carbohydrates (NFC and NDF)

Properly balancing NFC and NDF is critical for health and production in high producing dairy cows.

Variations in fiber digestibility affect production more than variations in starch digestibility

Starch digestibility => 3-5 lb/day

Fiber digestibility => 6-7 lb/day

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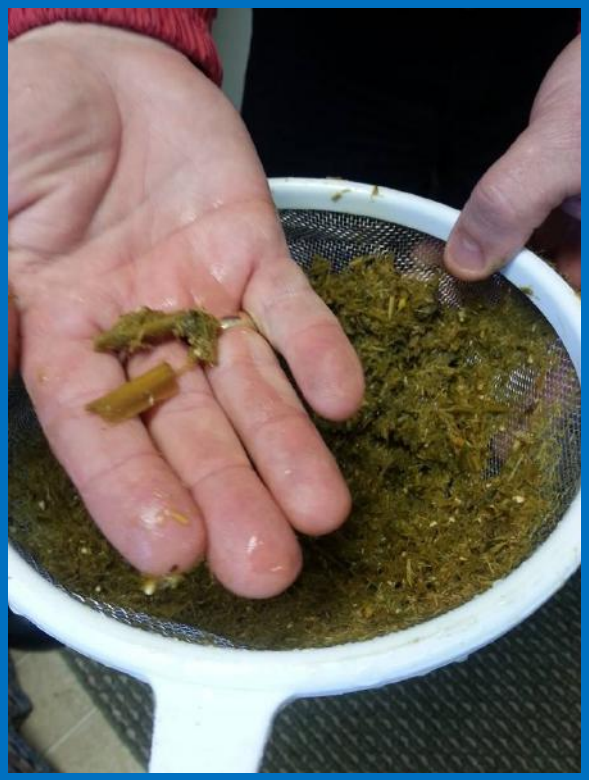
Assessing fiber digestion not easy



Poor digestion < 40%

Excellent digestion > 50%

A 2-3 unit change in fiber digestibility corresponds to

1 lb change in milk yield.

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Feeds used to add fiber/ lower NFC

	NDF	NDFD	NFC
	-------- % of DM --------		
Wheat straw	73	32	12
Corn gluten feed	35	82	31
Beet pulp	46	84	36
Soy hulls	60	90	18

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Feeds used to add fiber/ lower NFC

	NDF	NDFD	NFC
	-------- % of DM ------- ---		
Wheat straw	73	32	12
Corn gluten feed	35	82	31
Beet pulp	46	84	36
Soy hulls	60	90	18
Nutrifiber Forages	40-50	45-80	18-25

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NutriFiber

Why NutriFiber?

Grass silage or hay is a better source of physically effective fiber than feeds like beet pulp, soy hulls or corn gluten feed

NutriFiber grasses have been developed to have higher fiber digestibility than alfalfa, corn silage or other grasses

NutriFiber = Highest NDFD!

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NutriFiber

The Feeding Trial

Dr. David Combs
Dept. of Dairy Science
University of Wisconsin-Madison

- Green Spirit grass silage harvested
- 6 pens of 8 cows (48 cows)
- 2 treatments, 4 replications
- switched groups halfway through the trial
- 4 months
- Sponsored by Barenbrug USA

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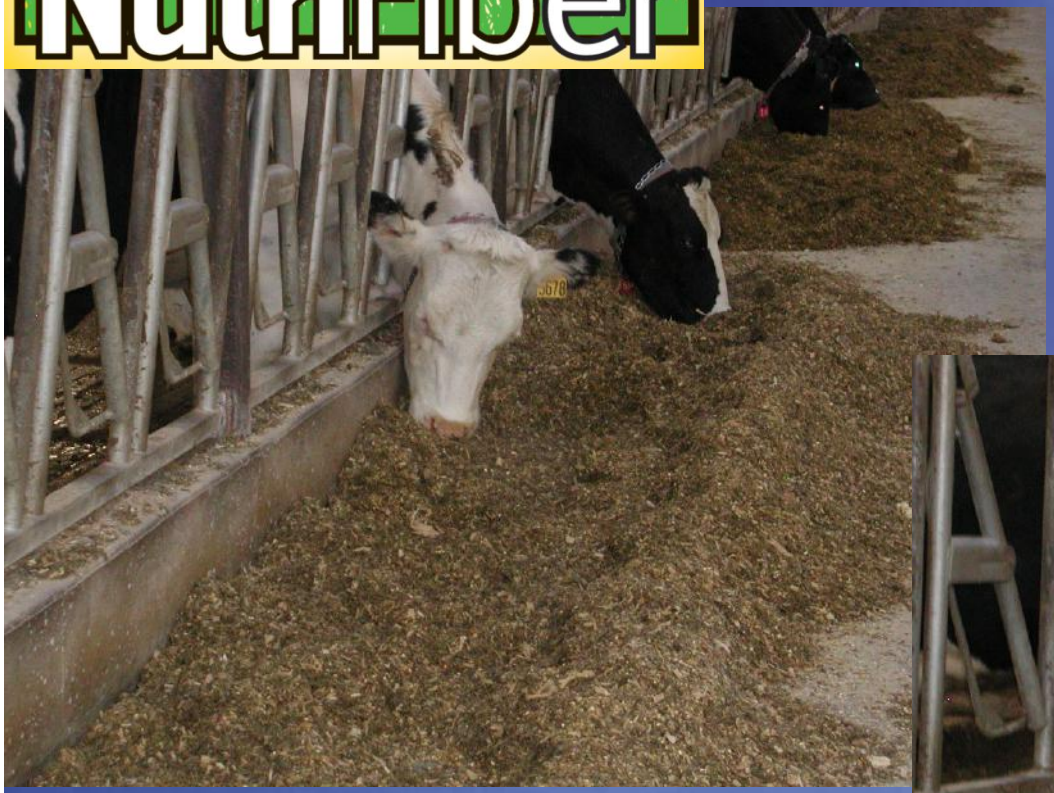
NutriFiber



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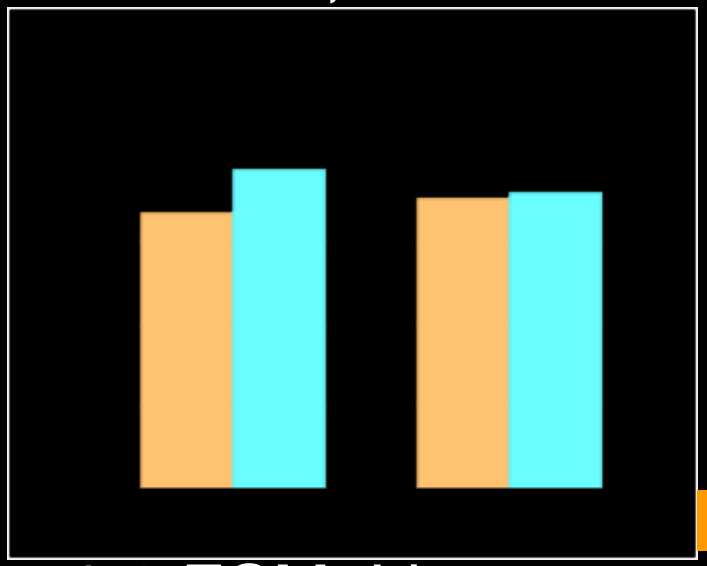
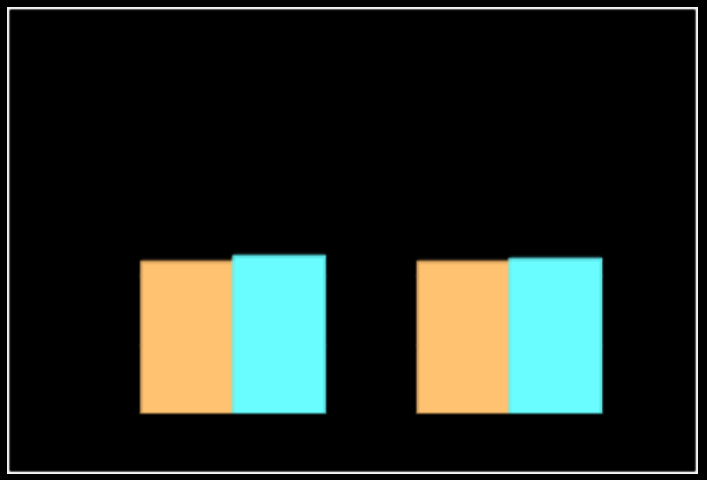
Barenbrug GreenSpirit* Silage in TMR for High Producing Dairy Cows. (UW-Madison, 2009)

Fat Test, %



4% FCM, Lb



Control

Green Spirit
Italian Ryegrass blend

*

NutriFiber

Barenbrug GreenSpirit* Silage in TMR for High Producing Dairy Cows. (UW-Madison, 2009)

	Control	GreenSpirit
	DM % of Diet	
4% FCM yield lb/cow/day	96	96
Fat %	3.6	3.75

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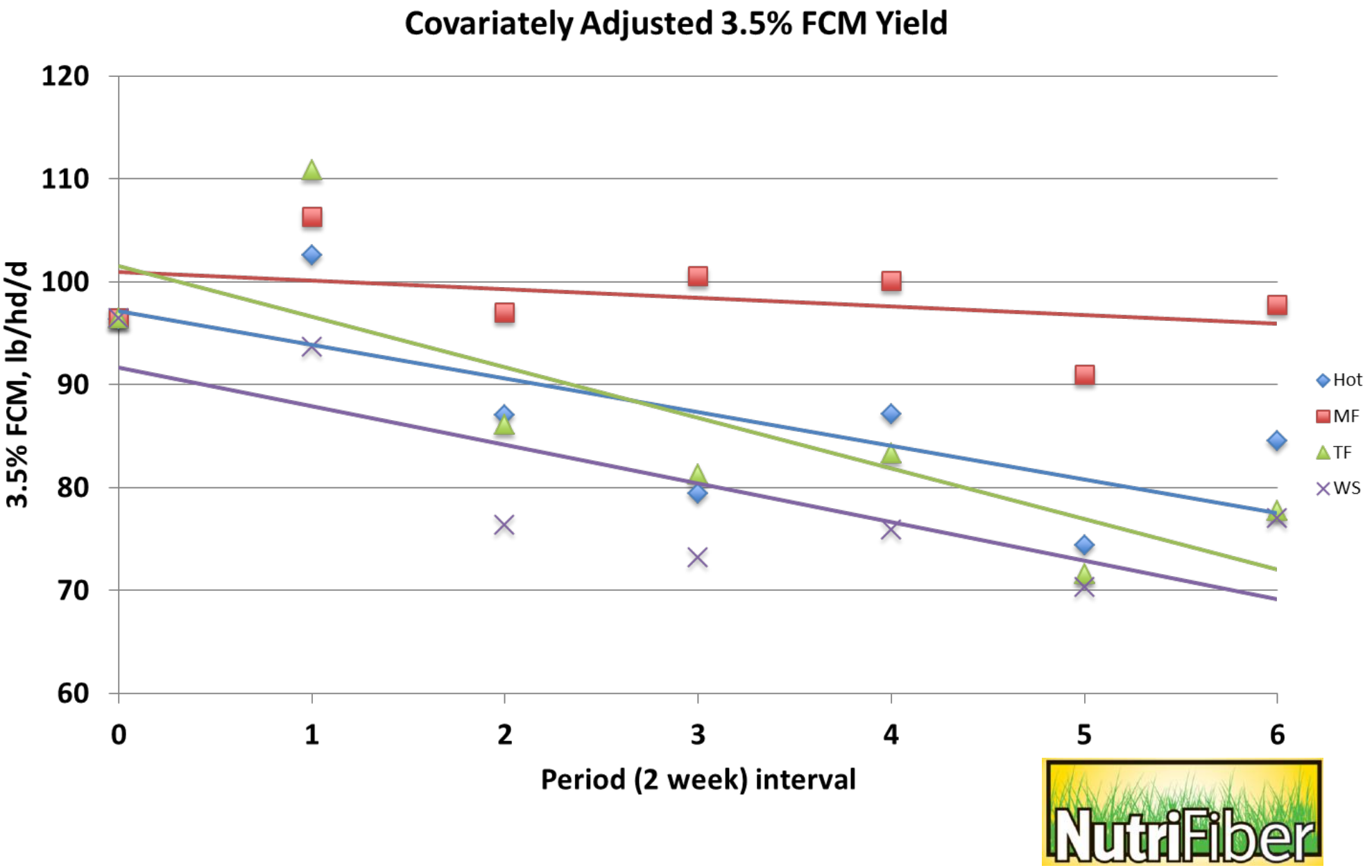
Barenbrug GreenSpirit* Silage in TMR for High Producing Dairy Cows. (UW-Madison, 2009)

- Similar milk production by including grass diets
- Higher fat content in the milk (statistically significant), indicating healthier rumen (absence of SARA)
- Were not able to detect any Lameness differences
- No crowding in pens….?
- Long term benefits ? Fertility?

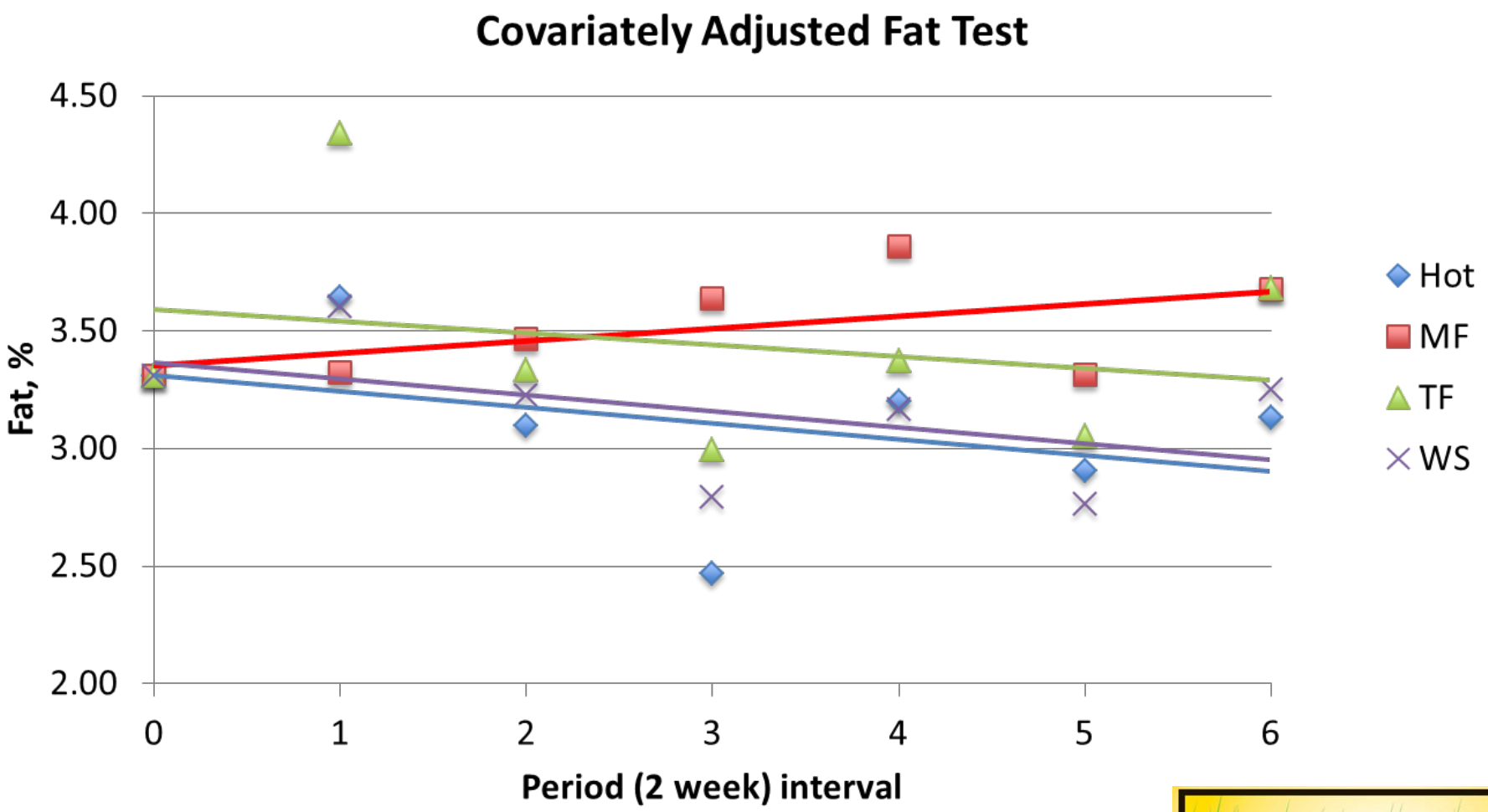
Partial replacement of Corn and Alfalfa Silages with Tall Fescue, Meadow Fescue or Wheat Straw (Verbetin and Combs, 2012)

	HOT	Bariane Fescue	Pradel Fescue	Straw
	% of Diet DM			
Corn silage	26	17	17	20
Alfalfa silage	26	17	17	20
Bariane Tall Fescue*		17		
Pradel Meadow Fescue*			17	
Wheat Straw				8
High Moisture Corn	26	25	26	
Protein/minerals	22	24	2	

Partial Replacement of Corn Silage/Alfalfa with BARIANE Tall Fescue Silage (STF) and HDR PRADEL Meadow Fescue Silage (MF) or Wheat Straw (WS). Verbeten and Combs 2010



Partial Replacement of Corn Silage/Alfalfa with BARIANE Tall Fescue Silage (TF) PRADEL Meadow Fescue Silage (MF) or Wheat Straw (WS) Verbeten and Combs 2010



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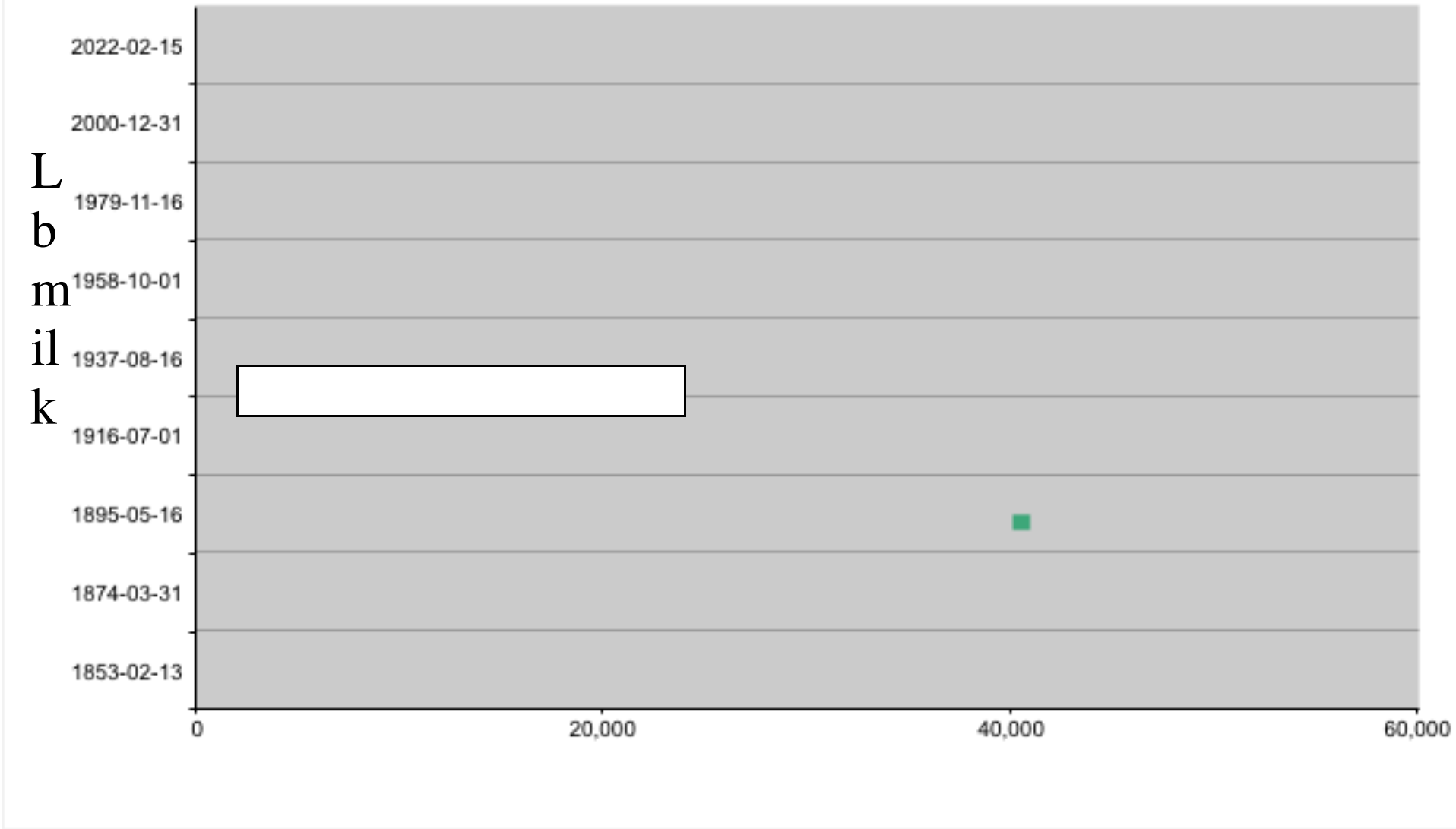
Troubleshooting with TTNDFD



NutriFiber: The solution!

Developed by Barenbrug for today's modern high-producing dairy cow

Incorporated into forages developed for on-farm production

Provides highly digestible effective fiber

Ideal component for balancing rations

TMRs designed for maximum milk production are typically high in NFC (starches and sugars), and low in NDF which can lead to Subacute Ruminal Acidosis (SARA).

Nutritional Phases - Beef

- Cow / Calf
  - High Milk Production
  - High Protein
- Feeder Cattle
  - High Protein
  - High Energy
- Finishing
  - High Energy
  - Lower Protein

NutriFiber

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Economics of Forage Based Production Systems
$ / ha

	Crested Wheat grass	Hybrid brome grass	Hybrid brome grass 2	Smooth brome grass	Meadow brome grass	Tall Fescue	Native pasture	Spring Wheat	Feed Barley
2004	-16.5	11.6	-26.7	-16.9	2.55	-	-	-152.4	-191.8
2005	83.0	84.7	-69.0	3.46	11.2	44.1	-99.0	-127.5	-179.0
2006	102.0	97.8	84.9	-24.6	77.0	54.6	-9.6	67.0	155.8
2007	80.5	161.6	97.9	61.7	123.8	210.7	-18.46	428.5	369.3
2008	-69.13	-	-53.42	-	-	102.0	-129.0	92.1	-121.6
Aver	*36.0*	*88.9*	*6.7*	*5.9*	*53.6*	*102.9*	*-64.0*	*61.5*	*6.5*

Lardner et a., 2009, Lanigan, Saskatchewan

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ITALIAN RYEGRASS

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Putting GreenSpirit to Work

- Green Spirit Italian ryegrass
- Requires vernalization to produce seed heads
- Annual Ryegrass: *Lolium multiflorum westerwoldicum*
- Italian ryegrass: *Lolium multiflorum*
- No seed head formation in first year after spring planting

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Spring Planting

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Green Spirit Italian Ryegrass

- High biomass production in short period
- Better forage quality than annual ryegrass
- Very effective in utilizing manure nutrients
- Unlike Winter Cereals – Good regrowth
- Emergency forage after Alfalfa Winterkill
- Excellent for Finishing Grass-Fed beef

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Italian ryegrass (Minnesota)

		(29 June) 2	(23 July) 2	(19 Aug) 2	(27 Sept) 2	(10 Nov) 2	Total
Entry	Description 1	DM Yld					
		Ton/ac					
GreenSpirit	65/35	0.97	1.95	1.65	1.31	0.47	6.35
Barmultra + Bartissimo	65/35	0.67	1.84	1.58	1.01	0.28	5.38
Barfest Festulolium		0.35	1.45	1.21	1.04	0.22	4.27
BG-34 perennial ryeg.	check	0.31	0.98	1.04	1.24	0.30	3.87
Baridana orchardg.	check	0.26	0.96	1.20	1.11	0.16	3.69
Robust barley	check	2.36	0.26	--	--	--	2.62
Marathon reed canaryg.	check	0.18	1.12	0.54	0.71	--	2.55
Jim oat	check	1.54	0.73	--	--	--	2.27
MEAN		0.83	1.16	1.34	1.14	0.29	3.88
LSD (0.05)		0.18	0.21	0.29	0.26	0.10	0.63

BARENBRUG

Green Spirit in New York

2008 BAR Italian Ryegrass Trial

Sown on May 13, 2008

		2008 Yield				% Heading		
Lot No.		**31-Jul**	**28-Aug**	**13-Oct**	**Total Season**	1-Jul	**28-Aug**	**13-Oct**
		- - - - tons per acre dry matter - - - -						
Jumbo	Annual	3.20	1.57	1.34	6.11	100	74	30
Barmultra II	Italian - 4n	2.14	1.62	1.51	5.27	0	0	0
BARDELTA	Italian - 2n	2.15	1.53	1.44	5.12	1	2	0
Hercules	??	2.23	1.63	1.26	5.11	20	19	5
BAREXTRA	Italian - 4n	2.07	1.47	1.56	5.10	0	0	0
Marshall	Annual	2.85	1.14	1.00	4.99	100	86	36
Tetr		2.11	0.67	0.66	3.53	100	52	100
BARTISSIMO	Italian	1.44	1.20	0.87	3.51	0	0	0
Spring								

Tremendous Breeding Advancements

RUG

Green Spirit in New York

2007 BAR Italian Ryegrass Trial - Fall - Planted September 19, 2007

		2008						
						Total	Heading Dates	
Name		19-May	19-Jun	29-Jul	1-Oct	Season	# Heads	Date
		- - - - tons per acre dry matter - - - - -						
Barmultra II	Italian - 4n	2.56	1.52	2.06	1.25	7.39	11	27-May
BAREXTRA	Italian - 4n	2.46	1.30	1.95	1.39	7.09	15	27-May
BARDELTA	Italian - 2n	2.43	1.37	1.63	1.05	6.48	10	27-May
Hercules	Annual	2.19	1.52	1.67	0.94	6.32	7	23-May
Marshall	Annual	2.97	1.72	1.07	0.52	6.27	5	21-May
Jumbo	Annual	2.82	1.69	1.14	0.53	6.18	16	21-May
Remington	Perennial	1.02	2.73	1.61	0.71	6.07	8	4-Jun
Triticale	Tritical	2.97	0.66	0.55	0.34	4.53	7	23-May

Green Spirit Superior in Yield and Quality to Triticale

RUG

Short Lived Forage Trial- Pennsylvania 2011-2012
Fall Sowing

	Dm Yield tons/acre			
	Cut 1	**Cut 2**	**Cut 3**	**Total**
Barherta-Green Spirit	1.85	2.39	1.83	**6.08**
Barmultra II - Green Spirit	1.83	2.40	1.79	**6.02**
Bruiser - Ryegrass	2.11	2.31	1.54	**5.96**
BarExtra - Green Spirit	1.91	2.19	1.72	**5.82**
KB Royal - Ryegrass	2.30	2.07	1.39	**5.76**
Marshall - Ryegrass	1.86	2.29	1.57	**5.71**
Bardelta - Green Spirit	1.82	2.10	1.70	**5.63**
Mol - Ryegrass	2.09	1.97	1.46	**5.52**
Feast II - Italian Ryegrass	1.73	2.10	1.53	**5.36**
Tillage RootMax - Ryegrass	1.87	1.92	1.28	**5.07**

	Cut 1	**Cut 2**	**Cut 3**	**Total**
Trical 141 Triticale	3.24			**3.24**
Trical 336 Triticale	3.24			**3.24**
Trical 815 Triticale	2.91			**2.91**
W1566 Wheat	2.55			**2.55**

BARENBRUG

Short Lived Forage Trial- Pennsylvania 2011-2012
Fall Sowing

	First Cutting				Second Cutting				Third Cutting				Average		
	CP %	ADF %	NDF %	NDF d 30	CP %	ADF %	NDF %	NDF d 30	CP %	ADF %	NDF %	NDF d 30	CP %	ADF %	NDF %
Barherta-Green Spirit	20.9	24.1	39.7	56.7	16.0	30.8	53.8	52.6	13.5	30.7	53.6	50.2	16.8	28.5	49.1
Barmultra - Green Spirit	22.1	26.8	41.4	54.0	16.5	31.9	55.2	51.1	14.1	30.9	52.6	53.2	17.5	29.8	49.7
Bruiser - Ryegrass	22.4	23.7	39.2	55.3	17.2	29.7	51.8	51.6	12.9	33.3	57.0	46.7	17.5	28.9	49.3
BarExtra - Green Spirit	20.7	24.1	40.4	55.2	17.8	28.1	49.5	57.8	14.3	29.7	51.8	51.0	17.6	27.3	47.3
KB Royal - Ryegrass	22.0	24.6	40.0	52.3	16.2	31.8	54.8	50.3	13.8	31.4	54.5	48.6	17.3	29.3	49.8
Marshall - Ryegrass	22.7	26.2	41.7	54.6	16.5	30.5	52.7	54.2	13.7	34.3	58.5	47.1	17.6	30.3	51.0
Bardelta - Green Spirit	20.6	25.4	41.8	55.6	15.6	30.5	53.8	52.0	12.8	30.9	53.7	50.9	16.4	28.9	49.7
Mol - Ryegrass	21.0	25.9	41.5	51.6	16.4	29.9	52.3	55.0	14.1	30.4	53.4	49.4	17.2	28.7	49.0
Feast II - Italian Ryegrass	22.1	28.8	43.9	51.9	17.3	30.3	53.0	56.0	14.6	29.2	50.5	56.5	18.0	29.4	49.1
Tillage RootMax - Ryegrass	22.8	27.3	42.2	52.0	19.7	27.7	49.9	56.6	14.4	28.6	50.3	51.5	19.0	27.9	47.5
	21.7	25.7	41.2	53.9	16.9	30.1	52.7	53.7	13.8	30.9	53.6	50.5	17.5	28.9	49.2

BARENBRUG

Forage Quality

Italian Ryegrass vs Triticale

	Ryegrass*	Triticale**
NDF	52.6	55.2
NDFD	58.8	48.6
Crude Protein	16.1	11.1
Starch	2.1	6.8
IVDMD	74.1	63.6
NFC	19.8	22.4

*Average of 176 samples
**Average of 91 samples

BARENBRUG

Green Spirit in a Cropping System

Forage Crop	Average Yield '07 & '08
GreenSpirit Italian Ryegrass -25 Day cut	8.62
GreenSpirit Italian Ryegrass -35 Day cut	8.73
Alfalfa	4.80
Soybean	3.87
Corn Silage	10.45
L.S.D (0.05)	**0.24**

IRG: 40 # of N each cutting, Corn 150 #

BARENBRUG

Green Spirit in a Cropping system

Forage Crop	Yield '07 & '08	Corn Silage Yield '08/'09	
GreenSpirit Italian Ryegrass -25 Day cut	8.62	9.65	
GreenSpirit Italian Ryegrass -35 Day cut	8.73	9.40	
Alfalfa	4.80	9.00	-7%
Soybean	3.87	8.70	-11%
Corn Silage	10.45	7.70	-25%
L.S.D (0.05)	**0.24**	**0.5**	

IRG: 40 # of N each cutting, Corn 150 #

BARENBRUG

Green Spirit in a Cropping system

Forage Crop 2007 & 2008	Forage Quality Parameters (Average)			
	Protein (% DM)	NDF (%DM)	NDFd (%NDF)	lbs milk /ton
GreenSpirit IRG -25 Day cut	22.8	44.8	75.2	3493
GreenSpirit IRG -35 Day cut	19.7	47.1	72.7	3439
Alfalfa	25.7	30.0	54.7	3614
Soybean	18.9	36.6	55.4	3597
Corn Silage	7.0	47.6	56.9	3279
L.S.D (0.05)	**0.5**	**1.15**	**1.75**	**53**

BARENBRUG


BARENBRUG

Grass Finished Beef

BARENBRUG

Windrowed GreenSpirit + Oats

BARENBRUG

Windrow GreenSpirit+ Oats

BARENBRUG

Window GreenSpirit+ Oats

Quality 8 months later - May

Crude Protein	11.35
T.D.N	56.5
NFC	26.3
NEG	0.29 MCAL/lb
NEM	0.54 MCAL/lb

BARENBRUG

GO GREENSPIRIT

WHAT ITALIAN?

BARENBRUG

Forages Grasses

Forage Species in Development

- **Tall Fescue**
- **Annual Ryegrass**
- **Orchard Grass**
- **Meadow Fescue**
- **Perennial Ryegrass**
- **Italian Ryegrass**
- **Timothy**

- Annual Bromes
- Kentucky bluegrass
- Smooth Brome
- Wheatgrass

- *Red Clover*
- *White Clover*
- *Rose clover*
- *Chicory*
- *Brassicas*

BARENBRUG

Orchardgrass

- Good species for light and shallow soils
- Good heat tolerance but does not like water logging
- Slow establishment
- Most common varieties are early heading and have poor palatability
- Late heading varieties more suitable for planting with alfalfa
- Improved varieties are late heading and have better palatability and digestibility
- Improved varieties have high leaf to stem ratio

BARENBRUG

Orchard grass Varieties

	Maturity	Winter Growth	Winter Hardiness	Rust Resistance
POTOMAC	3	3	6	Low
BARIDANA	**4**	**3**	**8**	**Very High**
BAREXCEL	4	4	8	High
BARLEGRO	**6**	**3**	**8**	**High**
INTENSIV	**5**	**3**	**8**	**Very High**
BARLEMAS	5	8	5	Very High

BARENBRUG


High Leaf Ratio: HLR

Orchardgrass Forage Quality

Value of High Leaf Ratio (HLR)

	Forage Quality at Boot Stage				Forage Quality at First Harvest in 2004			
		%	%		Date at	%	%	Maturity
Entry	Date	NDF	IVDDM		Harvest	NDF	IVDDM	Score (a)
Potomac	14-May	64.2	84.2		25-May	70.0	77.6	R 4.0
Baridana	14-May	62.6	87.3		25-May	69.6	79.4	R 2.0
Intensiv	18-May	62.8	85.0		25-May	69.2	80.3	R 1.5
Barexcel	14-May	60.7	86.3		25-May	70.5	77.4	R 2.5
9BTR-G	14-May	62.7	87.4		25-May	70.1	77.7	R 3.5

BARENBRUG

Tall Fescue

- Suited both for light and heavy soils
- Deep rooted and very good drought tolerance
- High dry matter production within one year of establishment
- Common varieties e.g. Kentucky 31, have a toxic endophyte that improves persistence
- Rough leaves make it less palatable than orchard grass
- High lignin content in leaves make it less digestible than orchard grass

BARENBRUG


Very Soft-leaved tall fescue
Traditional Rough leaf tall fescue

Soft-leaved tall fescue

- Bred for soft leaves
- Higher palatability tall fescue = higher intake
- Lower lignin content in the leaves improves digestibility = Higher energy values
- Improved persistence without toxic endophyte
- Very high Stand Density
- Better Bite Size

BARENBRUG

University of Kentucky Grazing Trials

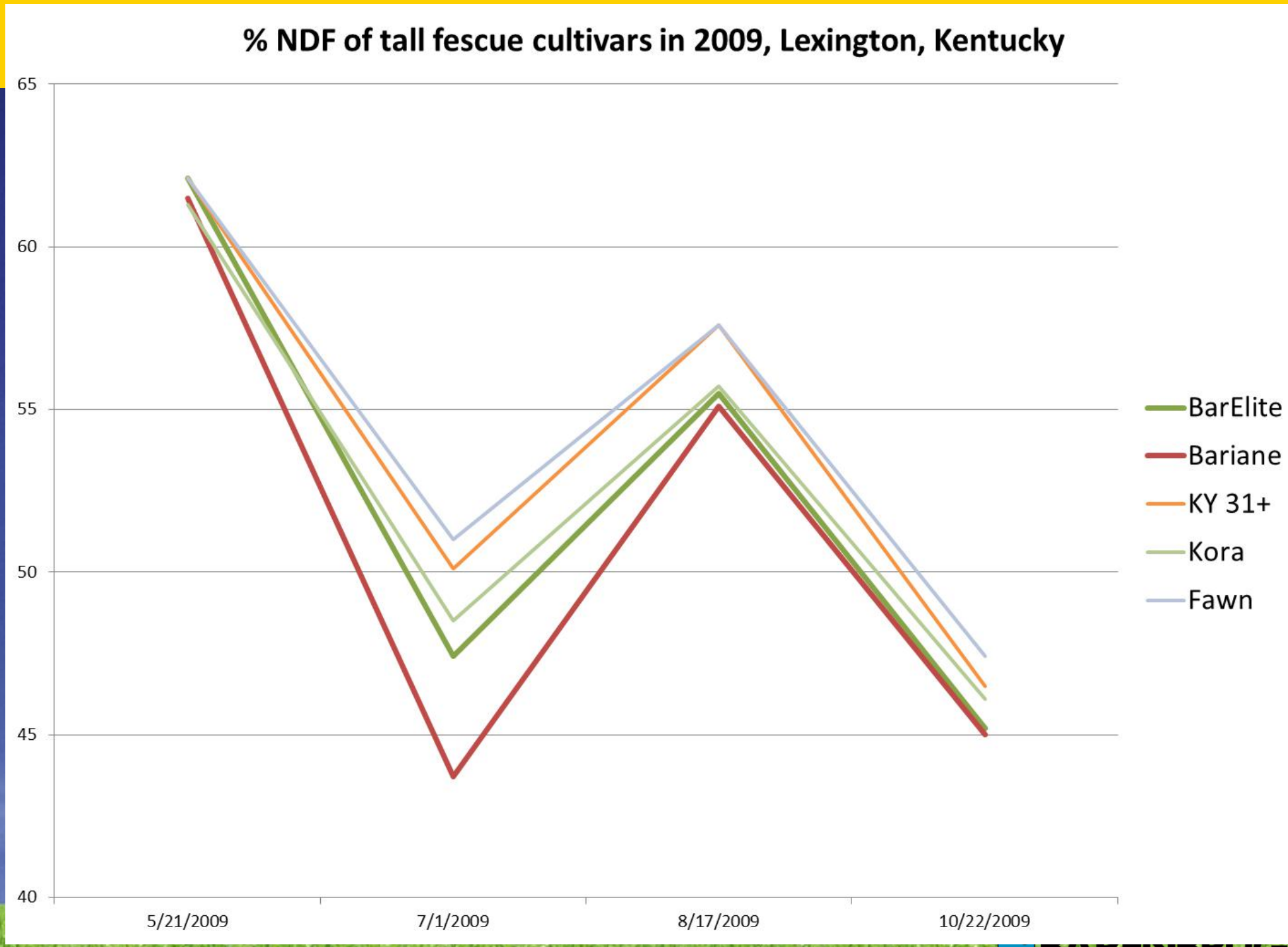
	Grazing Preference		
	2008	2009	2010
Bariane	6.5	7.2	8.0
BarElite	6.0	3.3	5.0
Barolex	6.8	3.2	5.0
Kentucky 31+	6.0	1.0	4.0
Select	3.7	1.0	2.7
Jesup Max-Q	5.7	1.0	2.0
L.S.D. (0.05)	1.3	0.7	1.2

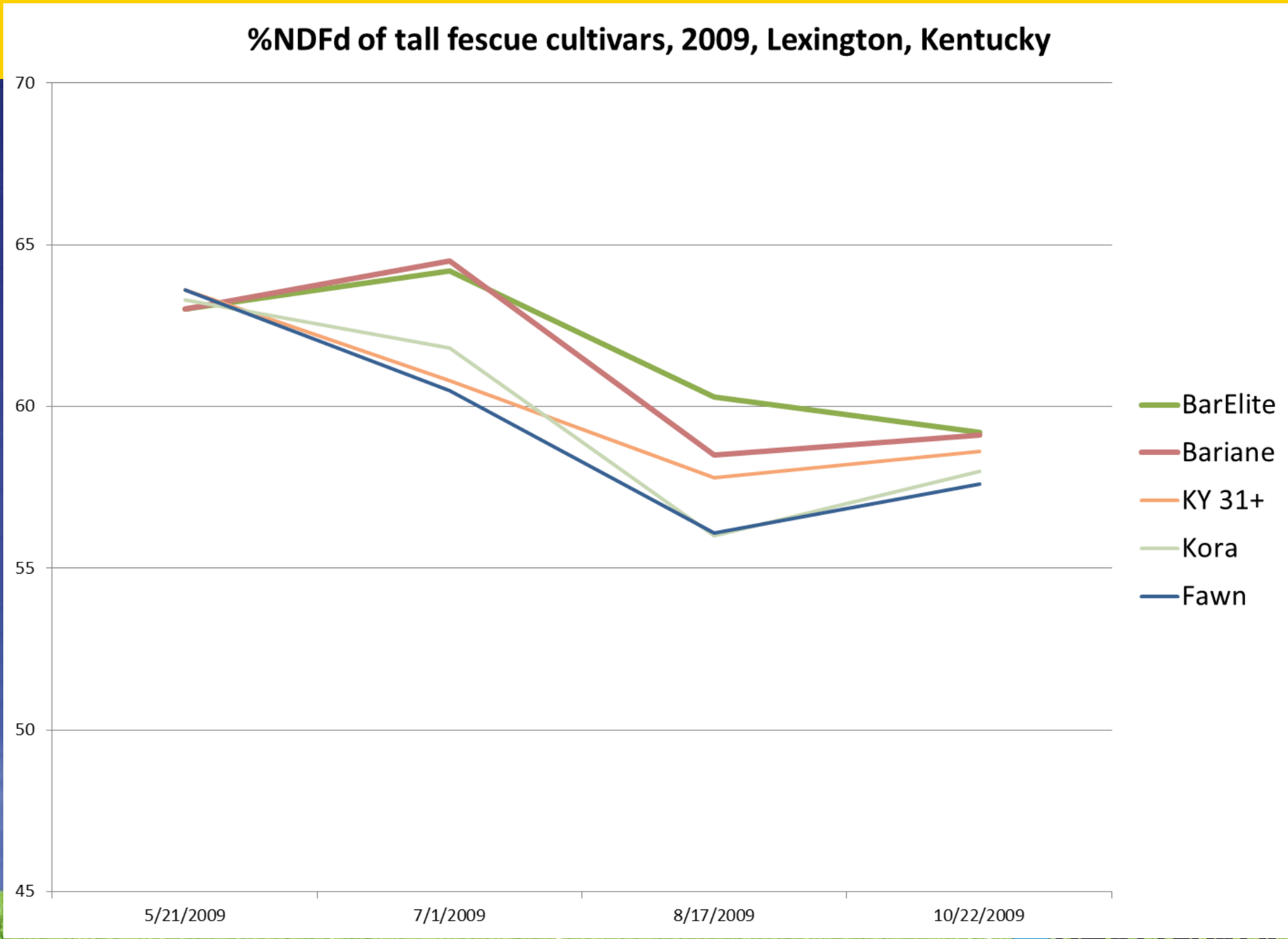
Prefe ing all forage was g

STF™-43

SOFT-LEAVED TALL FESCUE BLEND

BARENBRUG


% NDF of tall fescue cultivars in 2009, Lexington, Kentucky
65
60
55
50
45
40
5/21/2009
7/1/2009
8/17/2009
10/22/2009
BarElite
Bariane
KY 31+
Kora
Fawn


%NDFd of tall fescue cultivars, 2009, Lexington, Kentucky
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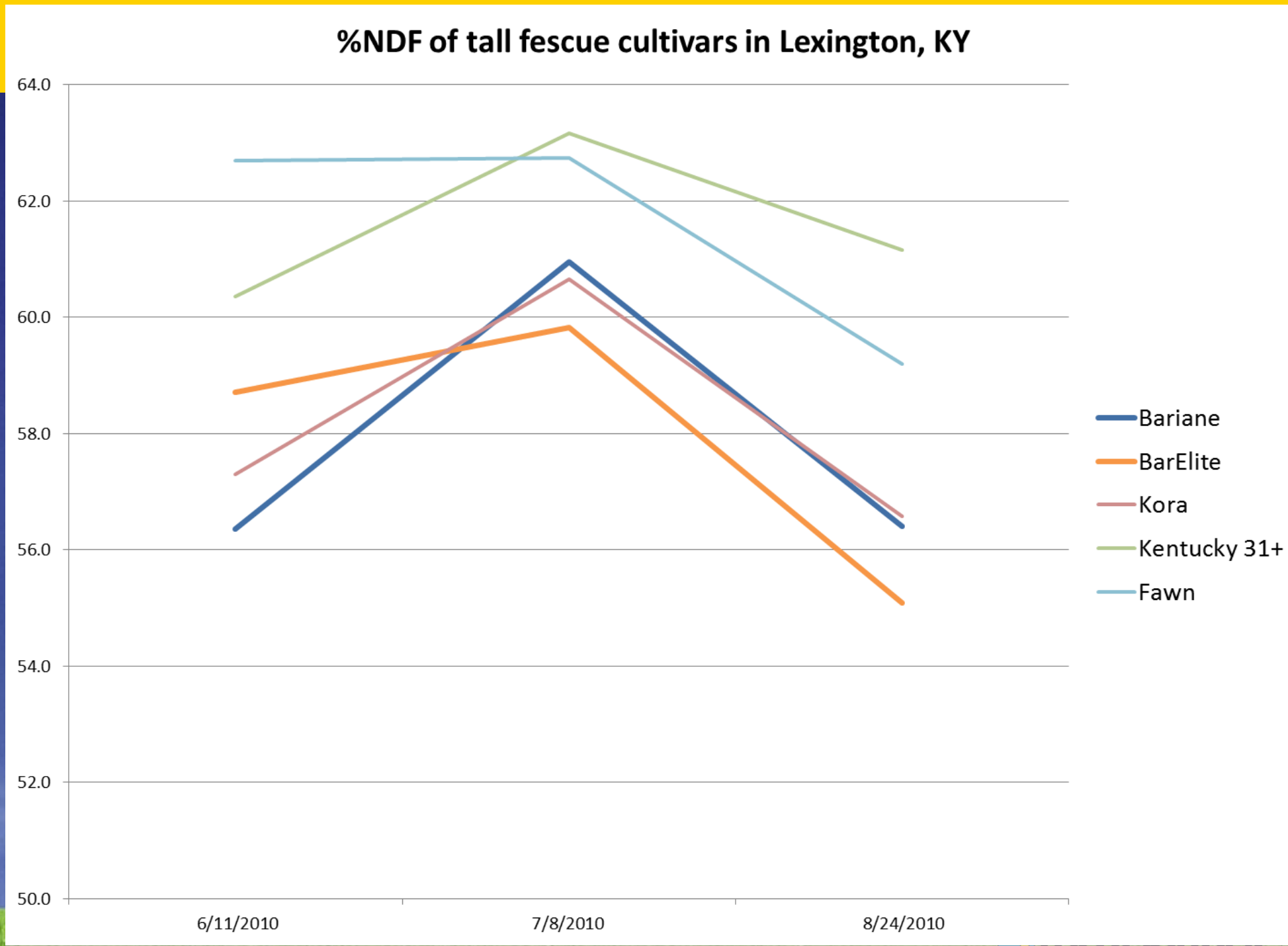
65
60
55
50
45
5/21/2009
7/1/2009
8/17/2009
10/22/2009
BarElite
Bariane
KY 31+
Kora
Fawn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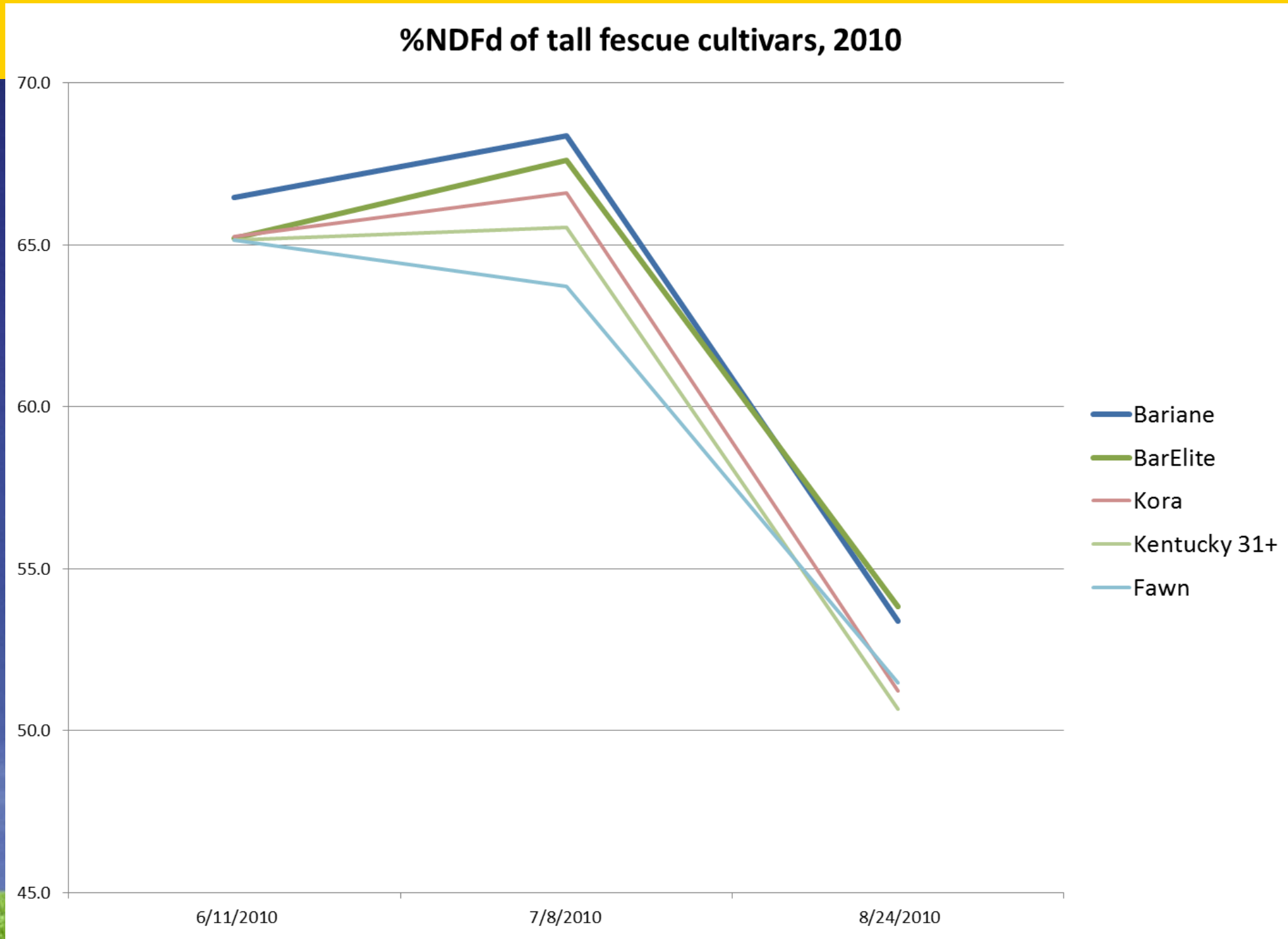
62.0
60.0
58.0
56.0
54.0
52.0
50.0
6/11/2010
7/8/2010
8/24/2010
Bariane
BarElite
Kora
Kentucky 31+
Fawn


%NDFd of tall fescue cultivars, 2010
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65.0
60.0
55.0
50.0
45.0
6/11/2010
7/8/2010
8/24/2010
Bariane
BarElite
Kora
Kentucky 31+
Fawn

DRYLAND - Meade, Nebraska	
3 year yields (tons/acre)	
Oahe Intermediate Wheatgrass	13.0
Manska Pubescent Wheatgrass	12.8
KY-31 Tall Fescue	11.7
Peak Smooth Brome	11.6
DROVER Tall Fescue	11.5
Tuscany II Tall Fescue	11.3
Omaha Virginia Wildrye	11.2
Regar Meadow Brome	11.1
Montana Meadow Brome	10.6
Hakari Alaska Brome	10.4
Newhy Hybrid Wheatgrass	10.4
Jessup MaxQ Tall Fescue	10.4
Lincoln Smooth Brome 6	9.9
Garrison Creeping Foxtail	8.5

IRRIGATED - North Platte, Nebraska	
3 year yields (tons/acre)	
DROVER Tall Fescue	24.0
KY-31 Tall Fescue	23.1
Tuscany II Tall Fescue	22.5
Newhy Hybrid Wheatgrass	21.6
Manska Pubescent Wheatgrass	21.4
Oahe Intermediate Wheatgrass	20.7
Jessup MaxQ Tall Fescue	20.6
Peak Smooth Brome	19.5
Hakari Alaska Brome	19.4
Montana Meadow Brome	18.6
Lincoln Smooth Brome5	18.0
Garrison Creeping Foxtail	17.2
Regar Meadow Brome	16.7
Climax Timothy	14.9

NEBRASKA
2014 Cool Season Grass Variety Test
Havelock, Lancaster County, Agronomy Research Farm
Dryland -- 2010 Seeding

Entry	Species	% Stand[1] 1-May-14	Dry Matter Tons/Acre* 2012 Total	2013 Total	2014 17-Jun	2014 5-Aug	2014 9-Oct	2014 TOTAL	2012-2014 TOTAL
Released cultivars									
Olga	Smooth bromegrass	72	2.68	3.88	3.54	0.16	0.33	4.03	10.70
Cache	Meadow bromegrass	94	2.22	3.71	2.98	0.33	0.31	3.63	9.50
BAR Dryland Mix	Mix	96	2.48	3.77	2.83	0.20	0.32	3.37	9.41
Arsenal	Meadow bromegrass	90	2.28	3.38	3.09	0.36	0.45	3.91	9.40
Peak	Smooth bromegrass	90							9.12
BarOptima PLUS E34	Tall fescue	93							8.78
Haymaker/Beefmaker	Intermediate wheatgrass	95							8.78
Paddock	Meadow bromegrass	93							8.77
Drover	Tall fescue	96							8.59
AC Knowles	Hybrid bromegrass	83	1.90	3.24	2.65	0.15	0.34	3.14	8.40
STF43 1:1 coated	Tall fescue	94	2.94	2.64	1.65	0.24	0.44	2.32	8.10
Bardurum	Tall fescue	94	2.70	2.87	1.88	0.34	0.48	2.70	7.92
Barexcel	Orchardgrass	65	2.47	2.86	1.60	0.37	0.56	2.51	7.65
STF43 uncoated	Tall fescue	91	2.40	2.53	1.94	0.22	0.42	2.61	7.56
STF43 1:0.5 coated	Tall fescue	95	3.10	2.50	1.48	0.22	0.44	2.13	7.51
Fojtan	Festulolium	91	2.64	2.25	1.62	0.32	0.41	2.31	7.19
Extend	Orchardgrass	56	1.99	2.62	1.37	0.41	0.51	2.29	6.86
Barlegro	Orchardgrass	49	1.82	2.45	1.57	0.50	0.64	2.72	6.70
Profit	Orchardgrass	68	2.27	2.26	1.29	0.40	0.51	2.20	6.41
Baridana	Orchardgrass	66	1.75	2.47	1.57	0.33	0.41	2.26	6.20
DASCADA	Orchardgrass	43	1.57	2.36	1.30	0.36	0.44	2.07	5.65

BAR Dryland Mix

BarOptima +E34 (Soft leaf Tall Fescue) 25%
BAR BiF 1GRL (Smooth Brome) 25%
BAR BcF 1FRRL (Meadow Brome) 25%
FRRL Wheatgrass (Intermediate) 25%

Entry	Species	% Stand[1] 1-May-14	Dry Matter Tons/Acre* 2012 Total	2013 Total	2014 17-Jun	2014 5-Aug	2014 9-Oct	2014 TOTAL	2012-2014 TOTAL
Released cultivars									
Olga	Smooth bromegrass	72	2.68	3.88	3.54	0.16	0.33	4.03	10.70
Cache	Meadow bromegrass	94	2.22	3.71	2.98	0.33	0.31	3.63	9.50
BAR Dryland Mix	Mix	96	2.48	3.77	2.83	0.20	0.32	3.37	9.41
Arsenal	Meadow bromegrass	90	2.28	3.38	3.09	0.36	0.45	3.91	9.40
Peak	Smooth bromegrass	90	1.69	3.62	3.19	0.21	0.33	3.76	9.12
BarOptima PLUS E34	Tall fescue	93	2.69	3.35	1.97	0.29	0.49	2.75	8.78
Haymaker/Beefmaker	Intermediate wheatgrass	95	1.83	3.36	3.23	0.12	0.36	3.72	8.78
Paddock	Meadow bromegrass	93	2.11	3.54	2.50	0.34	0.36	3.20	8.77
Drover	Tall fescue	96	2.83	2.85	1.81	0.34	0.73	2.84	8.59
AC Knowles	Hybrid bromegrass	83	1.90	3.24	2.65	0.15	0.34	3.14	8.40
STF43 1:1 coated	Tall fescue	94	2.94	2.64	1.65	0.24	0.44	2.32	8.10
Bardurum	Tall fescue	94	2.70	2.87	1.88	0.34	0.48	2.70	7.92
Barexcel	Orchardgrass	65	2.47	2.86	1.60	0.37	0.56	2.51	7.65
STF43 uncoated	Tall fescue	91	2.40	2.53	1.94	0.22	0.42	2.61	7.56
STF43 1:0.5 coated	Tall fescue	95	3.10	2.50	1.48	0.22	0.44	2.13	7.51
Fojtan	Festulolium	91	2.64	2.25	1.62	0.32	0.41	2.31	7.19
Extend	Orchardgrass	56	1.99	2.62	1.37	0.41	0.51	2.29	6.86
Barlegro	Orchardgrass	49	1.82	2.45	1.57	0.50	0.64	2.72	6.70
Profit	Orchardgrass	68	2.27	2.26	1.29	0.40	0.51	2.20	6.41
Baridana	Orchardgrass	66	1.75	2.47	1.57	0.33	0.41	2.26	6.20
DASCADA	Orchardgrass	43	1.57	2.36	1.30	0.36	0.44	2.07	5.65
Enhance	Tall fescue	91	2.06	1.54	1.05	0.12	0.16	1.34	4.93
Pradel	Meadow fescue	55	1.47	1.84	1.42	0.22	0.55	2.14	4.90

Meadow Fescue

- Morphologically closely related to tall fescue
- Digestibility is significantly better than tall fescue
- Tolerates both wet and dry soils
- Tolerates moderate grazing pressure
- Outperforms perennial ryegrass in drier weather
- Very cold tolerant
- New Varieties are high yielding

BARENBRUG

Meadow Fescue 2003, New York

Entry	2004	2005	2006	Heading		3 Yr-Total
Bor 22002	6.67	4.63	5.40	31-May		16.70
Fp25R99	6.15	4.06	5.08	19-May		15.28
Barvital	6.50	3.93	4.74	19-May		15.17
Fp99L2	6.04	4.05	5.02	24-May		15.12
Pradel	6.35	3.72	4.42	19-May		14.49
Bor 0101	5.47	3.25	4.36	26-May		13.08
L.S.D (0.05)	0.45	0.41	0.70			

Relative Forage Quality of Grasses

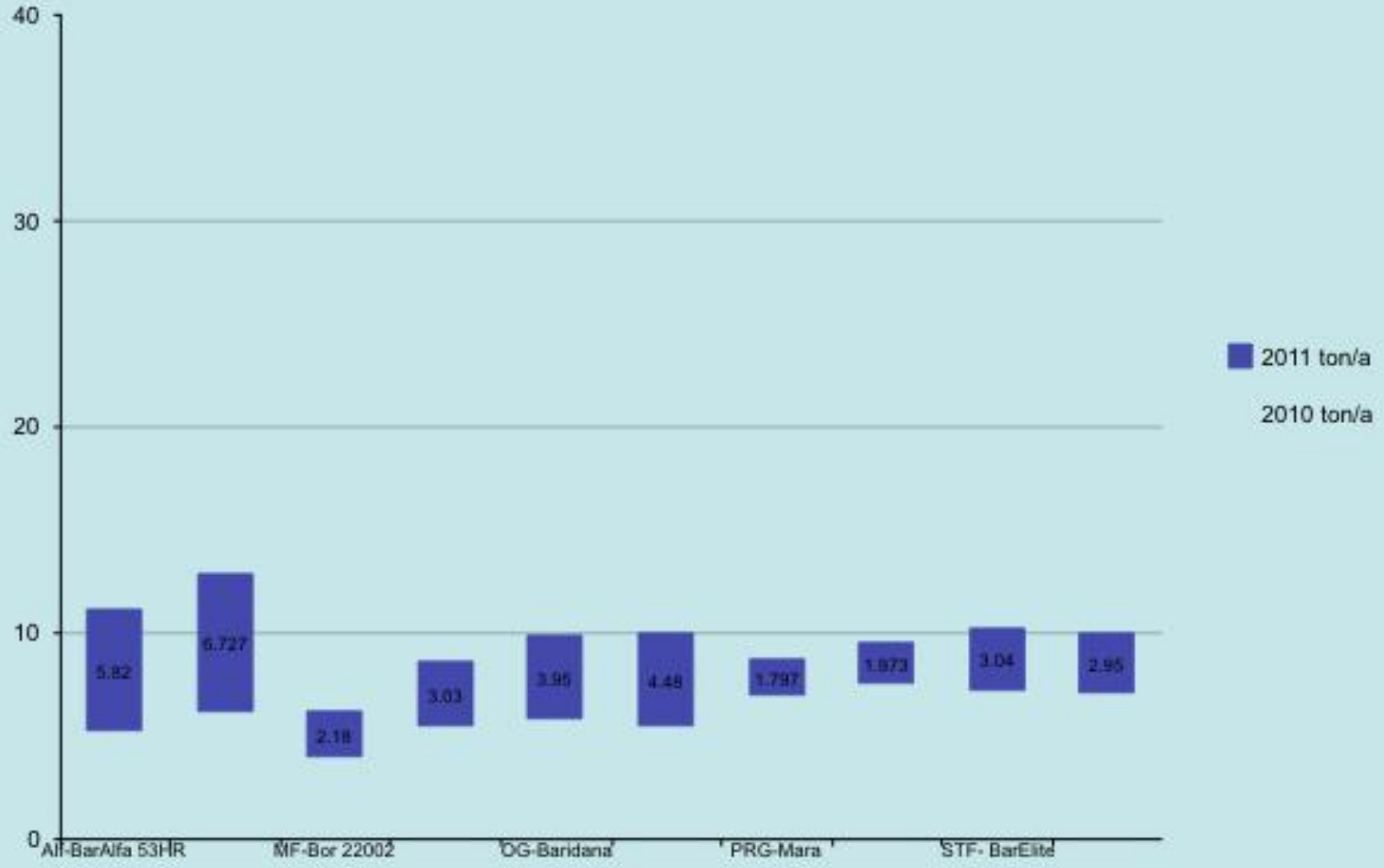
All Grasses harvested at Boot Stage

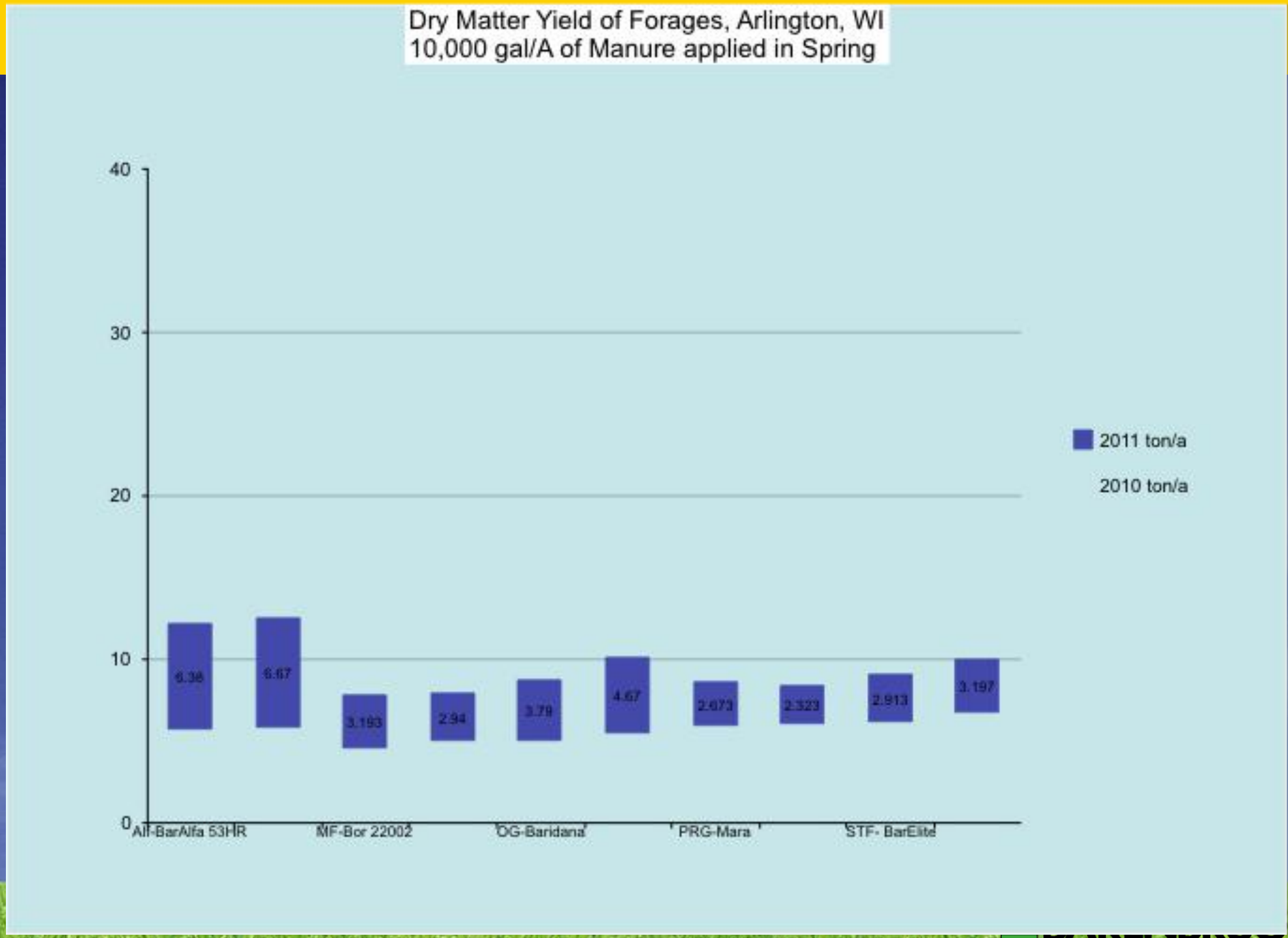
		Heading Date	PROTEIN (%)	NDF (%)	NDFd (%)	IVTD (%)
Perennial Ryegrass	BAR 1M	16-May	16.9	55.5	83.5	90.9
Perennial Ryegrass	Remington	25-May	14.0	57.0	81.0	89.2
Meadow Fescue	Pradel	16-May	16.8	55.5	83.7	90.9
Meadow Fescue	Barvital	14-May	17.7	51.9	89.0	94.3
Tall Fescue	Retu	21-May	15.5	57.2	75.4	85.9
Tall Fescue	Barcel	18-May	16.8	54.7	79.3	88.7
Orchard grass	Potomac	14-May	16.7	64.2	75.4	84.2
Orchard grass	Baridana	14-May	17.6	62.6	79.7	87.3
Timothy	Barpenta	17-Jun	8.1	67.7	66.8	77.5
Timothy	Climax	27-May	12.9	63.2	74.6	83.9

Grass Trial in Ithaca, NY, Forage quality predictions by NIRS;
NDF: neutral detergent fiber
NDFd: NDF digestibility (48 hour digestion)

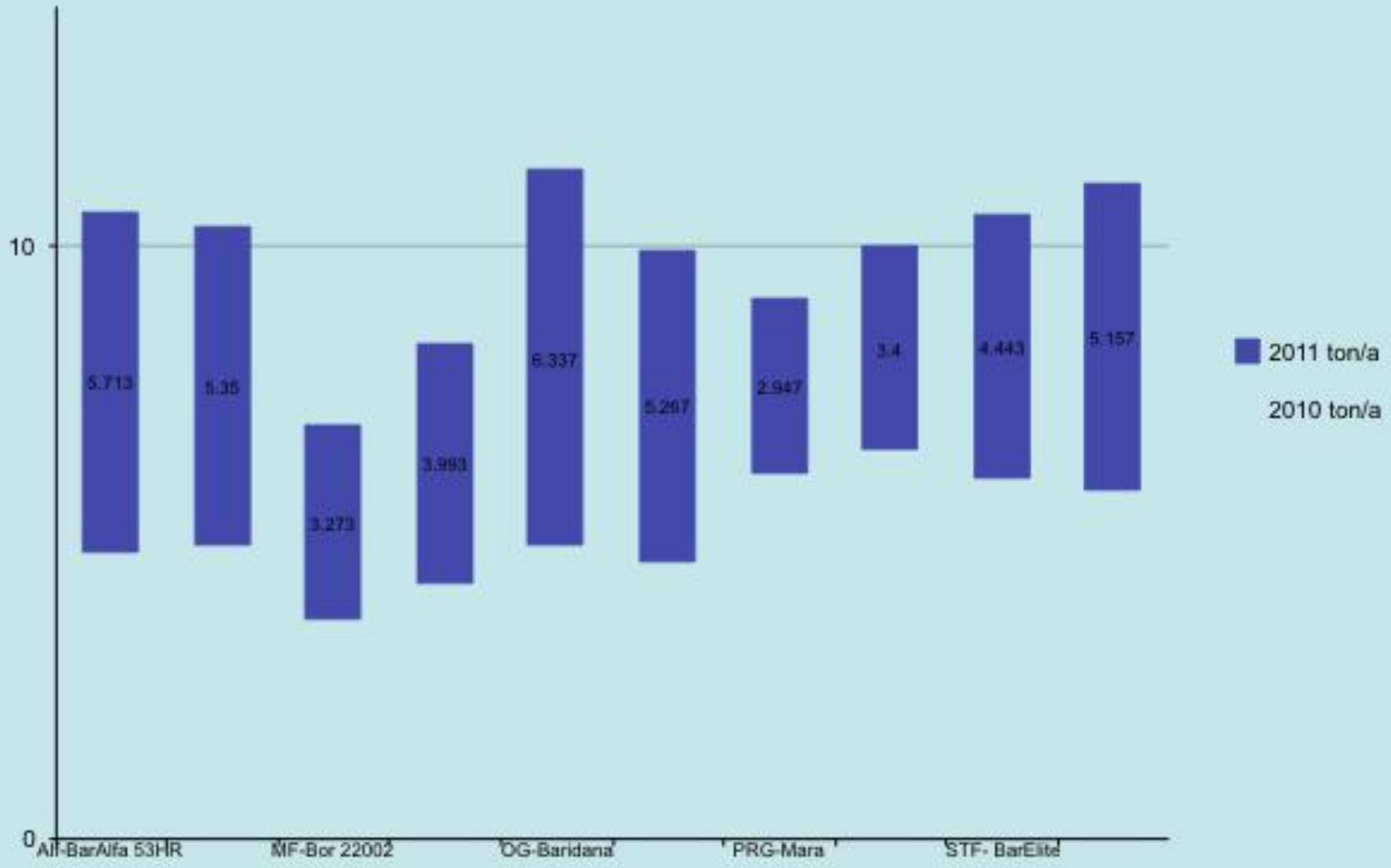
BARENBRUG

Dry Matter Yield of Forages, Arlington, WI
40 lbs of Nitrogen applied in Spring and after each cutting




Dry Matter Yield of Forages, Arlington, WI
10,000 gal/A of Manure applied in Spring
40
30
20
10
0
6.38
6.67
3.193
2.94
3.79
4.67
2.673
2.323
2.913
3.197
Alf-BarAlfa 53HR
MF-Bor 22002
OG-Baridana
PRG-Mara
STF- BarElite
2011 ton/a
2010 ton/a

Dry Matter Yield of Forages
5000 gallons of Manure Applied in Spring and after each Cutting



New Product

Milk Production from High Digestible Forage with High Tonnage

60% meadow fescue

40% soft leafed Tall Fescue

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Why Grass with Alfalfa

- Improve overall forage yields per acre
- Complementary to each other
- poor draining soils, low lying areas
- low pH soils
- Potato Leaf Hopper
- overwintering of alfalfa
- Better drying
- Manure utilization
- Better NDF digestibility
- Interseed into thinning stands of alfalfa, extend stand life, reduce weeds

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Reasons not to use grass with Alfafa

- Stemmy, only good for dry cows and horses
- Only first cut is good Quality
- Low in Protein
- Low in quality
- Does not yield enough
- Does not persist
- Only for grazing
- Hard to manage
  - Takes Over Alfalfa
  - Or Disappears from Alfalfa

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Challenges with Alfalfa + Grass mixtures

- Whether to fertilize?
- What seeding rate?
- How to sow?
- Which Grass to Use ?

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Timothy

- Adapted to moist and cool environments
- Suited for areas with harsh winters and short growing seasons
- Ideal for dry hay production
- Not a very drought tolerant species
- Palatable species
- Not very grazing tolerant; so used mostly in mixtures for pastures

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Relative Yield and Heading

	Yield tons/acre	Heading Date
Orchard grass	5.98	May 17
Tall Fescue	7.28	May 18
Meadow fescue	6.07	May 26
Perennial Ryegrass	5.19	May 29
Timothy	6.24	May 30

Grass trials, Cornell University, sown in 2005

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Relative Forage Quality of Grasses

All Grasses harvested at Boot Stage

		Heading Date	PROTEIN (%)	NDF (%)	NDFd (%)	IVTD (%)
Perennial Ryegrass	BAR 1M	16-May	16.9	55.5	83.5	90.9
Perennial Ryegrass	Remington	25-May	14.0	57.0	81.0	89.2
Meadow Fescue	Pradel	16-May	16.8	55.5	83.7	90.9
Meadow Fescue	Barvital	14-May	17.7	51.9	89.0	94.3
Tall Fescue	Retu	21-May	15.5	57.2	75.4	85.9
Tall Fescue	Barcel	18-May	16.8	54.7	79.3	88.7
Orchard grass	Potomac	14-May	16.7	64.2	75.4	84.2
Orchard grass	Baridana	14-May	17.6	62.6	79.7	87.3
Timothy	Barpenta	17-Jun	8.1	67.7	66.8	77.5
Timothy	Climax	27-May	12.9	63.2	74.6	83.9

Grass Trial in Ithaca, NY, Forage quality predictions by NIRS;
NDF: neutral detergent fiber
NDFd: NDF digestibility (48 hour digestion)

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Timothy in Alfalfa

- Late heading Species
- Does not like low cutting height of alfalfa
- High Fiber and low fiber digestibility

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Julian Days to Maturity

GRASS Varieties		1st Few Heads		Alfalfa Varieties	First-Bloom
Fawn	Tall Fescue	123			
Potomac	Orchard grass	125			
Kentucky 31	Tall Fescue	128			
Baridana	Orchard grass	132			
Intensiv	Orchard grass	136			
BarElite	Soft Leaf Tall Fescue	136			
Pradel	Meadow Fescue	138		Baralfa 42	143
Bariane	Soft Leaf Tall Fescue	140		Baralfa 53HR	143
Remington	Perennial Ryegrass	142			
Barfleo	Timothy	150			
Aurora	Timothy	150			

Albany, Oregon

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Grass Alfalfa Mixture Trial - Minnesota

Alfalfa	Grass	Ratio/N		Alfalfa	Grass	Ratio/N	lb alf/ac	lb gras/ac
Baralfa 32	Barcarella	2:1		Baralfa 42	Barcarella	2:1	12	6
Baralfa 32	Barcarella	1:1		Baralfa 42	Barcarella	1:1	9	9
Baralfa 32	Barcarella	1:1+N		Baralfa 42	Barcarella	1:1+N	9	9
Baralfa 32	Barcarella	1:2+N		Baralfa 42	Barcarella	1:2+N	6	12
Baralfa 32	Bariane	2:1		Baralfa 42	Bariane	2:1	12	6
Baralfa 32	Bariane	1:1		Baralfa 42	Bariane	1:1	9	9
Baralfa 32	Bariane	1:1+N		Baralfa 42	Bariane	1:1+N	9	9
Baralfa 32	Bariane	1:2+N		Baralfa 42	Bariane	1:2+N	6	12
Baralfa 32	BG-34	2:1		Baralfa 42	BG-34	2:1	12	6
Baralfa 32	BG-34	1:1		Baralfa 42	BG-34	1:1	9	9
Baralfa 32	BG-34	1:1+N		Baralfa 42	BG-34	1:1+N	9	9
Baralfa 32	BG-34	1:2+N		Baralfa 42	BG-34	1:2+N	6	12
Baralfa 32	PRG Turf	2:1		Baralfa 42	PRG Turf	2:1	12	6
Baralfa 32	PRG Turf	1:1		Baralfa 42	PRG Turf	1:1	9	9
Baralfa 32	PRG Turf	1:1+N		Baralfa 42	PRG Turf	1:1+N	9	9
Baralfa 32	PRG Turf	1:2+N		Baralfa 42	PRG Turf	1:2+N	6	12
Baralfa 32	Baridana	Rec		Baralfa 42	Baridana	Rec	13	5
Baralfa 32	RCG	Rec		Baralfa 42	RCG	Rec	12	6
Baralfa 32		Rec		Baralfa 42		Rec	18	0

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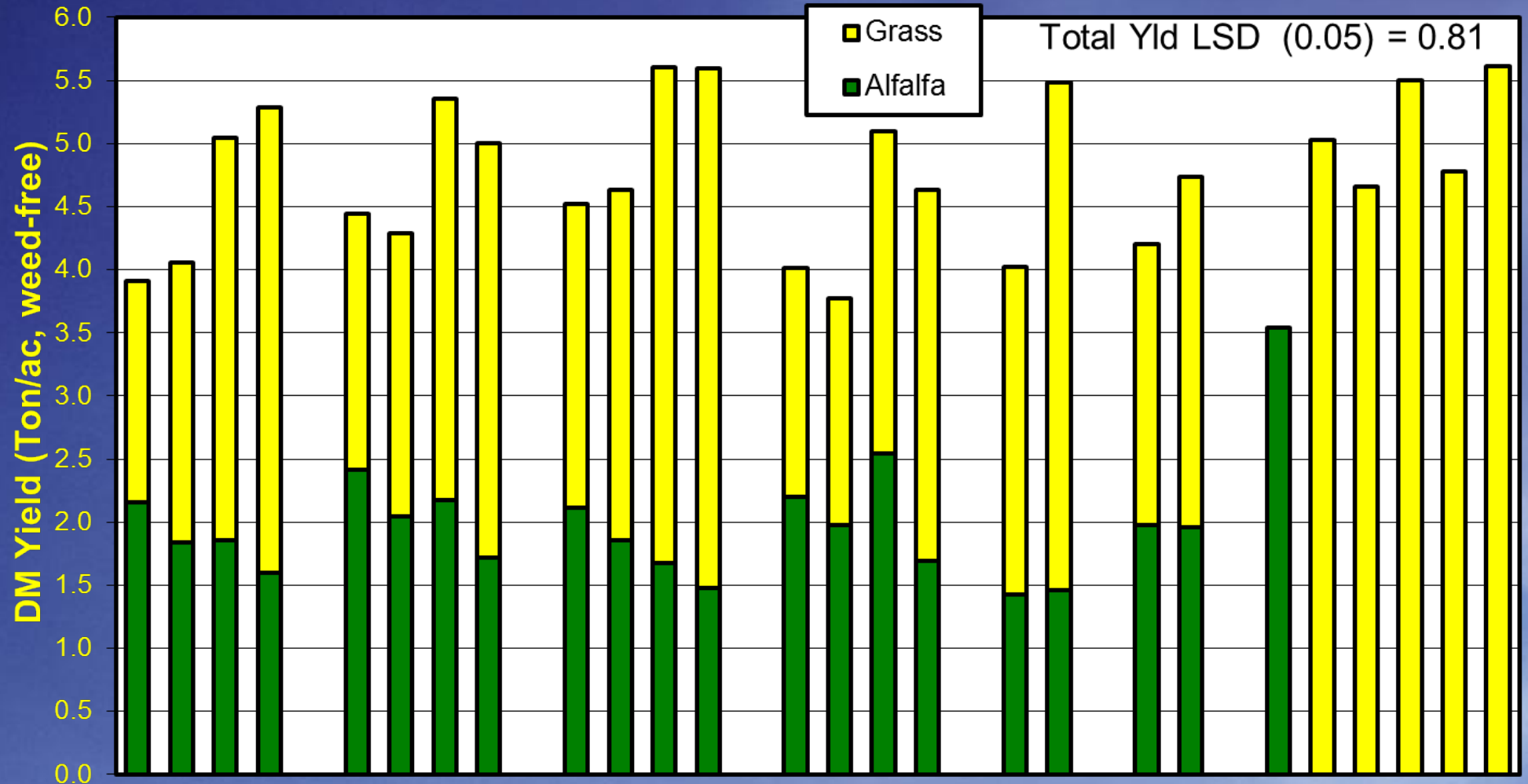
2007 Total-Season DM Yields (4 Harvests) and Species Composition of Alfalfa-Grass Mixtures at Rosemount, MN - *seeded August 2006*



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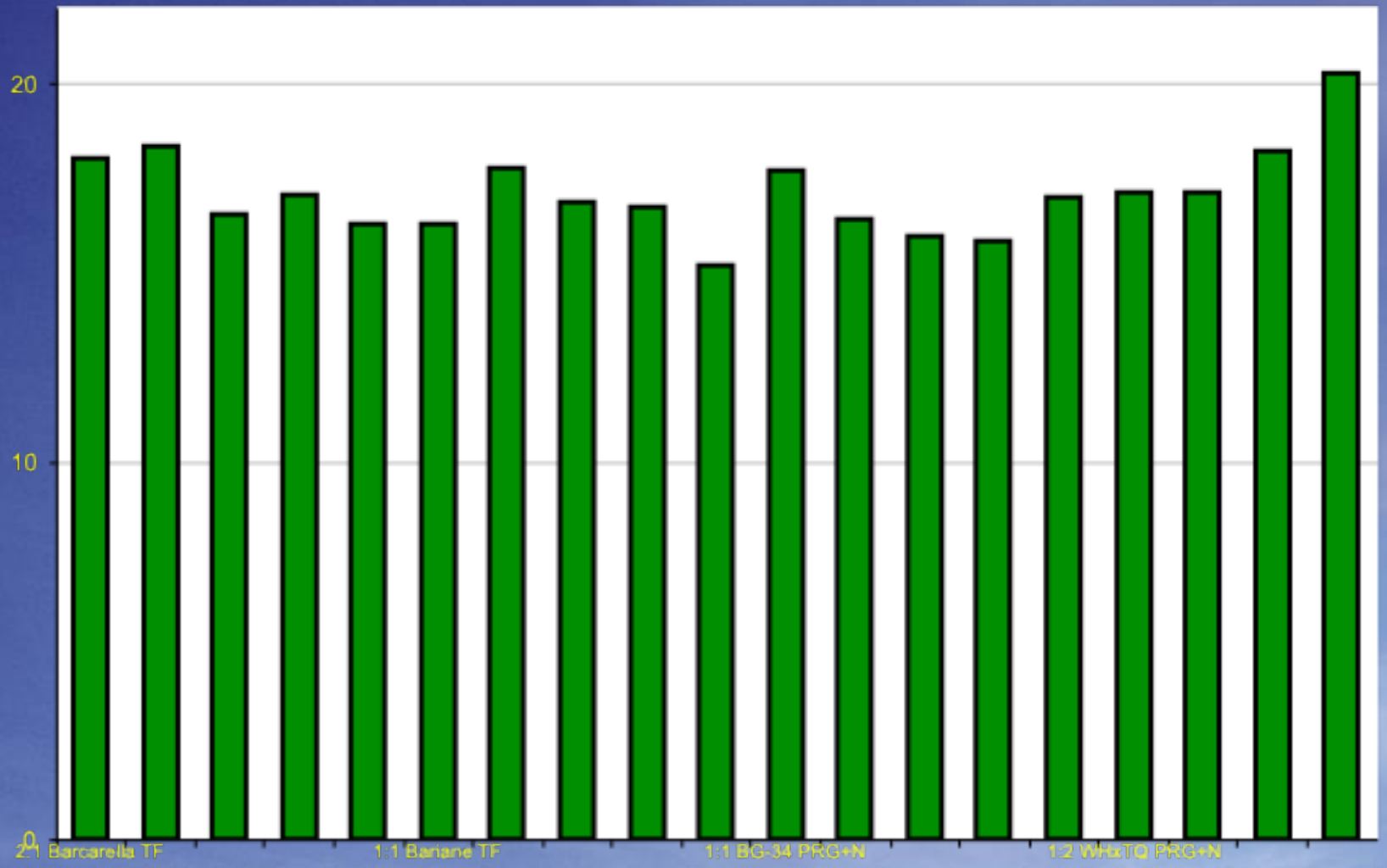
Season Average Crude Protein Concentration of Alfalfa-Grass Mixtures at Grand Rapids, MN (Seeded Aug. 2004; Baralfa 42 data



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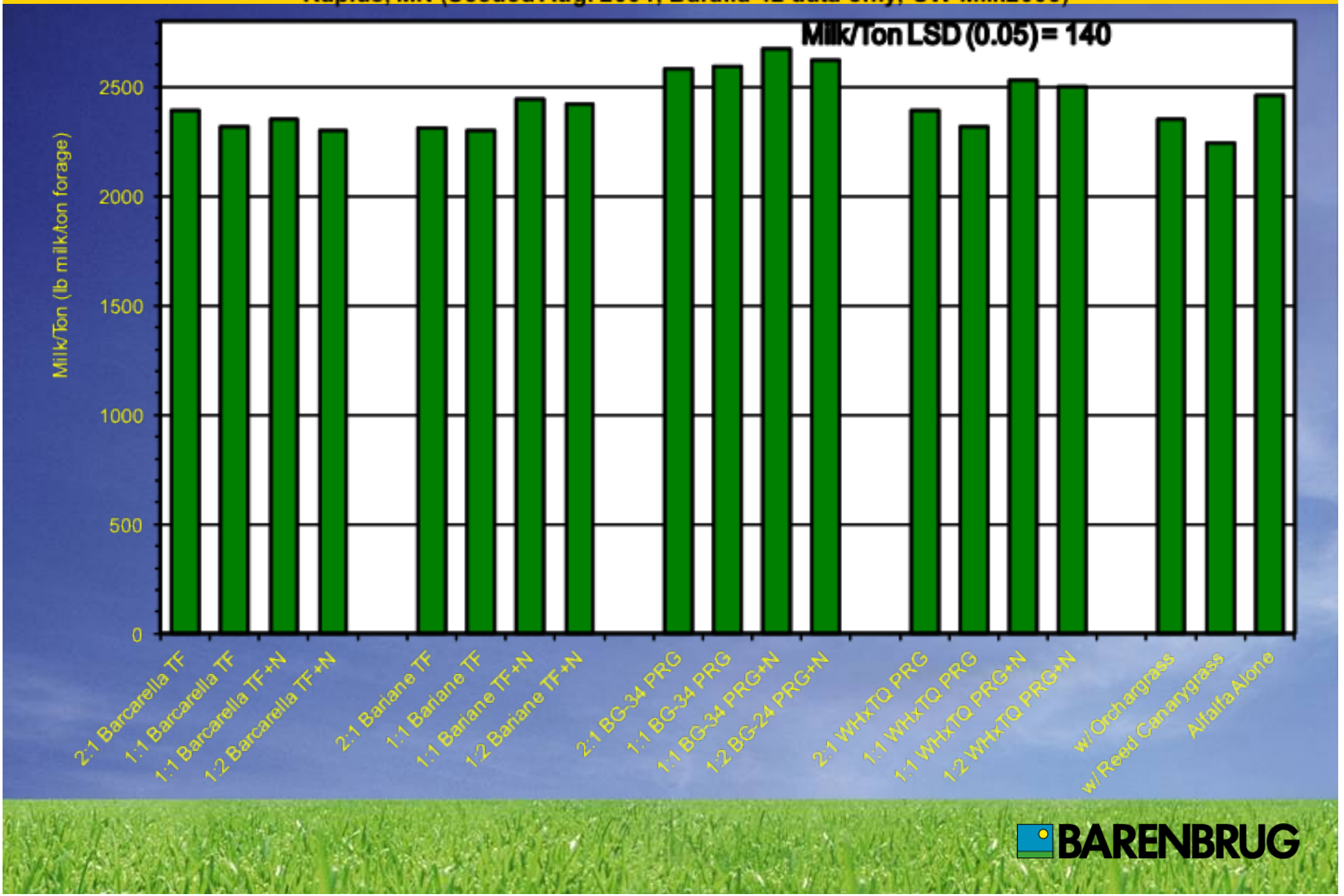
2005 Season Total Milk Production Potential per Ton for Alfalfa-Grass Mixtures at Grand Rapids, MN (Seeded Aug. 2004; Baralfa 42 data only; UW-Milk2006)



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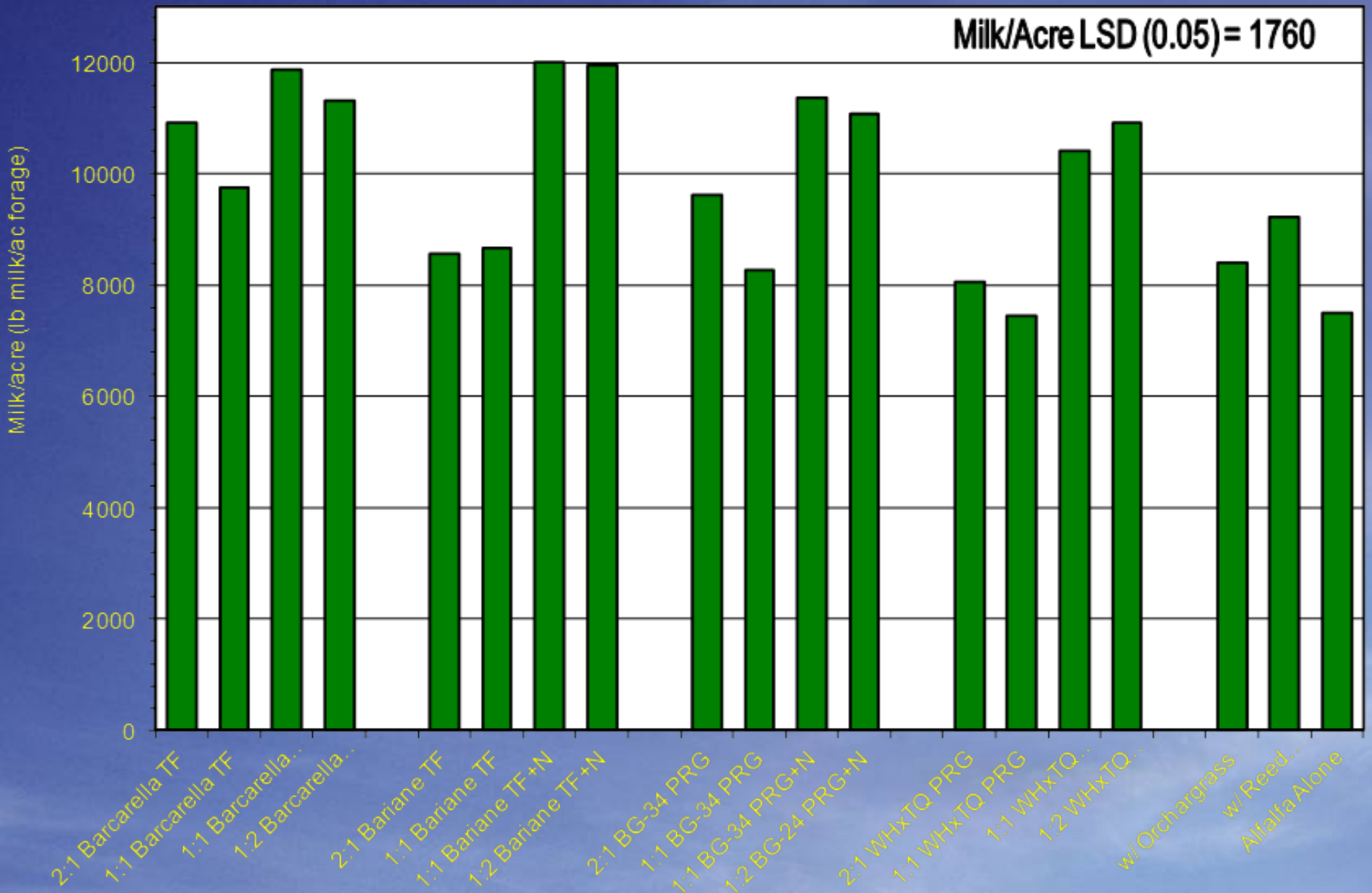
2005 Season Total Milk Production Potential per Acre of Alfalfa-Grass Mixtures at Grand Rapids, MN (Seeded Aug. 2004; Baralfa 42 data only; UW-Milk2006)



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2010/10/22 09:37


2010/10/22 09:37


2010/10/22 09:37


2010/10/22 09:37

STF-43

- Soft Leaf Fescue
- 5-15% more digestible than other tall fescue
- Ideal for Silage for High Producing Dairy Cows
- Very High Seedling Vigor or interseeding into existing alfalfa stands
- Very Late Heading to match cutting time of alfalfa

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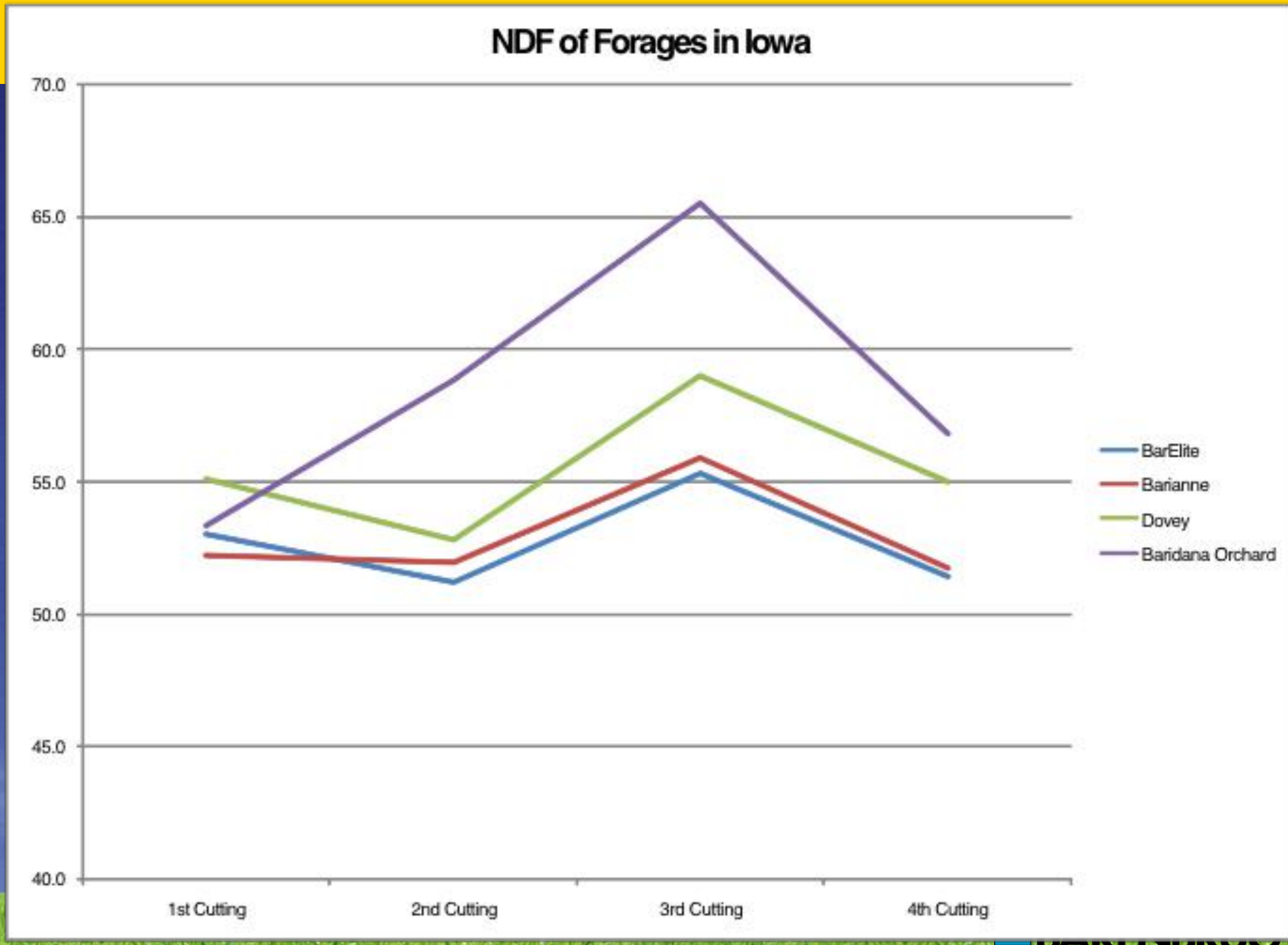
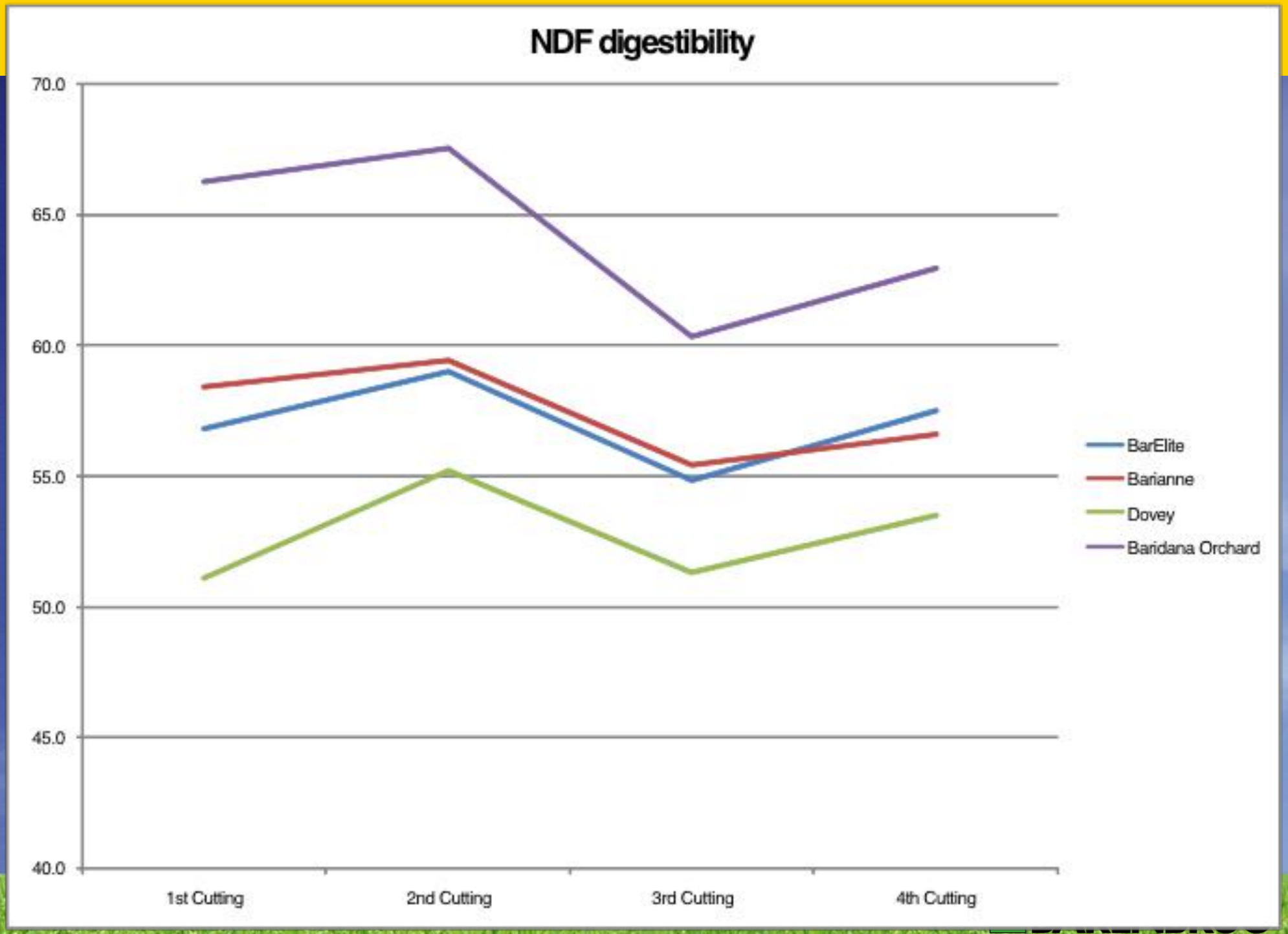
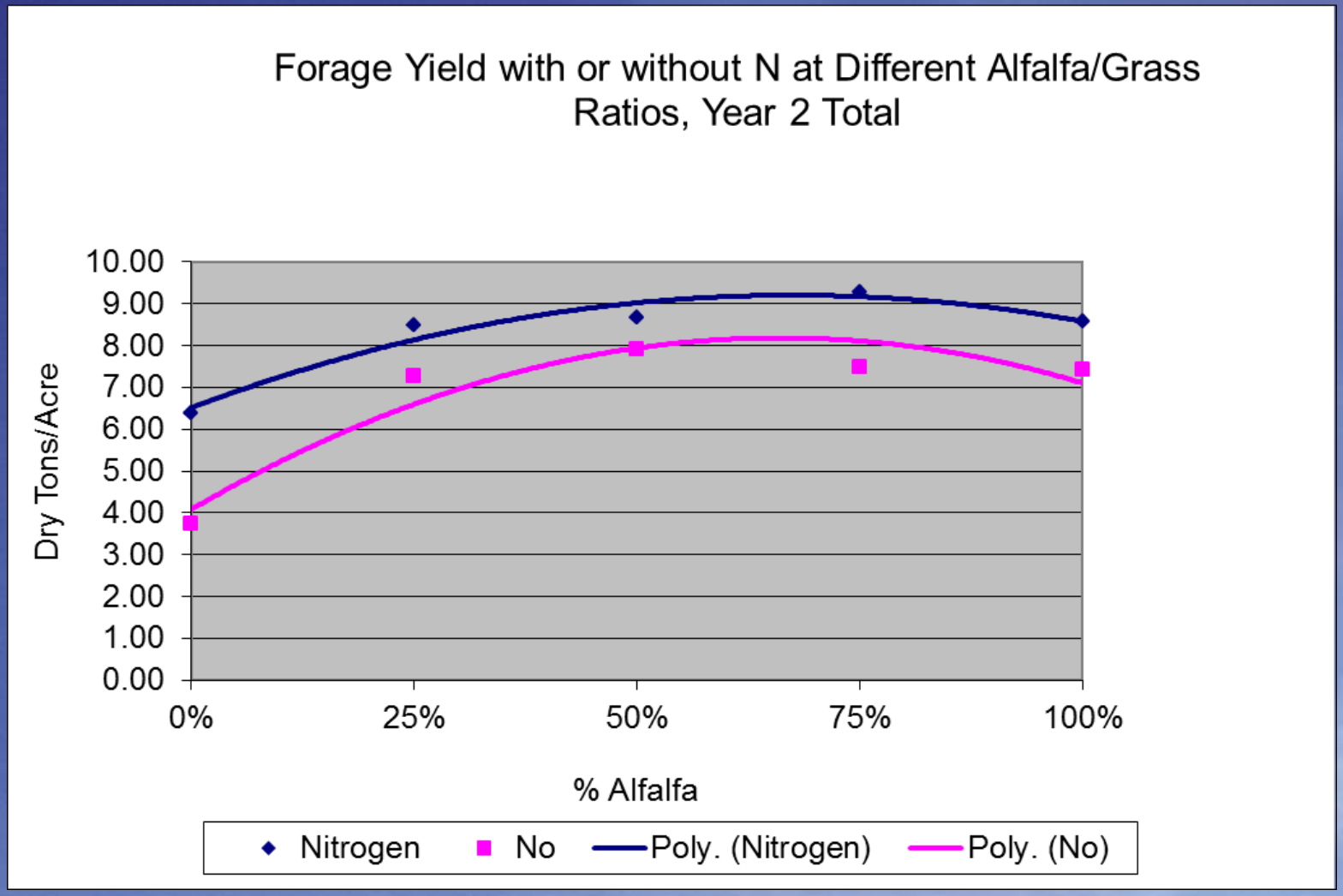

NDF of Forages in Iowa
70.0
65.0
60.0
55.0
50.0
45.0
40.0
1st Cutting
2nd Cutting
3rd Cutting
4th Cutting
BarElite
Barianne
Dovey
Baridana Orchard


NDF digestibility
70.0
65.0
60.0
55.0
50.0
45.0
40.0
1st Cutting
2nd Cutting
3rd Cutting
4th Cutting
BarElite
Barianne
Dovey
Baridana Orchard

2 Alfalfa vars with BarElite Tall Fescue, WI



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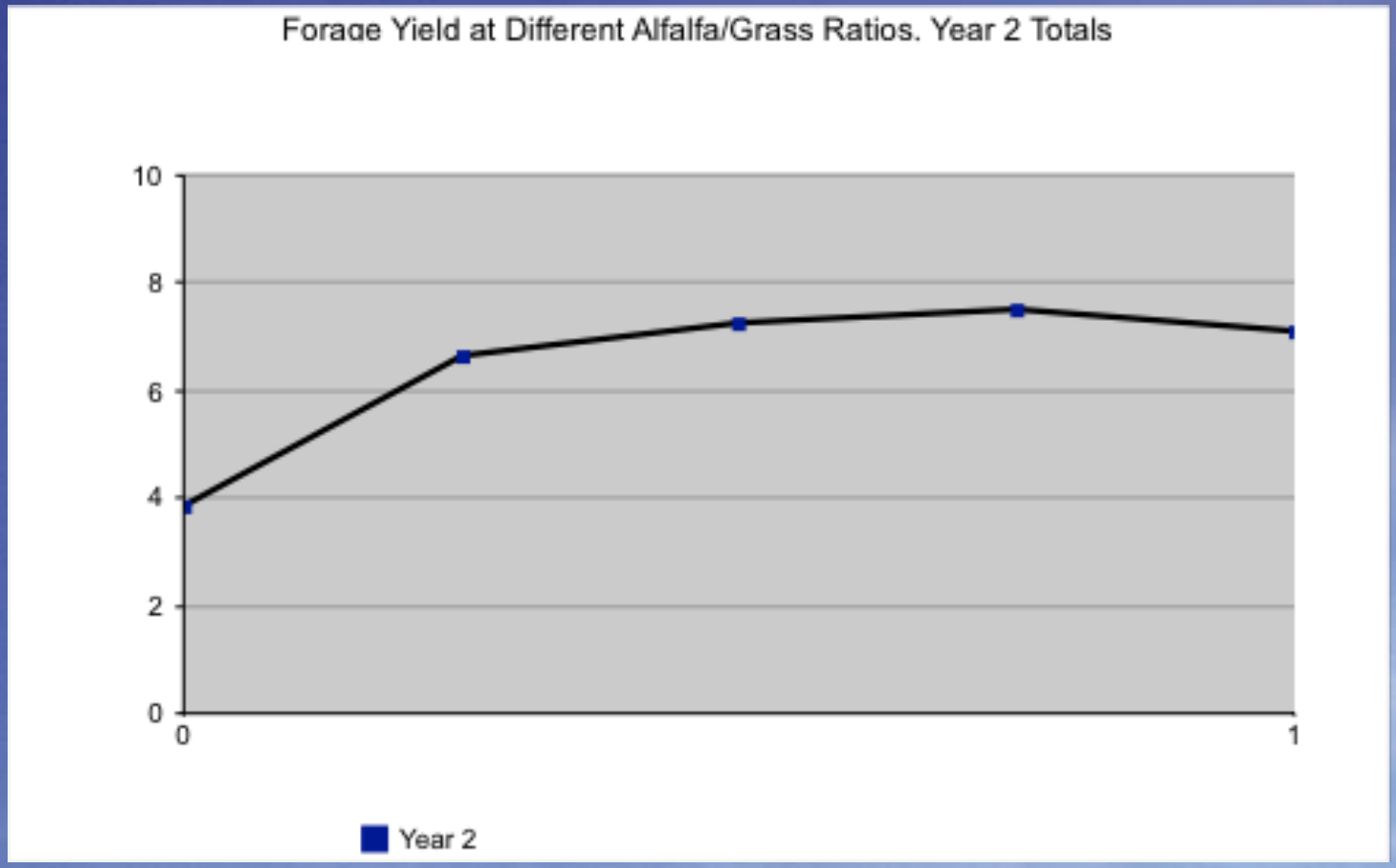
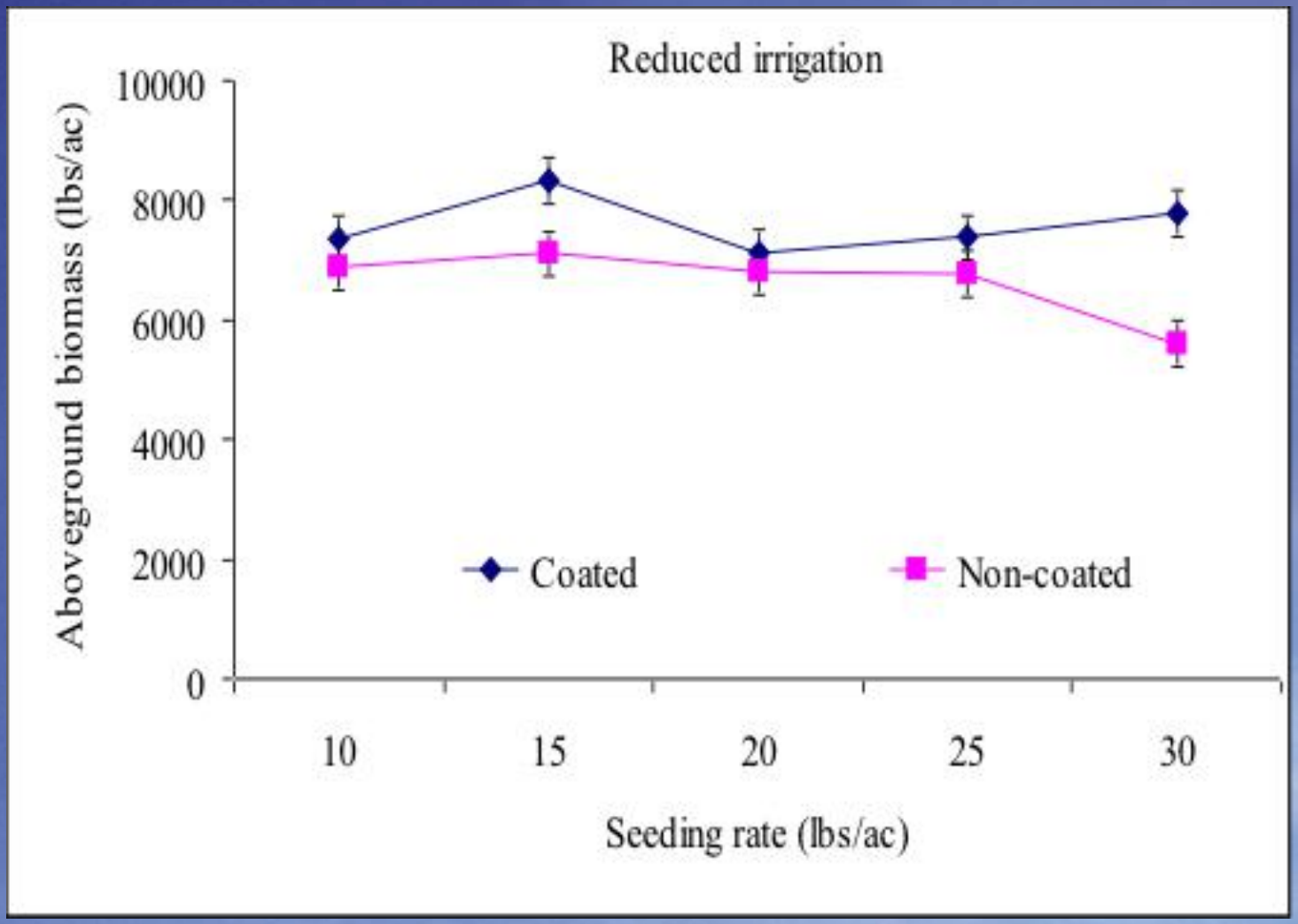
3 Alfalfa varieties with tall fescue (BTR 13), Wisconsin




YELLOW JACKET
ENHANCED SEED COATING

Yellow Jacket Coated Prosper tall fescue



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Recommendations

- Ideal grasses for planting with alfalfa should:
  - Match the maturity of alfalfa
    - Not too early……. And not too late.
  - Match the forage quality requirements of user
    - High Producing Dairy or Beef Hay/Silage /
    - Horse Hay
  - Have uniform forage quality throughout the season
  - Soft leaf late maturing tall fescues
    - Very late maturing orchard grass

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Performance of Dairy Cows on Alfalfa, Orchardgrass or Tall Fescue Silage.
Cherney et al. 2004 JDS

Silage NDFd	**48.3**	**72.7**	**48.3**	**68.9**	**54.3**

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Grass WITH Alfalfa

- E2 - 640
  - 2nd Generation Hybrid Alfalfa - 60%
  - Soft Leaf tall fescue 40%
  - Yellow Jacket
  - Silage Production
- E2 - 631
  - 2nd Generation Hybrid Alfalfa – 60%
  - Soft Leaf tall fescue 30%
  - Very late maturing orchard grass 10%
  - Yellow Jacket
  - Hay

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NutriFiber

Grasses for High Returns

- **GreenSpirit** ***Italian ryegrass***
  - Plant in fall or spring
  - harvest 4-5 times
  - Graze / Silage
  - Plant with Alfalfa, if thinning or winterkilled
- **E2** ***Alfalfa+Grass in one bag***
  - 640 for new seeding of alfalfa for Silage Production
  - 631 for new seeding of alfalfa for Hay Production
- **Milkway** ***Meadow + Soft leaf Fescue***
  - Interseed into existing alfalfa or plant alone
  - Graze / Silage for 4-6 years
- **STF-43** ***Soft leaf Fescue***
  - Improve thinning stands of alfalfa
  - Or Grow as Pure Stand for Silage or hay

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Questions?

Questions?

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