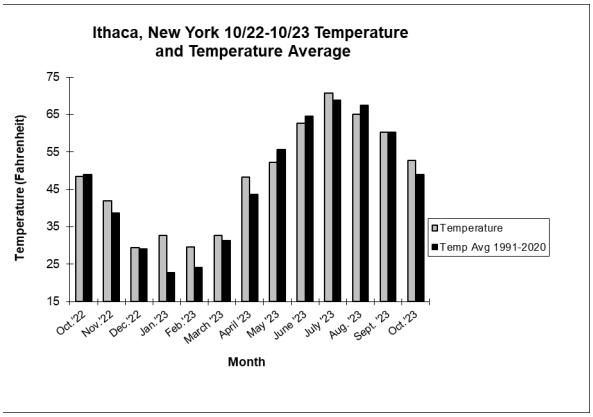
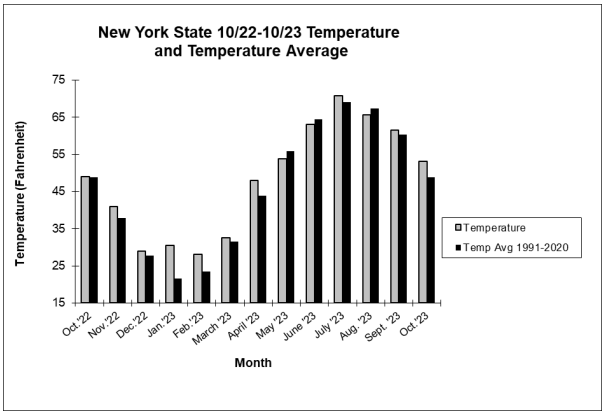
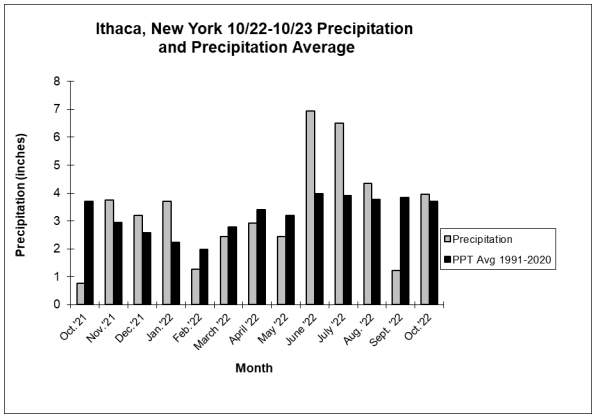
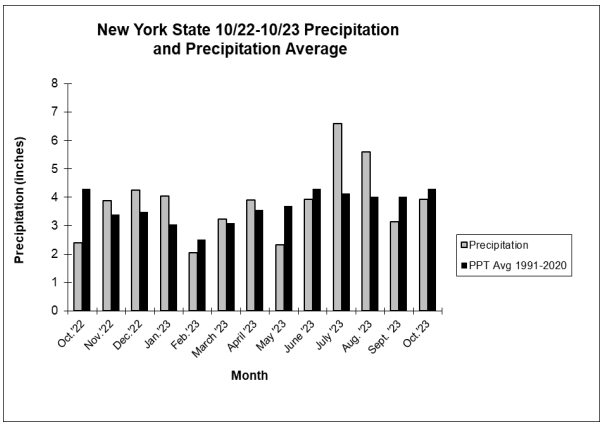
NEW YORK FORAGE LEGUME AND GRASS VARIETY YIELD TRIALS SUMMARY FOR 2023 – SEASON TOTALS

J. Hansen*, V. Moore, J. Chavez, J. Crawford, R. Crawford, S. Hanson, School of Integrative Plant Science, Plant Breeding and Genetics Section, College of Agriculture and Life Sciences, Cornell University, Ithaca, NY https://blogs.cornell.edu/varietytrials/forage/ Photo: Alfalfa trial harvest at Musgrave Research Farm, Aurora NY, Cornell University Agricultural Experiment Station.









Ithaca NY 10/22 to 10/23 temperature and precipitation avg. From 1991 to 2020. Weather data from the Northeast Regional Climate Center at Cornell U. http://www.nrcc.cornell.edu/regional/tables/tables.

New York State 10/22 to 10/23 temperature and precipitation, avg. from 1991 to 2020. Weather data from the Northeast Regional Climate Center at Cornell U. http://www.nrcc.cornell.edu/regional/tables/tables
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12/2023

Introduction Forage yield trials are planted and harvested annually at the Cornell University Agricultural Experiment Station in Ithaca and at other locations in New York State. Funding for these trials is from Cornell University Agricultural Experiment Station and from the companies that submitted the varieties/ cultivars in the trials. Most perennial forage trials are managed for four years; seeding year and three production years.

Alfalfa yields for 2023 averaged 4.1 tons per acre dry matter (0.9 tons more than 2022), red clover yields averaged 4.2 tons per acre dry matter (0.5 tons per acre more than 2022), and perennial forage grass yields averaged 3.1 tons per acre dry matter (0.4 tons per acre less than 2022).

Cultivar/Variety Selection

Plant breeders continue to develop new and improved varieties with better agronomic characteristics such as yield, disease and insect resistance, forage quality, etc. Seed cost of improved varieties can be higher than for other varieties, but this cost is generally offset when there is improved performance at each harvest over the life of the stand. In each New York trial, there is a group of top-yielding varieties. Variety performance should be critically evaluated by comparing yield with other varieties in two or more trials that are in the second or later year of production.

Weather and the 2023 Season: The 2022 alfalfa trials had poor stand establishment and thus were replanted in spring 2023. Forage trials in Ithaca NY successfully overwintered although there were only 58 out of 151 days with 1 inch or more of snow from November 2022 to March 2023 and snowfall was 22.3 inches below normal. In 2023, April was a warm dry month and was followed by cooler temperatures and low precipitation in May and early June. May 17-18 had a deep freeze that impacted area fruit farms. Starting June 13, Ithaca had 6.6 inches of rain for the remainder of the month, followed by a rainy July (6.5 inches or 2.6 inches above normal precipitation).

Thanks to the harvesting crew: Jesse Chavez, Ryan Crawford, Jamie Crawford, Abby Nonnenberg, Miguel Barrera, Ashton Pihl, Emileen Flores, Thomas Jacquot, Megan Williams, Erika Everest, Martin Ganev, Raksha Thapa, Leah Treffer, Ken Windstein and CUAES Farm Crews, including Farm managers Gene Sczepanski and Jeff Stayton.

Alfalfa (Tables 1 and 3, pages 3-5) varieties for New York usually need to have resistance (R) or high resistance (HR) to four diseases (bacterial wilt, Verticillium wilt, anthracnose, Phytophthora root rot). Varieties with fall dormancy rating greater than 4 will produce more forage in the fall and may have unacceptable winter-hardiness for New York, particularly in Northern New York.

The 2023 alfalfa, red clover and forage grass trials established well following planting in May. We expect to harvest these trials from 2024 to 2026. A limited number of potato leafhopper (PLH) resistant alfalfa varieties are tested in trials that are not sprayed with insecticide (page 4).

Red Clover (Table 2, page 4) is generally a two-production year crop in New York and is an excellent forage legume for short-rotation fields and for frost-seeding into established stands. The clover root curculio and the clover root borer are destructive pests on clover, eating the roots and destroying the plants in the later production years.

Grass yield (Tables 4, 5, and 6, pages 6-11) trials were fertilized with 315 lb/A ammonium sulfate in early April and after first, second and third harvests. Forage grass trials were harvested three or four times between May 23rd and October 27th. Grass yields by species for production year trials harvested 2023 are listed in summary **Table 4, pages 6-9**. Also listed are visual estimates of percent stand and heading date. Heading date is the calendar date when about 5 + seed heads at the boot stage were visible for each variety in one trial replicate. Use percent stand, heading date, and yield to select grass varieties that fit your forage program. Grass forage quality estimates from 2022 for the trials planted in 2020 and 2021 are presented in **Tables 6 and 7, pages 10-11**. Grass forage quality samples are taken at the first growth only (May/June), not at the other two or three harvests. When grass plants produce seed heads, the seed head stems lower forage quality. Samples from each variety are taken on two days – replicate samples on the day of harvest and replicate samples on the day of heading. Forage quality estimates from 2023 for trials planted in 2021 and 2022 will be available late winter.

See 2023 Cornell Guide for Integrated Field Crop Management for more detailed management information (http://fieldcrops.cals.cornell.edu/).

We express appreciation to the seed companies and forage breeding companies who test their forages in New York.

Trial applications for 2024 will be emailed to past trial participants in late January 2024. The applications will also be posted to the web: https://blogs.cornell.edu/varietytrials/forage/

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ALFALFA CULTIVAR YIELD TRIAL SUMMARY - NEW YORK - 2023

Table 1: NY Alfalfa Cultivar Yield Trial Results - 2023 Forage Yields

T/A = tons per acre dry matter; 5%LSD = to claim statistically significant yield differences between two cultivars, the yield difference must be equal to or greater than the CV = A statistical representation of the precision of a trial. Lower is better. Check cultivars are planted in every alfalfa trial except for Roundup Ready Trials. Checks are the cultivars Oneida VR, Vernal.

Ithaca, Tompkins County, Sown August 2020

Cultivars	2023 Total	3-Yr Total Season	3-Yr % of Cks.
	- tons per acre dry matter -		
SW5520Y	4.29	13.79	134
SW5509	4.35	13.77	134
SW4506	4.37	13.62	132
SW3407	4.05	13.44	130
SW4107	4.09	12.94	126
SW4412Y	4.09	12.86	125
SW4513	3.89	12.75	124
54VR10	4.04	12.63	123
MVS4220Q	3.84	12.60	122
MAGNUM 8-WET	3.80	12.34	120
REGEN	3.74	11.85	115
ALFABAR	3.51	11.54	112
ONEIDA VR	3.39	10.62	103
VERNAL	2.99	9.97	97
			Ck. Mean t/a
Mean (t/a)	3.89	12.39	10.30
5% LSD	0.30	0.76	
CV (%)	6.0	4.9	
Ithaca 2020 Experimentals			
FSG 420BR*	4.19	13.68	133
AFX174084*	4.19	13.45	131
AFX174082*	4.32	13.00	126

Summary statistics are for 20 trial entries.

Ithaca, Tompkins County, Sown May 2021

Cultivars	2023 Total	2-Yr Total Season	2-Yr % of Cks.
	- tons per acre dry matter -		
55V50	4.76	8.05	114
54Q29	4.84	7.94	113
HybriForce-4420/Wet	4.60	7.89	112
SW4515	4.66	7.69	109
FF42.A3	4.53	7.57	108
FSG 450	4.45	7.45	106
WL 349HQ	4.35	7.43	106
SW5615	4.34	7.25	103
ONEIDA VR	4.41	7.24	103
54Q16	4.39	7.16	102
6453Q	4.16	7.13	101
AFX 439	4.24	6.85	97
VERNAL	4.25	6.83	97
BISON	3.92	6.54	93
			Ck. Mean t/a
Mean (t/a)	4.44	7.36	7.04
5% LSD	0.41	0.72	
CV (%)	7.3	7.7	
Ithaca 2021 Experimentals			
SW5614*	4.63	7.66	109
SW5606*	4.41	7.34	104

Summary statistics are for 21 trial entries.

ROUNDUP READY ALFALFA TRIALS

Ithaca, Tompkins County, Sown May 2020

Released And Experimental Varieties	2023 Total	3-Yr Total Season	3-Yr % of Cks.
	T/A	T/A	
54VR10	4.29	13.75	109
AFX463-RR	3.95	12.87	102
AFX455-HVX	3.73	11.12	88
			Trial Mean (t/a)
Mean (t/a)	4.02	12.60	12.60
5% LSD	0.56	0.70	
CV (%)	10.1	4.0	

Summary statistics are for 4 trial entries.

Seeding Year, Crop	Soil series, # of harvests 2023
All trials at CUAES, Ithaca, Tompkins County, New York	
2020, Alfalfa	Williamson silt loam, 2 harvests
2021, Alfalfa	Bath and Valois soils, 3 harvests
2023, Alfalfa	Langford channery silt loam, 0 har.
2021, Red Clover	Bath and Valois, 3 harvests
2022, Red Clover	Hudson silty clay loam, 3 harvests
2023, Red Clover	Langford channery silt loam, 0 har.
2020, Forage Grass	Williamson silt loam, 3 harvests
2021,Grass Tim/Brome	Bath and Valois soils, 3 harvests
2021, Forage Grass	Williamson v.fine sandy loam, 4 har.
2022,Grass Tim/Brome	Hudson and Collamer silt loam,3 har.
2022, Forage Grass	Hudson silty clay loam, 4 harvests
2023, Forage Grass	Erie chippewa chan. silt loam, 0 har

ALFALFA CULTIVAR YIELD TRIAL SUMMARY - NEW YORK - 2023

Table 1 (con't): NY Alfalfa Cultivar Yield Trial Results - 2023 Forage Yields

INSECT RESISTANT ALFALFA TRIALS; Sown Ithaca NY 2020

2021 and 2022 trials were replanted in 2023.
PLH (Potato leafhopper) Damage Score - 1=minor to no damage; 5=severe damage
PLH populations were at moderate levels in 2023.
Oneida VR and Vernal are alfalfa cultivars susceptible to potato leafhopper.
Sown August 2020 T/A = Tons per acre dry matter

Released And Experimental Varieties	Tons per acre dry matter 2023 Total	3-Yr Total	% of Trial Mean 2023 Total	3-Yr Total	PLH Damage Score
	T/A	T/A			
55H96	4.01	12.69	112	111	1.2
SW4602LH*	3.94	12.28	110	108	1.1
BLUEBIRD	3.46	11.38	97	100	3.0
ONEIDA VR	3.40	10.72	95	94	4.1
VERNAL	3.17	10.47	88	92	4.4
			Trial Mean		
Mean	3.58	11.39	3.58 t/a	11.39 t/a	2.3
5% LSD	0.42	1.03			0.8
CV (%)	8.2	6.3			23.5

* Entered as an experimental population. Summary statistics are for 13 trial entries.

RED CLOVER CULTIVAR YIELD TRIAL SUMMARY - NEW YORK - 2023

Table 2: Red Clover Cultivar Yield Trials- 2023 CUAES, Ithaca, NY Tompkins Co.
Checks cultivars are Marathon and Cinnamon Plus.

RED CLOVER

Trial Sown May 2021 T/A = Tons per acre dry matter

Released And Experimental Cultivars	2023 Total	2 Yr. Total	% of Checks Mean 2023 Total	2 Yr. Total
	T/A	T/A		
Desire	4.79	8.55	106	105
Cinnamon Plus	4.61	8.41	102	103
Freedom!MR	4.53	8.39	100	103
CW040040	4.83	8.34	106	102
Raptor	4.55	8.32	100	102
BAR TP10	4.48	8.30	99	102
CW30091	4.59	8.29	101	102
Redkin	4.69	8.29	103	102
Blaze	4.44	8.17	98	100
TP-12	4.50	8.17	99	100
Evolve	4.43	8.15	98	100
Marathon	4.46	7.88	98	97
Barduro	3.58	6.88	79	84
			Ck.Mean t/a	Ck.Mean t/a
Mean	4.49	8.15	4.54	8.15
5% LSD	0.47	0.70		
CV (%)	7.4	6.1		

Summary statistics are for 16 trial entries.

RED CLOVER

Trial Sown May 2022 T/A = Tons per acre dry matter

Released And Experimental Cultivars	2023 Total t/a	% of Cks Mean 2023 Total
Ruby Red	4.90	127
20-LARC-1	4.44	115
BY-RC31	4.27	111
Medallion	4.13	107
Evolve	4.03	105
Marathon	3.95	103
Redkin	3.80	99
Cinnamon Plus	3.75	97
		Ck. Mean t/a
Mean	3.99	3.85
5% LSD	0.64	
CV (%)	11.4	

Summary statistics are for 17 trial entries.

RED CLOVER

Trial Sown May 2023 (not harvested in 2023)

Released And Experimental Cultivars	Entered By:
Cinnamon Plus	check
CW040040	Barenbrug
CW202	Barenbrug
Evolve	DLF USA
FF9615	check
Freedom!MR	check
GA-9908	Smith Seed Service
Marathon	check
Medallion	DLF USA
Redkin	DLF USA
SERV-V15	Smith Seed Service
Starfire II	check

Table 3: Alfalfa Cultivar Features and Red Clover Marketing / Trial Entrant Company.

For more information log on to the Web: https://blogs.cornell.edu/varietytrials/forage/

Cultivars listed are currently tested in Cornell Alfalfa Trials. Yield data for cultivars in new trial seedings will be available next year.

			Disease Resistance Ratings*					Marketing Co.	
Alfalfa Cultivar	**Marketing Company**	**FD**	**BW**	**VW**	**FW**	**AN**	**PRR**	**Phone Number**	**Web or E-mail Address**
342LH	Albert Lea	4	HR	HR	HR	R	R	800-352-5247	www.alseed.com
FINCH	Albert Lea	5	HR	HR	HR	HR	HR		
VIKING 374HD	Albert Lea	4	HR	HR	HR	HR	HR		
VIKING 394AP	Albert Lea	4	HR	HR	HR	HR	HR		
AFX 439	Alforex	4	HR	HR	HR	HR	HR	877-560-5181	www.alforexseeds.com
AFX455-HVX	Alforex	4	HR	HR	HR	HR	R		
AFX463-RR	Alforex	4	HR	HR	HR	HR	HR		
ALFABAR	Barenbrug	4,3,2	HR	HR	HR	HR	HR	800-547-4101	www.barusa.com
BLUEBIRD	Blue River Organic Seed	5	HR	HR	HR	HR	HR	800-370-7979	www.blueriverorgseed.com
HYBRIFORCE-4420 WET	Dairyland Seed Co.	4	HR	HR	HR	HR	HR	800-236-0163	www.dairylandseed.com
MAGNUM 8 WET	Dairyland Seed Co.	4	HR	HR	HR	HR	HR		
FF 42.A3	LaCrosse Seed	4	HR	HR	HR	HR	HR	800-328-1909	www.lacrosseseed.com
MVS4220Q	Mountain View Seeds	4	HR	HR	HR	HR	HR	503-588-7333	www.mtviewseeds.com
6453Q	Nexgrow	4	HR	HR	HR	HR	HR	800-568-5424	www.plantnexgrow.com
54Q16	Pioneer Hi-Bred	4	HR	HR	HR	HR	HR	800-247-6803	www.pioneer.com
54Q29	Pioneer Hi-Bred	4	HR	HR	R	HR	HR		
54VQ52	Pioneer Hi-Bred	4	HR	HR	R	HR	HR		
54VR10	Pioneer Hi-Bred	4	HR	HR	R	HR	HR		
54VR12	Pioneer Hi-Bred								
55H96	Pioneer Hi-Bred	5	HR	R	HR	HR	HR		
REGEN	Seedway	3	R	HR	HR	HR	R	800-836-3710	www.seedway.com
FSG 450	Seedway	4	HR	HR	HR	HR	HR		
BISON	Thomas Ag Services	3	R	R	R	R	R	541-497-5010	
SW3407	Alfalfa Partners	3	HR	HR	HR	HR	HR	720-506-9191	www.alfalfapartners.com
SW4107	Alfalfa Partners	4	HR	HR	HR	HR	HR		
SW4412Y	Alfalfa Partners	4	HR	HR	HR	HR	HR		
SW4506	Alfalfa Partners	4	HR	HR	HR	HR	HR		
SW4513	Alfalfa Partners								
SW4515	Alfalfa Partners	4	HR	HR	HR	HR	HR		
SW525LH	Alfalfa Partners	5	HR	HR	HR	HR	HR		
SW4602LH	Alfalfa Partners	4	HR	HR	HR	HR	HR		
SW5509	Alfalfa Partners	5	HR	HR	HR	HR	HR		
SW5511	Alfalfa Partners	5	HR	HR	HR	HR	HR		
SW5520Y	Alfalfa Partners	5	HR	HR	HR	HR	HR		
SW5615	Alfalfa Partners	5	HR	HR	HR	HR	HR		

*Disease ratings were provided by source companies, and from standard national tests.

Disease ratings code: HR = High resistance (50% or more of the plants resistant), R= Resistance (31-50% resistant), MR = Moderate resistance

FD = fall dormancy. Fall Dormancy ratings of 2,3 or 4 are recommended for New York State.

Cultivars rated R or HR to BW, VW, and Prr should have sufficient disease resistances to perform well in New York State.

*BW - bacterial wilt, VW-Verticillium wilt, FW-Fusarium wilt, An-Anthracnose, Prr-Phytophthora root rot

Red Clover Trial Entry	**Company (see page 9 for contant information.**
Ruby Red	Albert Lea Seed
Desire	Bailey Seed and Grain
Freedom!MR	Barenbrug
BAR TP10	Barenbrug
CW30091	Barenbrug
CW040040	Barenbrug
Barduro	Barenbrug
BY-RC31	Brett Young
Raptor	Columbia Seeds
Evolve	DLF USA
TP-12	DLF USA
Redkin	DLF USA
Evolve	DLF USA
Medallion	DLF USA
Redkin	DLF USA
Blaze	Mountain View Seeds

PERENNIAL FORAGE GRASS CULTIVAR YIELD TRIAL SUMMARY - NEW YORK - 2023

Table 4: 2023 Perennial Forage Grass Yield Summary (T/A - tons per acre dry matter)

Ithaca, Tompkins Co., Sown 2020, 2021, 2022,2023

Heading date is date when 5 heads in a 3.5 x 16 foot plot were visible.

LSD(0.05) = to claim statistically significant yield differences between two cultivars, the yield difference must be equal to or greater than the LSD. Ammonium sulfate was applied at 315 lb/acre after each harvest.

Above normal temperatures in May 2022 and drought in May and June 2022 may have delayed grass heading.

		2023			2022		2021		
Species/Cultivar	**Marketer**	**Total Season**	**% Stand Oct./Nov.**	**Heading Date**	**Total Season**	**Heading Date**	**Total Season**	**Heading Date**	**2 or 3 Yr Yield**
		T/A			T/A		T/A		T/A
Orchardgrass		**Sown August 10, 2020**							
Potomac	check	2.75	74	15-May	4.35	14-May	6.17	17-May	13.27
Pennlate	check	2.63	73	17-May	4.54	14-May	6.04	18-May	13.21
Harvestar	Columbia Seeds/ Radix Res.	2.55	69	18-May	4.15	17-May	6.35	20-May	13.05
OG 96	DLF USA	2.52	65	25-May	4.08	19-May	6.26	22-May	12.86
OG 80	DLF USA	2.27	65	18-May	4.00	19-May	6.13	22-May	12.41
Ammo	Barenbrug	2.45	75	17-May	4.04	14-May	5.90	17-May	12.39
Intensiv	Barenbrug	2.12	66	29-May	3.52	25-May	5.85	23-May	11.49
BAR DGLF 2095	Barenbrug	2.32	70	1-Jun	3.99	29-May	5.08	28-May	11.38
BAR DGLF 2094	Barenbrug	2.16	74	29-May	3.75	27-May	5.09	26-May	10.99
	LSD(.05)	0.18	7		0.25		0.33		0.49
Orchardgrass		**Sown May 18, 2021**							
Rushmore II	Mountain View Seeds	3.99	68	15-May	4.93	4-Jun			8.92
Bighorn	Mountain View Seeds	3.79	74	24-May	5.10	4-Jun			8.89
Persist	Smith Seeds	3.81	69	15-May	4.96	14-May			8.77
Pennlate	check	3.76	74	15-May	4.97	17-May			8.73
Potomac	check	3.68	68	13-May	4.91	21-May			8.59
Persist II	Smith Seeds	3.74	74	15-May	4.69	14-May			8.43
Alpine	Mountain View Seeds	3.57	63	29-May	4.74	29-May			8.31
Everlast	Seedway	3.54	74	19-May	4.65	21-May			8.19
OG96	DLF USA	3.37	65	29-May	4.81	2-Jun			8.18
Captur	DLF USA	3.19	69	1-Jun	4.55	29-May			7.74
	LSD(.05)	0.29	9		0.36				0.55
Orchardgrass		**Sown May 26, 2022**							
Potomac	check	3.89	84	11-May					
OG 96	DLF USA	3.77	79	23-May					
Captur	DLF USA	3.62	79	23-May					
Pennlate	check	3.54	83	11-May					
BAR DGL 22098	Barenbrug	3.53	81	17-May					
RAD-LCF54	Bailey Seed & Grain	3.52	83	22-May					
Intensiv	Barenbrug	3.28	86	1-Jun					
BAR DGL 22099	Barenbrug	3.18	86	19-May					
Ammo	Barenbrug	3.10	84	16-May					
Barlegro	Barenbrug	3.05	84	29-May					
	LSD(.05)	0.25	4						
Meadow Fescue		**Sown August 10, 2020**							
Pradel	Barenbrug	2.46	69	23-May	3.88	21-May	6.65	22-May	12.98
Pradel	check	2.45	68	23-May	3.73	21-May	6.61	22-May	12.79
BAR81d	Barenbrug	2.36	65	24-May	3.93	25-May	6.43	22-May	12.72
BAR FPF 82	Barenbrug	2.41	74	25-May	3.78	21-May	5.97	22-May	12.15
Driftless	Barenbrug	2.46	69	25-May	3.71	21-May	5.94	23-May	12.11
BAR FPF 77-2	Barenbrug	2.14	73	24-May	3.75	25-May	5.69	23-May	11.58
BAR FP 2044	Barenbrug	1.75	63	25-May	2.58	21-May	6.55	23-May	10.87
	LSD(.05)	0.22	5		0.29		0.49		0.75

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Above normal temperatures in May 2022 and drought in May and June 2022 may have delayed grass heading.

		2023			2022		2021		
Species/Cultivar	**Marketer**	**Total Season**	**% Stand Oct./Nov.**	**Heading Date**	**Total Season**	**Heading Date**	**Total Season**	**Heading Date**	**2 or 3 Yr Yield**
		T/A			T/A		T/A		T/A
Tall Fescue		**Sown August 10, 2020**							
FTF 118	DLF USA	2.80	65	22-May	4.92	17-May	7.69	22-May	15.40
FTF 119	DLF USA	2.81	73	22-May	4.87	19-May	7.19	20-May	14.87
Aprilia	BrettYoung	2.70	71	25-May	4.67	21-May	7.35	22-May	14.72
Armory	Barenbrug	2.81	75	19-May	4.45	19-May	7.29	20-May	14.55
BAR FAF 146	Barenbrug	2.85	71	22-May	4.59	21-May	7.02	22-May	14.46
BAR FAF 137	Barenbrug	2.39	74	25-May	4.66	25-May	6.94	23-May	13.98
KY-31+	check	2.74	65	18-May	3.94	17-May	7.30		13.98
BAR FAF 135	Barenbrug	2.25	74	23-May	4.36	25-May	6.61	23-May	13.21
BAR FAFL 239	Barenbrug	2.56	73	18-May	4.16	21-May	6.36	22-May	13.07
Bariane	Barenbrug	2.29	73	29-May	4.23	27-May	6.48	25-May	12.99
7 FACF 82	Barenbrug	2.15	70	25-May	4.07	25-May	6.58	25-May	12.80
BAR FA 9125	Barenbrug	1.92	74	18-May	3.34	25-May	5.27	25-May	10.53
	LSD(.05)	0.29	5		0.27		0.34		0.66
Tall Fescue		**Sown May 18, 2021**							
Triumphant	DLF USA	3.89	71	15-May	5.32	17-May			9.21
Teton II	Mountain View Seeds	3.77	69	15-May	5.30	17-May			9.07
Dominate	Seedway	3.71	71	18-May	5.32	17-May			9.03
Cajun II	Smith Seeds	3.87	74	19-May	5.10	17-May			8.96
Greendale	DLF USA	3.70	75	29-May	5.19	21-May			8.89
FTF 96	DLF USA	3.50	73	24-May	5.12	21-May			8.62
SETFPC-5BK	Smith Seeds	3.60	76	22-May	5.01	19-May			8.62
KY-31	check	3.55	76	22-May	5.06	17-May			8.61
SETFN97	Smith Seeds	3.39	75	24-May	4.99	19-May			8.38
Ranchero	Smith Seeds	3.48	78	19-May	4.67	19-May			8.15
Fawn	check	3.53	78	18-May	4.37	17-May			7.91
	LSD(.05)	0.17	6		0.26				0.34
Tall Fescue		**Sown May 26, 2022**							
Triumphant	DLF USA	4.23	83	11-May					
KY-31	check	3.51	78	18-May					
RGT Onctuosa	BrettYoung	3.48	78	23-May					
RAD-ERFH82	Columbia Seeds	3.43	81	18-May					
Greendale	DLF USA	3.34	76	22-May					
Fawn	check	3.33	80	16-May					
FTF 96	DLF USA	3.11	75	19-May					
Kiowa	BrettYoung	2.92	65	22-May					
Hyperbola (M.Fes.)	DLF USA	2.36	61	22-May					
	LSD(.05)	0.45	12						
Festulolium		**Sown May 18, 2021**							
FPF 7	DLF USA	3.88	76	19-May	4.65	17-May			8.53
FPF 8	DLF USA	3.50	74	29-May	4.94	25-May			8.44
Lenor	Columbia Seeds	3.60	74	1-Jun	4.41	27-May			8.01
Pradel (M.Fes.)	check	2.88	65	29-May	4.58	21-May			7.47
Tatran	Columbia Seeds	2.29	71	1-Jun	4.62	27-May			6.90
Spring Green	check	2.07	73	1-Jun	3.70	25-May			5.77
Sugarcrest	Mountain View Seeds	1.97	71	29-May	3.32	25-May			5.29
	LSD(.05)	0.29	6		0.46				0.65
Festulolium		**Sown May 26, 2022**							
FPF 7	DLF USA	3.47	78	17-May					
Tatran	Columbia Seeds	3.22	85	29-May					
Lenor	Columbia Seeds	3.08	74	23-May					
FPF 8	DLF USA	3.04	79	22-May					
Spring Green	check	2.79	86	23-May					
Sugarcrest	Mountain View Seeds	2.68	84	23-May					
Hyperbola (M.Fes.)	DLF USA	2.59	58	22-May					
Pradel (M.Fes.)	check	2.53	50	22-May					
	LSD(.05)	0.49	11						

PERENNIAL FORAGE GRASS CULTIVAR YIELD TRIAL SUMMARY - NEW YORK - 2023

PERENNIAL FORAGE GRASS CULTIVAR YIELD TRIAL SUMMARY - NEW YORK - 2023

Table 4: 2023 Perennial Forage Grass Yield Summary (T/A - tons per acre dry matter)

Ithaca, Tompkins Co., Sown 2020, 2021, 2022, 2023

Heading date is date when 5 heads in a 3.5 x 16 foot plot were visible.

LSD(0.05) = to claim statistically significant yield differences between two cultivars, the yield difference must be equal to or greater than the LSD. Ammonium sulfate was applied at 315 lb/acre after each harvest.

Above normal temperatures in May 2022 and drought in May and June 2022 may have delayed grass heading.

			2023			2022		2021		
Species/Cultivar	**Marketer**		**Total Season**	**% Stand Oct./Nov.**	**Heading Date**	**Total Season**	**Heading Date**	**Total Season**	**Heading Date**	**2 or 3 Yr Yield**
			T/A			T/A		T/A		T/A
Perennial Ryegrass			**Sown August 10, 2020**							
Spring Green (Fest.)	check		1.93	66	29-May	2.74	25-May	6.79	23-May	11.46
Remington	Barenbrug		1.49	69	7-Jun	2.91	2-Jun	5.97	28-May	10.37
Linn	check		1.87	63	18-May	2.78	17-May	5.00	20-May	9.65
Remington NEA2	Barenbrug		1.43	73	7-Jun	2.43	2-Jun	5.66	28-May	9.52
TetraSweet	MVS/ Peak Plant Genetics		1.41	64	1-Jun	2.42	25-May	5.53	23-May	9.36
Calibra	check		1.30	66	1-Jun	2.81	27-May	5.23	25-May	9.34
		LSD(.05)	0.12	6		0.59		0.35		0.63
Perennial Ryegrass			**Sown May 18, 2021**							
Tetramag	Mountain View Seeds		2.25	66	1-Jun	4.00	27-May			6.25
UGA E+	Mountain View Seeds		1.98	75	7-Jun	3.60	2-Jun			5.58
Remington	Barenbrug		2.13	80	7-Jun	3.37	2-Jun			5.49
GPT14021	Mountain View Seeds		1.96	73	7-Jun	3.40	2-Jun			5.37
Remington NEA2	Barenbrug		2.02	78	7-Jun	3.31	2-Jun			5.33
Tetrasweet	Mountain View Seeds		1.88	69	1-Jun	3.39	27-May			5.27
		LSD(.05)	0.16	7		0.37				0.38
GPT14021 = UGA E+										
Timothy			**Sown May 18, 2021**							
KY-Early	check		5.07	75	25-May	5.00	23-May			10.07
Conquest	Seedway		4.88	71	25-May	4.65	23-May			9.53
Valor	DLF USA		4.85	65	29-May	4.67	23-May			9.52
Zenyatta	DLF USA		4.87	73	25-May	4.38	23-May			9.24
Carson	Mountain View Seeds		4.44	76	29-May	4.41	27-May			8.84
Express II	Seedway		4.07	70	2-Jun	4.41	4-Jun			8.48
Barfleo	Barenbrug		4.27	66	2-Jun	3.96	2-Jun			8.23
PolarKing	BrettYoung		3.62	68	7-Jun	3.78	2-Jun			7.40
Baronaise	Barenbrug		3.02	65	13-Jun	3.72	4-Jun			6.74
Climax	check		2.77	73	13-Jun	3.73	4-Jun			6.49
		LSD(.05)	0.57	8		0.54				1.01
Timothy			**Sown May 20, 2022**							
Zenyatta	DLF USA		4.99	80	22-May					
BAR PHL 22KOO	Barenbrug		4.83	79	1-Jun					
Sahara DT	DLF USA		4.81	85	29-May					
Valor	DLF USA		4.69	84	25-May					
BarFleo	Barenbrug		4.28	86	5-Jun					
BAR PHL 22SEN	Barenbrug		3.84	84	1-Jun					
Hertta	BrettYoung		3.69	79	11-Jun					
Baronaise	Barenbrug		3.59	80	11-Jun					
Climax	check		3.42	84	7-Jun					
		LSD(.05)	0.35	5						
Bromegrass			**Sown May 18, 2021**							
Stratus	Allied		3.96	66	15-May	3.90	18-May			7.86
Barricade	Barenbrug		4.32	61	25-May	3.43	18-May			7.75
Peak	Allied		4.24	70	18-May	3.45	18-May			7.68
S9549	BrettYoung		4.22	61	15-May	3.44	18-May			7.66
S9356M	BrettYoung		3.63	45	17-May	3.15	18-May			6.78
		LSD(.05)	0.57	7		0.69				1.21
Bromegrass			**Sown May 20, 2022**							
S9549	BrettYoung		4.77	86	11-May					
Artillery	Barenbrug		4.73	88	19-May					
Peak	Allied		4.65	86	18-May					
Arsenal	Barenbrug		4.59	84	11-May					
Barricade	Barenbrug		4.42	80	11-May					
Stratus	Allied		4.24	85	11-May					
S9356M	BrettYoung		3.49	85	18-May					
Baruzzo	Barenbrug		3.04	85	16-May					
		LSD(.05)	0.59	5						

SHORT-LIVED FORAGE GRASS CULTIVAR YIELD TRIAL SUMMARY - NEW YORK - 2023

Table 4: 2023 Perennial Forage Grass Yield Summary (T/A - tons per acre dry matter)
Ithaca, Tompkins Co., Sown 2022, 2023
Heading date is date when 5 heads in a 3.5 x 16 foot plot were visible.
LSD(0.05) = to claim statistically significant yield differences between two cultivars, the yield difference must be equal to or greater than the LSD. Ammonium sulfate applied at 315 lb/acre after each harvest.

Short-lived Ryegrass Trial

Sown May 2022 Tailby 2 Variety	Marketer	2023 Total Season	2023 Heading Date	2023 % Stand 12/15/2023	2022 Total Season
		T/A			T/A
Halsey	Smith Seed Services	3.03	22-May	55	1.80
Dexter	Smith Seed Services	3.02	25-May	60	1.28
Meroa	Smith Seed Services	2.95	22-May	63	1.50
DynaPlus	Columbia Seeds/ Peak	2.94	22-May	5	1.64
GrazeKeeper	Smith Seed Services	2.87	25-May	48	1.30
SELWT19-9	Smith Seed Services	2.80	25-May	50	1.47
Green Spirit	Barenbrug	2.77	22-May	65	1.32
FrostProof	Smith Seed Services	2.77	18-May	3	1.51
KAIR12 TE	Burlingham Seeds.	2.73	19-May	18	1.50
KAIR DS	Burlingham Seeds.	2.68	18-May	18	1.62
Mantis	Smith Seed Services	2.68	18-May	1	1.80
KAIR 12DT	Burlingham Seeds.	2.68	18-May	3	1.47
Mervana	BrettYoung	2.66	22-May	73	1.36
ThS2x18BK	Smith Seed Services	2.64	18-May	2	1.80
AMP	Columbia Seeds/ Peak	2.63	18-May	1	1.70
SELWD19-7	Smith Seed Services	2.58	18-May	4	1.63
SELWTDWL 1	Smith Seed Services	2.54	18-May	3	1.57
Gulf	Smith Seed Services	2.30	18-May	4	1.27
SATSUKIBARE EX	Burlingham Seeds.	2.29	19-May	9	1.20
Feast II	check	2.21	25-May	63	1.85
	LSD(.05)	0.29			0.48

Short-lived Ryegrass Trial

Sown May 2023 Ketola 1 Variety	Marketer	2023 Har. 1 7-Aug	2023 Har. 2 24-Oct	Total Season
		T/A	T/A	T/A
Feast II	check	0.26	1.43	1.69
Allure	BrettYoung Seeds	0.26	1.37	1.63
Gulf	Smith Seed Services	0.23	1.01	1.24
Green Spirit	Barenbrug	0.21	1.36	1.57
	LSD(.05)	0.07	0.31	0.34

Company Name	Phone	Web address
Albert Lea Seed	800-352-5247	www.alseed.com
Allied Seed, L.L.C.	208-250-6321	www.alliedseed.com
Bailey Seed and Grain	800-407-7713	www.baileyseed.com
Barenbrug	800-547-4101	www.barusa.com
Blue River Organic Seed	800-370-7979	www.blueriverorgseed.com
Brett Young	800-665-5015	www.brettyoung.ca
Columbia Seeds	888-681-7333	www.columbiaseeds.com
DLF USA Inc.	800-445-2251	www.dlfis.com/
Grassland Oregon	503-566-9900	www.grasslandoregon.com
GROWMARK FS	800-787-2767	www.growmarkfs.com/midatlantic
LaCrosse Seed	800-328-1909	www.lacrosseseed.com
Mountain View Seeds	503-588-7333	www.mtviewseeds.com/
OreGro	541-258-1001	www.oregroseeds.com/
Preferred Seed	716-895-7333	www.preferredseed.com
Pure Seed	503-651-2130	www.pureseed.com
S&W Seed Co.	855-767-4486	www.swseedco.com
Seedway	800-836-3710	www.seedway.com
Smith Seed Services	888-550-2930	www.smithseed.com

Perennial Forage Grass Varieties - 2022 Forage Quality, Maturity and Yield at Spring Growth Boot Stage (See Table 5 below)

For the first two production years of each grass trial sown, samples for forage quality analyses were taken from each grass variety. Two samples were taken at boot stage or when seed heads were first visible. The data from these samples can be used to compare forage quality of varieties at approximately the same stage of maturity, however on different days.

Grasses increase in fiber concentration (%NDF) and decrease in fiber digestibility (%NDFd) by advancing calendar date and by increasing temperatures. Harvest grass at boot stage for optimum forage quality. Choose grass varieties first by species based on species agronomic characteristics, then by date of boot stage based on planned date of harvest, then by yield and forage quality (low fiber, high fiber digestibility). Predictions of milk per acre, milk per ton, and relative feed quality were found to be very highly correlated with %NDF and yield, thus are no longer reported.

The samples taken in 2023 will be analyzed and reported on in 2024. Forage analyses have been discontinued for 2023 plantings and beyond.

Table 5: Spring Forage Quality Data for Grass Varieties (2022 Trial Samples)

Trial Sown 2020 Boot Stage in 2022	Date at Boot Stage	% NDF	% NDFD
Perennial Ryegrass			
Linn	17-May	47	84
TetraSweet	25-May	42	87
Spring Green (Fest.)	25-May	48	83
Calibra	27-May	41	88
Remington	2-Jun	47	82
Remington NEA2	2-Jun	49	81
Tall Fescue			
KY-31+	17-May	52	85
FTF 118	17-May	55	80
Armory	19-May	54	78
FTF 119	19-May	54	79
BAR FAF 146	21-May	57	77
BAR FAFL 239	21-May	54	75
Aprilia	21-May	54	78
BAR FA 9125	25-May	53	78
BAR FAF 135	25-May	56	76
BAR FAF 137	25-May	56	75
7 FACF 82	25-May	55	76
Bariane	27-May	55	76
Meadow Fescue			
BAR FP 2044	21-May	49	87
Driftless	21-May	54	84
BAR FPF 82	21-May	55	84
Pradel	21-May	53	85
Pradel	21-May	55	84
BAR FPF 77-2	25-May	60	81
BAR81d	25-May	59	80
Orchardgrass			
Ammo	14-May	53	88
Pennlate	14-May	57	88
Potomac	14-May	56	87
Harvestar	17-May	58	86
OG 96	19-May	55	86
OG 80	19-May	57	87
Intensiv	25-May	58	83
BAR DGLF 2094	27-May	63	82
BAR DGLF 2095	29-May	63	80

Trial Sown 2021 Boot Stage in 2022	Date at Boot Stage	% NDF	% NDFD
Perennial Ryegrass			
Tetramag	27-May	39	89
Tetrasweet	27-May	39	90
GPT14021	2-Jun	42	78
Remington	2-Jun	45	77
Remington NEA2	2-Jun	47	76
UGA E+	2-Jun	48	76
Tall Fescue			
Cajun II	17-May	48	83
KY-31	17-May	47	85
Fawn	17-May	49	83
Dominate	17-May	52	82
Triumphant	17-May	47	85
Teton II	17-May	50	83
Ranchero	19-May	48	83
SETFN97	19-May	49	83
SETFPC-5BK	19-May	49	82
Greendale	21-May	53	78
FTF 96	21-May	52	81
Festulolium			
FPF 7	17-May	47	86
Pradel (M.Fescue)	21-May	45	89
FPF 8	25-May	53	77
Spring Green	25-May	41	88
Sugarcrest	25-May	42	87
Lenor	27-May	54	79
Tatran	27-May	43	86
Orchardgrass			
Persist	14-May	53	90
Persist II	14-May	53	88
Pennlate	17-May	56	88
Everlast	21-May	56	85
Potomac	21-May	56	85
Captur	29-May	62	82
Alpine	29-May	60	84
OG96	2-Jun	60	72
Bighorn	4-Jun	63	81
Rushmore II	4-Jun	64	80
Timothy			
KY-Early	23-May	47	86
Conquest	23-May	51	85
Zenyatta	23-May	53	84
Valor	23-May	51	86
Carson	27-May	56	83
PolarKing	2-Jun		
Barfleo	2-Jun	60	77
Baronaise	4-Jun	55	82
Climax	4-Jun	58	80
Express II	4-Jun	59	78
Bromegrass			
Peak	18-May		
Stratus	18-May	55	87
S9549	18-May	53	88
Barricade	18-May	49	87
S9356M	18-May	45	93

Perennial Forage Grass Varieties - 2022 Forage Quality, Maturity and Yield at Spring Growth at Harvest 1 (See Table 6 below)

Two samples were taken from each variety just prior to first harvest. The data from these samples can be used to compare forage quality of varieties on the same day, but at different stages of maturity. Varieties are sorted from earliest heading date to latest heading date within each trial.

Grass varieties that are harvested prior to boot stage such that the seed heads are not harvested in the first cutting, will have seed head emergence at the second harvest. Varieties with seed heads at second harvest can be expected to have lower forage quality at second harvest compared to a variety that does not have seed head emergence at that harvest. Samples were not taken for analyses at the second harvest.

Samples from 2023 will be analyzed and forage quality reported in 2024.Forage quality analyses discontinued for 2023 plantings and beyond.

Table 6: 2022 Spring, First Harvest Forage Quality Data for Grass Varieties

	Trial Sown 2020 First Harvest in 2022- May 31					Trial Sown 2021 First Harvest in 2022-June 2				
	Yield (t/a) Harvest 1	% NDF	% NDFD	% Seed Heads at Harvest 2	2022 Aftermath Forage Yield (t/a)	Yield (t/a) Harvest 1	% NDF	% NDFD	% Seed Heads at Harvest 2	2022 Aftermath Forage Yield (t/a)
Perennial Ryegrass						**Perennial Ryegrass**				
Linn	0.86	66	67	0	1.92	Tetramag	1.59	47	76	90	2.41
TetraSweet	0.62	50	79	15	1.80	Tetrasweet	1.15	43	77	23	2.24
Spring Green	0.71	62	73	10	2.03	GPT14021	0.79	42	78	70	2.61
Calibra	0.86	50	80	16	1.95	Remington	0.87	45	77	55	2.49
Remington	0.71	47	82	60	2.20	Remington NEA2	0.78	47	76	65	2.53
Remington NEA2	0.71	49	81	65	1.72	UGA E+	1.00	48	76	63	2.60
Tall Fescue						**Tall Fescue**				
KY 31+	0.94	63	71	0	3.00	Cajun II	1.18	61	67	0	3.91
FTF 118	1.20	62	69	0	3.72	KY-31	1.20	60	72	0	3.86
Armory	1.23	63	68	0	3.23	Fawn	0.96	62	69	0	3.42
FTF 119	1.07	61	69	0	3.80	Dominate	1.29	63	68	0	4.03
BAR FAF 146	1.18	64	70	0	3.42	Triumphant	1.26	58	73	0	4.06
BAR FAFL 239	1.07	63	68	0	3.09	Teton II	1.10	61	71	0	4.19
Aprilia	1.07	61	70	0	3.60	Ranchero	1.04	57	70	0	3.63
BAR FA 9125	0.68	60	74	0	2.66	SETFN97	1.23	59	68	0	3.76
BAR FAF 135	0.96	60	73	0	3.40	SETFPC-5BK	1.19	61	69	0	3.83
BAR FAF 137	1.02	61	71	0	3.64	Greendale	1.15	61	71	0	4.04
7 FACF 82	0.92	59	74	0	3.16	FTF 96	1.17	59	75	0	3.95
Bariane	0.98	59	72	0	3.25	**Festulolium**					
Meadow Fescue						FPF 7	1.01	57	70	0	3.64
BAR FP 2044	1.11	59	78	0	1.47	Pradel	1.43	52	79	0	3.15
Driftless	1.30	64	79	0	2.41	FPF 8	1.00	57	70	0	3.94
BAR FPF 82	1.70	65	75	0	2.08	Spring Green	1.71	55	77	58	1.99
Pradel	1.32	62	76	0	2.55	Sugarcrest	1.42	54	77	63	1.90
Pradel	1.21	61	77	0	2.52	Lenor	0.90	58	73	0	3.52
BAR FPF 77-2	1.60	65	78	0	2.15	Tatran	2.09	53	75	75	2.53
BAR81d	1.37	64	77	0	2.56	**Orchardgrass**					
Orchardgrass						Persist	1.28	66	77	0	3.68
Ammo	1.17	71	73	0	2.88	Persist II	1.18	67	76	0	3.51
Pennlate	1.28	72	71	0	3.25	Pennlate	1.22	63	78	0	3.75
Potomac	1.21	71	71	0	3.14	Everlast	1.30	58	81	0	3.36
Harvestar	1.13	71	73	0	3.02	Potomac	1.19	63	80	0	3.72
OG 96	0.88	70	78	0	3.20	Captur	0.97	62	80	0	3.59
OG 80	0.81	70	75	0	3.19	Alpine	1.13	61	81	0	3.62
Intensiv	0.95	65	80	0	2.57	OG96	1.16	61	80	0	3.65
BAR DGLF 2094	0.81	70	80	0	2.94	Bighorn	1.18	61	81	0	3.92
BAR DGLF 2095	0.92	67	78	0	3.07	Rushmore II	1.19	62	81	0	3.74
						Timothy First Harvest in 2022-June 21				
						KY-Early	2.58	63	68	0	1.20
						Conquest	2.49	65	72	0	1.24
						Zenyatta	2.81	68	68	0	1.15
						Valor	2.60	67	69	0	1.13
						Carson	2.95	65	65	0	1.46
						PolarKing	3.33	NA	NA	0	1.68
						Barfleo	3.07	66	68	0	1.34
						Baronaise	3.23	64	62	0	1.42
						Climax	2.99	64	61	0	1.39
						Express II	3.17	65	63	0	1.50
						Bromegrass First Harvest in 2022-June 21				
						Peak	2.38	62	68	0	1.07
						Stratus	2.37	63	71	0	1.53
						S9549	2.04	62	73	0	1.41
						Barricade	2.03	59	65	0	1.40
						S9356M	2.12	66	67	0	1.04

Alfalfa	Page(s)
342LH	5
54Q16	3,5
54Q29	3,5
54VQ52	5
54VR10	3,5
54VR12	5
55H96	4,5
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