2014 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. Competition from row crops for land use continues to squeeze forage production acres while equipment, land, and labor costs 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 2014, and a one- ton increase in dairy-quality alfalfa hay yield was worth up to $250/acre.

2014 Conditions.

Weather conditions in 2014 were variable across the state. Temperatures for the most part were cooler than in recent years. Rainfall hampered seeding of many crops in the spring. Rain in late May and early June delayed harvest of first cutting in many areas in the southern-lower Peninsula. Rainfall for the growing season was above normal 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 July through August. Third cutting yields at Lake City were low. Alfalfa varieties reached full bloom the last week of August and final cutting was removed in early September. Temperatures were again slow to increase in the Upper Peninsula in spring 2014. Cutting dates at Chatham in 2014 were more typical than in 2013. Annual rainfall total and 30-year averages for East Lansing 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 alfalfa to be cut four times at East Lansing and three times at Lake City and Chatham. Average yield of alfalfa varieties planted in trials from 2011 to 2013 at East Lansing was 6.74 tons per acre and the highest was more than 8 tons per acre in the 2011 seeding. Average alfalfa yield with 3 cuttings at Lake City and Chatham, respectively, were 3.69 and 3.66 tons per acre. The established grass variety trials averaged 4 tons per acre (range from 2.2 to 5.3) with three cuts at East Lansing in 2014. New trials of conventional and Roundup Ready alfalfa varieties and perennial grass trials were established at East Lansing, Lake City, and Chatham in 2014, but seeding year data are not reported here.

Table 1. Actual and 30-year-average precipitation from April to October 2008 to 2014 at four variety test sites across Michigan.

	2008	2009	2010	2011	2012	2013	2014	Avg	2008	2009	2010	2011	2012	2013	2014	Avg
	East Lansing								**Chatham**							
Apr	2.15	6.50	2.37	5.21	1.53	7.78	1.07	**2.81**	6.30	3.02	0.95	3.35	1.05	3.30	3.32	**2.46**
May	1.36	4.29	5.10	6.81	3.40	4.35	3.66	**2.73**	3.64	3.58	1.61	3.10	2.43	2.20	3.36	**3.15**
June	4.80	4.97	4.70	1.85	1.50	5.23	5.60	**3.54**	3.85	1.91	6.82	4.03	4.34	2.77	3.85	**3.61**
July	3.72	2.39	2.15	4.76	1.80	2.49	2.97	**3.02**	1.76	3.66	5.73	1.41	4.47	4.78	4.27	**3.56**
Aug	0.50	6.63	0.71	3.50	2.70	5.74	5.33	**3.12**	1.07	3.88	1.96	0.73	2.12	2.68	3.18	**3.55**
Sept	8.42	0.74	3.79	2.09	2.52	0.89	4.49	**2.50**	3.78	3.06	8.62	5.26	5.13	2.71	3.53	**4.16**
Oct	1.61	3.64	1.35	3.08	4.69	5.24	2.41	**2.20**	2.32	6.50	2.18	2.75	5.55	3.06	6.98	**3.24**
Total	**22.56**	**29.16**	**20.17**	**27.30**	**18.14**	**31.72**	**25.53**	**19.92**	**22.72**	**25.61**	**27.87**	**20.63**	**25.09**	**21.50**	**28.49**	**23.48**
	Lake City								**Ithaca**							
Apr	3.49	2.65	3.09	7.09	2.20	5.09	6.58	**2.88**	--	--	2.63	5.03	2.03	8.62	3.45	**3.09**
May	1.79	2.71	2.35	2.44	5.30	3.02	3.29	**2.67**	--	--	4.28	4.28	1.69	4.58	3.16	**3.49**
June	7.15	2.64	4.69	4.11	3.03	1.87	2.94	**3.09**	--	--	3.16	2.47	2.49	2.59	4.32	**3.46**
July	3.93	1.26	5.18	2.15	7.32	2.03	3.17	**3.26**	--	--	1.38	4.19	5.53	1.22	5.17	**2.76**
Aug	2.16	4.30	2.77	3.61	1.97	4.15	1.69	**3.01**	--	--	0.94	4.55	6.21	3.60	4.03	**3.45**
Sept	2.95	2.65	2.97	2.61	3.45	1.66	4.07	**3.25**	--	--	3.00	1.52	1.04	1.30	2.61	**3.43**
Oct	2.69	4.84	1.36	3.85	4.35	3.09	4.29	**2.65**	--	--	2.00	2.68	4.42	2.53	2.15	**2.90**
Total	**24.16**	**21.05**	**22.41**	**25.86**	**27.62**	**20.91**	**26.03**	**23.02**			**16.68**	**24.72**	**23.41**	**24.44**	**24.89**	**22.58**

ALFALFA VARIETY TEST

Michigan State University has evaluated more than 100 commercially available alfalfa varieties in its alfalfa variety trials since 2007. Plant breeders, developers, and marketers submit alfalfa varieties for evaluation. Varieties seeded in these trials are evaluated for yield and persistence for three full years after the seeding year. Testing locations in 2014 for the Michigan alfalfa variety trials were the Upper Peninsula Research and Extension Center at Chatham, the Lake City Research Center at Lake City, 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 61 alfalfa varieties seeded at East Lansing (2007-2013) and as single-year yield for the 2013 seeding (**Table 4**). Yields of 36 varieties seeded at Lake City from 2007-2013 are provided in **Table 5**. Three-year average yields are reported from trials established in 2008 and 2009, two-year yields of varieties seeded in 2012 and 1-year yields from the 2013 seeding at Chatham are in **Table 6.** Ten Roundup Ready alfalfa varieties were seeded at East Lansing in 2013. Four of these were seeded at Lake City and three were seeded at Chatham. First-year yields for Roundup Ready Alfalfa Varieties at the 3 locations are listed in **Table 8**. 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 9**. 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 12, 13, and Tables 16 - 20** for the conventional alfalfa trials and in **Tables 21-23** for the Roundup Ready Alfalfa trials harvested in 2014 at the 3 locations.

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.

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 7.** Individual cut yields are presented in **Table 14** for the PLH-resistant alfalfa test harvested in 2014.

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 11**). 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, 2013 and 2014. More than 35 varieties were planted at East Lansing in 2014. Twelve varieties, including the checks, were also planted at Lake City and Chatham in 2014. 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 and 2 of the 2011 and 2013 established trials. Dry matter yields, multi-year averages and first year totals, for trials seeded from 2006 to 2013 are presented in **Table 10.** Yield data from individual cuts are presented in **Tables 24 and 25** for each grass trial harvested in 2014.

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 bromegrass, 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 bromegrass** is one of the most winter-hardy grasses in Michigan and can be grown on a wide range of soil types. Smooth bromegrass 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), 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.

ANNUAL GRASS TESTS

An annual grass trial was established in early July and harvested 3 times in 2014. This trial was planted in plots 5 ft wide by 22 ft long. Harvest area was from the center 3 ft (6 rows) of each plot. Weed control was not needed in this trial and it was fertilized with N prior to first cutting and after cuts 1 and 2. Yields for the annual grass trial are reported in **Table 26**. Two varieties each of Annual and Italian ryegrass and one variety each of Teffgrass, Oats and Triticale were evaluated. A winter wheat and winter rye variety were included as a check comparison for both yield and winter survival.

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 27** 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 in Ithaca, MI. 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 September. 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	252,00	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	APH 1	APH 2	SN	Marketer
727	4	2	-	HR	HR	HR	HR	HR	HR	-	R	NEXGROW
5312	3	-	-	HR	HR	HR	HR	HR	-	-	-	Check Variety
5454	4	-	-	R	HR	HR	HR	HR	LR	-	MR	Check variety
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
Caliber	4	2	-	HR	HR	HR	HR	HR	HR	MR	MR	Beck's Hybrid
Chesapeake	3	2	-	HR	HR	HR	HR	HR	HR	HR	R	Dahlco/AgReliant
Cimarron VL410	4	-	-	HR	HR	R	R	HR	MR	-	R	Cimarron Seed
Contender	5	2	-	HR	HR	HR	HR	HR	HR	-	R	Beck's Hybrid
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	-	-	Check variety
DKA33-16	3	-	-	HR	HR	HR	HR	HR	HR	-	-	Monsanto
DKA40-51RR	4	1	RR	HR	HR	HR	HR	HR	HR	HR	R	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
DKA43-22RR	4	2	RR	HR	HR	HR	HR	HR	HR	R	HR	Monsanto
DKA44-16RR	4	2	RR	HR	HR	HR	HR	HR	HR	-	R	Monsanto
Enduro Elite	4	-	-	HR	HR	HR	HR	HR	HR	HR	-	Cisco Seeds
Evergreen 3	4	2	-	HR	HR	HR	HR	HR	HR	-	R	NEXGROW
Everlast II	4	2	-	HR	HR	HR	HR	HR	HR	-	-	Crop Production
Fierce	4	2	-	HR	HR	HR	HR	HR	HR	HR	-	Beck's Hybrid
ForageGold	4	2	-	HR	HR	HR	HR	HR	HR	-	-	Renk Seed
FSG 329	3	2	-	HR	HR	HR	HR	HR	HR	-	HR	Forage First
FSG 351	3	2	-	HR	HR	R	R	HR	R	-	R	Forage First
FSG 400 LH	4	-	-	HR	HR	HR	HR	HR	HR	-	-	Forage First
FSG 403LR	4	2	-	HR	HR	HR	HR	HR	HR	R	R	Forage First
FSG 406	4	1	-	HR	HR	HR	HR	HR	HR	-	R	Forage First
FSG 408DP	4	2	-	HR	HR	HR	R	HR	R	-	R	Forage First
FSG 420 LH	4	2	-	HR	HR	HR	HR	HR	HR	-	-	Forage First
FSG 424	4	1	-	HR	HR	HR	HR	HR	HR	R	-	Forage First
FSG 505	5	2	-	HR	HR	HR	HR	HR	HR	-	R	Forage First
FSG 528 SF	5	2	-	HR	R	HR	HR	R	R	-	-	Forage First
GA 409	4	-	-	HR	HR	HR	HR	HR	HR	HR	-	Pref Alfalfa Gen
Genoa	4	2	-	HR	HR	HR	HR	HR	-	-	R	NEXGROW

Table 3. (Continued)

Variety	FD †	WSI††	RR ‡	BW	PRR	AN	VW	FW	APH 1	APH 2	SN	Marketer
Gunner	5	1	-	HR	HR	HR	HR	HR	HR	-	R	Croplan Genetics
HybriForce 2400	4	1.8	-	HR	HR	HR	HR	HR	HR	-	-	Dairyland Seeds
HybriForce 3400	4	1.5	-	HR	HR	HR	HR	HR	HR	MR	-	Dairyland Seeds
HybriForce 3400QR	4	1.5	-	HR	HR	HR	HR	HR	HR	MR	-	Dairyland Seeds
HybriPro BR	5	-	-	HR	HR	HR	HR	HR	HR	R	HR	Hyland Seeds
KingFisher 243	5	2	-	HR	HR	HR	HR	HR	HR	-	-	Byron Seeds
KingFisher 4020	4	-	-	HR	HR	HR	HR	HR	HR	-	-	Byron Seeds
L333HD	3	2	-	HR	HR	HR	HR	HR	HR	-	-	Legacy Seeds
L447HD	4	2	-	HR	HR	HR	R	HR	HR	-	-	Legacy Seeds
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	-	-	Alforex Seeds
PGI 529	5	2	-	HR	HR	HR	HR	HR	-	-	-	Alforex Seeds
PGI 557	5	2	-	HR	HR	HR	HR	HR	HR	-	HR	Alforex Seeds
Pioneer 53H92	3	-	-	HR	HR	HR	R	HR	HR	-	-	Pioneer
Pioneer 54Q14	4	1	-	HR	HR	HR	HR	HR	HR	-	MR	Pioneer
Pioneer 54Q32	4	-	-	HR	HR	HR	HR	HR	HR	-	LR	Pioneer
Pioneer 55H94	5	-	-	HR	HR	HR	HR	HR	HR	-	HR	Pioneer
Pioneer 55Q27	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
Pioneer 55VR06	5	1	RR	HR	HR	HR	HR	R	HR	-	MR	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
RR501	5	-	RR	HR	HR	HR	-	HR	HR	-	HR	Monsanto
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

† Refer to Important Alfalfa Diseases in Michigan found in the summary for more information

†† Winter survival index : 1=superior winter survival, 2=very good, 3=good, 4=adequate, 5=low, 6=no winter survival.

‡ Roundup Ready Alfalfa Variety, BW = Bacterial Wilt, PRR = Phytophthora Root Rot, AN = Anthracnose, VW = Verticillium Wilt, FW = Fusarium Wilt, APH 1=Aphanomyces race one, APH 2 = Aphanomyces 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 2013.

		3-year average					2-yr avg	1-yr total	(Number) †
Variety	Marketer	2007	2008	2009	2010	2011	2012	2013	% Vernal ††
		dry matter tons/acre							
727	NEXGROW	-	6.74	-	-	-	-	-	(1)126
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
4S417	Mycogen Seeds	-	7.30	6.36	6.38	-	-	-	(3)128
6422Q	NEXGROW	-	-	7.29	-	6.19	-	-	(2)130
6585Q	NEXGROW		-	-	-	-	-	6.06	-
AmeriStand 403T	America's Alfalfa	-	-	6.08	-	-	-	-	(1)125
Ameristand 407TQ	America's Alfalfa	-	-	6.98	-	6.28	-	-	(2)127
Caliber ‡	Beck's Hybrids	-	-	-	-	-	-	-	-
Chesapeake	Dahlco Seeds/ AgReliant	-	-	6.79	-	-	-	-	(1)140
Contender	Beck's Hybrids	-	-	-	-	-	6.05	-	(1)104
DG 4210	Crop Production Services	-	-	-	6.56	6.23	-	-	(2)114
DKA43-13	Monsanto	-	6.81	-	6.31	-	-	-	(2)121
Enduro Elite ‡	Cisco Seeds	-	-	-	-	-	-	-	-
Everlast II	Legacy Seeds	-	-	6.06	-	-	-	-	(1)125
Fierce ‡	Beck's Hybrids	-	-	-	-	-	-	-	-
ForageGold	Renk Seed	-	-	6.39	-	-	5.89	-	(2)116
FSG 403LR	Forage First	-	-	-	-	-	-	6.46	-
FSG 424	Forage First	-	-	-	-	-	-	6.17	-
GA-409 ‡	Preferred Alfalfa	-	-	-	-	-	-	-	-
Genoa	NEXGROW	-	6.92	-	-	-	-	-	(1)129
Gunner	Croplan Genetics	-	-	-	-	5.83	-	-	(1)103
HybriForce 2400	Dairyland Seed Co.	-	7.55	6.68	6.27	-	-	-	(3)131
HybriForce 3400	Dairyland Seed Co.	-	-	-	-	6.50	6.93	6.78	(2)117
HybriForce 3400 QR	Dairyland Seed Co.	-	-	-	-	-	6.72	-	(1)115
HybriPro-BR ‡	Hyland Seeds	-	-	-	-	-	-	-	-
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
L455HD	Legacy Seeds	-	-	-	-	-	-	6.30	-
LegenDairy 5.0	Croplan Genetics	-	-	6.64	-	6.12	-	-	(2)122
LegenDairy XHD	Croplan Genetics	-	-	-	-	-	-	6.20	-
Magnitude	Allied Seed	-	-	-	-	-	6.38	-	(1)109
Mariner IV	Allied Seed	-	-	-	-	-	6.21	-	(1)106
Oneida VR	public	-	-	5.42	-	5.56	-	6.32	(2)105
PGI 459	Alforex	-	6.45	-	-	-	-	-	(1)121
PGI 529	Alforex	-	-	-	-	-	-	6.43	-
PGI 557	Alforex	-	-	-	-	6.11	-	-	(1)108
Pioneer 53H92	Pioneer	-	-	6.13	-	-	-	-	(1)126
Pioneer 54Q14 ‡	Pioneer	-	-	-	-	-	-	-	-
Pioneer 54Q32	Pioneer	-	-	6.50	-	6.03	-	-	(2)120
Pioneer 54QR04	Pioneer	-	-	-	-	-	-	6.16	-
Pioneer 55Q27	Pioneer	-	-	-	-	-	-	6.51	-
Pioneer 55V12	Pioneer	-	-	6.78	-	6.23	5.98	-	(3)117
Pioneer 55V48	Pioneer	6.42	7.07	7.28	-	-	-	-	(3)142
Pioneer 55V50	Pioneer	-	-	-	-	6.85	6.72	6.88	(2)118
Prolific II	Hyland Seeds	-	-	-	-	6.54	-	-	(1)115
Radiance HD	Legacy Seeds	-	-	6.91	-	-	-	-	(1)142
Rebound 6.0	Croplan Genetics	-	-	-	-	6.01	-	-	(1)106
Red Falcon BR	Blue River Hybrids	5.95	-	-	-	-	-	-	(1)132
SolarGold	Renk Seed	-	-	-	-	6.39	6.25	-	(2)110
Sonic	Nutech Seed	-	-	-	-	6.21	-	-	(1)100
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	5.67	5.84	5.92	(6)100
WL343HQ	W-L Research	6.47	-	-	5.81	-	-	-	(2)124
WL354HQ	W-L Research	-	-	-	-	5.97	-	-	(1)105
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	5.79	-	-	(2)102
Mean		**5.93**	**6.71**	**6.38**	**6.13**	**6.10**	**6.30**	**6.35**	**119**

† Number of 3-year trials with at least 2 full years of data. †† Average % Vernal of varieties with more than 2 years of yield data.
‡ Alfalfa varieties seeded at East Lansing in 2014 for the first time.

Table 5. Long-term yield averages (dry matter tons/acre) from MSU Alfalfa Variety Trials seeded in Lake City, Michigan from 2007 to 2013.

		3-yr. avg.					2-yr. avg.	1-yr. tot.	(Number) †
Variety	Marketer	2007	2008	2009	2010	2011	2012	2013	% Vernal ††
		dry matter tons/acre							
6417	NEXGROW	-	-	-	4.90	-	-	-	(1)114
6431	NEXGROW	-	3.17	-	-	-	-	-	(1)133
4A415	Mycogen Seeds	-	-	-	5.19	-	-	-	(1)120
4S417	Mycogen Seeds	-	-	3.84	5.18	-	-	-	(2)117
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	-	4.65	-	-	(2)107
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	4.63	-	3.12	(2)107
DKA43-13	Monsanto	-	-	3.73	-	-	-	-	(1)111
ForageGold	Renk Seed	-	-	-	-	-	4.12	-	(1)97
FSG 329	Forage First	-	-	4.09	-	-	-	-	(1)122
HybriForce 2400	Dairyland Seed	-	-	-	4.87	-	-	-	(1)113
HybriForce 3400	Dairyland Seed	-	-	-	-	-	4.54	-	(1)107
L455HD	Legacy Seeds	-	-	-	-	-	-	3.41	-
LegenDairy 5.0	Croplan Genetics	-	-	4.11	-	-	-	-	(1)122
Magnum 7 WET ‡	Dairyland Seed	-	-	-	-	-	-	-	-
Mariner IV ‡	Allied Seed	-	-	-	-	-	-	-	-
Oneida VR	public	-	-	-	-	-	-	3.31	-
Pioneer 53Q32	Pioneer	-	-	3.99	-	4.59	4.12	-	(3)105
Pioneer 54Q14 ‡	Pioneer	-	-	-	-	-	-	-	-
Pioneer 54QR04	Pioneer	-	-	-	-	-	-	3.17	-
Pioneer 55H94	Pioneer	-	-	-	-	4.39	-	-	(1)95
Pioneer 55Q27	Pioneer	-	-	-	-	-	-	3.24	-
Pioneer 55V12	Pioneer	-	-	3.52	-	4.36	4.00	-	(3)98
Pioneer 55V48	Pioneer	2.98	2.84	3.52	-	-	-	-	(3)108
Pioneer 55V50	Pioneer	-	-	-	-	4.80	4.24	3.42	(2)102
Prolific II ‡	Hyland Seed	-	-	-	-	-	-	-	-
SolarGold	Renk Seed	-	-	-	-	-	4.18	-	(1)98
Sonic	Nutech Seed	-	-	-	-	4.52	-	-	(1)98
Velocity	Nutech Seed	2.84	2.97	3.95	-	-	-	-	(3)112
Vernal	public	2.97	2.39	3.36	4.31	4.61	4.26	3.27	(6)100
WL 354HQ ‡	W-L Research	-	-	-	-	-	-	-	-
5312	check	2.96	-	-	4.69	4.72	-	-	(3)104
DK140	check	3.20	-	3.46	-	-	-	-	(2)105
PLH-resistant check	check	-	2.56	3.68	4.52	4.16	-	-	(4)103
Mean		**3.09**	**2.79**	**3.76**	**4.81**	**4.54**	**4.21**	**3.28**	**107**

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

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

‡ Alfalfa varieties seeded at Lake City in 2014 for the first time, no data reported.

Table 6. Long-term yield averages (dry matter tons/acre) from MSU Alfalfa Variety Trials seeded in Chatham, Michigan in 2008, 2009, 2012 and 2013.

		3-yr average		2-yr total	1-yr total	(Number) †
Variety	Marketer	2008	2009	2012	2013	% Vernal ††
		------ dry matter tons/acre ------				
6417	NEXGROW	3.73	-	-	-	(1)107
6431	NEXGROW	3.64	-	-	-	(1)104
4A421	Mycogen Seeds	-	3.10	-	-	(1)107
Ameristand 403T Plus	America's Alfalfa	-	3.07	-	-	(1)106
Ameristand 407TQ	America's Alfalfa	3.45	2.96	-	-	(2)100
DG 4210	Crop Production	-	-	-	4.15	-
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	-	-	3.03	-	-
Mariner IV	Allied Seed	-	-	2.89	-	-
Pioneer 53H92	Pioneer	-	2.88	-	-	(1)99
Pioneer 54Q32	Pioneer	-	3.28	-	-	(1)113
Pioneer 55V12	Pioneer	-	3.25	3.23	-	(1)112
Pioneer 55V48	Pioneer	3.42	2.96	-	-	(2)100
Pioneer 55V50	Pioneer	-	-	3.56	3.92	-
SolarGold	Renk Seed	-	-	3.58	-	-
Velocity	Nutech Seed	3.55	3.05	-	-	(2)103
Vernal	Public	3.50	2.90	3.16	4.18	(2)100
WL343HQ	W-L Research	3.55	-	-	-	(1)101
5312	check	-	3.27	-	4.08	(1)113
DK140	check	3.40	3.01	-	-	(2)100
Mean		**3.52**	**3.08**	**3.24**	**4.08**	**104**

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

Table 7. Three-year average yields (dm tons/acre) of Potato leafhopper resistant alfalfa varieties and check varieties seeded in four trials from 2007 to 2011 at East Lansing.

				3-yr. avg.			(Number) †
Variety	Marketer	2007	2008	2009	2010	2011	% Vernal ††
		---------- dry matter tons/acre ----------					
6426	NEXGROW	6.24	5.95	-	5.99	-	(3)135
4P424	Mycogen Seeds	6.13	-	-	-	-	(1)121
6475H	NEXGROW	-	-	-	5.92	5.54	(2)109
Ameristand 409LH	America's Alfalfa	-	-	-	-	5.74	(1)105
Evergreen 3	NEXGROW	-	5.78	-	-	-	(1)161
FSG420LH	Standish Milling/Allied	-	-	5.86	-	-	(1)118
Pioneer 53H92	Pioneer	6.60	6.01	5.77	5.91	-	(4)132
Pioneer 55H94	Pioneer	-	-	-	-	5.61	(1)103
Vernal	Public	5.08	3.58	4.97	5.11	5.47	(5)100
WL353LH	W-L Research	-	-	5.88	-	5.79	(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	6.27	(3)124
Mean		**5.96**	**5.54**	**5.71**	**5.94**	**5.74**	

† 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
‡Non-PLH resistant checks - currently marketed

Table 8. First-year yields (dry matter tons/acre) of Roundup Ready Alfalfa Varieties seeded in 2013 in East Lansing, Lake City, and Chatham, Michigan.

		2014 First-year total yields		
Variety	Marketer	East Lansing	Lake City	Chatham
		---------- dry matter tons/acre ----------		
428RR	Allied Seed	6.42	-	-
6497R	NEXGROW	6.46	-	-
AmeriStand 455TQ RR	America's Alfalfa	6.22	-	-
RR Stratica	Croplan Genetics	6.48	-	-
WL 356HQ.RR	W-L Research	6.49	-	-
WL 372HQ.RR	W-L Research	6.38	-	-
Pioneer 54QR04	Pioneer	6.47	3.51	-
DKA41-18RR	Monsanto	6.40	3.51	4.21
DKA44-16RR	Monsanto	6.53	3.38	3.93
Yieldmaster RR	Monsanto	6.33	3.35	4.19
Mean		**6.42**	**3.44**	**4.11**

† 2013 seeding cut 4 times at East Lansing, three cuttings each at Lake City and Chatham in 2014

Table 9. 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)

		North Branch 3-yr. avg. 2008 seeding	Capac ††† 2-yr. avg. 2011 Seeding	(Number) † % Vernal ††
Variety	Marketer	---- 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	Forage First	7.28	-	(1)117
FSG406	Forage First	7.44	-	(1)119
FSG408DP	Forage First	7.14	-	(1)115
FSG505	Forage First	7.89	-	(1)127
FSG528SF	Forage First	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	-	5.76	(1)110
Pioneer 55V12	Pioneer	-	5.04	(1)96
Pioneer 55V48	Pioneer	7.90	-	(1)127
Pioneer 55V50	Pioneer	-	5.58	(1)106
Prolific II	Hyland Seeds	-	5.79	(1)110
Rebound 6.0	Croplan 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
WL343HQ	W-L Research	7.63	-	(1)122
WL354HQ	W-L Research	-	5.52	(1)105
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.

††† Only 2 years data at the Capac location. Winter injury in 2013-14 resulted in decreased plant vigor in the spring regrowth and season-long yield reductions.

Table 10. Long-term average yields (dry matter tons/acre) of perennial forage grasses seeded in 2006 at East Lansing and Lake City, 2007, 2009, and 2011 at East Lansing and 1-yr total from 2013 at East Lansing.

			Lake City	East Lansing					
			Three-year average yields					1-yr tot	% species
Sp †	Variety	Marketer	2006	2006	2007	2009	2011	2013	mean ‡‡
			---------- Dry matter tons/acre ----------						
FEST	SpringGreen(organic)	Rose Agri-Seed Inc.	-	-	2.68	-	-	-	(1) 107
FEST	Becva ††	DLF International Seed	-	-	-	-	-	-	-
FEST	Barfest ††	Barenbrug Seed	-	-	-	-	-	-	-
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) 108
MB	**SPECIES MEAN**		**-**	**-**	**3.51**	**3.16**	**-**	**-**	
OR	Ambrosia	Amer. Grass Seed Prod	3.36	4.13	-	-	-	-	(2) 98
OR	Barlegro ††	Barenbrug Seed	-	-	-	-	-	-	-
OR	Bounty	Standish Milling	3.61	4.22	-	-	-	-	(2) 103
OR	Echelon ‡	DLF International Seed	-	-	-	-	3.79	-	(1) 98
OR	Elsie	Rose Agri-Seed Inc.	-	-	3.75	-	-	-	(1) 94
OR	Extend	Standish Milling	3.37	4.46	-	-	-	-	(2) 102
OR	Harvestar	Columbia Seeds	3.18	4.22	-	-	-	-	(2) 97
OR	Inavale	DLF International Seed	-	-	-	-	3.79	-	(1) 98
OR	Intensiv ‡	Barenbrug Seed	-	-	-	-	3.79	-	(1) 98
OR	Megabite	Rose Agri-Seed Inc.	-	-	4.09	-	-	-	(1) 102
OR	Persist ‡	Smith Seed	-	-	-	3.58	4.12	-	(2) 104
OR	Potomac ‡	check	-	-	4.15	3.49	3.83	-	(3) 100
OR	Warrior II	ProSeeds Marketing	-	-	3.95	-	-	-	(1) 99
OR	**SPECIES MEAN**		**3.38**	**4.26**	**3.99**	**3.54**	**3.86**	**-**	
PR	BarSprinter (2n)	Barenbrug Seed	-	-	2.08	-	-	-	(1) 94
PR	BG34 (blend)	Barenbrug Seed	-	-	1.87	-	-	-	(1) 85
PR	Boost (2n)	Standish Milling	-	2.94	-	-	-	-	(1) 103
PR	Calibra (4n)	check	-	-	-	1.92	-	-	(1) 102
PR	Elena DS (4n)	Allied Seed	-	-	-	-	-	3.55	(1) 123
PR	Eurostar (2n)	Seed Research of OR	2.05	2.83	-	-	-	-	(2) 100
PR	Fennema (2n)	Amer. Grass Seed Prod	-	-	-	-	2.21	-	(1) 87
PR	Kentaur (4n)	DLF International Seed	-	-	-	-	2.72	-	(1) 108
PR	Korok (4n)	Czech Republic	-	-	2.12	-	-	-	(1) 96
PR	Linn (2n) ††	check	-	-	-	1.84	2.39	2.20	(3) 96
PR	Mathilda (4n)	DLF International Seed	-	-	-	-	2.50.	-	-
PR	Mara (2n) ††	Barenbrug Seed	-	-	-	-	-	-	-
PR	Maximo ††	DLF International Seed	-	-	-	-	-	-	-
PR	Quartermaster (4n)	Lewis Seed	-	3.05	-	-	-	-	(1) 107
PR	Payday (4n) ††	Smith Seed	-	-	-	-	-	-	-
PR	Remington (4n) ††	Barenbrug Seed	-	-	2.78	-	2.81	-	(2) 118
PR	Verano (4n)	Columbia Seeds	2.01	2.59	-	-	-	-	(2) 95
PR	**SPECIES MEAN**		**2.03**	**2.85**	**2.21**	**1.88**	**2.53**	**2.88**	

Table 10. Continued

Sp †	Variety	Marketer	Lake City	East Lansing					% species
				Three-year average yields				1-yr tot	
			2006	2006	2007	2009	2011	2013	mean ‡‡
			---------- Dry matter tons/acre ----------						
RC	Chiefton	check	2.25	3.61	-	-	-	-	(2) 93
RC	Marathon	Standish Milling	2.76	3.89	-	-	-	-	(2) 107
RC	**SPECIES MEAN**		**2.51**	**3.75**	**-**	**-**	**-**	**-**	
SB	Lincoln ††	Check variety	-	-	-	-	-	-	-
SB	Hakari (Alaska Brome) ††	Barenbrug Seed	-	-	-	-	-	-	-
SB	MBA ††	DLF International Seed	-	-	-	-	-	-	-
TF	BarElite ††	Barenbrug Seed	-	-	4.15	-	-	-	(1) 91
TF	Bariane ‡	Barenbrug Seed	-	-	-	-	-	-	-
TF	Brava ††	Allied Seed	-	-	-	-	-	-	-
TF	Cajun II ††	Smith Seed	-	-	-	-	-	-	-
TF	Cowgirl	Rose Agri-Seed Inc.	-	-	4.84	-	-	-	(1) 107
TF	Enhance	Standish Milling	2.44	4.31	-	-	-	-	(2) 103
TF	Fawn	Seed Research of OR	-	4.10	-	-	-	-	(1) 100
TF	Flourish	Allied Seed	-	-	-	-	-	4.42	(1) 99
TF	Goliath	CISCO Seed	-	-	-	4.06	-	-	(1) 101
TF	Hymark	Fraser Seeds	-	-	-	-	4.42	-	(1) 99
TF	KY31E+ ‡	check	-	-	-	3.96	4.75	-	(2) 102
TF	KY31E- ‡	check	-	-	-	-	-	4.49	(1) 101
TF	Noria	ProSeeds Marketing	-	-	4.75	-	-	-	(1) 104
TF	Select	check	-	-	-	-	4.47	-	(1) 100
TF	STF 43	Barenbrug Seed	-	-	-	-	4.26	-	(1) 95
TF	Tower ††	DLF International Seed	-	-	-	-	-	-	-
TF	Tuscany II †††	Forage First	-	-	-	-	-	-	-
TF	Verdant	Amer. Grass Seed Prod	2.44	3.87	-	-	-	-	(2) 97
TF	**SPECIES MEAN**		**2.44**	**4.09**	**4.54**	**4.01**	**4.48**	**4.46**	
MF	Cosmonaut ††	Barenbrug Seed	-	-	-	-	-	-	-
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**	**-**	**-**	**-**	

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

Varieties seeded in the 2014 grass variety trials at East Lansing ††, Lake City †††, or both locations ‡.

Table 11. 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.

		Lake City	East Lansing			
		2004	2004	2009	2010	(Number) †
Variety	Marketer	3yr avg.	4-yr avg.	4-yr avg.	3-yr avg.	% Check ††
		---------- dry matter tons per acre ---------				
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	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
FSG9601	Allied Seed	2.77	3.96	-	-	(2)111
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)
Mean		**2.47**	**3.80**	**4.07**	**3.73**	

† Number of trials entered

†† Average % yield of the check variety (common).

Table 12. 2014 yield summary (DM tons/acre) of MSU Alfalfa Variety Trial seeded in East Lansing, Michigan, in June 2011.

	2014					2013	2012	2011	Grand
Entry	May 29	July 7	Aug 8	Sep 24	Total	Total	Total	Seeding yr	Total
DSB08-M †	2.38	2.30	1.62	1.47	7.77*	7.22*	5.39*	3.03*	23.41*
Pioneer 55V50	2.62	2.34	1.63	1.51	8.11*	6.90*	5.53*	2.73*	23.27*
Prolific II	2.39	2.15	1.55	1.44	7.54	6.73*	5.36*	2.98*	22.61*
HybriForce-3400 ††	2.38	2.09	1.62	1.49	7.57	6.73*	5.20*	2.73*	22.23*
SolarGold ††	2.39	2.17	1.64	1.52	7.71*	6.50	4.97*	2.38	21.56*
Ameristand 407TQ	2.24	2.01	1.57	1.36	7.16	6.53	5.14*	2.61*	21.44*
Sonic	2.33	1.93	1.49	1.34	7.09	6.40	5.14*	2.71*	21.34*
Pioneer 55V12	2.48	1.96	1.50	1.46	7.39	6.53	4.76	2.42	21.10
6422Q	2.33	2.10	1.58	1.48	7.49	6.44	4.63	2.31	20.87
DG4210	2.29	2.10	1.55	1.44	7.39	6.51	4.80	2.14	20.84
LegenDairy 5.0	2.27	2.00	1.55	1.33	7.15	6.32	4.89	2.40	20.76
PGI557	2.17	1.96	1.54	1.40	7.06	6.31	4.97*	2.36	20.70
WL 354HQ	2.31	2.02	1.48	1.33	7.13	6.19	4.58	2.42	20.32
Pioneer 54Q32	2.30	1.95	1.48	1.30	7.04	6.24	4.82	2.14	20.24
PLH-resistant check	2.22	1.83	1.34	1.30	6.69	5.97	4.70	2.73*	20.09
Rebound 6.0	2.26	2.15	1.47	1.37	7.26	6.11	4.66	2.06	20.09
Gunner	2.27	1.99	1.45	1.36	7.07	5.99	4.42	2.01	19.49
Vernal	2.34	1.83	1.31	1.20	6.68	5.89	4.44	2.27	19.28
403T	2.17	1.74	1.32	1.14	6.36	5.79	4.43	2.28	18.86
Oneida VR	2.21	1.65	1.32	1.25	6.42	5.66	4.60	2.18	18.86
TS4013	2.15	1.78	1.28	1.17	6.37	5.72	4.36	2.25	18.70
DSB-45 †	2.21	1.95	1.40	1.24	6.79	5.80	4.09	1.85	18.53
Mean	**2.31**	**2.00**	**1.48**	**1.36**	**7.15**	**6.30**	**4.81**	**2.41**	**20.67**
LSD 0.05	0.15	0.17	0.16	0.14	0.52	0.63	0.61	0.56	2.12
CV%	4.7	6.0	7.7	7.4	5.2	7.1	8.9	16.0	7.3

† Experimental Variety .

†† Released variety seeded as an experimental

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

Table 13. 2014 yield summary (DM tons/acre) of MSU Alfalfa Variety Trial seeded in Lake City, Michigan, in May 2011.

	2014				2013	2012	2011	Grand
Entry	June 12	July 24	Sep 8	Total	Total	Total	Seeding Year	Total
Pioneer 55V50	2.02	1.16	0.56	3.74*	5.69*	4.97*	1.50	15.90*
5312	1.93	1.21	0.62	3.76*	5.35*	5.05*	1.28	15.44*
Vernal	2.10	1.25	0.63	3.98*	5.25*	4.60	1.48	15.31*
DG 4210	1.97	1.21	0.51	3.69*	5.36*	4.84*	1.40	15.29*
Ameristand 407TQ	1.88	1.19	0.56	3.63*	5.35*	4.97*	1.26	15.21*
Pioneer 54Q32	1.99	1.22	0.50	3.71*	5.20	4.85*	1.28	15.04*
Sonic	1.92	1.16	0.49	3.57*	5.26*	4.72*	1.37	14.92*
Pioneer 55V12	2.02	1.19	0.55	3.75*	5.08	4.26	1.36	14.45*
Pioneer 55H94	1.81	1.16	0.50	3.47*	5.13	4.57	1.26	14.43
PLH-resistant check	1.63	0.99	0.46	3.07	4.81	4.59	1.36	13.83
Mean	**1.93**	**1.17**	**0.54**	**3.64**	**5.25**	**4.74**	**1.36**	**14.98**
LSD 0.05	0.20	0.23	0.15	0.54	0.48	0.40	0.34 ns	1.46
CV%	7.1	13.4	18.9	10.2	6.3	5.9	17.7	6.7

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

Table 14. 2014 Yield summary (DM tons/acre) of MSU Potato leafhopper Resistant Alfalfa Variety Trial seed in East Lansing, Michigan, in June 2011.

	2014					2013	2012	2011	Grand
Entry	May 29	July 6	Aug 8	Sep 19	Total	Total	Total	Seeding yr	Total
non-PLHR check †	2.26	1.99	1.60	1.32	7.16*	6.41*	5.25*	2.00*	20.82*
WL353LH	2.07	1.79	1.37	1.19	6.43	5.88	5.05*	2.33*	19.69*
403T	2.13	1.87	1.35	1.04	6.39	5.99	4.70	2.19*	19.27
AmeriStand 409LH	2.03	1.82	1.41	1.23	6.48	5.82	4.91	1.94	19.15
Pioneer 55H94	2.06	1.85	1.41	1.09	6.41	5.60	4.82	2.31*	19.14
6475H	1.97	1.81	1.38	1.18	6.34	5.67	4.61	2.16*	18.78
Vernal	2.05	1.69	1.31	1.07	6.13	5.69	4.60	2.05*	18.47
Mean	**2.08**	**1.83**	**1.40**	**1.16**	**6.48**	**5.87**	**4.85**	**2.14**	**19.33**
LSD 0.05	0.12	0.16	0.14	0.14	0.45	0.28	0.41	0.35	1.22
CV%	4.2	5.7	6.9	8.3	4.7	3.2	5.8	10.8	4.3

† Commercially available check, not a PLH-resistant variety * Yield is not statistically different from the greatest value in the column.

Table 15. 2014 yield summary (DM tons/acre) of MSU Alfalfa Variety Trial seeded in East Lansing, Michigan, in August 2012.

	2014					2013	2-year
Entry	June 9	July 10	Aug 14	Oct 1	Total	Total	Total
HybriForce-3400 ††	3.01	1.79	1.45	1.20	7.46*	6.39*	13.85*
HybriForce-3400QR ††	2.86	1.66	1.41	1.08	7.01	6.42*	13.43*
Pioneer 55V50	3.15	1.81	1.39	1.13	7.49*	5.94	13.43*
DSC08-5 †	2.77	1.69	1.44	1.27	7.18*	6.16*	13.34*
DSC03-BR †	2.79	1.73	1.37	1.25	7.14*	5.86	13.00
Magnitude	2.76	1.72	1.40	1.18	7.07*	5.68	12.75
SolarGold	2.69	1.67	1.40	1.12	6.88	5.62	12.50
Mariner IV	2.72	1.63	1.25	1.16	6.77	5.65	12.42
Contender	2.58	1.66	1.32	1.17	6.74	5.35	12.09
Pioneer 55V12	2.73	1.64	1.19	0.99	6.55	5.41	11.96
ForageGold	2.46	1.50	1.21	0.92	6.10	5.67	11.77
Vernal	2.58	1.48	1.14	0.97	6.18	5.50	11.68
Mean	**2.76**	**1.67**	**1.33**	**1.12**	**6.88**	**5.81**	**12.69**
LSD 0.05	0.24	0.10	0.18	0.11	0.46	0.32	0.70
CV%	6.0	4.0	9.1	6.7	4.7	3.9	3.9

† Experimental Variety. †† Released variety seeded as an experimental

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

Table 16. 2014 yield summary (DM tons/acre) of MSU Alfalfa Variety Trial seeded in Lake City, Michigan, in August 2012.

	2014				2013	2-year
Entry	June 12	July 24	Sep 8	Total	Total	Total
HybriForce-3400 †	2.28	1.64	0.62	4.54*	4.53*	9.07*
Vernal	2.28	1.64	0.59	4.51*	4.00	8.51
Pioneer 55V50	2.37	1.55	0.60	4.52*	3.95	8.47
SolarGold	2.21	1.50	0.56	4.26*	4.10	8.36
Pioneer 54Q32	2.33	1.54	0.53	4.40*	3.84	8.24
ForageGold	2.19	1.46	0.54	4.18	4.06	8.24
Pioneer 55V12	2.13	1.48	0.53	4.14	3.85	7.99
Mean	**2.26**	**1.54**	**0.57**	**4.36**	**4.05**	**8.41**
LSD 0.05	0.19	0.16	0.11	0.34	0.35	0.40
CV%	5.6	7.2	13.8	5.2	5.9	3.2

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

Table 17. 2014 yield summary (DM tons/acre) of MSU Alfalfa Variety Trial seeded in Chatham, Michigan, in August 2012.

	2014				2013	Grand
Entry	June 19	July 31	Sept 17	Total	Total	Total
SolarGold	1.90	1.33	0.54	3.77*	3.39	7.16
Pioneer 55V50	1.60	1.20	0.60	3.39*	3.73	7.12
Pioneer 55V12	1.40	1.11	0.54	3.05*	3.40	6.45
Vernal	1.75	0.97	0.49	3.22*	3.09	6.30
ForageGold	1.44	0.85	0.51	2.80*	3.25	6.05
Mariner IV	1.36	0.88	0.48	2.71	3.06	5.77
Mean	**1.58**	**1.06**	**0.53**	**3.16**	**3.32**	**6.48**
LSD 0.05	0.59	0.57	0.21	1.01	0.85 ns	1.71 ns
CV%	24.9	36.1	27.2	21.7	17.1	17.5

* Yield is not statistically different from the greatest value in the column.
ns - Yields among varieties in this column trial are not statistically different.

Table 18. 2014 yield summary (DM tons/acre) of MSU Conventional Alfalfa Variety Trial seeded in East Lansing, Michigan in August 2013.

	2014				
Entry	June 4	July 11	Aug 14	Oct 2	1-yr Total
Pioneer 55V50	2.41	1.96	1.38	1.13	6.88*
HybriForce-3400	2.40	1.92	1.42	1.03	6.78*
DSD03-T †	2.42	1.92	1.34	1.01	6.70*
Pioneer 55Q27	2.24	1.85	1.36	1.07	6.51*
FSG 403LR	2.23	1.86	1.35	1.03	6.46*
PGI 529 ††	2.14	1.99	1.28	1.02	6.43
Oneida VR	2.26	1.76	1.34	0.97	6.32
L455HD	2.09	1.88	1.34	0.99	6.30
LS905 †	2.00	1.86	1.42	1.01	6.29
LS804 †	2.02	1.83	1.38	1.05	6.28
DSD07-M †	2.10	1.71	1.32	1.08	6.20
LegenDairy XHD	2.17	1.80	1.24	0.99	6.20
LS803 †	2.01	1.86	1.35	0.98	6.19
FSG 424	2.15	1.83	1.19	1.00	6.17
Pioneer 54QR04	2.08	1.76	1.31	1.00	6.16
6585Q	2.00	1.78	1.25	1.03	6.06
DG4210	2.07	1.70	1.19	0.98	5.93
Vernal	2.22	1.71	1.11	0.89	5.92
Mean	**2.17**	**1.83**	**1.31**	**1.01**	**6.32**
LSD 0.05	0.16	0.16	0.21	0.08	0.43
CV %	5.0	5.9	11.4	5.7	4.8

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

Table 19. 2014 yield summary (DM tons/acre) of MSU Conventional Alfalfa Variety Trial seeded in Lake City, Michigan, in July 2013.

	2014			
Entry	June 12	July 24	Sep 8	1-yr Total
LS804 †	1.73	1.26	0.43	3.42
Pioneer 55V50	1.66	1.27	0.48	3.42
L455HD	1.77	1.25	0.39	3.41
Oneida VR	1.67	1.22	0.42	3.31
Vernal	1.76	1.17	0.34	3.27
Pioneer 55Q27	1.69	1.19	0.37	3.24
Pioneer 54QR04	1.59	1.19	0.40	3.17
DG4210	1.59	1.18	0.35	3.12
Mean	**1.68**	**1.22**	**0.40**	**3.30**
LSD 0.05	0.22	0.15	0.14	0.45 ns
CV %	8.9	8.6	23.2	9.4

† Experimental Variety.

ns - Total yield among varieties in this trial are not statistically different.

Table 20. 2014 yield summary (DM tons/acre) of MSU Conventional Alfalfa Variety Trial seeded in Chatham, Michigan, in July 2013.

	2014			
Entry	June 19	July 31	Sept 17	Total
Vernal	1.62	1.28	1.29	4.18
DG 4210	1.60	1.35	1.20	4.15
5312	1.57	1.33	1.18	4.08
Pioneer 55V50	1.46	1.45	1.01	3.92
Mean	1.56	1.35	1.17	4.08
LSD 0.05	0.31	0.26	0.35	0.52 ns
CV%	12.3	12.0	18.7	8.0

ns - Total yield among varieties in this trial are not statistically different.

Table 21. 2014 yield summary (DM tons/acre) of MSU Roundup Ready Alfalfa Variety Trial seeded in East Lansing, Michigan, in July 2013.

	2014					2013	Grand
Entry	May 31	July 6	Aug 13	Sep 29	Total	Seeding Year	Total
WL 356HQ.RR	2.18	1.78	1.47	1.06	6.49	0.68*	7.17
6497R	2.13	1.81	1.46	1.07	6.46	0.70*	7.16
RR Stratica	2.16	1.77	1.43	1.11	6.48	0.68*	7.16
DKA44-16RR	2.17	1.78	1.49	1.10	6.53	0.63	7.16
Pioneer 54QR04	2.14	1.77	1.48	1.08	6.47	0.67*	7.14
WL 372HQ.RR	2.11	1.83	1.39	1.05	6.38	0.72*	7.10
428RR	2.13	1.75	1.47	1.08	6.42	0.68*	7.10
DKA41-18RR	2.10	1.77	1.48	1.06	6.40	0.66	7.06
Yieldmaster RR	2.14	1.69	1.43	1.06	6.33	0.67*	7.00
AmeriStand 455TQ RR	2.03	1.70	1.41	1.08	6.22	0.63	6.85
Mean	**2.13**	**1.77**	**1.45**	**1.07**	**6.42**	**0.67**	**7.09**
LSD 0.05	0.15	0.11	0.14	0.08	0.36 ns	0.05	0.38 ns
CV %	4.7	4.2	6.7	5.2	3.8	5.1	3.7

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

Table 22. 2014 yield summary (DM tons/acre) of MSU Roundup Ready Alfalfa Variety Trial seeded in Lake City, Michigan, in July 2013.

	2014			
Entry	June 12	July 24	Sep 8	1-yr Total
Pioneer 54QR04	1.68	1.35	0.48	3.51
DKA41-18RR	1.68	1.36	0.47	3.51
DKA44-16RR	1.63	1.29	0.45	3.38
Yieldmaster RR	1.60	1.29	0.45	3.35
Mean	**1.65**	**1.32**	**0.46**	**3.43**
LSD 0.05	0.15	0.09	0.07	0.26 ns
CV %	5.6	4.4	9.3	4.7

ns - Total yield among varieties in this trial are not statistically different.

Table 23. 2014 yield summary (DM tons/acre) of MSU Roundup Ready Alfalfa Variety Trial seeded in Chatham, Michigan, in July 2013.

	2014			
Entry	June 19	July 31	Sept 17	Total
DKA 41-18RR	1.64	1.32	1.24	4.21
Yieldmaster RR	1.63	1.36	1.20	4.19
DKA 44-16RR	1.49	1.26	1.18	3.93
Mean	**1.59**	**1.31**	**1.21**	**4.11**
LSD 0.05	0.35	0.13	0.23	0.63 ns
CV%	12.9	5.7	10.8	8.9

ns - Total yield among varieties in this trial are not statistically different.

Table 24. 2014 yields (DM tons/acre) of the MSU perennial Grass Variety Trial seeded in East Lansing, Michigan, in May 2013.

		2014						2-yr
	2013	Plant Maturity †		Cut 1	Cut 2	Cut 3		Total
Tall Fescue	Seeding yr	May 26	June 3	June 10	July 22	Sep 25	Total	
AGRFA 179 ††	1.00	1.0	30.0	2.02	1.23	1.50	4.75	5.75
AGRFA 200 ††	1.03	0.3	25.0	1.98	1.27	1.45	4.70	5.73
GT 213 ††	0.97	15.0	62.5	2.01	1.25	1.42	4.68	5.65
KY 31 minus ‡	0.95	22.5	57.5	1.97	1.20	1.32	4.49	5.44
Flourish	1.02	10.0	37.5	1.89	1.21	1.33	4.42	5.44
Mean	**0.99**	**9.8**	**42.5**	**1.97**	**1.23**	**1.40**	**4.61**	**5.60**
LSD (0.05)	0.23ns	8.1	14	0.27	0.10	0.11	0.36ns	0.52ns
CV %	14.8	54.2	21.4	9.0	5.2	4.9	5.0	6.1
Perennial Ryegrass								
Elena DS	0.62	0.5	50.0	2.10	0.67	0.78	3.55*	4.17*
RAD-MRF145 ††	0.53	1.0	55.0	2.17	0.59	0.57	3.34*	3.87*
Linn ‡	0.37	1.0	75.0	1.32	0.62	0.26	2.20	2.57
Mean	**0.51**	**0.8**	**60.0**	**1.86**	**0.63**	**0.54**	**3.03**	**3.54**
LSD (0.05)	0.20	0.6 ns	26.4 ns	0.42	0.12	0.16	0.54	0.64
CV %	22.5	40.0	25.5	12.9	11.3	17.7	10.3	10.4

† Maturity Percent of tillers with head visible. †† Experimental grass varieties. ‡ Check variety

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

ns - Total yield among varieties are not statistically different.

Table 25. 2014 yields (DM tons/acre) of the MSU Perennial Grass Variety Trial seeded in East Lansing, MI, in May 2011

	2013	2012	2014						3-year
			Plant Maturity †		Cut 1	Cut 2	Cut 3		
	Total	Total	May 26	June 3	June 3	July 15	Sep 19	Total	Total
Orchardgrass									
Persist	3.67	4.38*	85.0	93.8	2.10	0.90	1.32	4.32	12.37
Potomac ‡	3.57	3.74	80.0	92.5	1.96	0.91	1.31	4.17	11.48
Intensiv	3.39	3.61	1.0	30.0	2.07	0.99	1.33	4.38	11.38
Inavale	3.39	3.71	37.5	91.3	2.06	0.89	1.31	4.26	11.36
Echelon	3.51	3.67	6.3	55.0	1.89	0.94	1.34	4.18	11.36
Mean	**3.51**	**3.82**	**42.0**	**72.5**	**2.01**	**0.93**	**1.32**	**4.26**	**11.59**
LSD 0.05	0.35ns	0.45	14.5	15.6	0.22	0.15	0.21	0.52ns	1.01ns
CV %	6.5	7.6	22.4	14.0	7.2	10.5	10.2	8.0	5.7
Perennial Ryegrass									
Remington	2.20*	3.06*	0.0	5.0	1.63	0.78	0.76	3.17*	8.43*
Kentaur	2.28*	3.00*	0.0	15.0	1.34	0.78	0.75	2.87	8.15*
Mathilde	1.96*	2.60	0.0	27.5	1.35	0.86	0.75	2.95	7.51
Linn ‡	1.95	2.70	1.8	91.3	1.31	0.64	0.56	2.52	7.17
Fennema	1.67	2.51	0.0	26.3	1.17	0.65	0.62	2.45	6.63
Mean	**2.01**	**2.77**	**0.4**	**33.0**	**1.36**	**0.74**	**0.69**	**2.79**	**7.58**
LSD 0.05	0.32	0.28	1.5	14.1	0.10	0.12	0.14	0.24	0.62
CV %	10.2	6.7	283.3	27.6	4.7	10.3	13.3	5.7	5.3
Tall Fescue									
KY31+ ‡	4.33	4.61	2.0	82.5	2.33	1.27	1.70	5.30	14.24
Select	4.09	4.32	4.3	92.5	2.55	1.11	1.36	5.01	13.42
Hymark	4.10	4.01	7.8	90.0	2.52	1.15	1.46	5.14	13.25
STF 43	3.93	3.64	0.5	72.5	2.36	1.31	1.55	5.22	12.79
Mean	**4.11**	**4.15**	**3.6**	**84.4**	**2.44**	**1.21**	**1.52**	**5.17**	**13.43**
LSD 0.05	0.43ns	1.08ns	4.2	16.1	0.27	0.18	0.33	0.72ns	2.09ns
CV %	6.5	16.3	72.3	11.9	6.9	9.5	13.4	8.7	9.7

† Maturity - Percent of tillers with head visible. ‡ Check variety * Yield is not statistically different from the greatest value
ns - Total yield among varieties are not statistically different.

Table 26. 2014 yields (DM tons/acre) of the MSU Annual Grass Variety Trial seeded July 11, 2014 in East Lansing, MI

				2014			
		First cutting (Aug 26)		Cut 1	Cut 2	Cut 3	
Entry	Species	Maturity †	Height	Aug 26	Oct 1	Nov 10	Total
DLFPS-LMT 15 ††	Italian Ryegrass	Vegetative	19.3	1.00	1.60*	0.56*	3.15*
Fox	Italian Ryegrass	Vegetative	20.3	0.88	1.50*	0.59*	2.97*
Big Bang	Annual ryegrass	Pollinating	31.0	1.09	1.22	0.52*	2.82
Fria	Annual ryegrass	Pollinating	26.5	0.98	1.20	0.53*	2.70
CW 0604	Teffgrass	>20% headed	31.8	1.65*	0.59	-	2.24
HiOctane	Winter Triticale	Vegetative	19.3	0.67	0.95	0.54*	2.15
Frankenmuth	Winter Wheat	Vegetative	19.3	0.80	0.65	0.39	1.84
Wheeler	Winter Rye	Vegetative	25.3	0.90	0.42	0.38	1.70
Seten	Oats	Boot, < 20 % heads	36.3	1.31	-	-	1.37
Mean			**24.4**	**1.03**	**1.02**	**0.50**	**2.32**
LSD 0.05			3.2	0.17	0.19	0.11	0.29
CV%			8.6	11.1	12.5	13.7	8.5

† Visual maturity and height of plants (inches) prior to first cutting. †† Experimental variety
* Yield is not statistically different from the greatest value in the column.

Table 27. Stand persistence and grazing preference of forage grasses planted April 23, 2010, near Ithaca, Michigan. Managed for hay production in 2011 and 2012, and grazed by horses in 2013 and 2014.

			2014 Grazing Data					2013 Grazing Data				Hay production			
			June 21			October 21		June 13		October 23		Percent Ground Cover			
Entry	Species ‡	Marketer	% Ground Cover	% Target Species †	Graz pref ††	% Target Species †	% Ground Cover	% Ground Cover	Graz pref ††	% Ground Cover	Graz pref ††	Sept 2010	April 2011	June 2011	Dec 2012
Ky31E-	Tall Fescue	Check	87.5*	87.5*	3.3	88.8*	100*	83*	5.0	78*	5.0	90	100	100	83
Hykor	Fest (TF type)	DLF Int'l	81.3*	81.3*	4.3	96.3*	100*	80	4.3	68	7.0	100	100	97	85
Savory	Tall Fescue	Check	81.3*	81.3*	2.5	91.3*	100*	85*	5.3	89*	4.5	80	96	97	90
Fojtan	Fest (TF type)	DLF Int'l	81.3*	81.3*	4.0	92.5*	100*	85*	4.8	89*	4.3	96	96	80	93
Barmix1	Mixture	Barenbrug	80.0*	NA	3.5	NA	100*	78	2.8	75	7.5*	90	100	90	90
Barmix2	Mixture	Barenbrug	76.3*	NA	7.5*	NA	100*	83*	6.5	75	7.5*	96	100	93	95
Potomac	Orchardgrass	Check	45.0	51.3	7.0*	85.0*	100*	73	4.3	82*	5.5	100	100	90	93
Ginger	K Bluegrass	Check	82.5*	82.5*	3.0	92.5*	98.8*	90*	0.3	76	8.5*	60	90	87	95
Harvestar	Orchardgrass	Columbia Seeds	37.5	20.0	6.8	66.3	97.5*	73	4.0	80*	5.8	100	100	90	88
BigBlue	K Bluegrass	Rose Agriseed	78.8*	78.8	8.5*	93.8*	96.3*	90*	6.5	85*	7.8*	56	86	73	100
Giant	RedTop Bent.	Rose Agriseed	73.8*	56.3	6.8	21.3	96.3*	73	5.5	80*	5.5	86	100	93	85
Narnia	Timothy	DLF Int'l	76.3*	47.5	9.0*	35.0	95.0*	75	6.8	70	7.5*	66	80	83	78
Climax	Timothy	Check	58.8	45.0	9.0*	60.0	92.5	60	7.5	59	8.0*	76	86	87	80
Gain	Fest (Not TF)	Check	38.8	4.0	8.8*	32.5	86.3	40	7.5	28	8.0*	96	96	90	55
FullThrottle	P Ryegrass	Columbia Seeds	30.0	6.3	8.5*	17.5	82.5	70	7.5	58	7.5*	96	100	100	95
Calibra	P Ryegrass	Check	30.0	8.8	9.0*	25.0	72.5	70	8.8	50	8.5*	100	100	100	83
Experimental															
B8_0798	K Bluegrass	Blue Moon Seeds	80*	80.0*	7.8*	96.3*	98.8*	90*	7.3	86*	8.8*	46	72	77	98
AGRFA1521	Tall Fescue	AGResearch LTD	87.5*	85.0*	2.5	88.8*	100*	85*	2.8	83*	5.3	80	90	87	90
IS-Php1	Timothy	DLF Int'l	58.8	42.5	7.5 *	55.0	95.0*	65	6.0	55	7.8*	86	100	83	80
Mean			**66.7**	**55.2**	**6.3**	**66.9**	**95.3**	**76.0**	**5.4**	**72.0**	**6.8**	**84.0**	**94.0**	**89.0**	**87.0**
LSD 0.05			17.5	17.5	2.1	19.4	7.2	8.0	2.1	12.0	1.4	22.0	12.0	5.0	10.0
CV %			18.5	22.2	23.2	20.3	5.3	7.4	26.9	11.4	14.9	18.8	9.3	12.1	8.1

* Not significantly different from the highest numerical value in the column
† Percent Target Species - Visual rating of 1 to 100, with 100 indicating 100 percent stand of the intended species.
†† Graz pref = Grazing Preference Score, with 0= not grazed, and 10 = all plants grazed
‡ Fest - Festulolium, TF type = Tall Fescue type, Not TF Type = Not a Tall Fescue type, Bent = Bentgrass, K. Bluegrass = Kentucky Bluegrass, P ryegrass = Perennial ryegrass

Marketers	Phone	Web Addresses
AgResearch Ltd	828-645-3872	www.agresearchusa.com
Alforex Seeds	877-560-5181	www.alforexseeds.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 Zeeland)	+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
Forage First	517-749-7364	www.foragefirst.com
Hyland Seed	800-265-7403	www.hylandseeds.com
Lacrosse Forage and Turf	800-647-8873	www.lacrosseseed.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