

2013 Michigan Forage Variety Test Report

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Forage crops are essential components of diversified agricultural production systems in Michigan. They provide feed for livestock, fix nitrogen for crop rotations, reduce soil erosion, improve soil structure, fertility and water retention, protect water quality, provide habitat for wildlife, generate biomass for fuel conversion, and create eye appeal to landscapes. As grain prices rise, competition from row crops for land use is squeezing forage production acres while equipment, land, and labor costs continue to increase. Under these market conditions, the importance of improving yield per acre through use of better forage varieties is an important component of profitability. Michigan hay prices remained strong in 2013, and a one-ton increase in dairy-quality alfalfa hay yield was worth up to \$250/acre.

2013 Conditions

Weather conditions in 2013 were much more favorable for growing forages than in 2012, but not always favorable for drying hay. Rainfall for the growing season was

well above normal at East Lansing. Much of the above average rain was in April and May, and heavy rains in late May and early June delayed harvest of first cutting in many areas in the Lower Peninsula. First cut was delayed into the first week of June at East Lansing. At Lake City, first cutting date was on schedule and average rainfall for the summer was near normal, but rainfall distribution was uneven with dry conditions from late June to early August. Temperatures were slow to increase in the Upper Peninsula in spring 2013. First cutting of alfalfa at Chatham was on July 1, two weeks later than usual. Annual rainfall total and 30-year averages for East Lansing, Capac, and Ithaca in southern Lower Michigan, at Lake City in northern Lower Michigan, and at Chatham in the Upper Peninsula are in **Table 1**. Growing conditions allowed for alfalfa to be cut four times at East Lansing and Capac, and three times at Lake City and Chatham. The established grass variety trial was cut four times in 2013 at East Lansing. Yields of all species tested were above the 2012 yields.



Compared to established stands in 2012, average yield of alfalfa was 14% higher at East Lansing, 15% higher at Capac in eastern Lower Michigan, 9% higher at Lake City in northern Lower Michigan and 30% higher in the new seeding at Chatham. New trials of both conventional and Roundup Ready alfalfa varieties were established at East Lansing, Lake City, and Chatham in 2013, but seeding year data are not reported here.

ALFALFA VARIETY TEST

Michigan State University has evaluated more than 90 commercially available alfalfa varieties in its alfalfa variety trials since 2007. Plant breeders, developers, and

Table 1. Actual and 30-year-average precipitation from April to October 2008 to 2013 at five variety test sites across Michigan.

	2008	2009	2010	2011	2012	2013	Avg	2008	2009	2010	2011	2012	2013	Avg	2008	2009	2010	2011	2012	2013	Avg	
East Lansing								Chatham							Ithaca							
Apr	2.15	6.50	2.37	5.21	1.53	7.78	2.81	6.30	3.02	0.95	3.35	1.05	3.30	2.46	--	--	2.63	5.03	2.03	8.62	3.09	
May	1.36	4.29	5.10	6.81	3.40	4.35	2.73	3.64	3.58	1.61	3.10	2.43	2.20	3.15	--	--	3.57	4.28	1.69	4.58	3.49	
June	4.80	4.97	4.70	1.85	1.50	5.23	3.54	3.85	1.91	6.82	4.03	4.34	2.77	3.61	--	--	3.16	2.47	2.49	2.59	3.46	
July	3.72	2.39	2.15	4.76	1.80	2.49	3.02	1.76	3.66	5.73	1.41	4.47	4.78	3.56	--	--	1.38	4.19	5.53	1.22	2.76	
Aug	0.50	6.63	0.71	3.50	2.70	5.74	3.12	1.07	3.88	1.96	0.73	2.12	2.68	3.55	--	--	0.94	4.55	6.21	3.60	3.45	
Sept	8.42	0.74	3.79	2.09	2.52	0.89	2.50	3.78	3.06	8.62	5.26	5.13	2.71	4.16	--	--	3.00	1.52	1.04	1.30	3.43	
Oct	1.61	3.64	1.35	3.08	4.69	5.24	2.20	2.32	6.50	2.18	2.75	5.55	3.06	3.24	--	--	2.00	2.68	4.42	2.53	2.90	
Lake City								Capac														
Apr	3.49	2.65	3.09	7.09	2.20	5.09	2.88	--	--	--	4.03	1.24	7.62	2.85								
May	1.79	2.71	2.35	2.44	5.30	3.02	2.67	--	--	--	4.63	2.36	1.48	3.08								
June	7.15	2.64	4.69	4.11	3.03	1.87	3.09	--	--	--	6.33	1.63	2.97	3.27								
July	3.93	1.26	5.18	2.15	7.32	2.03	3.26	--	--	--	3.19	2.67	2.85	3.30								
Aug	2.16	4.30	2.77	3.61	1.97	4.15	3.01	--	--	--	2.50	2.02	2.99	2.92								
Sept	2.95	2.65	2.97	2.61	3.45	1.66	3.25	--	--	--	3.85	0.06	1.48	3.68								
Oct	2.69	4.84	1.36	3.85	4.35	3.09	2.65	--	--	--	0.81	3.64	2.22	2.80								

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marketers submit alfalfa varieties for evaluation. Varieties seeded in these trials are evaluated for yield and persistence for at least three full years after the seeding year. Testing locations in 2013 for the Michigan alfalfa variety trials were the Upper Peninsula Research and Extension Center at Chatham, the Lake City Research Center at Lake City, the Lynn Island Farm near Capac, and the Michigan State University Agronomy Farm at East Lansing. Yield is expressed in dry matter tons per acre as an average over years for 51 alfalfa varieties seeded at East Lansing (2007-2011) and as single-year yield for the 2012 seeding (**Table 4**). Yields of 32 varieties seeded at Lake City from 2007-2012 are provided in **Table 5**. Three-year average yields of varieties seeded at North Branch in 2008 and 2-year average yields of varieties seeded at Capac in 2011 are in **Table 6**. **Table 7** contains yield results from 21 varieties entered in the trials established in 2008, 2009, and the first-year yields of varieties seeded in 2012 at Chatham (Alger Co.) in the Upper Peninsula. Vernal (fall dormancy 2), a sixty-year-old variety with little disease resistance, is used as the check variety because it is familiar to most growers and is a good check for yield and persistence in a standard 3 or 4-cut system. An index value for variety yield as a percent of Vernal is presented for each alfalfa entry. Individual cut yields are presented in **Tables 11 – 15, and Tables 18 - 20** for each conventional alfalfa test harvested in 2013.

POTATO LEAFHOPPER-RESISTANT ALFALFA TEST

Potato leafhopper (PLH) is the most damaging insect to alfalfa yields in Michigan. It does not overwinter in Michigan, but arrives carried by the gulf-stream air currents in mid to late June. It damages alfalfa by injecting a piercing mouthpart into the stem and petiole of alfalfa and injecting toxic saliva that girdles the plant. This results in decreased flow of nutrients within the plant, stunting, and “hopperburn,” a distinctive yellowing of leaflet tips. Yield, forage quality, and persistence may be reduced when sufficient numbers of PLH exist. Resistance to PLH does not mean that alfalfa will not also benefit from insecticide applications, especially in the establishment year. Depending on the height of the alfalfa, the economic threshold for PLH-resistant varieties may be two to three times greater

than the threshold for non-resistant varieties. Results of PLH-resistant varieties and susceptible checks seeded from 2007 to 2011 at East Lansing are listed in **Table 8**. Individual cut yields are presented in **Tables 16 - 17** for each PLH-resistant alfalfa test harvested in 2013.

Selection of an Alfalfa Variety

Alfalfa stands may be established with goals of short-term or long-term stand life. Varieties chosen for short-term stands in Michigan (three to four years) should be: 1) at least moderately winterhardy (score 1 to 3), 2) high yielding, and 3) resistant to bacterial wilt (BW) and anthracnose (AN). Resistance to *Phytophthora* root rot (PRR) is desirable when alfalfa is grown on damp, fine-textured soils.

Winterhardiness is of primary importance for long-term stands. Winterhardy varieties may be slower to recover than moderately hardy varieties after a mid-September cutting. Compared to moderately hardy varieties, winterhardy varieties may flower three to five days later in the first cutting. Winterhardy varieties may be lower in yield than moderately hardy varieties in three- to five-year-old stands, but are usually higher yielding after about five years, especially in northern Michigan. For longest stand life, select high-yielding, winterhardy varieties resistant to PRR, AN, and VW. Varieties in dormancy group 2 are more long-lived than moderately hardy varieties (dormancy groups 3 and 4), but will not yield as well.

The appropriate cutting management system depends on the location, yield goal, forage quality goal, and desired stand life. Location matters because fewer cuttings are possible in shorter growing seasons. Five-cut systems may be feasible in southern Michigan, but it is rarely possible to get more than three in the Upper Peninsula. Regardless of location, there is a clear tradeoff between number of cuttings and stand persistence. More cuttings per year at shorter intervals will result in greater forage quality and greater cumulative yield for the first three to four years, but will also reduce long-term stand life.

The reliability of variety rankings increases with the number of environments (i.e. the number of tests) in which the variety has been tested. Therefore, varieties that have been entered in only one or two tests may not perform as expected in a farm situation.

Winterhardiness and Fall Dormancy Ratings

Fall dormancy (FD) ratings are determined by the amount of regrowth after a mid-September cutting. In the past, high FD ratings were associated with poor winterhardiness, but new breeding efforts by some companies may have broken the link between FD and winterhardiness. Trials in Wisconsin have shown some varieties with high FD ratings (4-5) to be as winterhardy as varieties with lower FD ratings (2-3). Non-winterhardy varieties used in the West have FD ratings of 5, 6, or 7. Non-winterhardy alfalfa varieties are usually not well adapted for Michigan, even for short-term stands. While fall dormancy and winterhardiness ratings are reported by seed companies, Wisconsin is also evaluating winter-survival (WSI) of several commercial varieties (**Table 3**).

Alfalfa Disease Ratings

An alfalfa variety consists of a population of plants which are genetically different from each other. Varieties are described according to the mean response of all plants, such as average yield, and as a frequency of certain types of plants, such as the percentage of plants resistant to some pest or disease. Thus, even in a “resistant” variety, only a portion of the plants will be resistant. Moderate resistance, for example, means that 15 to 30% of the plants are resistant, but 70 to 85% are susceptible. Even a variety classified as resistant may suffer damage from a disease. Moderate resistance is generally considered adequate for good alfalfa production. Even resistant varieties, however, are susceptible to PRR or *Pythium* diseases in the seedling stage. A list of disease resistance for varieties evaluated for yield at MSU is provided in **Table 3**. Additional information and pictures of alfalfa diseases can be found at www.alfalfa.org/pdf/AlfalfaAnalyst.pdf.

Bacterial Wilt (BW). BW is present in all of Michigan. All of the named varieties sold in Michigan are adequately resistant to BW. “Common” alfalfa varieties sold by some seed companies are not recommended since the seed may be from susceptible plants.

Phytophthora Root Rot (PRR). This fungal disease, first found in Michigan in 1972, is now one of the state's most important alfalfa diseases. PRR occurs on heavy or poorly drained soils. Any soil,

however, when saturated during a rainy period of seven to ten days may result in severe injury, especially to one- to two-month old seedlings. Seed companies have been treating alfalfa seed with the fungicide *Apron* for several years. Seed treating with *Apron* may be helpful in improving stands of resistant varieties. Treating a susceptible variety, such as Vernal, is probably not helpful. Most of the highest yielding varieties entered in our tests are resistant to PRR.

Anthracnose (AN). This disease, first found in Michigan in 1976, is becoming more severe each year. It occurs during hot, moist summers and is most common in the southern third of Lower Michigan. The fungus infects stems and crowns and may kill some plants. It is now recommended that only anthracnose resistant varieties be planted in Michigan.

Verticillium Wilt (VW). First detected in Michigan in 1982, VW has not increased in severity as expected. It is generally introduced with infected seed. It usually is not a problem until the third year, and then primarily in the first cutting. Growing alfalfa for three to four years in rotation with corn will help break the disease cycle. Resistance to *verticillium* is recommended if planting alfalfa after alfalfa.

Aphanomyces (APH) *Aphanomyces euteiches* is a soil-borne fungus that is similar to PRR and thrives in cool-moist conditions. It can kill or severely stunt young seedlings and causes a chronic root disease in established plants. Seedlings infected with APH will have yellow leaves (chlorosis) and gray roots and stems. There are two races of APH. Alfalfa resistant to race 2 is also resistant to race 1; however, resistance to race 1 does not infer resistance to race 2. Resistance to APH should be considered when establishing alfalfa in poorly drained areas.

Stem/bulb nematode (SN). (*Ditylenchus dipsaci*) is a microscopic pest that can become a problem in areas where alfalfa is grown for many years. Symptoms of nematode damage include stunted plants and club-like stems. Crop rotation is the best method for controlling stem nematode.

RED CLOVER TEST

Red clover is a short-lived perennial legume that is well-adapted to Michigan. It is used for hay, haylage, pasture, and cover cropping. It is among the most shade tolerant legumes and is easy to establish by conventional methods and frost-seeding.

MSU conducted variety tests for red clover at East Lansing and Lake City in 2004, and at East Lansing in 2009 and 2010 (**Table 9**). Tests were conducted using the same methods as the alfalfa tests, but for a shorter time period (3 years including establishment) and with three cuts per year.

PERENNIAL COOL-SEASON GRASS TEST

Perennial cool-season grass tests have been evaluated for yield and persistence. The most recent trials were established at East Lansing in 2011 and 2013. Each test was seeded as a randomized complete block design using four replications. Nitrogen fertilizer was applied at green-up in early April and after cuts 1, 2, and 3 of the 2011 established trial. Dry matter yields (multi-year averages) for trials seeded from 2006 to 2011 are presented in **Table 10**, and individual cut yields are presented in **Tables 21 - 22** for each grass test harvested in 2013.

A brief description of tested grass species is provided below, with a summary of management recommendations in **Table 2**. Selection of a grass variety should first consider adaptation of the species to the conditions of the proposed site and intended use as hay/haylage or pasture. Only then should individual varieties and desired yield come under consideration. The reliability of variety rankings increases with the number of environments (i.e. the number of tests) in which the variety has been tested. Therefore, varieties that have been entered in only one test may not perform as expected in a farm situation.

Orchardgrass (*Dactylis glomerata* L.) is a high-yielding, competitive perennial bunchgrass that grows more rapidly than most other Michigan forages in the early spring. Orchardgrass grows well on a wide range of soil types, but is not suited for wet sites. Orchardgrass has similar nutritive characteristics to timothy and smooth brome, and is often grown together with alfalfa. Because orchardgrass matures earlier than alfalfa, late-maturing varieties

of orchardgrass are preferred when the two are grown in mixture.

Bromegrasses (*Bromus spp.*) are rhizomatous, sod-forming grasses that are high in forage quality and yield. **Smooth brome** is one of the most winter-hardy grasses in Michigan and can be grown on a wide range of soil types. Smooth brome has poor regrowth potential, producing most of its yield in the first cutting, and it should not be grazed or cut during stem elongation or early heading to prevent a reduction in tillering. **Meadow brome** has better regrowth potential and heat tolerance than smooth brome. Crosses between smooth and meadow brome, sometimes called **Intermediate Brome**, can have the best traits of both parents.

Timothy (*Phleum pratense* L.) is a bunchgrass that forms an open sod and persists well under poorly drained conditions. It is best known for its winterhardiness and ability to survive when covered by ice. Timothy is a late-maturing grass that produces most of its yield in the first cutting and requires a long rest period after harvest, making it undesirable for harvest systems with more than two cuttings.

Fescues (*Schedonorus spp.*) are sod-forming grasses known for good fall growth and stockpiling potential. Tall fescue is persistent under frequent short grazing, heavy traffic, drought, and poor drainage on many soil types. Many new varieties of **tall fescue** are endophyte-free or contain novel endophytes that are not toxic to animals as are endophytes in older varieties. Tall fescue varieties containing the toxic wild-type endophyte (E+) are not recommended for Michigan. **Meadow fescue** has better forage quality, palatability, and cold tolerance than tall fescue and does not contain toxic endophytes.

Ryegrasses (*Lolium spp.*) are sod-forming bunchgrasses that are noted for extremely high forage quality and good regrowth potential. **Perennial ryegrass** is suitable for rotational grazing and multiple harvests for haylage, but it lacks the winterhardiness of many other grasses, will go dormant under hot, dry conditions, and is difficult to dry as hay because of its waxy leaf cuticle. It requires high fertility and performs best under irrigation in

Michigan. Annual (Westerwold) and Italian ryegrasses are short-lived species that differ from each other only in vernalization requirement for flowering. Italian ryegrass requires a cold period to initiate heading and annual ryegrass does not. Italian and annual ryegrasses are generally similar to perennial ryegrass in adaptation and use characteristics, except that many varieties are not winterhardy in Michigan.

Festuloliums (*Schedonorus x Lolium spp.*) are crosses between a fescue (meadow or tall fescue) and a ryegrass (perennial or Italian ryegrass), thus combining the persistence of fescue with the palatability and nutritive quality of ryegrass. The large number of possible parent combinations results in a great range of appearance, yield and quality characteristics among festulolium varieties.

Kentucky bluegrass (*Poa pratensis* L.) is a relatively short-statured, sod-forming perennial grass that is very palatable when vegetative. It persists under frequent, close grazing and is very winter hardy in Michigan, but is unpalatable when heading and quickly goes dormant under hot, dry summer conditions. Kentucky bluegrass is more suitable for grazed than harvested forage systems.

HORSE PASTURE GRAZING TOLERANCE TEST

Selection of grasses for horse pastures presents a different set of criteria from pastures for other livestock. Horses are

often present on pastures more or less continuously without significant rest periods for grass recovery, and are often stocked at greater animal densities than production livestock. Horses also inflict more traffic damage to crowns because they are very active and often wearing shoes.

The primary objective of this test is to evaluate persistence of forage varieties under heavy continuous grazing pressure by horses. The ideal forage variety for a horse pasture is able to maintain good sod cover under this stress while also providing a source of nutrition that is preferred by horses. The grazing tolerance test presented in **Table 23** was planted in 2010 but for administrative reasons, grazing did not begin until 2013. Stand ratings are included for the two hay production years, but remember that this represents a different type of management stress.

Grass varieties were planted in plots measuring 10 x 15 ft within 2-acre paddocks on Claybrook Farm. Each plot was replicated four times. Conventional tillage and a plot planter were used for establishment. The remainder of the paddock consisted of a mixture of orchardgrass, tall fescue, bluegrass, and timothy. Beginning in 2013, the entire paddock including non-plot area was continuously grazed by 3 to 6 Dutch Warmblood horses from May to November. Plots were visually scored for percent ground cover and grazing preference approximately three weeks after

spring turnout of horses and again near the end of the grazing season.

STATISTICS

For competed tests, long-term yields are presented as the average annual yield for the three years after establishment. For tests not yet completed, averages are presented across the numbers of years available, excluding the establishment year. The yield index, expressed as percent of check (alfalfa) or percent of species mean (grass), provides a reference point for estimation of relative differences among varieties in tests conducted across different years or sites.

Statistical tests provide objective comparison of variety performance and reduce the possibility that a numerical difference could be due to random chance or spatial variability in the test field. Statistical comparisons among specific varieties are restricted to within a single test. The Least Significant Difference (LSD) is used to determine whether two varieties are statistically different. When the difference in yield between two varieties is greater than the LSD value, it is 95% certain that the difference between varieties is real. If the difference between varieties is less than or equal to the LSD value, the variety yields are statistically the same. The Coefficient of Variation (CV) is an indicator of consistency across the test replications, with a lower value being desirable. Consistency across replications is desirable because it allows statistical significance at lower LSD values.

Table 2. Planting specifications and site/use suitability of tested forage species in Michigan.

	Seeding rate (lb/acre) †	Seeds/lb (approx.)	Ease of establishment	Stand life (yr)	Acid	Wet	Drought	Cold	Heat	Pasture	Hay
Alfalfa	12-16	199,000	easy	3-7	P††	P	E	E	E	VG	E
Red Clover	8-12	252,000	easy	2-3	G	F	G	VG	F	F	G
Brome, meadow	15-20	93,000	fair	5+	G	P	G	E	G	G	G
Brome, smooth	12-15	136,000	slow	5+	G	P	E	E	G	F	G
Fescue, meadow	15-20	230,000	easy	3-5	G	VG	E	G	G	E	E
Fescue, tall	10-15	230,000	easy	5+	G	VG	VG	G	G	E	E
Festulolium	25-35	230,000	easy	3	F-G	G	*	*	*	E	G
KY bluegrass	5-15	2,200,000	easy	5+	G	G	P	E	P	E	P
Orchardgrass	10-15	653,000	easy	4-5	G	F	G	G	G	F	E
Reed canarygrass	6-8	534,000	slow	5+	G	E	VG	VG	G	G	G
Ryegrass, annual/Italian	20-30	227,000	easy	1-2	F	G	P	F	P	E	F
Ryegrass, perennial	20-30	230,000	easy	3-4	F	G	P	F	P	E	P
Timothy	6-12	1,234,000	easy	5+	G	F	P	E	P	P	E

†Use lower end of range for drilling and higher end for broadcasting. Reduce rates proportionately when planting in mixtures.
††Suitability Rating: P = poor, F = fair, G = good, VG = very good, E = excellent, * = variety-dependent.

Table 3. Fall dormancy (FD), winter survival index (WSI), and disease resistance ratings for alfalfa cultivars in MSU variety trials.

Variety	FD†	WSI††	RR‡	BW	PRR	AN	VW	FW	APH1	APH2	SN	Marketer
727	4	2	-	HR	HR	HR	HR	HR	HR	-	R	NEXGROW
5312	3	-	-	HR	HR	HR	HR	HR	-	-	-	Pioneer
5454	4	-	-	R	HR	HR	HR	HR	LR	-	MR	Pioneer
6415	4	2	-	HR	HR	HR	HR	HR	HR	-	-	NEXGROW
6417	4	2	-	HR	HR	HR	HR	HR	HR	-	-	NEXGROW
6426	4	2	-	HR	HR	HR	HR	HR	HR	-	HR	NEXGROW
6431	4	2	-	HR	HR	HR	HR	HR	-	-	-	NEXGROW
6552	5	-	-	HR	HR	HR	HR	HR	HR	-	-	NEXGROW
428RR	4	1	RR	HR	HR	HR	HR	HR	HR	-	MR	Allied Seed
4A415	2	2	-	HR	HR	HR	HR	HR	HR	R	HR	Mycogen
4A421	4	2.5	-	HR	HR	HR	HR	HR	HR	-	-	Mycogen
4P424	4	-	-	HR	HR	HR	HR	HR	-	-	-	Mycogen
4S417	4	2	-	HR	HR	HR	HR	HR	HR	-	-	Mycogen
6200HT	2	2.5	-	HR	HR	HR	HR	HR	HR	-	MR	NEXGROW
6305Q	3	1	-	HR	HR	HR	HR	HR	HR	-	-	NEXGROW
6422Q	4	1	-	HR	HR	HR	HR	HR	HR	-	-	NEXGROW
6475H	4	2	-	HR	HR	HR	HR	HR	HR	-	-	NEXGROW
6497R	4	2	RR	HR	HR	HR	HR	HR	HR	-	R	NEXGROW
6585Q	5	2	-	HR	HR	HR	HR	HR	HR	-	HR	NEXGROW
AmeriStand 403T Plus	4	2	-	HR	HR	HR	HR	HR	HR	-	MR	America's Alfalfa
AmeriStand 407TQ	4	2	-	HR	HR	HR	HR	HR	HR	R	MR	America's Alfalfa
AmeriStand 409LH	4	2	-	HR	HR	HR	HR	HR	HR	-	R	America's Alfalfa
AmeriStand 455TQ RR	4	2	RR	HR	HR	HR	HR	HR	HR	-	R	America's Alfalfa
Ascend	3	-	-	HR	HR	HR	HR	HR	-	-	-	Hyland Seeds
Chesapeake	3	2	-	HR	HR	HR	HR	HR	HR	R	R	Dahlco/AgReliant
Cimarron VL410	4	-	-	HR	HR	R	R	HR	MR	-	R	Spink/Cimarron Seed
Contender	5	2	-	HR	HR	HR	HR	HR	HR	-	R	Beck's Hybrids
DG 3210	3	1	-	HR	HR	HR	HR	HR	HR	-	R	Crop Production
DG 4210	4	1	-	HR	HR	HR	HR	HR	HR	-	R	Crop Production
DK140	4	2	-	HR	HR	HR	HR	HR	HR	-	-	Dekalb
DKA33-16	3	-	-	HR	HR	HR	HR	HR	HR	-	-	Monsanto
DKA41-18RR	4	2	RR	HR	HR	HR	HR	HR	HR	-	R	Monsanto
DKA43-13	4	2	-	HR	HR	HR	HR	HR	HR	-	-	Monsanto
DKA44-16RR	4	2	RR	HR	HR	HR	HR	HR	HR	-	R	Monsanto
Evergreen 3	4	2	-	HR	HR	HR	HR	HR	HR	-	R	NEXGROW
Everlast II	4	2	-	HR	HR	HR	HR	HR	HR	-	-	Crop Production
ForageGold	4	2	-	HR	HR	HR	HR	HR	HR	-	-	Renk Seed
FSG 329	3	2	-	HR	HR	HR	HR	HR	HR	-	HR	Standish Milling/Allied
FSG 351	3	2	-	HR	HR	R	R	HR	R	-	R	Standish Milling/Allied
FSG 400 LH	4	-	-	HR	HR	HR	HR	HR	HR	-	-	Standish Milling/Allied
FSG 403LR	4	2	-	HR	HR	HR	HR	HR	HR	R	R	Farm Science Genetics
FSG 406	4	1	-	HR	HR	HR	HR	HR	HR	-	R	Standish Milling/Allied
FSG 408DP	4	2	-	HR	HR	HR	R	HR	R	-	R	Standish Milling/Allied
FSG 420 LH	4	2	-	HR	HR	HR	HR	HR	HR	-	-	Standish Milling/Allied
FSG 424	4	1	-	HR	HR	HR	HR	HR	HR	R	-	Farm Science Genetics
FSG 505	5	2	-	HR	HR	HR	HR	HR	HR	-	R	Standish Milling/Allied
FSG 528 SF	5	2	-	HR	R	HR	HR	R	R	-	-	Standish Milling/Allied
Genoa	4	2	-	HR	HR	HR	HR	HR	-	-	R	NEXGROW
Gunner	5	1	-	HR	HR	HR	HR	HR	HR	-	R	Croplan Genetics
HybriForce 2400	4	1.8	-	HR	HR	HR	HR	HR	HR	-	-	Dairyland Seed
HybriForce 3400	4	1.5	-	HR	HR	HR	HR	HR	HR	MR	-	Dairyland Seed
KingFisher 243	5	2	-	HR	HR	HR	HR	HR	HR	-	-	Byron Seed
KingFisher 4020	4	-	-	HR	HR	HR	HR	HR	-	HR	-	Byron Seed
L333HD	3	2	-	HR	HR	HR	HR	HR	HR	-	-	Legacy Seeds
L447HD	4	2	-	HR	HR	HR	R	HR	HR	-	-	Legacy Seeds

Table 3. (Continued)												
Variety	FD†	WSI††	RR‡	BW	PRR	AN	VW	FW	APH1	APH2	SN	Marketer
L455HD	4	-	-	HR	HR	HR	HR	HR	HR	-	-	Legacy Seeds
LegenDairy 5.0	3	3	-	HR	HR	HR	HR	HR	R	-	MR	Croplan Genetics
LegenDairy XHD	3	2	-	HR	HR	HR	HR	HR	HR	-	HR	Croplan Genetics
Magnitude	4	1	-	HR	HR	HR	HR	HR	HR	-	HR	Allied Seed
Mariner IV	4	2	-	HR	HR	HR	HR	HR	HR	R	HR	Allied Seed
Oneida VR	3	-	-	R	MR	MR	HR	HR	-	-	-	Public
PGI 459	4	-	-	HR	HR	HR	HR	HR	R	-	-	Producers Choice
PGI 557	5	2	-	HR	HR	HR	HR	HR	HR	-	HR	Producers Choice
Pioneer 53H92	3	-	-	HR	HR	HR	R	HR	HR	-	-	Pioneer
Pioneer 54Q32	4	-	-	HR	HR	HR	HR	HR	HR	-	LR	Pioneer
Pioneer 55H94	5	-	-	HR	HR	HR	HR	HR	HR	-	HR	Pioneer
Pioneer 55Q47	5	1	-	HR	HR	HR	HR	HR	HR	R	HR	Pioneer
Pioneer 55QR04	4	1	RR	HR	HR	HR	HR	HR	HR	-	R	Pioneer
Pioneer 55V12	5	-	-	R	HR	HR	HR	HR	HR	-	R	Pioneer
Pioneer 55V48	5	-	-	HR	HR	HR	R	HR	HR	-	-	Pioneer
Pioneer 55V50	5	-	-	HR	HR	HR	HR	R	HR	HR	R	Pioneer
Prolific II	3	2	-	HR	HR	HR	HR	HR	HR	R	-	Hyland Seeds
Radiance HD	4	2	-	HR	HR	HR	R	HR	HR	-	-	Ampac Seeds
Rebound 6.0	4	1	-	HR	HR	HR	HR	HR	HR	HR	R	Croplan Genetics
Red Falcon BR	4	2	-	HR	HR	HR	HR	HR	HR	-	-	Blue River Hybrids
RR Alf 4R100	4	2	RR	HR	HR	HR	HR	HR	HR	-	MR	Monsanto
RR Stratica	4	2	RR	HR	HR	HR	HR	HR	HR	-	R	Croplan Genetics
SolarGold	4	2	-	HR	HR	HR	HR	HR	HR	-	MR	Renk Seed
Sonic	4	1	-	HR	HR	HR	HR	HR	HR	HR	-	Nutech Seed
SpringGold	5	-	-	HR	HR	HR	R	HR	HR	-	R	Renk Seed
Velocity	4	2	-	HR	HR	HR	HR	HR	HR	-	-	Nutech Seed
Vernal	2	2	-	R	S	S	S	MR	S	-	S	Public
WL 343 HQ	4	1.5	-	HR	HR	HR	HR	HR	HR	-	MR	W-L research
WL 353 LH	4	2	-	HR	HR	HR	HR	HR	HR	-	R	W-L Research
WL 354 HQ	4	1	-	HR	HR	HR	HR	HR	HR	HR	R	W-L Research
WL 356 HQ RR	4	1	RR	HR	HR	HR	HR	HR	HR	HR	HR	W-L Research
WL 363 HQ	5	2	-	HR	HR	HR	HR	HR	HR	-	HR	W-L Research
WL 372 HQ RR	5	2	RR	HR	HR	HR	HR	HR	HR	-	HR	W-L Research
Yieldmaster RR	4	2	RR	HR	HR	HR	HR	HR	HR	-	R	Monsanto

† Fall Dormancy rating scale: 1=highly dormant, 9=non-dormant.
†† Winter survival index : 1=superior winter survival, 2=very good, 3=good, 4=adequate, 5=low, 6=no winter survival.
‡ RR = Roundup Ready, BW = Bacterial Wilt, PRR = Phytophthora Root Rot, AN = Anthracnose, VW = Verticillium Wilt, FW = Fusarium Wilt, APH1=Aphanomyces race one unless 2 present for race two, SN=Stem nematode.

Table 4. Long-term yield averages (dry matter tons/acre) from MSU Alfalfa Variety Trials seeded in East Lansing, Michigan from 2007 to 2012.

Variety	Marketer	3-year average				2-yr avg 2011	1-yr tot 2012	(Number) † % Vernal ††
		2007	2008	2009	2010			
----- dry matter tons/acre -----								
4S417	Mycogen Seeds	-	7.30	6.36	6.38	-	-	(3)128
6415	NEXGROW	5.90	6.37	-	-	-	-	(2)125
6417	NEXGROW	-	7.06	-	6.36	-	-	(2)123
6431	NEXGROW	-	6.93	-	-	-	-	(1)130
6552	NEXGROW	-	6.46	-	-	-	-	(1)121
6422Q	NEXGROW	-	-	7.29	-	5.54	-	(2)129
727	NEXGROW	-	6.74	-	-	-	-	(1)126
AmeriStand 403T Plus	America's Alfalfa	-	-	6.08	-	-	-	(1)125
Ameristand 407TQ	America's Alfalfa	-	-	6.98	-	5.84	-	(2)128
Chesapeake	Dahlico Seeds/ AgReliant	-	-	6.79	-	-	-	(1)140
Contender	Beck's Hybrids	-	-	-	-	-	5.35	-
DG 4210	Crop Production Services	-	-	-	6.56	5.66	-	(2)114
DKA43-13	Monsanto	-	6.81	-	6.31	-	-	(2)121
Everlast II	Crop Production Services	-	-	6.06	-	-	-	(1)125
ForageGold	Renk Seed	-	-	6.39	-	-	5.67	(1)132
Genoa	NEXGROW	-	6.92	-	-	-	-	(1)129
Gunner	Croplan Genetics	-	-	-	-	5.21	-	(1)101
HybriForce 2400	Dairyland Seed Co.	-	7.55	6.68	6.27	-	-	(3)131
HybriForce 3400	Dairyland Seed Co.	-	-	-	-	5.97	6.39	(1)115
HybriForce 3400 QR	Dairyland Seed Co.	-	-	-	-	-	6.42	-
KingFisher 243	Byron Seed	-	-	6.20	-	-	-	(1)128
KingFisher 4020	Byron Seed	-	-	-	6.32	-	-	(1)114
L333HD	Legacy Seeds	-	6.30	-	-	-	-	(1)118
L447HD	Legacy Seeds	-	6.92	-	-	-	-	(1)129
LegenDairy 5.0	Croplan Genetics	-	-	6.64	-	5.61	-	(2)123
Magnitude	Allied Seed	-	-	-	-	-	5.68	-
Mariner IV	Allied Seed	-	-	-	-	-	5.65	-
Oneida VR	Public	-	-	5.42	-	5.13	-	(2)105
PGI 459	Producer's Choice	-	6.45	-	-	-	-	(1)121
PGI 557	Producer's Choice	-	-	-	-	5.64	-	(1)109
Pioneer 53H92	Pioneer Hi-breds Int'l	-	-	6.13	-	-	-	(1)126
Pioneer 54Q32	Pioneer Hi-breds Int'l	-	-	6.50	-	5.53	-	(2)120
Pioneer 55V12	Pioneer Hi-breds Int'l	-	-	6.78	-	5.65	5.41	(2)125
Pioneer 55V48	Pioneer Hi-breds Int'l	6.42	7.07	7.28	-	-	-	(3)142
Pioneer 55V50	Pioneer Hi-breds Int'l	-	-	-	-	6.22	5.94	(1)120
Prolific II	Hyland Seeds	-	-	-	-	6.05	-	(1)117
Radiance HD	Ampac Seeds	-	-	6.91	-	-	-	(1)142
Rebound 6.0	Croplan Genetics	-	-	-	-	5.39	-	(1)104
Red Falcon BR	Blue River Hybrids	5.95	-	-	-	-	-	(1)132
SolarGold	Renk Seed	-	-	-	-	5.74	5.62	(1)111
Sonic	Nutech Seed	-	-	-	-	5.77	-	(1)112
SpringGold	Renk Seed	6.12	-	-	-	-	-	(1)136
Velocity	Nutech Seed	6.57	7.01	6.10	-	-	-	(3)134
Vernal	Public	4.50	5.35	4.85	5.53	5.17	5.50	(5)100
WL343HQ	W-L Research	6.47	-	-	5.81	-	-	(2)124
WL354HQ	W-L Research	-	-	-	-	5.39	-	(1)104
WL363HQ	W-L Research	-	7.00	6.84	6.26	-	-	(3)128
5312	check	5.71	5.79	5.83	6.06	-	-	(4)116
5454	check	-	-	6.26	-	-	-	(1)129
DK140	check	5.69	-	6.06	-	-	-	(2)126
PLH-resistant check	check	-	-	-	5.59	5.34	-	(2)102
Mean		5.93	6.71	6.38	6.13	5.60	5.76	122

† Number of 3-year trials with at least 2 years of data after the seeding year.

†† Average % Vernal of varieties with more than 2 years yield data

Table 5. Long-term yield averages (dry matter tons/acre) from MSU Alfalfa Variety Trials seeded in Lake City, Michigan from 2007 to 2012.								
Variety	Marketer	3-year average				2-yr avg	1-yr tot	(Number) †
		2007	2008	2009	2010	2011	2012	% Vernal ††
----- dry matter tons/acre -----								
4A415	Mycogen Seeds	-	-	-	5.19	-	-	(1)120
4S417	Mycogen Seeds	-	-	3.84	5.18	-	-	(2)117
6417	NEXGROW	-	-	-	4.90	-	-	(1)114
6431	NEXGROW	-	3.17	-	-	-	-	(1)133
6200HT	NEXGROW	3.43	-	-	-	-	-	(1)115
6305Q	NEXGROW	-	-	-	4.91	-	-	(1)114
6422Q	NEXGROW	-	-	3.99	-	-	-	(1)119
AmeriStand 403T Plus	America's Alfalfa	-	-	3.48	-	-	-	(1)104
AmeriStand 407TQ	America's Alfalfa	-	-	3.81	-	5.16	-	(2)109
Ascend	Hyland Seed	3.21	-	-	-	-	-	(1)108
Chesapeake	Dahlco Seeds/AgReliant	-	-	3.81	-	-	-	(1)113
Cimarron VL410	Spink/Cimarron Seed	3.12	-	-	-	-	-	(1)105
DG 3210	Crop Production Services	-	-	-	4.62	-	-	(1)107
DG 4210	Crop Production Services	-	-	-	4.87	5.10	-	(2)108
DKA43-13	Monsanto	-	-	3.73	-	-	-	(1)111
ForageGold	Renk Seed	-	-	-	-	-	4.06	-
FSG 329	Standish Milling/Allied Seed	-	-	4.09	-	-	-	(1)122
HybriForce 2400	Dairyland Seed	-	-	-	4.87	-	-	(1)113
HybriForce 3400	Dairyland Seed	-	-	-	-	-	4.53	-
LegenDairy 5.0	Croplan Genetics	-	-	4.11	-	-	-	(1)122
Pioneer 54Q32	Pioneer Hi-breds Int'l	-	-	3.99	-	5.03	3.84	(2)110
Pioneer 55H94	Pioneer Hi-breds Int'l	-	-	-	-	4.85	-	(1) 98
Pioneer 55V12	Pioneer Hi-breds Int'l	-	-	3.52	-	4.67	3.85	(2)100
Pioneer 55V48	Pioneer Hi-breds Int'l	2.98	2.84	3.52	-	-	-	(3)108
Pioneer 55V50	Pioneer Hi-breds Int'l	-	-	-	-	5.33	3.95	(1)108
SolarGold	Renk Seed	-	-	-	-	-	4.10	-
Sonic	Nutech Seed	-	-	-	-	4.99	-	(1)101
Velocity	Nutech Seed	2.84	2.97	3.95	-	-	-	(3)112
Vernal	public	2.97	2.39	3.36	4.31	4.93	4.00	(5)100
5312	check	2.96	-	-	4.69	5.20	-	(3)105
DK140	check	3.20	-	3.46	-	-	-	(2)105
PLH-resistant check	check	-	2.56	3.68	4.52	4.70	-	(4)104
Mean		3.09	2.79	3.76	4.81	5.00	4.05	111

† Number of 3-year trials with at least 2 years of data after the seeding year.
†† Average % of Vernal of varieties with at least 2 years of yield data

Table 6. Long-term yield averages (dry matter tons/acre) from MSU Alfalfa Variety Trials seeded in North Branch in 2008 (3-yr average) and Capac in 2011 (2-yr average).				
Variety	Marketer	North Branch 3-yr. avg. 2008 Seeding	Capac 2-yr. avg. 2011 Seeding	(Number) † % Vernal ††
----dry matter tons/acre ----				
6417	NEXGROW	7.28	-	(1)117
6552	NEXGROW	7.64	-	(1)123
Ameristand 407TQ	America's Alfalfa	7.84	5.62	(2)117
Ascend	Hyland Seeds	7.53	-	(1)121
DG 4210	Crop Production Services	-	5.48	(1)105
DKA43-13	Monsanto	7.19	-	(1)115
FSG351	Standish Milling/Allied Seed	7.28	-	(1)117
FSG406	Standish Milling/Allied Seed	7.44	-	(1)119
FSG408DP	Standish Milling/Allied Seed	7.14	-	(1)115
FSG505	Standish Milling/Allied Seed	7.89	-	(1)127
FSG528SF	Standish Milling/Allied Seed	7.18	-	(1)115
Genoa	NEXGROW	7.47	-	(1)120
Gunner	Croplan Genetics	-	5.48	(1)105
HybriForce 2400	Dairyland Seed Co.	-	5.75	(1)110
LegenDairy 5.0	Croplan Genetics	-	5.55	(1)106
PGI 459	Producer's Choice	7.71	-	(1)124
Pioneer 54Q32	Pioneer Hi-bred Int'l	-	5.76	(1)110
Pioneer 55V12	Pioneer Hi-bred Int'l	-	5.04	(1) 96
Pioneer 55V48	Pioneer Hi-bred Int'l	7.90	-	(1)127
Pioneer 55V50	Pioneer Hi-bred Int'l	-	5.58	(1)106
Prolific II	Hyland Seeds	-	5.79	(1)110
Rebound 6.0	Crolan Genetics	-	5.48	(1)105
Sonic	Nutech Seed	-	5.61	(1)107
Velocity	Nutech Seed	7.24	-	(1)115
Vernal	public	6.23	5.24	(2)100
WL354HQ	W-L Research	-	5.52	(1)105
WL343HQ	W-L Research	7.63	-	(1)122
WL363HQ	W-L Research	7.62	5.29	(2)112
5312	check	6.79	5.41	(2)106
DK140	check	7.16	-	(1)115
PLH-resistant check 1	check	6.39	-	(1)103
PLH-resistant check 2	check	-	4.75	(1) 91
Mean		7.33	5.46	112
† Number of trials entered.				
†† Average % of Vernal.				

Table 7. Long-term yield averages (dry matter tons/acre) from MSU Alfalfa Variety Trials seeded in Chatham, Michigan in 2008 and 2009, and first-year yields of varieties seeded in 2012.					
Variety	Marketer	3-year average		1-yr total	(Number) †
		2008	2009	2012	% Vernal ††
----- dry matter tons/acre -----					
4A421	Mycogen Seeds	-	3.10	-	(1)107
6417	NEXGROW	3.73	-	-	(1)107
6431	NEXGROW	3.64	-	-	(1)104
Ameristand 403T Plus	America's Alfalfa	-	3.07	-	(1)106
Ameristand 407TQ	America's Alfalfa	3.45	2.96	-	(2)100
DKA 33-16	Monsanto	3.70	-	-	(1)106
DKA 43-13	Monsanto	-	3.23	-	(1)111
Evergreen 3	NEXGROW	3.23	-	-	(1) 92
ForageGold	Renk Seed	-	-	3.25	-
Mariner IV	Allied Seed	-	-	3.06	-
Pioneer 53H92	Pioneer Hi-breds Int'l	-	2.88	-	(1) 99
Pioneer 54Q32	Pioneer Hi-breds Int'l	-	3.28	-	(1)113
Pioneer 55V12	Pioneer Hi-breds Int'l	-	3.25	3.40	(1)112
Pioneer 55V48	Pioneer Hi-breds Int'l	3.42	2.96	-	(2)100
Pioneer 55V50	Pioneer Hi-breds Int'l	-	-	3.73	-
SolarGold	Renk Seed	-	-	3.39	-
Velocity	Nutech Seed	3.55	3.05	-	(2)103
Vernal	Public	3.50	2.90	3.09	(2)100
WL343HQ	W-L Research	3.55	-	-	(1)101
DK140	check	3.40	3.01	-	(2)100
5312	check	-	3.27	-	(1)113
Mean		3.52	3.08	3.32	104
† Number of completed 3-year trials					
†† Average % Vernal					

Table 8. Long-term yield averages (dry matter tons/acre) from MSU Potato Leafhopper Resistant Alfalfa Variety Trials seeded in East Lansing, Michigan from 2007 to 2010, and the 2-year average yield seeded in 2011.

Variety	Marketer	3-year average				2-yr avg 2011	(Number) † % Vernal ††
		2007	2008	2009	2010		
----- dry matter tons/acre -----							
4P424	Mycogen Seeds	6.13	-	-	-	-	(1)121
6426	NEXGROW	6.24	5.95	-	5.99	-	(3)135
6475H	NEXGROW	-	-	-	5.92	5.14	(2)108
Ameristand 409LH	America's Alfalfa	-	-	-	-	5.37	(1)104
Evergreen 3	NEXGROW	-	5.78	-	-	-	(1)161
FSG420LH	Standish Milling/Allied	-	-	5.86	-	-	(1)118
Pioneer 53H92	Pioneer Hi-bred	6.60	6.01	5.77	5.91	-	(4)132
Pioneer 55H94	Pioneer Hi-bred	-	-	-	-	5.21	(1)101
Vernal	Public	5.08	3.58	4.97	5.11	5.15	(5)100
WL353LH	W-L Research	-	-	5.88	-	5.47	(2)112
5312	check	5.76	-	-	-	-	(1)113
5454	check	-	-	5.54	-	-	(1)111
non-resistant check 1 ‡	currently marketed	-	6.40	-	-	-	(1)179
non-resistant check 2 ‡	currently marketed	-	-	6.28	6.76	5.83	(3)124
Mean		5.96	5.54	5.71	5.94	5.36	123
† Number of 3-year trials with at least 2 years of data after the seeding year.							
†† Average % Vernal of varieties with at least 2 years of yield data							
‡ Commercially available check, not considered to be a PLH resistant variety							

Table 9. Long-term average yields (dry matter tons per acre), including the seeding year, of red clover varieties seeded in 2004 at Lake City, and in 2004, 2009, and 2010 at East Lansing.

Variety	Marketer	Lake City	East Lansing			(Number) † % Check ††
		2004 3y-r avg.	2004 4-yr avg.	2009 4-yr avg.	2010 3-yr avg.	
----- dry matter tons per acre -----						
COMMERCIAL						
Amos	DLF International	2.17	-	-	-	(1) 82
Arlington	public	-	-	3.83	-	(1)118
Cardinal	Seed Research of OR	2.54	3.86	4.11	-	(3)112
Cinnamon Plus	FFR Cooperative	-	-	-	4.24	(1)142
Michigan common	Public (check)	2.64	3.39	3.25	2.99	(4)100
Dominion	Seed Research of OR	2.50	3.94	4.17	-	(3)113
Emerald	Byron Seeds	-	-	4.63	-	(1)143
Marathon	public	-	-	-	3.95	(1)132
Starfire	Ampac Seed Company	2.21	3.83	-	-	(2) 98
Starfire II	Ampac Seed Company	-	-	4.44	-	(1)137
EXPERIMENTAL						
FSG9601	Allied Seed	2.77	3.96	-	-	(2)111
Mean		2.47	3.80	4.07	3.73	117
† Number of trials entered.						
†† Average % yield of the check variety (common).						

Table 10. Long-term average yields (dry matter tons/acre) of forage grasses seeded in 2006 at East Lansing and Lake City, 2007 and 2009 at East Lansing and 2-year average yields from the 2011 seeding at East Lansing.

Species †	Variety (ploidy)	Marketer	Three-year average yields				2-yr. avg. EL 2011	% species meant††
			Lake City 2006	East Lansing 2006	East Lansing 2007	East Lansing 2009		
----- Dry matter tons/acre -----								
FEST	SpringGreen organic	Rose Agri-Seed Inc.	-	-	2.68	-	-	(1)107
FEST	Gain	Allied Seed	-	-	2.34	-	-	(1) 93
FEST	SPECIES MEAN		-	-	2.51			
KB	Ginger	check	-	-	-	3.18	-	(1)112
KB	Lato	Allied Seed	-	-	2.19	-	-	(1)108
KB	Thorough Blue	ProSeeds Marketing	-	-	1.86	-	-	(1) 92
KB	BigBlue	Rose Agri-Seed Inc.	-	-	-	2.48	-	(1) 88
KB	SPECIES MEAN		-	-	2.03	2.83		
MB	AC Knowles	Agriculture Canada	-	-	2.83	-	-	(1) 81
MB	Macbeth	CISCO Seed	-	-	-	3.24	-	(1)103
MB	Montana	Seed Research of OR	-	-	4.19	3.07	-	(2)109
MB	SPECIES MEAN		-	-	3.51	3.16		
OR	Ambrosia	Amer. Grass Seed Prod	3.36	4.13	-	-	-	(2) 98
OR	Bounty	Standish Milling	3.61	4.22	-	-	-	(2)102
OR	Elsie	Rose Agri-Seed Inc.	-	-	3.75	-	-	(1) 94
OR	Extend	Standish Milling	3.37	4.46	-	-	-	(2)102
OR	Harvestar	Seed Research of OR	3.18	4.22	-	-	-	(2) 97
OR	Intensive	Barenbrug Seed	-	-	-	-	3.50	(1) 94
OR	Megabite	Rose Agri-Seed Inc.	-	-	4.09	-	-	(1)103
OR	Persist	Smith Seed	-	-	-	3.58	4.03	(2)105
OR	Potomac	check	-	-	4.15	3.49	3.66	(3)100
OR	Warrior II	ProSeeds Marketing	-	-	3.95	-	-	(1) 99
OR	SPECIES MEAN		3.38	4.26	3.99	3.54	3.73	
PR	BarSprinter (2n)	Barenbrug Seed	-	-	2.08	-	-	(1) 89
PR	Boost (2n)	Standish Milling	-	2.94	-	-	-	(1)103
PR	Calibra (4n)	check	-	-	-	1.92	-	(1)102
PR	Eurostar (2n)	Seed Research of OR	2.05	2.83	-	-	-	(2)100
PR	Fennema (2n)	Amer. Grass Seed Prod	-	-	-	-	2.09	(1) 87
PR	Kentaur (4n)	DLF International Seed	-	-	-	-	2.64	(1)110
PR	Korok (4n)	Czech Republic	-	-	2.12	-	-	(1) 91
PR	Linn (2n)	check	-	-	-	1.84	2.33	(2) 98
PR	Mathilda (4n)	DLF International Seed	-	-	-	-	2.28	(1) 95
PR	Quartermaster (4n)	Lewis Seed	-	3.05	-	-	-	(1)107
PR	Remington (4n)	Barenbrug Seed	-	-	2.78	-	2.63	(2)115
PR	Verano (4n)	Columbia Seeds	2.01	2.59	-	-	-	(2) 94
PR	SPECIES MEAN		2.03	2.85	2.33	1.88	2.39	
RC	Chiefton	check	2.25	3.61	-	-	-	(2) 94
RC	Marathon	Standish Milling	2.76	3.89	-	-	-	(2)106
RC	SPECIES MEAN		2.51	3.75	-	-	-	
TF	BarElite	Barenbrug Seed	-	-	4.15	-	-	(1) 91
TF	Cowgirl	Rose Agri-Seed Inc.	-	-	4.84	-	-	(1)106
TF	Enhance	Standish Milling	2.44	4.31	-	-	-	(2)103
TF	Fawn	Seed Research of OR	-	4.10	-	-	-	(1)100
TF	Goliath	CISCO Seed	-	-	-	4.06	-	(1)101
TF	Hymark	Fraser Seeds	-	-	-	-	4.06	(1) 98
TF	KY31 E+	check	-	-	-	3.96	-	(1) 99
TF	KY31 E-	check	-	-	-	-	4.47	(1)108
TF	Noria	ProSeeds Marketing	-	-	4.75	-	-	(1)104
TF	Select	check	-	-	-	-	4.21	(1)102
TF	STF 43	Barenbrug Seed	-	-	-	-	3.79	(1) 92
TF	Verdant	Amer. Grass Seed Prod	2.44	3.87	-	-	-	(2) 96
TF	SPECIES MEAN		2.44	4.09	4.58	4.01	4.13	
MF	Pradel	check	-	-	-	3.15	-	(1)106
MF	Preval	Ampac Seed Company	-	-	-	2.78	-	(1) 94
MF	SPECIES MEAN		-	-	-	2.97	-	
Tim	BarPenta	Barenbrug Seed	-	-	3.94	-	-	(1)101
Tim	Climax	check	2.14	4.03	3.84	-	-	(3) 92
Tim	Crest	Allied Seed	2.44	4.94	-	-	-	(2)105
Tim	Summit	Allied Seed	2.55	4.87	-	-	-	(2)106
Tim	SPECIES MEAN		2.38	4.61	3.89	-	-	
GRAND MEAN			2.66	3.88	3.36	3.06	3.31	

† FEST=Festulolium, KB=Kentucky bluegrass, MB=Meadow brome grass, OR=Orchardgrass, PR=Perennial ryegrass, RC=Reed canarygrass, TF= Tall fescue, MF= Meadow fescue, Tim=Timothy.

†† Number of tests and percent yield of the mean within tests entered for each grass species.

Entry	2013					2012 Total	2011 Total	2010 Seeding Year	Grand Total
	June 4	July 4	Aug 9	Sep 26	Total				
DSA08-M †	2.33	1.41	1.25	1.40	6.39*	5.80*	7.96*	5.81*	25.97*
FG 46M329 †	2.20	1.50	1.25	1.38	6.33*	6.16*	7.85*	4.71	25.06*
FG 46M328 †	2.22	1.59	1.26	1.40	6.49*	6.22*	7.60*	4.61	24.92*
Mycogen 4S417	2.22	1.22	1.19	1.32	5.94	5.69*	7.52*	5.32*	24.47*
DG 4210	2.09	1.48	1.26	1.45	6.28*	5.92*	7.49*	4.76	24.46*
6417	2.01	1.44	1.20	1.29	5.94	5.67*	7.48*	4.88	23.97*
HybriForce-2400	2.20	1.26	1.26	1.29	6.02	5.65*	7.13	5.09	23.90*
WL363HQ	2.11	1.38	1.10	1.25	5.85	5.46*	7.46*	5.07	23.85
Kingfisher 4020	2.05	1.26	1.17	1.24	5.72	5.86*	7.37*	4.87	23.82
FG 46M126 †	2.09	1.43	1.14	1.31	5.97	5.69*	7.26*	4.58	23.51
DKA43-13	1.97	1.48	1.26	1.37	6.09*	5.41*	7.42*	4.51	23.44
5312	2.28	1.19	1.08	1.14	5.69	5.43*	7.06	4.77	22.95
WL343HQ	1.99	1.34	1.13	1.19	5.65	4.91	6.88	4.67	22.12
PLH-resistant check	1.94	1.13	1.01	0.97	5.04	4.83	6.90	5.01	21.78
Vernal	2.07	1.02	1.03	1.05	5.18	4.85	6.55	4.34	20.92
Mean	2.12	1.34	1.17	1.27	5.91	5.57	7.33	4.87	23.70
LSD 0.05	0.15	0.10	0.13	0.17	0.41	0.88	0.72	0.49	2.07
CV%	5.0	5.3	7.8	9.6	4.8	11.0	7.0	7.1	6.1

† Experimental Variety
* Yield is not statistically different from the greatest numerical value in the column.

Entry	2013				2012 Total	2011 Total	2010 Seeding Year	Grand Total
	June 13	July 25	Sept 23	Total				
Mycogen 4A415	2.33	2.03	0.57	4.94*	5.05*	5.57*	1.70*	17.26*
Mycogen 4S417	2.27	1.98	0.61	4.85*	5.28*	5.40*	1.54*	17.08*
403T	2.30	1.87	0.54	4.72*	4.97*	5.18*	1.75*	16.62*
6305Q	2.33	2.02	0.53	4.88*	4.87*	4.97*	1.35*	16.07*
DG 4210	2.41	2.02	0.55	4.98*	4.87*	4.77	1.37*	16.00*
6417	2.25	2.09	0.62	4.95*	5.08*	4.66	1.19*	15.88*
HybriForce-2400	2.29	1.77	0.53	4.59*	4.82*	5.20*	1.27*	15.87*
5312	2.19	1.80	0.53	4.53*	4.51	5.04*	1.53*	15.61*
PLH-resistant check	2.09	1.75	0.53	4.36*	4.23	4.98*	1.48*	15.02*
DG 3210	2.06	1.95	0.48	4.50*	4.66*	4.69	1.09*	14.93
Vernal	1.74	1.58	0.46	3.77	4.21	4.94*	1.25*	14.17
Mean	2.21	1.90	0.54	4.64	4.78	5.04	1.41	15.86
LSD 0.05	0.34	0.43	0.23	0.90	0.71	0.66	0.35	2.16
CV%	10.7	15.7	29.6	13.4	10.3	9.0	17.0	9.5

† Experimental Variety
* Yield is not statistically different from the greatest numerical value in the column.

Entry	2013					2012	2011	Grand
	June 8	July 5	Aug 8	Oct 4	Total	Total	Seeding Year	Total
DSB08-M †	2.64	1.59	1.47	1.51	7.22*	5.39*	3.03*	15.65*
Pioneer 55V50	2.58	1.61	1.32	1.39	6.90*	5.53*	2.73*	15.16*
Prolific II	2.53	1.49	1.31	1.40	6.73*	5.36*	2.98*	15.07*
HybriForce-3400 ††	2.51	1.41	1.33	1.47	6.73*	5.20*	2.73*	14.65*
Ameristand 407TQ	2.33	1.50	1.36	1.35	6.53	5.14*	2.61*	14.29*
Sonic	2.49	1.40	1.23	1.28	6.40	5.14*	2.71*	14.26*
SolarGold ††	2.20	1.56	1.34	1.41	6.50	4.97*	2.38	13.85
Pioneer 55V12	2.49	1.46	1.22	1.38	6.53	4.76	2.42	13.71
PGI557	2.18	1.43	1.34	1.37	6.31	4.97*	2.36	13.65
LegenDairy 5.0	2.27	1.48	1.32	1.26	6.32	4.89	2.40	13.63
DG4210	2.24	1.53	1.34	1.40	6.51	4.80	2.14	13.45
PLH-resistant check	2.29	1.32	1.17	1.20	5.97	4.70	2.73*	13.41
6422Q	2.24	1.59	1.28	1.33	6.44	4.63	2.31	13.38
Pioneer 54Q32	2.35	1.43	1.24	1.23	6.24	4.82	2.14	13.19
WL 354HQ	2.20	1.46	1.21	1.31	6.19	4.58	2.42	13.19
Rebound 6.0	2.18	1.49	1.15	1.28	6.11	4.66	2.06	12.82
Vernal	2.29	1.34	1.08	1.19	5.89	4.44	2.27	12.60
403T	2.31	1.30	1.09	1.09	5.79	4.43	2.28	12.50
Oneida VR	2.28	1.21	1.03	1.14	5.66	4.60	2.18	12.44
Gunner	2.19	1.44	1.15	1.20	5.99	4.42	2.01	12.42
TS4013	2.17	1.21	1.13	1.21	5.72	4.36	2.25	12.33
DSB-45 †	2.14	1.43	1.13	1.09	5.80	4.09	1.85	11.75
Mean	2.32	1.44	1.24	1.30	6.30	4.81	2.41	13.52
LSD 0.05	0.20	0.13	0.21	0.24	0.63	0.61	0.56	1.68
CV%	6.1	6.6	11.9	13.0	7.1	8.9	16.0	8.8

† Experimental Variety
†† Released variety seeded as an experimental.
* Yield is not statistically different from the greatest numerical value in the column.

Entry	2013				2012	2011	Grand
	June 13	July 25	Sept 23	Total	Total	Seeding Year	Total
Pioneer 55V50	2.74	2.19	0.77	5.69*	4.97*	1.50*	12.16*
5312	2.40	2.16	0.80	5.35*	5.05*	1.28*	11.69*
DG 4210	2.48	2.19	0.69	5.36*	4.84*	1.40*	11.60*
Ameristand 407TQ	2.41	2.17	0.76	5.35*	4.97*	1.26*	11.57*
Sonic	2.49	2.04	0.74	5.26*	4.72*	1.37*	11.35*
Pioneer 54Q32	2.32	2.22	0.66	5.20	4.85*	1.28*	11.33*
Vernal	2.50	2.00	0.75	5.25*	4.60	1.48*	11.33*
Pioneer 55H94	2.47	1.99	0.68	5.13	4.57	1.26*	10.95
PLH-resistant check	2.30	1.85	0.66	4.81	4.59	1.36*	10.77
Pioneer 55V12	2.40	1.97	0.71	5.08	4.26	1.36*	10.69
Mean	2.45	2.08	0.72	5.25	4.74	1.36	11.35
LSD 0.05	0.23	0.34	0.11	0.48	0.40	0.34	1.01
CV%	6.3	11.3	10.4	6.3	5.9	17.7	6.1

* Yield is not statistically different from the greatest numerical value in the column.

Entry	2013				Total	2012 Total	2011 Seeding Year	Grand Total
	June 3	July 9	Aug 13	Sept 16				
Prolific II	1.97	1.49	1.54	1.07	6.07*	5.50*	3.88*	15.45*
HybriForce-2400	2.08	1.60	1.49	1.01	6.17*	5.32*	3.53*	15.02*
Sonic	1.98	1.46	1.46	0.99	5.88*	5.34*	3.59*	14.81*
Pioneer 54Q32	2.02	1.55	1.44	1.10	6.10*	5.42*	3.00	14.52
AmeriStand 407TQ	1.99	1.64	1.46	1.03	6.12*	5.12*	3.28	14.52
Rebound 6.0	1.90	1.59	1.43	1.08	5.99*	4.97	3.53*	14.48
DG 4210	1.95	1.57	1.42	1.04	5.98*	4.97	3.47*	14.42
Legendary 5.0	1.89	1.58	1.47	1.02	5.97*	5.12*	3.33*	14.42
Pioneer 55V50	2.03	1.55	1.40	0.95	5.94*	5.22*	3.20	14.35
WL 354HQ	1.96	1.52	1.44	1.06	5.97*	5.06	3.16	14.18
5312	1.96	1.38	1.33	0.89	5.55	5.27*	3.31*	14.13
Gunner	1.91	1.60	1.47	1.03	6.00*	4.95	3.16	14.11
Vernal	1.88	1.34	1.37	0.92	5.51	4.97	3.63*	14.10
WL363HQ	1.86	1.47	1.39	1.00	5.72	4.86	3.12	13.70
Pioneer 55V12	1.80	1.38	1.27	0.90	5.35	4.73	3.02	13.11
PLH-resistant check	1.62	1.45	1.34	0.75	5.15	4.34	3.12	12.61
Mean	1.93	1.51	1.42	0.99	5.84	5.07	3.33	14.25
LSD 0.05	0.16	0.11	0.11	0.08	0.30	0.40	0.59	0.91
CV%	5.7	5.2	5.6	5.9	3.7	5.6	12.5	4.5

* Yield is not statistically different from the greatest numerical value in the column.

Entry	2013				Total	2012 Total	2011 Total	2010 seeding year	Grand Total
	June 4	July 1	Aug 9	Sept 26					
non-PLHR check ‡	2.39	1.34	1.54	1.51	6.78*	6.43*	7.06*	4.26	24.53*
Pioneer 53H92	2.10	1.09	1.29	1.25	5.74	5.43	6.56*	4.72*	22.45
6426	1.96	1.10	1.39	1.31	5.76	5.79	6.43	4.44*	22.42
6475H	1.95	1.08	1.35	1.39	5.76	5.69	6.31	4.15	21.91
Vernal	1.93	0.73	1.17	1.18	5.01	4.45	5.88	3.77	19.11
Mean	2.07	1.07	1.35	1.33	5.81	5.56	6.45	4.27	22.08
LSD 0.05	0.16	0.14	0.07	0.13	0.24	0.50	0.60	0.40	1.01
CV %	5.0	8.4	3.3	6.2	2.7	5.8	6.1	6.0	3.0

‡ Commercially available check, not a PLH-resistant variety

* Yield is not statistically different from the greatest numerical value in the column.

Entry	2013				Total	2012 Total	2011 Seeding Year	Grand Total
	May 31	July 5	Oct 1					
non-PLHR check ‡	1.82	1.82	1.54	1.23	6.41*	5.25*	2.00*	13.66*
WL353LH	1.76	1.65	1.38	1.10	5.88	5.05*	2.33*	13.26*
403T	1.76	1.68	1.41	1.14	5.99	4.70	2.19*	12.88*
Pioneer 55H94	1.57	1.66	1.31	1.06	5.60	4.82	2.31*	12.74
AmeriStand 409LH	1.74	1.63	1.37	1.07	5.82	4.91*	1.94	12.67
6475H	1.63	1.64	1.36	1.03	5.67	4.61	2.16*	12.43
Vernal	1.72	1.57	1.30	1.10	5.69	4.60	2.05*	12.34
Mean	1.72	1.67	1.38	1.10	5.87	4.85	2.14	12.85
LSD 0.05	0.07	0.12	0.18	0.08	0.28	0.41	0.35	0.84
CV%	2.3	4.6	8.8	5.2	3.2	5.8	10.8	4.4

‡ Commercially available check, not a PLH-resistant variety

* Yield is not statistically different from the greatest numerical value in the column.

Table 18. 2013 yield summary (DM tons/acre) of MSU Alfalfa Variety Trial seeded in East Lansing, Michigan, in August 2012					
Entry	2013				1-yr Total
	June 5	July 8	Aug 14	Oct 11	
HybriForce-3400QR ††	2.30	1.37	1.57	1.19	6.42*
HybriForce-3400 ††	2.30	1.36	1.47	1.25	6.39*
DSC08-5 †	2.04	1.36	1.55	1.21	6.16*
Pioneer 55V50	2.09	1.35	1.35	1.14	5.94
DSC03-BR †	2.01	1.34	1.38	1.12	5.86
Magnitude	1.87	1.31	1.46	1.04	5.68
ForageGold	1.95	1.23	1.43	1.06	5.67
Mariner IV	2.00	1.27	1.33	1.06	5.65
SolarGold	1.88	1.26	1.43	1.04	5.62
Vernal	2.00	1.20	1.34	0.97	5.50
Pioneer 55V12	1.95	1.22	1.24	1.01	5.41
Contender	1.75	1.24	1.33	1.03	5.35
Mean	2.01	1.3	1.41	1.09	5.81
LSD 0.05	0.14	0.08	0.19	0.14	0.32
CV%	4.9	4.2	9.6	8.7	3.9
† Experimental Variety .					
†† Released variety seeded as an experimental.					
* Yield is not statistically different from the greatest numerical value in the column.					

Table 19. 2013 yield summary (DM tons/acre) of MSU Alfalfa Variety Trial seeded in Lake City, Michigan, in August 2012.				
Entry	2013			1-yr Total
	June 13	July 25	Sep 23	
HybriForce-3400 †	2.20	1.51	0.81	4.53*
Solargold	1.98	1.39	0.73	4.10
ForageGold	2.10	1.28	0.69	4.06
Vernal	1.99	1.35	0.66	4.00
Pioneer 55V50	1.95	1.32	0.67	3.95
Pioneer 55V12	2.00	1.24	0.61	3.85
Pioneer 54Q32	1.90	1.31	0.63	3.84
Mean	2.02	1.34	0.69	4.05
LSD 0.05	0.27	0.09	0.09	0.35
CV%	8.8	5.0	8.9	5.9
† Released variety seeded as an experimental.				
* Yield is not statistically different from the greatest numerical value in the column.				

Table 20. 2013 yield summary (DM tons/acre) of MSU Alfalfa Variety Trial seeded in Chatham, Michigan, in August 2012				
Entry	2013			1-yr Total
	July 1	July 30	Oct 14	
Pioneer 55V50	2.35	0.78	0.61	3.73*
Pioneer 55V12	2.25	0.64	0.51	3.40*
SolarGold	2.26	0.65	0.48	3.39*
ForageGold	2.26	0.52	0.48	3.25*
Vernal	2.00	0.64	0.45	3.09*
Mariner IV	1.97	0.58	0.51	3.06*
Mean	2.18	0.64	0.51	3.32
LSD 0.05	0.52	0.18	0.24	0.85
CV %	15.8	19.3	31.6	17.1
* Yield is not statistically different from the greatest numerical value in the column				

Table 21. 2013 yields (DM tons/acre) of the MSU Perennial Grass Variety Trial seeded in East Lansing, Michigan, in May 2011.

	2012		2013					2-yr total
	Total	Plant Maturity†	Cut 1	Cut 2	Cut 3	Cut 4	Total	
			5/31	6/28	8/14	10/1		
Orchardgrass								
Persist	4.38*	7.8	1.61	0.76	0.67	0.63	3.67*	8.05*
Potomac‡	3.74	8.0	1.52	0.85	0.65	0.56	3.57*	7.31
ISG OG53	3.67	7.0	1.47	0.83	0.71	0.50	3.51*	7.18
ISG OG52	3.71	8.3	1.36	0.80	0.72	0.52	3.39*	7.10
Intensiv	3.61	5.8	1.40	0.85	0.69	0.46	3.39*	7.00
Average	3.82	7.4	1.47	0.82	0.69	0.53	3.51	7.33
LSD 0.05	0.45	1.4	0.22	0.08	0.12	0.10	0.35	0.64
CV %	7.6	12.0	9.8	7.2	11.7	11.2	6.5	5.7
Perennial Ryegrass								
Kentaur	3.00*	3.3	0.72	0.70	0.65	0.22	2.28*	5.28*
Remington	3.06*	2.8	0.70	0.72	0.57	0.22	2.20*	5.26*
Mathilde	2.60	3.3	0.66	0.52	0.55	0.22	1.96*	4.56
Linn‡	2.70	9.8	1.03	0.27	0.48	0.17	1.95	4.65
Fennema	2.51	3.5	0.59	0.42	0.49	0.18	1.67	4.18
Average	2.77	4.5	0.74	0.52	0.55	0.20	2.01	4.78
LSD 0.05	0.28	0.9	0.15	0.07	0.19	0.05	0.32	0.46
CV %	6.7	13.2	13.8	8.5	23.0	13.3	10.2	6.3
Tall Fescue								
Kentucky 31(E-)‡	4.61	8.5	1.73	0.81	1.02	0.77	4.33	8.94
Select	4.32	8.8	1.91	0.72	0.88	0.59	4.09	8.41
Hymark	4.01	8.5	1.77	0.69	0.86	0.78	4.10	8.11
STF 43	3.64	7.3	1.59	0.81	0.85	0.69	3.93	7.57
Mean	4.15	8.3	1.75	0.76	0.90	0.71	4.11	8.26
LSD 0.05	1.08ns	0.5	0.15	0.09	0.20	0.14	0.43ns	1.49ns
CV %	16.3	4.0	5.5	7.0	13.9	12.6	6.5	11.3
*Not statistically different from the greatest numerical value in the column for that species.								
† Maturity visual ratings from 1 to 10 prior to first cutting. 10 = 100% of plot headed, 1 = 100% of plot still vegetative								
‡ Check variety								

Table 22. 2013 yields (DM tons/acre) of the MSU Perennial Grass Variety Trial seeded in East Lansing, Michigan, in May 2013.

	Cut 1 9/27	Cut 1 '9/27
Tall Fescue		Perennial Ryegrass
AGRFA 200	1.03*	Elena DS 0.62*
Flourish	1.02*	RAD-MRF145 0.53*
AGRFA 179	1.00*	Linn‡ 0.37
GT 213	0.97*	
KY 31 (E-)‡	0.95*	
Mean	0.99	Average 0.51
LSD (0.05)	0.23	LSD (0.05) 0.20
CV %	14.8	CV % 22.5
‡ Check variety		

Table 23. Stand persistence and grazing preference of forage grasses sown April 23, 2010, in Ithaca, Michigan, managed for hay production in 2011-2012, and grazed by horses in 2013.

Variety	Species	Marketer	Grazing Preference†		Percent Stand††					
					Seeding	Hay Production			Grazing	
			2013		2010	2011		2012	2013	
			6/13	10/23	Sept	April	June	Dec	6/13	10/23
Commercial										
Savory	Tall Fescue	Check	5.3	4.5	80	96	97	90	85*	89*
Fojtan	Festulolium	DLF Int'l	4.8	4.3	96	96	80	93	85*	89*
Big Blue	KY Bluegrass	Rose Agriseed	6.5	7.8*	56	86	73	100	90*	85*
Potomac	Orchardgrass	Check	4.3	5.5	100	100	90	93	73	82*
Giant	Bentgrass	Rose Agriseed	5.5	5.5	86	100	93	85	73	80*
Harvestar	Orchardgrass	Columbia Seeds	4.0	5.8	100	100	90	88	73	80*
Ky31(E-)	Tall Fescue	Check	5.0	5.0	90	100	100	83	83*	78*
Ginger	KY Bluegrass	Check	0.3	8.5*	60	90	87	95	90*	76
Barmix1	Blend	Barenbrug	2.8	7.5*	90	100	90	90	78	75
Barmix2	Blend	Barenbrug	6.5	7.5*	96	100	93	95	83*	75
Narnia	Timothy	DLF Int'l	6.8	7.5*	66	80	83	78	75	70
Hyor	Festulolium	DLF Int'l	4.3	7.0	100	100	97	85	80	68
Climax	Timothy	Check	7.5	8.0*	76	86	87	80	60	59
FullThrottle	Perennial Ryegrass	Columbia Seeds	7.5	7.5*	96	100	100	95	70	58
Calibra	Perennial Ryegrass	Check	8.8	8.5*	100	100	100	83	70	50
Gain	Festulolium	Check	7.5	8.0*	96	96	90	55	40	28
Experimental										
B8_0798	KY Bluegrass	AGSP/Blue Moon Seeds	7.3	8.8*	46	72	77	98	90*	86*
AGRFA1521	Tall Fescue	AGResearch LTD	2.8	5.3	80	90	87	90	85*	83*
IS-Php1	Timothy	DLF Int'l	6.0	7.8*	86	100	83	80	65	55
Mean			5.4	6.8	84	94	89	87	76	72
LSD (0.05)			2.1	1.4	22	12	5	10	8	12
CV			26.9	14.9	18.8	9.3	12.1	8.1	7.4	11.4

*Not significantly different from the highest numerical value in the column.

† Grazing Preference Score, with 0=not grazed, and 10=all plants grazed. Number of grazing days before first rating: 21 days.

†† Visual rating of 1 to 100, with 100 indicating 100% stand of the planted species.

Table 24. Contact information for participating marketers.

2013 Marketers	Phone	Web Addresses
AgResearch Ltd	828-645-3872	www.agresearchusa.com
Allied Seed	866-325-6671	www.alliedseed.com
Amer. Grass Seed Prod.	800-247-7815	www.agsp.us
America's Alfalfa	800-873-2532	www.americasalfalfa.com
Ampac Seed Co.	866-530-7333	www.ampacseed.com
Barenbrug USA	800-547-4101	www.barusa.com
Blue River Hybrids	800-370-7979	www.blueriverorgseed.com
Byron Seed	888-836-3697	www.bestforage.com
Cimarron USA	800-874-7945	www.cimarronusa.com
CISCO Seed	800-888-2986	www.ciscoseeds.com
Columbia Seed	541-757-1468	www.columbiaseeds.com
Crop Production Services	970-685-3300	www.cpsagu.com
Croplan Genetics	888-295-3011	www.croplangenetics.com
Cropmark Seeds (New Zealand)	+64-3-347-7950	www.cropmarkseeds.com
Dahlco Seeds	888-324-5261	www.agreliantgenetics.com
Dairyland Seed Co.	800-236-0163	www.dairylandseed.com/
DLF-International Seeds	800-445-2251	www.dlfis.com
FFR Cooperative	765-589-3123	www.ffrcoop.org
Hyland Seed	800-265-7403	www.hylandseeds.com
Lacrosse Forage and Turf	800-647-8873	www.lftseed.com
Legacy Seed	866-791-6390	www.legacyseeds.com
Lewis Seed Co.	541-491-3700	www.lewisseed.com
Midvalley Ag Prod.	541-752-2408	unavailable
Monsanto	800-768-6387	www.monsanto.com
Mycogen Seeds	800-692-6432	www.mycogen.com
NEXGROW	855-463-9476	www.plantnexgrow.com
Nutech Seed	800-942-6748	www.nutechseed.com
Pioneer Hi-bred Int'l	800-247-6803	www.pioneer.com
Producers Choice	877-560-5181	www.producerschoiceseed.com
ProSeeds Marketing	541-928-9999	www.proseedsmarketing.com
Renk Seed	800-289-7365	www.renkseed.com
Rose Agri-Seed	503-651-2130	www.roseagriseed.com
Seed Research of Oregon	800-253-5766	www.sroseed.com
Smith Seed Services	888-550-2930	www.smithseed.com
Spink Seed Co.	517-745-5804	unavailable
Standish Milling	989-846-6911	unavailable
Winfield Solutions	989-845-2093	www.winfield.com
W-L Research	800-406-7662	www.wlresearch.com