

NEW YORK FORAGE LEGUME AND GRASS VARIETY YIELD TRIALS

SUMMARY FOR 2005

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<http://plbrgen.cals.cornell.edu/programsandprojects/departmental/foragetest/>

Forage yield trials are planted and harvested annually at Cornell University. Funding for these trials is provided by the companies that submit the varieties/cultivars in the trials, from Cornell University College of Agriculture and Life Sciences, and from Northern New York Agricultural Development Program. Trials are managed for four years; seeding year and three production years.

2005 Growing Season. (Figures 1,2 and 3)

Forage yields for 2005 were disappointingly low due to two factors. First, May was cooler and drier than normal. The temperature was 3.2 degrees Fahrenheit lower than average for the entire state and was 4.8 degrees lower for Ithaca where over half of the yield trials are planted. Precipitation in May was 2.3 inches lower than average for the entire state and was 1.9 inches lower than average for Ithaca. Forage maturity was not strongly affected by the May weather, so grasses started heading out in mid-May and the alfalfa was at early bloom stage in the first week in June as usual, even though forages were only about half the normal height.

Secondly, the months of July, August, and September were dry and hot, particularly in the Fingerlakes Region. In Ithaca, the average temperature was 3.8 degrees higher than normal and rain was 4.5 inches lower than normal. Over the growing season, Ithaca had 13 days with temperatures greater than or equal to 90 degrees Fahrenheit.

Cultivar/Variety Selection

Plant breeders continue to develop new and improved cultivars. Cultivars are continually released and were selected for improved agronomic characteristics such as yield, disease and insect resistance, forage quality, etc. Seed cost of improved cultivars can be greater than for other cultivars, but this cost is easily offset when there is improved performance at each harvest over the life of the stand.

In each New York trial, there is not one best cultivar, but rather a group of top-yielding cultivars. Cultivar performance should be critically evaluated by comparing yield with other cultivars in two or more trials that are in the second or later year of production.

Alfalfa (Tables 1 and 2) cultivars for New York should have resistance (R) or high resistance (HR) to four diseases (bacterial wilt, Verticillium wilt, anthracnose, Phytophthora root rot) and fall dormancy rating should be 2, 3, or 4. Cultivars with higher fall dormancy ratings will go dormant later in the fall. Cultivars with fall dormancy ratings higher than 4 may have unacceptable winter-hardiness for New York, particularly in Northern New York. The trials in Perry and Cobleskill were harvested four times during the growing season. The remaining trials were harvested three times.

Red Clover (Table 3) 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. For the comparison of varieties, trials of red clover will be harvested in the third production year if the plants in the trial do not severely winterkill after the second production year.

Birdsfoot Trefoil (Table 3) is a legume that tolerates soils that alfalfa will not be productive on. Birdsfoot trefoil should always be planted in combination with other forages like perennial grasses. Also, birdsfoot trefoil does not tolerate low cutting heights, so it is advisable to leave 5+ inches of stubble in the field. The birdsfoot trefoil trial reported in Table 3 was harvested four times per year in 2004 and 2005.

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Grass yield (Table 4) trials were fertilized with 200 lb/A ammonium nitrate in early April and after first, second, and third harvests. Forage grass trials are harvested four times between May 20th and October 10th. Grass yields by species for 2005 are listed in the summary table. Also listed is a visual estimate of percent stand and heading date. Heading date is the calendar date when about 5 heads per plot were visible. Use percent stand, heading date and yield to select grass varieties that fit your management program.

Grass forage quality estimates from 2004 for the trials planted in 2002 are presented in **Table 5**. Grass forage quality estimates from 2004 for trials planted in 2003 are presented in **Table 6**. In December 2005, the quality estimates from 2005 for trials planted in 2003 and 2004 will be available on our web site.

We express appreciation to all of our cooperators in allowing us to plant field plot trials of forages on their farms, and to our employees for their hard work in harvesting and maintaining field plots.

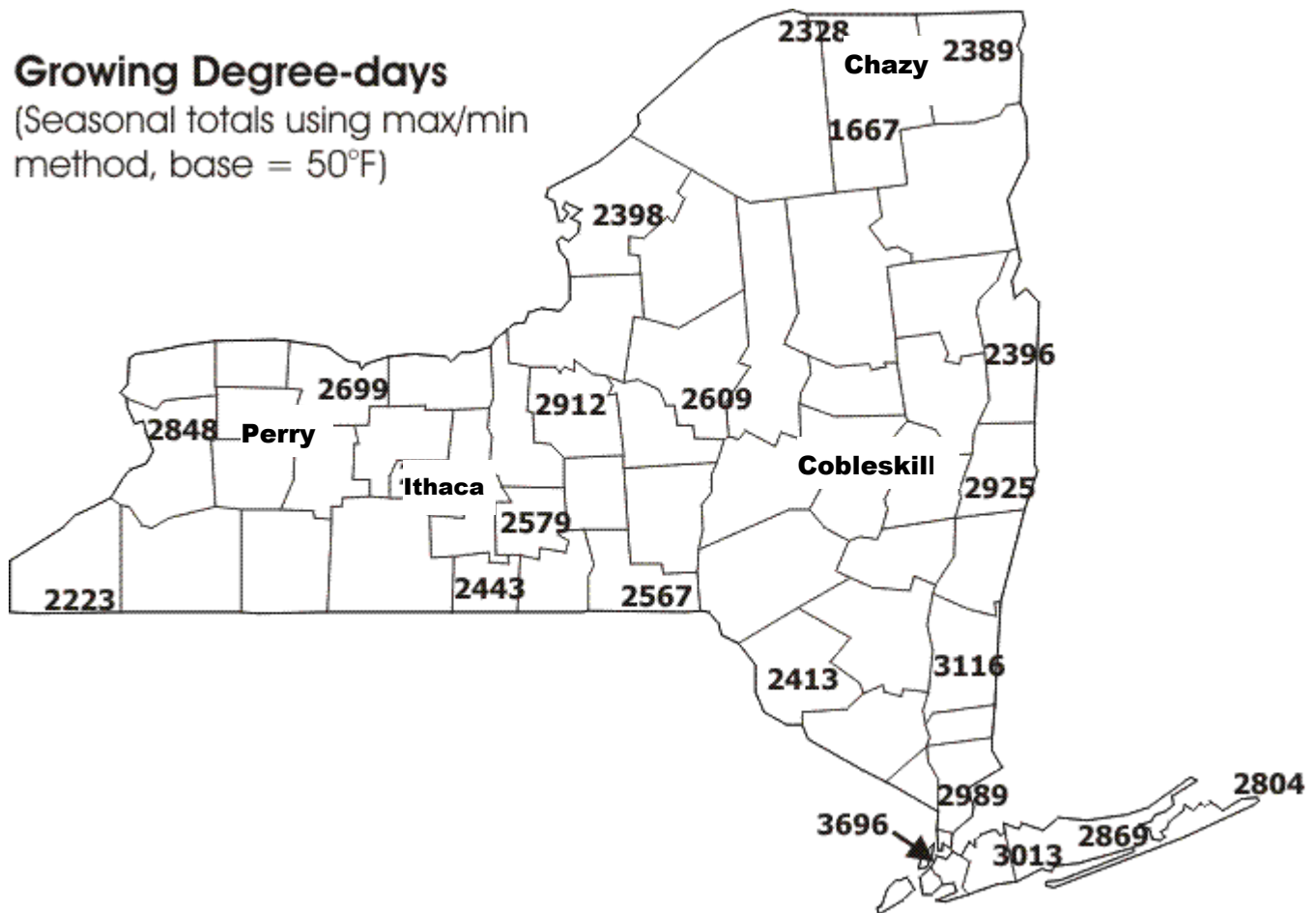


Figure 1: 2005 NYS Growing Degree Day and Trial Location Map.
Map by Dr. Paul Weston, Cornell University
<http://www.entomology.cornell.edu/Extension/Woodys/GDDtracker.htm>

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Table 1: New York Alfalfa Cultivar Yield Trial Results - 2005 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 LSD. CV = A statistical representation of the precision of a trial. Lower is better.

Summary of Alfalfa Cultivar Performance in 2005

Ithaca, Tompkins Co., Sown May 10, 2002

Cultivar	Yielded in the		Total No. of Trials Tested	Cultivar	2005		
	Avg. % of Cks.	No. of Trials			Total (adj.)	Total (adj.)	% of Ck. Mean
420	111	1	2		--- tons per acre dry matter ---		
4375LH	107	1	1	Seedway 9558	4.60	14.36	114
4A421	110	3	3	HYTEST 410	4.89	14.25	113
54Q25	110	1	2	Paragon BR	4.81	14.19	112
54V46	116	2	2	4A421	5.03	14.01	111
6415	110	3	3	WL 319HQ	4.72	13.92	110
AmeriStand 403T	108	1	1	Tribute	5.00	13.87	110
Baralfa53 HR	108	1	2	Paramount II	4.63	13.83	109
Dakota	107	1	2	AmeriStand 403T	4.75	13.62	108
DKA33-16	113	1	2	5312 (check)	4.55	13.43	106
DKA42-15	115	2	2	Reward II	4.65	13.40	106
Everlast	105	1	2	Hybri-Force 400	4.60	13.34	105
Evermore	109	1	2	Oneida Ultra	4.24	13.18	104
FSG 351	110	2	2	Baralfa 53 HR	4.43	13.10	104
FSG 406	108	1	2	Feast +EV	4.27	12.69	100
FSG 408DP	110	2	2	Oneida VR (check)	4.19	12.32	97
FSG 505	111	2	2	Vernal (check)	4.07	12.20	96
Genoa	114	2	2				Ck. Mean
Guardsman II	105	1	1	Trial Mean	4.44	13.27	12.65
Hybri-Force 400	110	2	3	5% LSD	0.64	1.12	
HybriForce-420/Wet	109	3	4	CV (%)	11.4	6.7	
HYTEST 410	113	3	3				
LegenDairy 5.0	108	1	2				
Lightning EXTRA	113	2	2				
NOVA	112	1	2				
Paragon BR	112	1	1				
Paramount II	112	3	3				
Power 4.2	106	1	2				
Rebound 5.0	112	2	2				
Seedway 9558	112	2	2				
Tribute	110	1	1				
WL 319HQ	110	1	2				
WL 327	112	1	1				
WL 335HQ	111	1	2				
WL 348 AP	111	2	2				
WL 357HQ	112	2	2				

Cobleskill, Schoharie Co., Sown April 24, 2002

Cultivar	2005		% of Ck. Mean
	Total (adj.)	Total (adj.)	
	----- tons per acre dry matter -----		
HYTEST 410	5.57	19.18	118
Paramount II	5.19	18.70	115
WL 327	4.88	18.23	112
Hybri-Force 400	4.65	17.74	109
Seedway 9558	4.58	17.72	109
Oneida Ultra	4.22	17.12	106
Oneida VR (check)	4.24	16.56	102
5312 (check)	4.35	16.47	102
Feast +EV	4.13	16.16	100
Vernal (check)	4.04	15.60	96
			Ck. Mean
Trial Mean (T/A)	4.28	16.73	16.21
5% LSD	0.39	0.80	
CV(%)	7.8	4.2	

*Data from production year trials only, not from trials sown in 2005. Cks. = Check Cultivars are Oneida VR, Pioneer 5312, Vernal.

Trial	Soil series, elevation, # of harvests
Ithaca, 2002 Page 1	Niagra silt loam, 960 ft., 3 harvests
Cobleskill, 2002 Pg.1	Barbour Tioga fine sandy loam, 1170 ft., 4 har.
Ithaca, 2003, Page 1&3	Erie channery silt loam, 960, 3 harvests
Ithaca, 2004, Page 2	Madalin silt loam, 990 ft, 3 harvests
Chazy, 2004, Page 2	Raynham variant silt loam, 185 ft., 3 harvests
Parry, 2004, Page 2	Conesus gravelly silt loam, 1050 ft., 4 har.
Ithaca, 2002, Page 3	Dalton channery silt loam, 1010 ft., 3 har.
Ithaca, 2005, Page 3	Wallington silt loam, 1000 ft., 2 har.

Ithaca, Tompkins Co., Sown April 29, 2003

Cultivar	2005		% of Ck. Mean
	Total (adj.)	Total (adj.)	
	-- tons per acre dry matter --		
6415	3.96	9.15	114
4A421	3.92	9.11	114
54V46	3.81	9.02	113
DKA33-16	3.91	9.00	113
FSG 505	3.84	8.93	112
420	3.80	8.83	111
Evermore	3.70	8.67	109
FSG 351	3.71	8.63	108
FSG 406	3.82	8.60	108
4375LH	3.66	8.55	107
HybriForce-420/Wet	3.72	8.55	107
54Q25	3.64	8.53	107
Dakota	3.67	8.53	107
WL 346LH	3.61	8.39	105
Oneida VR (check)	3.55	8.37	105
Oneida Ultra	3.56	8.31	104
Power 4.2	3.64	8.31	104
5312 (check)	3.57	8.30	104
Everlast	3.45	8.23	103
6400HT	3.47	8.18	102
54H91	3.28	7.88	99
Vernal (check)	3.07	7.31	91
			Ck. Mean
Trial Mean (T/A)	3.64	8.48	7.99
5% LSD	0.22	0.48	
CV(%)	4.8	4.5	

Many Thanks to our Cooperators:

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Tim Dodge	Cornell Univ. Field Technician
Steve Lis	Cornell Univ. Field Technician
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Dr. Mike Davis	Cornell Univ. Farm Manager at Chazy
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Julie Stavisky	Area IPM Educator
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Chazy, Clinton Co., Sown May 13, 2004			Ithaca, Tompkins Co., Sown May 12, 2004		
Replant of winterkilled trials planted in 2002,2003					
Cultivar	2005		Cultivar	2005	
	Total (adj.)	% of Ck. Mean		Total (adj.)	% of Ck. Mean
	T/A			T/A	
54V46	3.86	118	DKA42-15	5.55	112
FSG 351	3.64	112	Genoa	5.53	111
Paramount II	3.64	112	Lightning EXTRA	5.48	110
Hybri-Force 400	3.59	110	FSG 408DP	5.46	110
54Q25	3.58	110	6415	5.46	110
FSG 505	3.57	110	WL 357 HQ	5.44	110
Baralfa53 HR	3.52	108	Rebound 5.0	5.41	109
6415	3.50	107	HybriForce-420/Wet	5.39	109
HYTEST 410	3.50	107	WL 348 AP	5.38	109
Dakota	3.50	107	LegenDairy 5.0	5.34	108
4A421	3.47	106	6420	5.32	107
Power 4.2	3.44	106	5312 (check)	5.29	107
Guardzman II	3.43	105	Oneida Ultra	5.29	107
Everlast	3.41	105	WL 335 HQ	5.20	105
420	3.41	105	NOVA	5.13	103
Vernal (check)	3.39	104	Oneida VR (check)	4.97	100
HybriForce-420/Wet	3.38	104	Vernal (check)	4.62	93
Oneida VR (check)	3.37	103			Ck. Mean
DKA33-16	3.31	102	Trial Mean (T/A)	5.05	4.96
FSG 406	3.31	102	5% LSD	0.36	
54H91	3.26	100	CV(%)	5.8	
Evermore	3.26	100			
WL 319 HQ	3.23	99			
6400HT	3.17	97			
5312 (check)	3.01	92			
		Ck. Mean			
Trial Mean (T/A)	3.42	3.26			
5% LSD	0.36				
CV(%)	9.3				

Perry, Wyoming Co., Sown April 30, 2004

Trials Sown in 2005

Cultivar	2005		Cultivar	2005	
	Total (adj.)	% of Ck. Mean		Ithaca % of Cks.	Chazy % of Cks.
	T/A				
DKA42-15	7.58	118	361 HY	107	108
Genoa	7.50	117	4A421	96	93
Lightning EXTRA	7.40	115	4R429	107	104
Rebound 5.0	7.38	115	4S419	130	105
WL 357HQ	7.34	114	5312 (check)	108	99
WL 348AP	7.22	113	53Q30	109	102
NOVA	7.16	112	54V46	108	102
WL 335HQ	7.13	111	6415	114	
FSG 408DP	7.12	111	Baralfa 32IQ	119	103
HybriForce-420/Wet	7.04	110	BPR 387	115	106
5312 (check)	6.96	108	Genoa	96	108
LegenDairy 5.0	6.95	108	Guardzman II	115	
Oneida Ultra	6.81	106	Integrity	88	
Integrity	6.68	104	Milestone	113	97
FSG 400LH	6.60	103	Oneida Ultra	107	
Oneida VR (check)	6.50	101	Oneida VR (check)	114	99
Vernal (check)	5.79	90	Prolific	103	104
		Ck. Mean	Vernal (check)	79	102
Trial Mean (T/A)	6.66	6.42	WL 348 AP		94
5% LSD	0.27				
CV(%)	3.6		Ck. Mean (T/A)	0.71	3.07
			5% LSD	0.18	0.39

Alfalfa Trials to Test Insect Resistant Cultivars -

PLH Damage Score - 1=minor to no damage; 5=severe damage

Cultivar	No-Insecticide Alfalfa Trial Sown May 6, 2002				4-Yr. PLH Damage
	2005		3-Yr.		
	Total Season	% of Cks.	Total	% of Cks.	
	T/A		T/A		
54H91	3.35	86	16.47	108	1.8
5312 (check)	4.08	105	16.19	106	3.5
GPVL44	3.62	93	15.88	104	3.6
Pegasus	3.10	79	15.85	104	2.2
Vernal (check)	3.77	97	15.07	99	3.4
CK2000	3.31	85	14.76	96	3.5
Oneida VR (check)	3.85	99	14.64	96	4.1
		Ck. Mean		Ck. Mean	
Trial Mean	3.48	3.90	15.51	15.30	
5% LSD	0.60		1.74		
CV(%)	12.0		7.8		

In 2004 and 2005, analyzed replications 1,4,5,6.

Cultivar	No-Insecticide Alfalfa Trial Sown April 30, 2003				3-Yr. PLH Damage
	2005*		2-Yr.		
	Total Season	% of Cks.	Total	% of Cks.	
	T/A		T/A		
WL 346LH	3.99	108	9.24	107	1.3
4375LH	3.89	105	9.17	106	1.6
5312 (check)	3.91	106	8.88	103	3.5
54H91	3.73	101	8.81	102	1.6
Oneida VR (check)	3.73	101	8.80	102	3.9
Vernal (check)	3.42	93	8.25	95	3.6
		Ck. Mean		Ck. Mean	
Trial Mean	3.68	3.69	8.65	8.64	
5% LSD	0.37		0.70		
CV(%)	8.8		7.0		

*two harvests in 2005 due to lack of rain in July and August.

Cultivar	No-Insecticide Alfalfa Trial Sown April 29, 2005			
	2005			
	26-Jul	% of Cks.	PLH Damage	PLH Count 7/21/05*
	T/A			
54H91	1.09	139	2.2	10
6325	1.08	139	4.3	27
WL 347 LH	1.06	135	3.2	24
WL 345 LH	1.01	130	3.0	22
5312 (check)	0.84	108	5.0	39
Oneida VR (check)	0.80	102	5.0	39
Vernal (check)	0.70	89	5.0	32
		Ck. Mean		
Trial Mean	0.95	0.78	3.7	27
5% LSD	0.18		0.6	12
CV(%)	16.0		15.0	28.6

*Number of PLH per 5 sweeps per plot averaged over 4 plots

Table 2: Alfalfa Cultivar Features

For more information log on to the Web:

<http://plbrgen.cals.cornell.edu/programsandprojects/departmental/foragetest/>

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

Alfalfa Cultivar	Marketing Company	Disease Resistance Ratings*						Marketing Co.		Web or E-mail Address
		FD	BW	VW	FW	AN	PRR	Phone Number		
Evermore	Allied Seeds LLC	4	HR	R	HR	R	HR	1-800-880-8127	www.alliedseedllc.com	
AmeriStand 403T	America's Alfalfa	4	HR	HR	HR	HR	HR	1-888-895-7333	www.americasalfalfa.com	
Baralfa 32 IQ	Barenbrug, USA	3	HR	R	HR	HR	HR	1-800-547-4101	www.barusa.com	
Baralfa 53 HR	Barenbrug, USA	5	HR	R	HR	HR	HR			
BPR 387	Bio-Plant Research	4	HR	HR	HR	HR	HR	1-800-593-7708		
Milestone	Chemgro Seeds	3	HR	R	HR	R	HR	1-800-346-4769	www.chemgro.com	
Paragon BR	Chemgro Seeds	3	HR	R	HR	R	HR			
Paramount II	Chemgro Seeds	3	HR	HR	HR	HR	HR			
Tribute	Chemgro Seeds	4	HR	HR	HR	HR	HR			
LegenDairy 5.0	Croplan Genetics	3	HR	HR	HR	HR	HR	1-651-765-5710	www.croplangenetics.com	
Rebound 5.0	Croplan Genetics	4	HR	HR	HR	HR	HR			
HybriForce-400	Dairyland Seeds	4	HR	R	HR	R	HR	1-800-236-0163	www.dairylandseed.com	
HybriForce-420/Wet	Dairyland Seeds	4	HR	R	HR	R	HR			
Prolific	Doebler's	3	HR	R	HR	R	HR	1-570-753-3210	www.doebliers.com	
Pegasus	FS SEEDS	4	HR	HR	HR	HR	HR	1-800-245-2435	www.fsseeds.com	
6325	Garst Seed Co.	3	HR	HR	HR	HR	HR	1-888-464-2778	www.garstseed.com	
6415	Garst Seed Co.	4	HR	HR	HR	HR	HR			
6400HT	Garst Seed Co.	4	HR	HR	HR	HR	HR			
Feast + EV	Garst Seed Co.	3	HR	HR	HR	R	HR			
Dakota	Great Plains Res. Co.	4	R	MR	R	MR	HR	1-800-874-7945	www.GreatPlainsResearch.com	
NOVA	Great Plains Res. Co.	4	HR	R	HR	R	HR			
HYTEST 410	HYTEST Seeds	4	HR	HR	HR	HR	HR	1-717-737-4529	www.hytestseeds.com	
420	Legacy Seeds	4	HR	R	HR	HR	HR	1-208-461-6881		
Everlast	Legacy Seeds	4	HR	R	HR	HR	HR			
DKA33-16	Monsanto	3	HR	HR	HR	HR	HR	1-800-335-2676	www.monsanto.com	
DKA42-15	Monsanto	4	HR	HR	HR	HR	HR			
4375LH	Mycogen Seeds	4	HR	R	HR	HR	HR	1-800-MYCOGEN	www.dowaqro.com/mycogen	
4A421	Mycogen Seeds	4	HR	HR	HR	HR	HR			
4R429	Mycogen Seeds	4	HR	HR	HR	HR	HR			
4S419	Mycogen Seeds	2	HR	HR	HR	HR	HR			
Integrity	PGI Alfalfa, Inc.	4	HR	HR	HR	HR	HR	1-866-744-5710		
53Q30	Pioneer Hi-Bred	3	HR	HR	HR	HR	HR	1-800-247-6803	www.pioneer.com	
54H91	Pioneer Hi-Bred	4	HR	HR	R	HR	HR			
54Q25	Pioneer Hi-Bred	4	HR	HR	HR	HR	HR			
54V46	Pioneer Hi-Bred	4	R	HR	HR	HR	HR			
Power 4.2	Power Seeds	4	HR	R	HR	HR	HR	1-705-748-3000	www.powerseeds.net	
Lightning EXTRA	Preferred Seed Co.	4	HR	HR	HR	HR	HR	1-716-895-7333	www.preferredseed.com	
361 HY	Preferred Seed Co.	4	HR	HR	HR	R	HR			
Guardman II	Seedway/FSG	4	HR	HR	HR	HR	HR	1-800-836-3710	info@seedway.com	
Oneida Ultra	Seedway/FSG	4	HR	HR	HR	R	R			
Seedway 9558	Seedway/FSG	3	HR	HR	HR	HR	R			
FSG 351	Seedway/FSG	3	HR	R	HR	R	HR			
FSG 400 LH	Seedway/FSG	4	HR	HR	HR	HR	HR			
FSG 406	Seedway/FSG	4	HR	HR	HR	HR	HR			
FSG 408 DP	Seedway/FSG	3	HR	R	HR	R	HR			
FSG 505	Seedway/FSG	5	HR	HR	HR	HR	HR			
FSG LH300	Seedway/FSG	3	HR	HR	HR	HR	HR			
Genoa	NK Brand Seeds	4	HR	HR	HR	HR	HR	1-800-445-0956	www.nk-us.com	
WL 319HQ	UAP; AgriCulver;HYTEST	3	HR	HR	HR	HR	HR	1-717-653-9381	www.wlresearch.com	
WL 327	AgriCulver Seeds	4	HR	R	HR	HR	HR	1-800-836-3701	www.agriculverseeds.com	
WL 335HQ	HYTEST Seeds	4	HR	HR	HR	HR	HR	1-585-455-9667	rcbrown@landolakes.com	
WL 345LH	AgriCulver Seeds	4	HR	HR	HR	HR	HR			
WL 347LH	HYTEST; UAP	4	HR	HR	HR	HR	HR			
WL 348AP	AgriCulver; HYTEST; UAP	4	HR	HR	HR	HR	HR			
WL 357HQ	AgriCulver; HYTEST; UAP	5	HR	HR	HR	HR	HR			
5312	check	3	HR	HR	HR	HR	HR			
Oneida VR	check	3	R	HR	HR	MR	MR			
Vernal	check	2	R	-	MR	-	-			

*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-Anthraxnose, Prr-Phytophthora root rot

Ithaca, Tompkins County, Sown April 29, 2003

See Table 1, page 3 for description of abbreviations used in this table.

Red Clover Cultivar	Marketing Company*	2005		2-Yr.	
		Total Season	% of Checks	Total	% of Checks
		T/A		T/A	
Dominion (RC 9804G)	Seed Research of Oregon	3.22	119	8.74	108
Raven (RC 9402)	Seed Research of Oregon	2.95	109	8.61	107
Marathon (check)	Check	2.88	107	8.44	104
Cinnamon Plus	Allied Seed, L.L.C.	3.04	113	8.43	104
Freedom!	Barenbrug	2.92	108	8.42	104
RC9101	Allied Seed, L.L.C.	3.00	111	8.40	104
FSG-9601	Seedway/FSG	2.62	97	8.11	100
Arlington (check)	Check	2.52	93	7.71	95
			Ck. Mean		Ck. Mean
Trial Mean		2.76	2.70	8.13	8.08
5% LSD		0.28		0.39	
CV(%)		8.7		4.2	

Ithaca, Tompkins County, Sown May 7, 2004

Red Clover Cultivar/Experimental	Marketing Company*	2005	
		Total Season	% of Trial Checks
Duration	Check	4.70	108
Rocket	FS Seeds	4.53	104
Marathon (check)	Check	4.37	101
Arlington (check)	Check	4.30	99
CW 10002	Cal/West	4.28	99
WVPB-RC-NT-KY2	Smith Seed Services	4.08	94
			Ck. Mean
Trial Mean		4.38	4.34
5% LSD		0.52	
CV(%)		7.9	

In 2005, analyzed replicates 2,4,5,6.

Drought conditions lead to variability in forage growth.

**Birdsfoot Trefoil and Timothy Trial
Cobleskill, Schoharie Co., Sown April 24, 2002**

Cultivar		2005		3-Yr.	
		Total Season	% of Norcen	Total	% of Norcen
		T/A		T/A	
Pardee	Seedway/FSG/FS Seeds	3.27	130	13.39	110
Norcen	Check	2.52	100	12.20	100
Exact	AgriCulver	2.55	101	11.88	97
Trial Mean		2.79		12.43	
5% LSD		0.30		0.94	
CV(%)		8.1		5.7	

All plots were seeded with 'Chazy' timothy.

* For marketing company information see Table 2 and Table 4 (end).

Table 4: Perennial Forage Grass Variety Yield Trials in New York Ithaca, Tompkins Co., Sown 2002, 2003, 2004

T/A = tons per acre dry matter; 5%LSD = to claim statistically significant yield differences between two varieties, the yield difference must be equal to or greater than the LSD. Heading date is date when 5 heads in a 3.5 x 16 foot plot were visible.

Grass Species Variety		2005		2004		2003		2 or 3-Yr. Total	
		Total Season	% Stand 6-Oct	Heading Date	Total Season	Heading Date	Total Season		Heading Date
Perennial Ryegrass and Festulolium		Sown May 6, 2002							
		T/A			T/A		T/A	T/A	
Duo (festulolium)	AMPAC, AgriCulver	2.63	78	27-May	5.07	18-May	6.75	26-May	14.44
Spring Green (festulolium)	Check	2.97	70	30-May	4.22	19-May	6.82	26-May	14.01
Garibaldi	DLF Internationl Seeds	2.79	70	3-Jun	4.40	23-May	6.42	2-Jun	13.62
Bastion	Check	2.49	71	24-May	4.25	15-May	6.00	22-May	12.74
Citadel	Check	2.50	71	31-May	4.36	23-May	5.79	26-May	12.65
Quartet	AMPAC	1.75	65	6-Jun	3.34	26-May	5.68	6-Jun	10.78
BAR Lp 9132	Barenbrug	1.65	79	13-Jun	3.22	9-Jun	4.88	11-Jun	9.75
	5% LSD	0.24	7		0.55		0.47		
Perennial Ryegrass and Festulolium		Sown May 9, 2003							
Spring Green (festulolium)	Check	3.49	70	25-May	5.70	16-May			9.20
Remington	Barenbrug	3.19	81	3-Jun	5.32	25-May			8.51
Bastion	Check	3.17	71	19-May	4.70	14-May			7.87
PSGG9-04	PICKSEED CANADA INC	2.94	65	22-May	4.85	16-May			7.80
Citadel	Check	2.99	66	30-May	4.66	18-May			7.65
Paddock	Seedway	2.55	75	6-Jun	3.81	27-May			6.36
	5% LSD	0.32	5		0.47				
Perennial Ryegrass		Sown May 18, 2004							
Modane	Seed Research of Oregon	3.59	86	3-Jun					
Bastian	Check	3.47	84	22-May					
Eurostar	Seed Research of Oregon	3.35	89	3-Jun					
Citadel	Check	3.31	85	31-May					
Bargala	Barenbrug	3.28	89	3-Jun					
Grand Daddy	Seedway/FSG	3.21	88	27-May					
Proton	Seed Research of Oregon	3.18	88	6-Jun					
Barsprinter	Barenbrug	3.01	90	3-Jun					
RESPECT	DLF International Seeds	2.88	89	27-May					
	5% LSD	0.39	4						
Tall Fescue		Sown May 6, 2002							
Hykor (festulolium)	DLF International Seeds	5.06	70	24-May	6.17	14-May	8.05	21-May	19.27
Select	FS Seeds	4.96	74	27-May	5.95	16-May	8.03	22-May	18.94
Bull	Preferred	4.78	70	24-May	6.21	14-May	7.64	20-May	18.63
Kora	DLF International Seeds	4.52	70	25-May	5.73	17-May	7.69	22-May	17.94
	5% LSD	0.27	6		0.45		0.55		

Table 4: Perennial Forage Grass Variety Yield Trials in New York Ithaca, Tompkins Co., Sown 2002, 2003, 2004

T/A = tons per acre dry matter; 5%LSD = to claim statistically significant yield differences between two varieties, the yield difference must be equal to or greater than the LSD.

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

		2005			2004		2003		
Grass Species		Total	% Stand	Heading	Total	Heading	Total	Heading	2 or 3-Yr.
Variety	Marketing Company	Season	6-Oct	Date	Season	Date	Season	Date	Total
Tall Fescue Sown May 9, 2003		T/A			T/A		T/A		T/A
Enhance	Seedway, FSG/ Allied Seed, L	4.62	78	25-May	6.74	16-May			11.36
Bull	Preferred	4.63	78	23-May	6.70	14-May			11.32
Select	Check	4.64	75	23-May	6.55	16-May			11.19
Montendre	Seed Research of Oregon	4.02	76	27-May	5.69	17-May			9.71
	5% LSD	0.38	6		0.36				
Reed Canarygrass Sown May 24, 2002									
Vantage	Check	4.25	88	3-Jun	6.26	23-May	6.97	30-May	17.48
Palaton	Check	3.93	86	1-Jun	5.78	21-May	6.53	30-May	16.24
Chiefton	Seed Research of Oregon	4.02	84	31-May	5.82	21-May	6.29	30-May	16.13
Venture	Check	3.97	88	31-May	5.64	21-May	6.30	30-May	15.91
	5% LSD	0.30	5		0.25		0.44		
Reed Canarygrass Sown May 9, 2003									
Palaton	Check	3.34	81	31-May	5.62	21-May			8.96
Marathon	FS Seeds	3.26	84	31-May	5.35	21-May			8.61
	5% LSD	0.24	5		0.64				
Orchardgrass Sown May 6, 2002									
Benchmark Plus (OG9705)	Allied Seed, L.L.C.	4.12	74	18-May	5.27	12-May	6.65	14-May	16.04
Extend	Seedway, FSG	4.42	70	24-May	4.82	14-May	6.52	20-May	15.75
Stampede	Check	4.09	70	20-May	4.74	12-May	6.46	16-May	15.30
Baridana	Check	4.01	73	24-May	4.49	13-May	6.12	20-May	14.62
Potomac	Check	3.74	76	18-May	4.47	11-May	6.30	14-May	14.51
Intensiv	Check	3.67	69	24-May	4.67	18-May	5.95	26-May	14.29
BAR Dgl BTR 9G	Barenbrug	3.59	73	18-May	4.42	13-May	6.16	14-May	14.16
	5% LSD	0.28	4		0.66		0.57		
Orchardgrass Sown May 9, 2003									
Stampede	Check	4.66	74	16-May	5.33	12-May			9.99
Bounty (OG9701)	Seedway/ FSG/ Allied, L.L.C.	4.73	75	12-May	5.18	11-May			9.90
Extend	Seedway, FSG	4.45	75	19-May	5.33	14-May			9.78
Baridana	Check	4.63	73	19-May	4.77	13-May			9.40
Potomac	Check	4.30	80	13-May	4.90	11-May			9.20
Haymaster (OG9704)	Allied Seed, L.L.C.	4.26	74	19-May	4.46	14-May			8.72
	5% LSD	0.27	7		0.40				
Orchardgrass Sown May 18, 2004									
Stampede	Check	5.03	88	20-May					
Command	Seed Research of Oregon	4.74	88	23-May					
Intensiv	Check	4.48	79	25-May					
Baridana	Check	4.45	89	20-May					
LG 31	DLF International Seeds	4.36	86	30-May					
Impuls	Seed Research of Oregon	4.03	83	24-May					
	5% LSD	0.33	4						

Table 4: Perennial Forage Grass Variety Yield Trials in New York Ithaca, Tompkins Co., Sown 2002, 2003, 2004

T/A = tons per acre dry matter; 5%LSD = to claim statistically significant yield differences between two varieties, the yield difference must be equal to or greater than the LSD. Heading date is date when 5 heads in a 3.5 x 16 foot plot were visible.

Grass Species Variety	Marketing Company	2005			2004		2003		2 or 3-Yr. Total
		Total Season	% Stand 6-Oct	Heading Date	Total Season	Heading Date	Total Season	Heading Date	
Timothy	Sown May 24, 2002	T/A			T/A		T/A		T/A
Summit	Seedway, FSG	2.92	83	27-May	5.08	20-May	6.79	29-May	14.80
Express	Seed Research of Oregon	2.67	85	2-Jun	5.03	27-May	6.35	10-Jun	14.04
Barmidi	Barenbrug	2.55	74	10-Jun	4.20	11-Jun	6.06	19-Jun	12.82
Chazy	Seedway	2.42	85	30-May	4.15	21-May	5.92	2-Jun	12.49
Climax	Check	2.30	84	27-May	3.92	22-May	5.73	16-Jun	11.95
	5% LSD	0.25	8		0.37		0.24		
Timothy	Sown May 9, 2003								
Derby (TM9901)	Allied Seed, L.L.C.	3.48	74	25-May	6.04	21-May			9.52
Crest (TM0102)	Seedway / FSG	3.50	79	1-Jun	5.96	27-May			9.45
Summit	Seedway / FSG	3.44	74	25-May	5.54	20-May			8.98
AC Opal	PICKSEED CANADA, INC.	3.17	75	7-Jun	5.48	7-Jun			8.66
Comer	PICKSEED CANADA, INC.	3.04	70	3-Jun	5.51	31-May			8.55
AC Alliance	PICKSEED CANADA, INC.	3.32	78	30-May	5.22	25-May			8.54
Express	Seed Research of Oregon	2.98	78	1-Jun	5.47	28-May			8.45
Chazy	Seedway	3.08	79	30-May	5.30	21-May			8.38
Climax	Check	2.73	75	31-May	4.86	27-May			7.59
Tenho	Barenbrug	2.97	78	7-Jun	4.20	7-Jun			7.17
	5% LSD	0.35	5		0.55				
Timothy	Sown May 18, 2004								
Climax	Check	3.77	88	3-Jun					
Monza	Seed Research of Oregon	3.76	86	27-May					
Moverdi	Seed Research of Oregon	3.76	80	10-Jun					
Chazy	Seedway	3.65	86	30-May					
	5% LSD	0.49	5						
Bromegrass	Sown May 24, 2002								
York	AMPAC	2.65	60	23-May	3.94	14-May	6.73	21-May	13.31
Peak	Seedway/FSG/ FS Seeds	2.69	58	23-May	3.56	14-May	6.32	20-May	12.57
Bravo	Check	2.25	53	23-May	3.56	16-May	6.45	21-May	12.27
Saratoga	Check	1.68	48	23-May	2.92	16-May	6.41	23-May	11.00
	5% LSD	0.49	15		0.54		0.49		

Company Contact Information: If company phone number and web site are not listed below, see Table 2.

Company	Phone	Web/E-mail Address
AMPAC	1-541-928-1651	www.ampacseed.com
Cal/West	1-530-666-3331	www.calwestseeds.com
DLF International Seeds	1-541-369-2251	
Farm Science Genetics(FSG)	1-888-305-0500	www.farmsciencegenetics.com
PICKSEED CANADA INC.	1-705-878-9240	www.pickseed.com
Seed Research of Oregon	1-800-253-5766	www.sroseed.com
Smith Seed Services	1-888-550-2930	

Table 5: 2004 Forage Quality Predictions by NIRS for Grass Varieties planted in NY 2002 Trials at Ithaca, Tompkins Co. Page 11

NDF = neutral detergent fiber, IVDDM = in vitro digestible dry matter (48 hour digestion)

Boot Stage is date when 5 heads in a 3.5 x 16 foot plot were visible; Maturity score T=number of nodes;

R 0=boot stage, R 1=head partially emerged; R 2=head fully emerged; R 3=peduncle fully emerged.

Perennial Ryegrass and Festulolium (F)

Variety	Forage Quality at Boot Stage			Forage Quality at First Harvest in 2004					
	Date at Boot Stage	% PROTEIN	% NDF	% IVDDM	Date at Harvest	Maturity Score	% PROTEIN	% NDF	% IVDDM
Duo (F)	18-May	15.1	51.1	93.2	24-May	R 1.5	12.2	57.8	87.3
Spring Green (F)	19-May	14.5	51.9	92.9	24-May	R 1.8	13.5	56.8	89.1
Garibaldi	23-May	13.7	51.0	92.1	24-May	R 1.0	14.0	52.4	91.4
Bastion	15-May	16.5	50.5	93.7	24-May	R 2.0	12.6	57.5	87.5
Citadel	23-May	13.6	48.6	92.2	24-May	R 1.3	13.4	48.0	92.3
Quartet	26-May	13.8	47.6	92.6	24-May	T 4.0	14.9	47.7	93.4
BAR Lp 9132	9-Jun	10.5	43.8	92.9	24-May	T 2.0	15.7	45.7	93.6

Tall Fescue and Festulolium (F)

Hykor (F)	14-May	17.9	54.2	88.7	20-May	R 1.0	14.1	55.7	86.3
Select	16-May	16.4	58.9	85.7	20-May	R 1.0	13.8	56.2	85.5
Bull	14-May	17.2	58.2	85.9	20-May	R 1.8	13.6	59.1	82.9
Kora	17-May	15.5	57.0	88.0	20-May	R 0.5	14.0	55.6	87.9

Reed canarygrass

Vantage	23-May	14.8	68.9	77.0	25-May	R 1.0	15.5	67.9	77.9
Palaton	21-May	16.1	68.3	79.5	25-May	R 1.5	14.7	69.0	77.5
Chiefton	21-May	16.9	66.9	81.2	25-May	R 0.5	14.9	69.3	76.8
Venture	21-May	16.7	67.3	80.3	25-May	R 1.0	14.9	68.8	76.7

Orchardgrass

Benchmark Plus (O)	12-May	16.4	65.6	83.9	20-May	R 3.0	12.5	66.3	81.5
Extend	14-May	17.1	60.5	89.8	20-May	R 2.0	13.8	63.8	86.0
Stampede	12-May	16.5	61.5	87.0	20-May	R 2.3	13.0	64.0	84.1
Baridana	13-May	17.2	60.8	87.4	20-May	R 1.5	13.4	62.8	85.9
Potomac	11-May	16.8	64.7	84.7	20-May	R 3.0	12.7	66.9	81.2
Intensiv	18-May	13.2	59.9	88.6	20-May	R 0.5	12.4	59.6	86.8
BAR Dgl BTR 9G	13-May	16.7	62.2	87.6	20-May	R 2.5	12.6	67.2	81.9

Timothy

Summit	20-May	13.8	63.2	83.8	27-May	R 2.0	12.1	67.8	77.9
Express	27-May	12.2	65.6	82.0	27-May	R 0.5	12.9	67.2	81.1
Barmidi	11-Jun	9.9	67.2	78.5	27-May	T 2.0	14.6	60.9	85.3
Chazy	21-May	14.8	62.2	85.5	27-May	R 1.0	12.7	65.8	79.8
Climax	28-May	13.1	64.4	83.3	27-May	T 3.0	14.8	60.9	85.6

Bromegrass

York	14-May	19.5	62.4	89.1	25-May	R 3.0	13.8	72.3	77.8
Peak	14-May	19.6	61.0	90.2	25-May	R 3.0	13.7	72.4	76.8
Bravo	16-May	18.9	64.2	88.7	25-May	R 2.0	15.1	69.3	81.3
Saratoga	16-May	18.3	63.7	89.2	25-May	R 2.5	13.8	71.9	79.5

Table 6: 2004 DATA for trial planted in 2003 -DATA FROM 2005 AVAILABLE IN DECEMBER 2005. Page 12

NDF = neutral detergent fiber, IVDDM = in vitro digestible dry matter (48 hour digestion)

Boot Stage is date when 5 heads in a 3.5 x 16 foot plot were visible; Maturity score T=number of nodes;

R 0=boot stage, R 1=head partially emerged; R 2=head fully emerged; R 3=peduncle fully emerged.

	Forage Quality at Boot Stage				Forage Quality at First Harvest in 2004				
	Date at Boot Stage	% PROTEIN	% NDF	% IVDDM	Date at Harvest	Maturity Score	% PROTEIN	% NDF	% IVDDM
Perennial Ryegrass and Festulolium (F)									
Spring Green (F)	16-May	16.6	53.9	93.2	25-May	R 2.0	12.3	61.7	85.2
Remington	25-May	13.4	57.4	88.3	25-May	R 0.0	14.2	56.0	89.7
Bastion	14-May	16.6	49.6	93.9	25-May	R 2.0	12.6	61.1	84.3
PSGG9-04	16-May	15.8	55.7	91.6	25-May	R 2.0	12.1	64.3	83.4
Citadel	18-May	15.8	50.6	93.8	25-May	R 2.0	13.8	55.3	89.7
Paddock	27-May	14.6	51.2	92.4	25-May	T 4.0	15.6	52.1	90.3
Tall Fescue									
Enhance	16-May	17.8	57.7	86.2	20-May	R 1.0	15.9	57.4	84.3
Bull	14-May	17.3	57.8	85.5	20-May	R 2.0	14.2	60.8	81.0
Select	16-May	17.7	57.4	85.7	20-May	R 1.0	14.3	58.9	83.1
Montendre	17-May	17.7	55.9	87.1	20-May	R 0.0	16.8	57.1	85.6
Reed Canarygrass									
Palaton	21-May	15.5	67.6	78.0	25-May	R 1.0	14.4	70.7	75.1
Marathon	21-May	15.1	68.4	77.5	25-May	R 1.3	13.8	70.6	74.3
Orchardgrass									
Stampede	12-May	17.1	63.5	84.6	20-May	R 2.3	14.5	66.8	80.6
Bounty (OG9701)	11-May	16.3	63.0	85.5	20-May	R 3.0	14.2	66.3	79.7
Extend	14-May	17.1	63.2	86.9	20-May	R 1.5	14.5	65.2	83.6
Baridana	13-May	17.4	62.7	85.5	20-May	R 1.3	15.0	64.8	82.6
Potomac	11-May	16.4	64.5	83.9	20-May	R 2.5	13.6	67.6	78.9
Haymaster (OG9704)	14-May	18.1	60.7	87.0	20-May	R 1.5	14.0	65.4	81.6
Timothy									
Derby (TM9901)	21-May	14.2	63.3	84.8	27-May	R 2.5	11.4	67.3	78.4
Crest (TM0102)	27-May	12.1	65.6	82.1	27-May	R 0.5	12.8	65.3	83.0
Summit	20-May	13.5	64.3	84.0	27-May	R 2.0	11.3	68.1	77.8
AC Opal	7-Jun	9.4	69.0	77.9	27-May	T 3.0	13.9	63.7	84.0
Comer	31-May	10.6	65.6	80.7	27-May	R 0.0	13.0	65.1	82.6
AC Alliance	25-May	13.0	66.1	82.3	27-May	R 0.5	13.2	64.6	83.6
Express	28-May	11.7	65.5	81.3	27-May	R 0.0	13.6	65.5	82.9
Chazy	21-May	16.0	59.3	88.1	27-May	R 1.5	12.2	64.8	81.9
Climax	21-May	16.5	58.8	88.7	27-May	R 1.0	13.3	64.4	82.5
Tenho	7-Jun	9.6	67.1	79.9	27-May	T 3.0	15.1	61.2	86.7

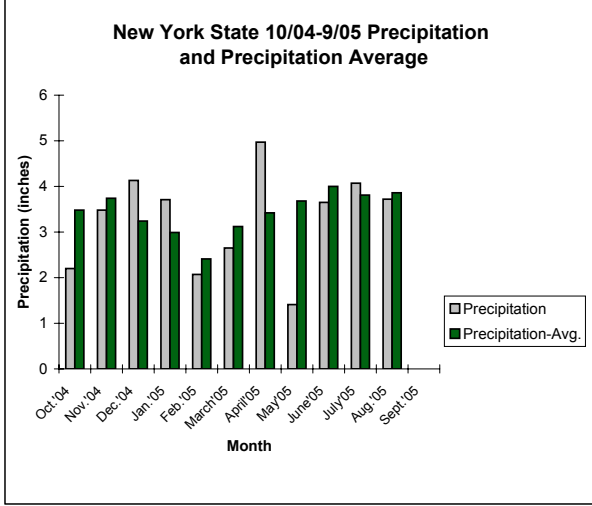
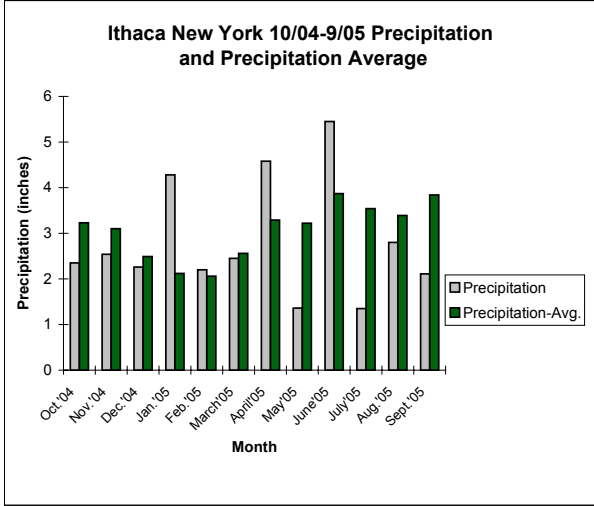
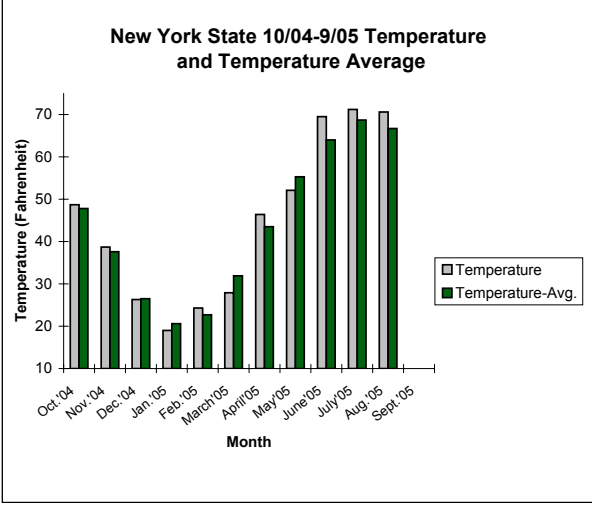
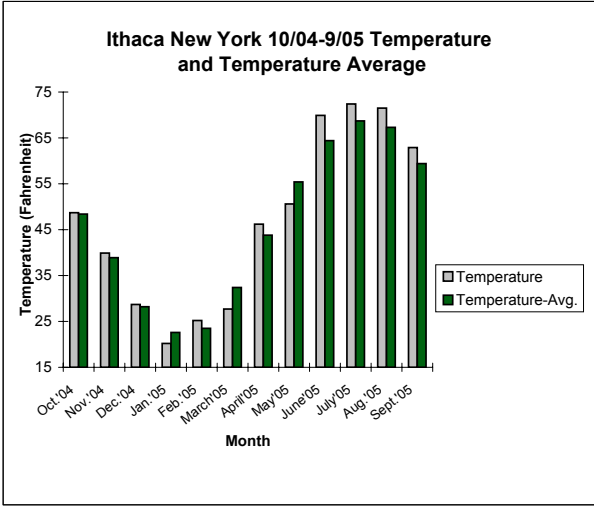


Figure 2: New York State 10/04-9/05 temperature and precipitation. Weather data from the Northeast Regional Climate Center at Cornell University.

Figure 3: New York State 10/04-9/05 temperature and precipitation. Weather data from the Northeast Regional Climate Center at Cornell University.