

# 2009 Long-Term Summary of Kentucky Forage Variety Trials

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## Introduction

Forage crops occupy approximately 7 million acres in Kentucky. Forages provide a majority of the nutrition for beef, dairy, horse, goat, sheep, and wild-life in the state. In addition, forage crops play an environmentally friendly role in soil conservation, water quality, and air quality. There are over 60 forage species adapted to the climate and soil conditions of Kentucky. Only 10 to 12 of these species occupy the majority of the acreage, but within these species is a tremendous variation in varieties.

This publication was developed to provide a user-friendly guide to choosing the best variety for producers based on a summary of forage yield and grazing tolerance trials conducted in Kentucky over the past 10 to 12 years. Detailed variety reports and forage management publications are available from your local county agent or by visiting the University of Kentucky forage website at [www.uky.edu/Ag/Forage](http://www.uky.edu/Ag/Forage) and clicking on the Forage Variety Trial link.

## Species in This Report

**Red clover** (*Trifolium pratense* L.) is a high-quality, short-lived, perennial legume that is used in mixed or pure stands, for pasture, hay, silage, green chop, soil improvement, and wildlife habitat. This species is adapted to a wide range of climatic and soil conditions and, therefore, is versatile as a forage crop. Stands of improved varieties are generally productive for two to three years, with the highest yields occurring in the year following establishment. Red clover is used primarily as a renovation legume

for grass pastures. It is a dominant forage legume in Kentucky because it is relatively easy to establish and has high forage quality and high yield.

**White clover** (*Trifolium repens* L.) is a low-growing, perennial pasture legume with white flowers. It differs from red clover in that the stems (stolons) grow along the surface of the soil and can form adventitious roots that may lead to the development of new plants. White clover is classified into ladino, Dutch, and intermediate types. The intermediate types combine the higher yield of ladino with the grazing tolerance of the Dutch types.

**Alfalfa** (*Medicago sativa*) has historically been the highest yielding, highest quality forage legume grown in Kentucky. It forms the basis of Kentucky's cash hay enterprise and is an important component in dairy, horse, beef, and sheep diets. Choosing a good alfalfa variety is a key step in establishing a stand of alfalfa. The choice of variety can impact yield, stand persistence, and insect and disease resistance.

**Orchardgrass** (*Dactylus glomerata*) is a high-quality, productive, cool-season grass that is well adapted to Kentucky conditions. This grass is used for pasture, hay, green chop, and silage, but it requires better management than tall fescue for higher yields, quality, and long stand life. It produces an open, bunch-type sod, making it very compatible with alfalfa or red clover as a pasture and hay crop or as habitat for wildlife.

**Tall fescue** (*Festuca arundinacea*) is a productive, well-adapted, persistent, soil-conserving, cool-season grass that is grown on approximately 5.5 million acres in Kentucky. This grass, used for both hay and pasture, is the forage base for most of Kentucky's livestock enterprises, particularly beef cattle. The predominant

variety, KY31, was developed in Kentucky for long-term persistence but contains a fungal endophyte that produces alkaloids detrimental to livestock production and reproductive health. Endophyte-free tall fescue varieties produce no detrimental alkaloids, but UK research shows that they are less persistent than KY31. New novel endophyte tall fescue varieties contain safe endophytes, which enhance stand persistence but cause no detrimental animal symptoms.

**Annual ryegrass** (*Lolium multiflorum*) and **perennial ryegrass** (*Lolium perenne*) are high-quality, productive, cool-season grasses used in Kentucky. Both have exceptionally high seedling vigor and are highly palatable to livestock. Annual ryegrasses are increasing in use across Kentucky as more winter-hardy varieties are released and promoted. Annual ryegrass is productive for four to six months and is used primarily for late fall and early to late spring pasture. Perennial ryegrass can be used as a short-lived hay or pasture plant and has growth characteristics similar to tall fescue. It is less persistent than other cool-season grass species. There are both diploid (two sets of chromosomes) and tetraploid (four sets of chromosomes) varieties of perennial ryegrass. Tetraploids have larger tillers and seedheads and wider leaves. Tetraploid types tend to be taller and less dense than diploid types, even in early stages of regrowth. Diploid types produce more tillers, have better stand persistence and are more tolerant to heavy grazing.

**Timothy** (*Phleum pratense*) is the fourth most widely sown cool-season perennial grass used in Kentucky for forage after tall fescue, orchardgrass, and Kentucky bluegrass. Timothy is primarily harvested as hay, particularly for horses. In Kentucky, timothy behaves like a short-lived perennial, with stands lasting two to four years.

**Kentucky bluegrass** (*Poa pratensis*) is a high-quality, highly palatable, long-lived pasture plant with limited use for hay. It tolerates close frequent grazing better than most grasses. It has low yields and low summer production and becomes dormant and brown during hot, dry summers. Kentucky bluegrass is best suited for pastures where a dense sod is more important than high-forage production (e.g., horse pastures).

**Festuloliums** are hybrids between various fescues and ryegrasses with higher quality than tall fescue and improved stand survival over perennial ryegrass. Their use in Kentucky is still limited because they do not survive as long as tall fescue.

## Important Selection Considerations

### Local Adaptation and Seasonal Yield.

Choose a variety/species that is adapted to your region of Kentucky, as indicated by good performance across years and locations in replicated yield trials. Also, look for varieties that are productive in the desired season of use. For management recommendations, check with your county Extension agent or see the UK forage website at [www.uky.edu/Ag/Forage](http://www.uky.edu/Ag/Forage). The following comprehensive bulletins may be especially useful:

- *Grain and Forage Crop Guide for Kentucky* (AGR-18)
- *Establishing Forage Crops* (AGR-64)
- *Rotational Grazing* (ID-143)
- *Forage Identification and Use Guide* (AGR-175)
- *Lime and Fertilizer Recommendations* (AGR-1)

**Seed Quality.** Buy premium-quality seed that is high in germination and purity and free from weed seed. Buy certified seed or proprietary seed of an improved variety. An improved variety is one that has performed well in independent trials. Other information on

the label will include the test date (which must be within the past nine months), the level of germination, and the amount of other crop and weed seed. Order seed well in advance of planting time to assure that it will be available when needed.

## Description of the Tests

**Yield trials.** Plots were seeded at the recommended seeding rate per acre and were planted into a prepared seedbed with a disk drill. Plots were 5 by 15 feet in a randomized complete block design, with four replications. Grass plots were fertilized with 60 lb/A actual N in March, after the first cutting, and again in late summer, for a total of 180 lb/A per season. Other fertilizers (lime, P and K) were applied as needed according to the University of Kentucky soil test recommendations. The tests were harvested using a sickle-type forage plot harvester to simulate a spring cut hay/summer grazing/fall stockpile management system. Fresh weight samples were taken at each harvest to calculate percent dry matter production. Management practices for establishment, fertility, weed control, and harvest timing were in accordance with University of Kentucky recommendations.

**Grazing trials.** Plots were 5 by 15 feet in a randomized complete block design, with each variety replicated six times. Plots were seeded at the recommended seeding rate per acre and were planted into a prepared seedbed using a disk drill. Grazing was continuous from April to October.

Plots were grazed down to below 4 inches quickly and were maintained at 2 to 4 inches (sometimes less) for the remainder of the grazing season. Supplemental hay was fed during periods of slowest growth. Visual ratings of percent stand were made in the fall several weeks after the cattle were removed to check stand survival after the grazing season and in the spring prior to grazing to check on winter survival and spring growth.

Because trials were seeded in rows, persistence ratings were based on density within a row and not total ground cover. Grass plots were fertilized with 60 pounds of actual N per acre in the spring and 30 to 40 pounds of actual N in early November after cattle or horses were removed from the pasture. Other fertilizers (lime, P, and K) were applied as needed according to the University of Kentucky soil test recommendations. Management practices for establishment, fertility and weed control were in accordance with University of Kentucky recommendations.

## Results and Discussion

These tables summarize long-term yield and stand persistence data of commercial varieties that have been entered in the University of Kentucky trials. The data is listed as a percentage of the mean of the commercial varieties entered in each specific trial. In other words, the mean for each trial is 100 percent; varieties with percentages over 100 yielded better than average, and varieties with percentages less than 100 yielded lower than average. For the grazing trials, varieties with percentages over 100 persisted better than average, and varieties with percentages less than 100 persisted less than average. Also in the grazing trials the alfalfa varieties were compared to Alfagraze and the fescue varieties were compared to KY31+ instead of the mean of all the commercial varieties. Direct, statistical comparisons of varieties cannot be made using the summary tables, but these comparisons do help to identify varieties for further consideration. Varieties that have performed better than average over many years and at several locations have very stable performance; others may have performed very well in wet years or on particular soil types. These details may influence variety choice, and the information can be found in the yearly reports. To determine which yearly report to refer to, see footnote in each table.

**Table 1. Summary of Kentucky White Clover Yield Trials 1998-2009 (yield shown as a percentage of the mean of the commercial varieties in the trial).**

Variety	Type <sup>4</sup>	Proprietor	Lexington						Princeton		Quicksand		Eden Shale	Mean <sup>3</sup> (#trials)
			02 <sup>1,2</sup>	03	04	06	07	08	03	05	98	03	03	
			3yr <sup>5</sup>	3yr	3-yr	2-yr	2-yr	2yr	3yr	3-yr	3yr	2yr	2yr	
Advantage	Ladino	Allied Seed, L.L.C.		125									106	116(2)
Alice	Intermediate	Barenbrug								86				-
Avoca	Dutch	DLF International Seeds				59				82				71(2)
Barblanca	Intermediate	Barenbrug		92										-
CA ladino	Ladino	Public	100		124				103		100	98		105(5)
Colt	Intermediate	Seed Research of OR		90		57				114				87(3)
Common	Dutch	Public	100					53		78				77(3)
Companion	Ladino	Oregro Seeds						74						-
Crescendo	Ladino	Cal/West Seeds	105			140				109				118(3)
Excel	Ladino	Allied Seed, L.L.C.			100									-
Durana	Intermediate	Pennington		94		94	88	79	87	83		101	95	92(7)
Insight	Ladino	Allied Seed, L.L.C.				128								-
Ivory	Intermediate	Cebeco	96											-
Ivory II	Intermediate	DLF International Seeds					86							-
Jumbo	Ladino	Ampac Seed	93											-
Kopu II	Intermediate	Ampac Seed	97			97	95	94						96(3)
Patriot	Intermediate	Pennington		103		87	104	117	104	100		98	99	99(7)
Pinnacle	Ladino	Allied Seed, L.L.C.				120				111				116(2)
Rampart	Ladino	Allied Seed, L.L.C.					80	84						-
Regal	Ladino	Public	99	96	92		125	100	107	100	100	104		103(8)
RegalGraze	Ladino	Cal/West Seeds				127	140	111						134(2)
Resolute	Intermediate	FFR/Southern States				63								-
Seminole	Ladino	Saddle Butte Ag. Inc			108	70	79							86(3)
Super Haifa	Intermediate	Allied Seed, L.L.C.			77									-
Tillman II	Ladino	Caudill Seed	103											-
Will	Ladino	Allied Seed, L.L.C.	107			162	150	141		136				139(4)

<sup>1</sup> Year trial was established.

<sup>2</sup> Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in forage yield between varieties. To find actual yields, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 2002 was harvested 3 years, so the final report would be "2004 Red and White Clover Report" archived in the KY Forage website at <www.uky.edu/Ag/Forage>.

<sup>3</sup> Mean only presented when respective variety was included in two or more trials.

<sup>4</sup> Ladino white clover shows higher yield than intermediate and dutch white clover but often shows lower long term survival (>3 years), especially under grazing or harsh environmental conditions. See Table 11 for survival under grazing.

<sup>5</sup> Number of years of data

## Summary

Selecting a good forage variety is an important first step in establishing a productive stand of forage. Proper management, beginning with seedbed preparation and continuing throughout the life of the stand, is necessary for even the highest-yielding variety to produce to its genetic potential. For more detailed information on yield and grazing tolerance within species, go to individual 2009 reports on the forage Web site. See below for specific reports. The forage Web site contains all reports from 2001 through 2009.

## Yield and Grazing Tolerance Reports

(www.uky.edu/Ag/Forage/ForageVarietyTrials2.htm)

- 2009 Alfalfa Report (PR-589)
- 2009 Red and White Clover Report (PR-590)
- 2009 Tall Fescue and Brome Report (PR-592)
- 2009 Orchardgrass Report (PR-591)
- 2009 Timothy and Kentucky Bluegrass Report (PR-593)
- 2009 Annual and Perennial Ryegrass Report (PR-594)
- 2009 Alfalfa Grazing Tolerance Report (PR-595)
- 2009 Red and White Clover Grazing Tolerance Report (PR-596)
- 2009 Cool-Season Grass Grazing Tolerance Report (PR-597)
- 2009 Cool-Season Grass Horse Grazing Report (PR-598)

## Other Reports Not Included in this Summary Report

- 2009 Native Warm-Season Perennial Grass Report (PR-599)
- 2009 Summer Annual Grass Report (PR-601)

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**Table 2. Summary of Kentucky Red Clover Yield Trials 1998-2009 (yield shown as a percentage of the mean of the named commercial varieties in the trial).**

Variety	Proprietor	Lexington						Princeton						Quicksand						Eden Shale				Mean <sup>3</sup> (#trials)		
		00 <sup>1,2</sup> 3yr <sup>4</sup>	01 3yr	02 3yr	03 3yr	04 3yr	06 2yr	08 2yr	09 3yr	10 3yr	11 3yr	12 3yr	13 3yr	14 3yr	15 3yr	16 3yr	17 3yr	18 3yr	19 3yr	20 3yr	00 3yr	01 2yr	02 2yr		03 2yr	08 2yr
AA117ER	ABI Alfalfa						110																			96(3)
Acclaim	Allied Seed			92																						
Arlington	WI Agr. Exp.Sta.			72																						
Belle	Agribiotech	88		82				93																		88(3)
Cherokee	FL Agr. Exp.Sta.	78		65																						72(2)
Cinnamon	FFR/Sou.St.	111		108				115																		109(4)
Cinnamon Plus	FFR/Sou.St.				97																					106(8)
Dominion	Seed Research of OR																									106(10)
Duration	Cisco Co.		86	100																						99(5)
Emarwan	Turf-Seed					91																				97(3)
Freedom!	Barenbrug	108	105	127	123	96	118	91	103	103	105	110	136	110	109	111	103	119	105	102	102	102	102	98		96(2)
Freedom!MR	Barenbrug				118	115	102	114	111			106	101				94	111					118			109(2)
FSG 9601	Allied Seed					89																				109(10)
Greenstar	Genesis Turf													100												-
Impact	Specialty Seeds	106	97							98																100(3)
Juliet	Caudill Seed																									92
Kenland (cert.)	KY Ag.Exp.Sta.	110	111	127	139	118	117	117	97	117	104	102	92	105	112	111	88	105	103	104	104	98	104	104	98	109(2)
Kenland (uncert)	Public													83	78	83										81(4)
Kenstar	KY Ag.Exp.Sta.		105							104					107											105(3)
Kenton	KY Ag.Exp.Sta.	100	93	119	109	90	95	112	123	104	98	95	105	109		93	99	106	93	102	102	98				102(19)
Kenway	KY Ag.Exp.Sta.	106	104	111	134		97	119	121	103	100		94	100		100		103	93	102						106(15)
Mammoth	Public									61																-
Morning Star	Cal/West Seeds													96												90
Plus	Allied Seed	113		113						110											97					108(4)
Plus II	Allied Seed								126																	110(2)
Prima	Public	92		74																						83(2)
Red Gold	Proseeds Marketing								81																	92(3)
Red Gold Plus	Turner Seed		97	97			95			95				92						98						103
RedlanGrazie	ABI Alfalfa	95								101																97(6)
RedlanGrazie II	Americas Alfalfa		91	104																						98(2)
Redland Max	ABI Alfalfa						95																			96(3)
Redstart	Syngenta	102		78																						-
Robust	Scott Seed	92																								90(2)
Robust II	Seed Research of OR													107												-
Rocket	Seed Research of OR													102												106
Rojo Diablo	Great Plains		99												101											104(2)
Royal Red	FFR/Sou.St.	108	92		91					79										96						100(2)
Rustler	Oregro Seeds								82										101							93(5)
Scarlet	Dairyland	95																								92(2)
Sienna	Great Plains			91																						-
Solid	Production Service	97	102	98	84			79		112	98	87	86		94									84		99(2)
Starfire	Ampac Seed	97	93	99						98																92(13)
Starfire II	Cal/West & Ampac								98					108												96(5)
Triple Trust 350	ABI Alfalfa						101						92													105(4)
Vesna	DLF-Jenks		53												96											95(3)

1 Year trial was established.

2 Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in forage yield between varieties. To find actual yields, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 2000 was harvested 3 years, so the final report would be "2002 Red and White Clover Report" archived in the KY Forage website at <www.uky.edu/Ag/Forage>.

3 Mean only presented when respective variety was included in two or more trials.

4 Number of years of data.





**Table 4. Summary of Kentucky Tall Fescue Yield Trials 1999-2009 (yield shown as a percentage of the mean of the commercial varieties in the trial).**

Variety	Proprietor	Lexington					Princeton					Quicksand				Mean <sup>3</sup> (#trials)
		1999 <sup>1,2</sup> 2-yr <sup>4</sup>	2001 3-yr	2003 2-yr	2005 3-yr	2007 2-yr	1998 2-yr	2000 2-yr	2002 3-yr	2004 3-yr	2006 3-yr	1999 2-yr	2001 2-yr	2003 2-yr	2005 4-yr	
Atlas	Proseeds	107										89				98(2)
BarElite	Barenbrug					99										-
Bariane	Barenbrug			87	103									95		95(3)
Barolex	Barenbrug				94											-
BarOptima PLUS E34	Barenbrug					103										-
BAR 9 TMPO	Barenbrug	96										97				97(2)
Bronson	Ampac Seed				91	97								102		97(3)
Bull	Improved Forages			98	106			102	103					97		101(5)
Carmine	DLF International		99										97			98(2)
DLF-B	DLF International	96														-
Enhance	Allied Seed									111						-
Festival	Pickseed West		107							106			107			107(3)
Fuego	Advanta Seeds	99														-
Hoedown	DLF International		104										106			105(2)
Jesup EF	Pennington Seed						106									-
Jesup MaxQ	Pennington Seed				102	105			98					100	102	101(5)
Johnstone	Proseeds	95	108									95				99(3)
KENHY	KY Agric Exp Sta.									92						-
Kokanee	Ampac Seed		89					86								88(2)
KY31+	KY Agric Exp Sta.	102	118	113	112	109	122	108	104	77	106	107	124	98	110	108(14)
Maximize	Turf-Seed	96	95									105	93			97(4)
Nanryo	Jap. Grassland ForageSeed/USDA-ARS, El Reno, OK					97										-
Noria	ProSeeds Marketing					102										-
Resolute	Ampac Seed		90										65			78(2)
Savory	DLF International										93					-
Seine	Advanta Seeds	99								100						99(2)
Select	FFR/Sou. St.	106	106	94	103	102	105	105	95	109	103	107	112	102	91	103(14)
Stockman	Seed Research of OR			109						104	99			105		104(4)
TF0203G	Seed Research of OR					88										-
TF33	Barenbrug						70									-
Tuscany	Forage Genetics		112													-
Tuscany II	Seed Research of OR										100					-
Vulcan	International Seeds						97									-

<sup>1</sup> Year trial was established.

<sup>2</sup> Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in forage yield between varieties. To find actual yields, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 1999 was harvested 2 years, so the final report would be "2001 Tall Fescue Report" archived in the KY Forage website at <[www.uky.edu/Ag/Forage](http://www.uky.edu/Ag/Forage)>.

<sup>3</sup> Mean only presented when respective variety was included in two or more trials.

<sup>4</sup> Number of years of data.

**Table 5. Summary of Kentucky Orchardgrass Yield Trials 1999-2009 (yield shown as a percentage of the mean of the commercial varieties in the trial).**

Variety	Proprietor	Lexington				Princeton					Quicksand				Mean <sup>3</sup> (#trials)
		1999 <sup>1,2</sup> 2-yr <sup>4</sup>	2001 2-yr	2003 3-yr	2006 4-yr	1998 2-yr	2000 2-yr	2002 3-yr	2004 3-yr	2006 3-yr	1999 2-yr	2001 2-yr	2003 3-yr	2005 4-yr	
Abertop	Pennington						71							-	
Albert	Univ. of Wis.		103								106			105(2)	
Amba	DLF International Seeds		96								80			88(2)	
Ambassador	DLF International Seeds							95						-	
Ambrosia	American Grass Seed Prod.								90					-	
Athos	DLF International Seeds		98								105			102(2)	
Benchmark	FFR/Sou. St.	103				101	97	113			106			104(5)	
Benchmark Plus	FFR/Sou. St.				100			107		107			107	102	105(5)
Boone	Public					103	104							104(2)	
Bronc	Grassland West						98							-	
Bounty	Allied Seed				101									98	100(2)
Century	Seed Research of Oregon				98									104	101(2)
Command	Seed Research of Oregon								87						-
Crown	Donley Seed	101				105		101			97				101(4)
Crown Royale	Donley Seed										110				-
Crown Royale Plus	Donley Seed							108					97		103(2)
Eastwood	Ampac Seed		86								86				86(2)
Endurance	DLF International Seeds									104					-
Extend	Allied Seed								100						-
Hallmark	James VanLeeuwen		102	102				103	98			101	96		100(6)
Harvestar	Columbia seeds				91					106				100	99(3)
Haymaster	FFR/Sou. St.				94									97	96(2)
Haymate	FFR/Sou. St.	106				93	100	106			108	104	103		103(7)
Icon	Seed Research of Oregon				105									98	102(2)
Intensiv	Barenbrug			102											-
LG-31	DLF International Seeds								92						-
Mammoth	DLF International Seeds		102								104				103(2)
Megabite	Turf-Seed	94	105								101				100(3)
Niva	DLF International Seeds							81							-
Persist	Smith Seed			123	105				101				108	101	108(5)
Potomac	Public	104						98			99				100(3)
Prairie	Turner Seed		101		107		95	104		100		102	105	107	103(8)
Renegade	Grassland West						95								-
Shiloh	Proseeds Marketing					109									-
Shiloh II	Proseeds Marketing								117						-
Spanish Pink	DLF International Seeds					82									-
Spanish Red	DLF International Seeds	101									94				98(2)
Takena	Smith Seed		107					100				108			105(3)
Tekena II	Smith Seed			110	102				109				106	104	106(5)
Tekapo	Ampac Seed	88			91					98	94	92	105	91	94(7)
Tucker	Oregro Seeds									96					-
Udder	Improved Forages			100	107		102	102					106	99	103(6)
Vision	Cropmark Seeds			63									67		65(2)

<sup>1</sup> Year trial was established.

<sup>2</sup> Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in forage yield between varieties. To find actual yields, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 1999 was harvested 2 years, so the final report would be "2001 Orchardgrass Report" archived in the KY Forage website at <[www.uky.edu/Ag/Forage](http://www.uky.edu/Ag/Forage)>.

<sup>3</sup> Mean only presented when respective variety was included in two or more trials.

<sup>4</sup> Number of years of data.



**Table 6. Summary of Kentucky Timothy Yield Trials 2000-2009 (yield shown as a percentage of the mean of the commercial varieties in the trial).**

Variety	Proprietor/KY Distributor	Lexington					Quicksand		Princeton		Mean <sup>3</sup> (#trials)
		00 <sup>1,2</sup> 2yr <sup>4</sup>	01 3yr	02 4yr	06 3yr	07 2yr	99 2yr	01 2yr	00 3yr	04 2yr	
Alma	Newfield Seeds Co/Caudill Seed Co.									81	-
Auroro	General Feed and Grain	100					98				99(2)
Barpenta	Barenbrug					82					-
Clair	Ky Agric. Exp. Station		109	115	107	93		108		122	109(6)
Classic	Cebeco International Seeds	100		88			87				92(3)
Climax	Canada Agr. Res. Station				79	105					92(2)
Colt	FFR Cooperative	105		101	90		112			99	101(5)
Common	Public		96								-
Derby	FFR Cooperative				112	114				124	117(3)
Dolina	DLF-Trifolium	100		91							96(2)
Express	Seed Research of Oregon			97		97					97(2)
Hokuei	Snow Brand Seed	103									-
Hokusei	Snow Brand Seed	97					99				98(2)
Joliet	Newfield Seeds Co/Caudill Seed Co.									90	-
Jonaton	Newfield Seeds Co/Caudill Seed Co.									84	-
Outlaw	Grassland West Company								107		-
Richmond	Pickseed Canada Inc.	100					103				102(2)
Summit	Allied Seed, L.L.C.			114							-
Talon	Seed Research of Oregon				110	117					114(2)
Treasure	Seed Research of Oregon				103	116					110(2)
Tundra	DLF-Trifolium	95									-
Tuukka	Ampac Seed Company		95	90				92	93		93(4)

<sup>1</sup> Year trial was established.

<sup>2</sup> Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in forage yield between varieties. To find actual yields, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 2000 was harvested 2 years, so the final report would be "2002 Timothy Report" archived in the KY Forage website at <www.uky.edu/Ag/Forage>.

<sup>3</sup> Mean only presented when respective variety was included in two or more trials.

<sup>4</sup> Number of years of data.

**Table 7. Summary of Kentucky Bluegrass Yield Trials 1996-2009 (yield shown as a percentage of the mean of the commercial varieties in the trial).**

Variety	Proprietor/KY Distributor	Lexington					Princeton	Mean <sup>3</sup> (#trials)
		96 <sup>1,2</sup> 3yr <sup>4</sup>	03 2yr	04 3yr	06 3-yr	07 2yr	02 3yr	
Adam 1	Radix Research			98				-
Barderby	Barenbrug					97	114	106(2)
Common	Public				70	61		66(2)
Ginger	ProSeeds Marketing		89		121	116		108(3)
Kenblue	Public	90		102	132			110(3)
Lato	Turf Seed Inc.	110				126		118(2)
RAD-339	Radix Research				102			-
RAD-5	Radix Research				98			-
RAD-643	Radix Research				96			-
RAD-731zx	Radix Research				86			-
RAD-762	Radix Research				95			-
Slezanka	DLF International Seeds		111					-

<sup>1</sup> Year trial was established.

<sup>2</sup> Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in forage yield between varieties. To find actual yields, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 2004 was harvested 2 years, so the final report would be "2006 Timothy and Kentucky Bluegrass Report" archived in the KY Forage website at <www.uky.edu/Ag/Forage>. The 96 and 03 Lexington and 02 Princeton results are in the appropriate Tall Fescue Reports.

<sup>3</sup> Mean only presented when respective variety was included in two or more trials.

<sup>4</sup> Number of years of data.

**Table 8. Summary of Kentucky Annual Ryegrass Yield Trials 1999-2009 (yield shown as a percentage of the mean of the commercial varieties in the trial).**

Variety	Proprietor	Lexington <sup>1</sup>								Princeton			Bowling Green		Mean <sup>4</sup> (#trials)	
		1999 <sup>2,3</sup>	2001	2003	2004	2005	2006	2007	2008	2000	2002	2004	2000	2003		
All trials are 1 year yields																
Abundant							26									-
Acrobat	Proseeds Marketing								244							-
Andy	DLF International	112	105							99						105(3)
Angus I	DLF International											80				-
Aurelia	Forage Genetics		120									130				125(2)
Avance	DLF International	113								109						111(2)
Barextra	Barenbrug										117					-
Big Daddy	FFR/Sou. St.	87	86							90	85		104			90(5)
Bruiser	Ampac Seed								111							-
Common	Public									85	85		95	87		88(4)
DH-3	Allied Seed							106	45							76(2)
Diamond T							18									-
Domino	DLF International										121					-
Fantastic	Ampac Seed	83						105	98		90			97		92(4)
Feast	Ampac Seed		90													-
Feast II	Ampac Seed		98						59		123					93(3)
Flying A	Oregro Seeds						85		100							-
Graze-N-Gro	Seed Research of OR			105				78				94		107		96(4)
Gulf	Public		72					78	44	81	77	57	86			71(7)
Hercules	Barenbrug	114								110						112(2)
Jackson	The Wax Co.				80	100	138	120	100		87			96		97(6)
Jeanne	DLF International		124													-
Jumbo	Barenbrug			103										104		104(2)
King	Lewis Seed		92													-
Marshall	The Wax Co.	87		92	120	100	221	116	169	102	97		114	106		110(10)
Monarque	Seed Research of OR											117				-
Passerel Plus	Pennington Seed										100					-
Rio		88								100	97		102			97(4)
Spark	DLF International	87											83			85(2)
Stockaid							181									-
Striker	Seed Research of OR							104								-
TAMTBO	Oregro Seeds								80							-
Tam 90									82		85					84(2)
TetraPro									67							-
Tetrelite II	DLF International											122				-
T-Rex							25									-
Winter Star	Ampac Seed		87								96					92(2)
Zorro	DLF International	120	127							135	130		118			126(5)

<sup>1</sup> In annual ryegrass, low yielding varieties usually result from winterkill. Note: Due to severe winterkill, yield results from the 2006 planting were not included in the overall mean. See "2009 Annual and Perennial Ryegrass and Festulolium Report" Table 2 for yield and stand data for the 2006 planting.

<sup>2</sup> Year trial was established.

<sup>3</sup> Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in forage yield between varieties. To find actual yields, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 1999 was harvested 1 year, so the final report would be "2000 Annual and Perennial Ryegrass Report" archived in the KY Forage website at <[www.uky.edu/Ag/Forage](http://www.uky.edu/Ag/Forage)>.

<sup>4</sup> Mean only presented when respective variety was included in two or more trials.

**Table 9. Summary of Kentucky Perennial Ryegrass Yield Trials 1999-2009 (yield shown as a percentage of the mean of the commercial varieties in the trial).**

Variety	Proprietor	Lexington							Princeton		Bowling Green		Mean <sup>3</sup> (#trials)
		1999 <sup>1,2</sup> 2yr <sup>4</sup>	2001 2yr	2003 2yr	2004 3yr	2005 3yr	2006 2yr	2007 2yr	2000 2yr	2002 3yr	2000 2yr	2003 2yr	
Aires	Ampac Seed		95							93			94(2)
Amazon	AgriBioTech	108			99					107			104(3)
Anaconda	Caudill Seed	113							95		103		104(3)
Aubisque	Seed Research of OR			144								99	122(2)
Bandit	Grassland West								106		114		110(2)
Bastion C-2	Seed Research of OR				91								-
Bestfor	Improved Forages								113	107	120		113(3)
Bestfor Plus	Improved Forages			116	108	118						136	120(4)
BG-34	Barenbrug					83	85						84(2)
Bison	International Seeds											140	-
Boost	Allied Seed							128					-
Boxer	AgriBioTech	121							106				114(2)
Calibra	DLF International									112			-
CAS MP64	Cascade International		97										-
Citadel	Ag Canada	101							94	113	103		103(4)
Derby	Public										74		-
Eurostar	Seed Research of OR							116					-
Feeder	Seed Research of OR							77					-
Granddaddy	Smith Seed		118				101	108		111			110(4)
GreenGold	Grasslands Oregon						96						-
Lasso	DLF International		98										-
Linn	Public	87	98	98	102		98	83	87	88	77		91(9)
Manhattan										85			-
Mara	Barenbrug										85		-
Matrix	Cropmark seeds			77								64	-
Maverick Gold	Ampac Seed		97							71			84(2)
Polly II	FFR/Sou. St.	104							110		125		113(3)
Polly Plus	Allied Seed			64								60	62(2)
Power	Ampac Seed							112					-
Quartermaster	Radix Research					122							-
Quartet	Ampac Seed		97			56		45		113			78(4)
RAD-CPS212	Radix Research					134							-
RAD-MI125	Mountain View Seeds						120						-
Sampson	International Seeds	87											-
Sierra	Lewis Seed Co.					89							-
Tonga	Ampac Seed					96							-
Yatsyn	Barenbrug	80							89				85(2)

<sup>1</sup> Year trial was established.

<sup>2</sup> Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in forage yield between varieties. To find actual yields, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 1999 was harvested 2 years, so the final report would be "2001 Annual and Perennial Ryegrass Report" archived in the KY Forage website at <www.uky.edu/Ag/Forage>.

<sup>3</sup> Mean only presented when respective variety was included in two or more trials.

<sup>4</sup> Number of years of data.

**Table 10. Summary of Kentucky Festulolium Yield Trials 1999-2009 (yield shown as a percentage of the mean of the commercial varieties in the trial).<sup>1</sup>**

Variety	Proprietor	Lexington					Princeton	Quicksand		Mean <sup>4</sup> (#trials)
		1999 <sup>2,3</sup> 2-yr <sup>5</sup>	2001 3-yr	2003 2-yr	2005 3-yr	2007 2-yr	2000 2-yr	2001 2-yr	2003 2-yr	
Duo	Ampac Seed	104			84					94(2)
Felina	DLF International		101							-
Hykor	DLF International			98					98	98(2)
Spring Green	Turf-Seed		88		105	101		97		98(4)
Vorage	Improved Forages						99			-

<sup>1</sup> The festuloliums were in fescue trials from 1999-2005 and in the 2007 perennial ryegrass trial.

<sup>2</sup> Year trial was established.

<sup>3</sup> Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in forage yield between varieties. To find actual yields, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 1999 was harvested 2 years, so the final report would be "2001 Tall Fescue Report" archived in the KY Forage website at <www.uky.edu/Ag/Forage>.

<sup>4</sup> Mean only presented when respective variety was included in two or more trials.

<sup>5</sup> Number of years of data.

**Table 11. Summary of Kentucky White Clover Grazing trials 2002-2009 (stand persistence shown as a percent of the mean of the commercial varieties in the test).**

Variety	Type	Proprietor	2002 <sup>1,2</sup>	2004	2006 <sup>3</sup>	2006	2008 <sup>4</sup>	Mean <sup>5</sup> (#trials)
			2yr <sup>6</sup>	4yr	2yr	2yr	2yr	
Alice	Intermediate	Barenbrug USA		59	98			79(2)
Barblanca	Intermediate	Barenbrug USA		118	91	151		120(3)
Colt	Intermediate	Seed Research of OR		114	134	122		123(3)
Crescendo	Ladino	Cal/West	84			72		78(2)
Durana	Intermediate	Pennington		83	105	103	101	98(4)
Insight	Ladino	Allied Seed				77		-
Ivory	Intermediate	Cebeco	132	142				137(2)
Kopu II	Intermediate	Ampac Seed			77	122		100(2)
Patriot	Intermediate	Pennington		110	137	122	101	118(4)
Rampart	-	Oregro Seeds					100	-
Regal	Ladino	Public	92		57	54	100	76(4)
RegalGraze	Ladino	Cal/West			84	87	99	90(3)
Resolute	Intermediate	FFR/Southern States			101	106		104(2)
Seminole	Ladino	Saddle Butte Ag. Inc.		75		97		86(2)
Tillman II	Ladino	Caudill Seed	92					-
Will	Ladino	Allied Seed			117	87	101	102(3)

<sup>1</sup> Year trial was established.

<sup>2</sup> Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in stand persistence between varieties. To find actual persistence ratings, look in the yearly report for the final year of each specific test. For example, the trial planted in 2002 was grazed for 2 years so the final persistence report would be "2004 Red and White Clover Grazing Tolerance Report" archived in the KY Forage website at <[www.uky.edu/Ag/Forage](http://www.uky.edu/Ag/Forage)>.

<sup>3</sup> This trial was replanted in the spring of 2006 due to poor establishment in the fall of 2005.

<sup>4</sup> This trial was replanted in the spring of 2008 due to poor establishment in the fall of 2007.

<sup>5</sup> Mean only presented when respective variety was included in two or more trials.

<sup>6</sup> Number of years of data.

**Table 12. Summary of Kentucky Alfalfa Grazing trials 1994-2009 (stand persistence shown as a percent of the grazing tolerant Alfagrazze).**

Variety	Proprietor	Variety Characteristics <sup>1</sup>														Mean <sup>5</sup> (#trials)	
		Disease Resistance <sup>2</sup>															
		FD	Bw	Fw	An	PRR	APH	1994 <sup>3,4</sup> 3yr <sup>6</sup>	1996 3yr	1997 4yr	1998 3yr	2000 2yr	2000 3yr	2001 3yr	2004 4yr		2005 4yr
ABT 205	W-L Research	2	HR	HR	HR	HR	R	HR	R	HR	R	94	84				89(2)
ABT 350	W-L Research	3	HR	HR	HR	HR	HR	HR	HR	HR	HR						
ABT 405	W-L Research	4	HR	HR	HR	HR	HR	HR	HR	HR	HR	71	69				83(5)
Alfagrazze	Americas Alfalfa	2	MR	R	MR	R	-	100	100	100	100	100	100	100	100	100	100(10)
Amerigraze 401+Z	Americas Alfalfa	4	HR	HR	HR	HR	R	HR	HR	HR	R	120	53				78(6)
Ameristand 403T	Americas Alfalfa	4	HR	HR	HR	HR	HR	HR	HR	HR	HR					141	143(2)
Ameristand 407TQ	Americas Alfalfa														136		
Apollo	Americas Alfalfa	4	R	R	R	R	-	48	75	33	47	17	31	25	36	27	39(9)
Arc (certified)	Public	4	LR	MR	HR	-	-	38									
Baralfa 54	Barenbrug USA	-	R	HR	HR	HR	HR		78								
Cut-n-Graze	Americas Alfalfa	3	HR	HR	HR	HR	R	68									
FK 421	Donley Seed Co.	4	HR	H	H	H	H						100				
Feast	Garst Seeds	3	HR	HR	HR	HR	R		146			87	92				108(3)
Fortress	Syngenta	3	R	R	R	R	R	40	71								56(2)
Gold Plus	PGI Alfalfa	4	HR	HR	HR	HR	R				81						
Grazeking	FFR/Southern States	5	MR	HR	HR	R	S		91	41				50			61(3)
Haygrazer	Great Plains Research	4	HR	HR	R	R	MR		75	39		38					51(3)
Integrity	PGI Alfalfa	4	HR	HR	HR	HR	HR							172			
Legacy	Green Seed	4	R	R	R	R	R	32									
Magnagrazze	Dairyland Seed Co.	3	HR	HR	R	HR	-	56									
Pasture Plus	MBS	3	HR	HR	R	HR	MR	60									
Pioneer 98	Pioneer	3	HR	R	HR	R	-				56						
ProGro	MBS Inc.	4	HR	HR	R	HR	MR				81						
Quantum	ABI Alfalfa	2	HR	HR	HR	HR	R	71									
Rebel	Target Seed	4	HR	HR	HR	HR	HR									79	
Rugged	Target Seed	3	HR	HR	HR	HR	HR									146	
Rushmore	Syngenta	4	HR	HR	HR	HR	HR	32									
Saranac AR (cert.)	Public	4	MR	R	HR	LR	-		77				100				89(2)
Spredor 3	Syngenta	1	HR	HR	R	MR	S	71	123		75				68		96(4)
Stam pede	Allied Seed	3	HR	R	R	HR	R		73								
Triple Trust 450	ABI/America's Alfalfa	5	HR	HR	HR	HR	HR								145		
Wintergreen	ABI Alfalfa	3	HR	HR	HR	HR	R	95									75(3)
WL 326GZ	W-L Research	4	HR	HR	HR	HR	HR		118		88						103(2)
115 Brand	Monsanto	3	HR	HR	R	HR	R				56	85					71(2)
5373	Pioneer	4	HR	HR	HRT	MR	LR	21									
5432	Pioneer	4	HR	HR	-	MR	-							51			

<sup>1</sup> Variety characteristics: FD=fall dormancy, Bw=bacterial wilt, Fw=fusarium wilt, An=anthracnose, PRR=phytophthora root rot, APH=aphanomyces root rot. Information provided by seed companies.  
<sup>2</sup> Disease resistance: S=susceptible, LR=low resistance, MR=moderate resistance, R=resistance, HR=high resistance.  
<sup>3</sup> Year trial was established  
<sup>4</sup> Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in stand persistence between varieties. To find actual persistence ratings, look in the yearly report for the final year of each specific test. For example, the Lexington trial planted in 1996 was grazed for 3 years so final persistence report would be "1999 Alfalfa Grazing Tolerance Report" archived in the KY Forage website at <www.uky.edu/Ag/Forage>.  
<sup>5</sup> Mean only presented when respective variety was included in two or more trials.  
<sup>6</sup> Number of years of data.

**Table 13. Summary of 1996-2009 Kentucky Tall Fescue Grazing Tolerance Trials (stand persistence shown as a percent of the stand rating of KY 31+).**

Variety	Proprietor	Lexington												Princeton		Mean <sup>3</sup> (#trials)		
		1996 <sup>1,2</sup> 3yr <sup>4</sup>	1997 4yr	1998 3yr	1999 4yr	2000 4yr	2001 4yr	2002 4yr	2003 4yr	2004 4yr	2005 4yr	2006 3yr	2002 4yr					
Advance MaxQ	Pennington Seed																	
Bariane	Barenbrug USA																	
Barcel	Barenbrug USA	92																68(3)
Barolex	Barenbrug USA																	
BarOptima PLUS E34	Barenbrug USA																	74(2)
BAR9TMPO	Barenbrug USA																	
Bronson	Ampac Seed				75													
Cattle Club	Green Seed		37	98	70	93	91											78(2)
Carmine	DLF-Jenks						90											
Cowgirl	Rose Agri-Seed																	
Dovey	Barenbrug USA	92																
Festival	Pickseed West																	
Festorina	Advanta Seeds	98	86		57													80(3)
Fuego	Advanta Seeds			27														
Hoedown	DLF-Jenks					88												
Jesup EF	Pennington Seed		63	91														
Jesup MaxQ	Pennington Seed																	
Johnstone	Proseeds		65	107			92											
KY31+	KY Agri. Exp Sta.	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100(12)
KY31-	KY Agri. Exp Sta.	94	90	102	84		98	103	98	100	100	100	100	82	99	105	105	96(11)
Kenhy	Public			116														
Kokanee	Ampac Seed					43												
Martin II	International Seeds		59															
Maximize	Rose Agri-Seed						99											
Orygun	-								99									
Resolute	Ampac Seed																	
Select	FFR/Sou. St.			109	69	107	101	100	100	100	100	100	67	96	98	98	98	94(9)
Southern Cross	-		25															
Stargrazer	FFR/Sou. St.	90			52	86	89											79(4)
Stockman	Seed Res. of OR											102						
TF33	Barenbrug USA			34														
Tuscany II	Seed Res. of OR														99			
Verdant	Am.Grass Seed														90			
Vulcan	International Seeds			109														

<sup>1</sup> Year trial was established.

<sup>2</sup> Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in stand persistence between varieties. To find actual persistence ratings, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 1997 was grazed 4 years so the final report would be "2001 Cool-Season Grass Grazing Tolerance Report" archived in the KY Forage website at <www.uky.edu/Ag/Forage>.

<sup>3</sup> Mean only presented when respective variety was included in two or more trials.

<sup>4</sup> Number of years of data.

**Table 14. Summary of 1996-2009 Kentucky Orchardgrass Grazing Tolerance Trials (stand persistence shown as a percent of the mean of the commercial varieties in the trial).**

Variety	Proprietor	Lexington										Princeton		Mean <sup>3,5</sup> (#trials)		
		1996 <sup>1,2</sup> 3yr <sup>4</sup>	1997 4yr	1998 3yr	1999 4yr	2000 4yr	2001 4yr	2002 4yr	2003 4yr	2004 4yr	2005 4yr	2002 4yr				
Abertop	Pennington Seed										38					
Albert	Univ. of Wisconsin									115						
Amba	DLF-Jenks									71						
Ambrosia	Pennington Seed		90													
Athos	DLF-Jenks									93				60		77(2)
Benchmark	FFR/Sou. States	100	105	115	94	118	123	114			114				133	113(8)
Benchmark Plus	FFR/Sou. States							120							133	135(3)
Boone	Public			131		102										117(2)
Cheyenne	Western Prod. Inc.			94												
Command	Seed Research of OR										81					
Crown	Donley Seed		86	96												91(2)
Crown Royale	Donley Seed									100						
Crown Royale Plus	Donley Seed										124				83	104(2)
Hallmark	James VanLeeuwen	107		104	103					115		113			83	104(6)
Haymate	FFR/Sou. States	93	71	102	96	53	115	100			100	118			83	92(9)
Intensiv	Barenbrug USA											51				
Mammoth	DLF-Jenks									115						
Megabite	Turf Seed									77						
Niva	DLF-Jenks										76				83	80(2)
Persist	Smith Seed													138		
Pizza	Advanta Seeds			63												
Potomac	Public	98									116		119		117	113(4)
Prairie	Turner Seed					127	121								83	110(3)
Profile	Scott Seed	98									116					107(2)
Progress	Scott Seed	111														
Tekapo	Ampac Seed	93	166	92	104			74		55	74	118		50	100	94(9)
Takana	Smith Seed		81							99						90(2)
WP300	Western Prod. Inc.			94												

<sup>1</sup> Year trial was established

<sup>2</sup> Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in stand persistence between varieties. To find actual persistence ratings, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 1997 was grazed 4 years so the final report would be "2001 Cool-Season Grass Grazing Tolerance Report" archived in the KY Forage website at <www.uky.edu/Ag/Forage>.

<sup>3</sup> Mean only presented when respective variety was included in two or more trials.

<sup>4</sup> Number of years of data.

<sup>5</sup> Stand thinning may have been greater for preferred varieties due to closer grazing. See individual trial tables in the "2009 Cool Season Grass Grazing Tolerance Report" for preference ratings.

**Table 15. Summary of 2000-2009 Kentucky Perennial Ryegrass Grazing Tolerance Trials (stand persistence shown as a percent of the mean of the commercial varieties in the trial).**

Variety	Proprietor	2000 <sup>1,2</sup>	2001	2003	2005	Mean <sup>3</sup> (#trials)
		4yr <sup>4</sup>	3yr	4yr	3yr	
AGRLP103	AgResearch USA	133		86		110(2)
Aries	Ampac Seed		139			-
BG 34	Barenbrug USA				176 <sup>5</sup>	-
Citadel	Donley Seed	112				-
Granddaddy	Smith Seed Services		121			-
Lasso	DLF-Jenks		130			-
Linn	Public	117	129	63		103(3)
Maverick	Ampac Seed		36			-
Polly II	FFR/Southern States	37	68			53(2)
Quartet	Ampac Seed		77		63	70(2)
Remington	Barenbrug USA			151 <sup>5</sup>		-
Tonga	Ampac Seed				61	-

<sup>1</sup> Year trial was established.

<sup>2</sup> Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in stand persistence between varieties. To find actual persistence ratings, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 2000 was grazed 4 years so the final report would be "2004 Cool-Season Grass Grazing Tolerance Report" archived in the KY Forage website at <[www.uky.edu/Ag/Forage](http://www.uky.edu/Ag/Forage)>.

<sup>3</sup> Mean only presented when respective variety was included in two or more trials.

<sup>4</sup> Number of years of data.

<sup>5</sup> Grazing tolerance values for these entries may have been elevated due to the low survival of the other commercial varieties in the trials for these years. See 2009 Cool-Season Grass Grazing Tolerance Report for more details.