

2015 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 2015, and a one-ton increase of average quality alfalfa hay yield was worth up to \$150 to 200/acre.

2015 Conditions.

Winter temperatures were cold again in 2015 and remained cool with dry conditions through April. Planting of many crops in the spring was a little behind and

many new seedlings were slow growing. First cutting hay began in a timely manner in late May and in some cases was ahead of schedule. Rain in early June brought the hay harvest in some locations to a sudden halt. Rainfall in the state ranged from below normal in the northern locations to above normal in some southern parts of the state. Localized flooding from heavy rain during June reinforced the importance of adequate drainage in both alfalfa and grass fields. At Lake City, first cutting date was ahead of schedule. Rain at Lake City was slightly below average in June and July and the distribution was uneven. Precipitation at Chatham from June through September was more than 4.5 inches below the 30-year average. 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 three or four times at East Lansing and three times at Lake City and Chatham. The established grass variety trials at East Lansing were cut three times in 2015. First cutting in all of the variety trials at East Lansing



was complete by June 4. Grass trials at northern locations yielded well at first cutting, but showed slow or no regrowth until late in the summer. Grass trials at Lake City were cut 2 or 3 times, depending on species. First cutting at Chatham was at the end of June with little regrowth the rest of the summer and grass was not cut again. Average yield with 4 cuttings of the conventional alfalfa varieties planted in 2012 and 2013 was 6.5 tons per acre and the highest was 7.4 tons per acre. Roundup Ready alfalfa varieties planted in 2013 and harvested 4 times in 2015 averaged 6.1 and ranged from 5.8 to 6.3 tons per acre.

Table 1. Actual and 30-year-average precipitation from April to October 2009 to 2015 at four variety test sites across Michigan.

	2009	2010	2011	2012	2013	2014	2015	Avg	2009	2010	2011	2012	2013	2014	2015	Avg
	East Lansing								Chatham							
Apr	6.50	2.37	5.21	1.53	7.78	1.07	1.10	2.87	3.02	0.95	3.35	1.05	3.30	3.32	2.03	2.15
May	4.29	5.10	6.81	3.40	4.35	3.66	4.83	3.18	3.58	1.61	3.10	2.43	2.20	3.36	5.60	3.05
June	4.97	4.70	1.85	1.50	5.23	5.60	7.23	3.67	1.91	6.82	4.03	4.34	2.77	3.85	2.67	3.02
July	2.39	2.15	4.76	1.80	2.49	2.97	2.89	3.13	3.66	5.73	1.41	4.47	4.78	4.27	2.15	3.41
Aug	6.63	0.71	3.50	2.70	5.74	5.33	6.15	3.69	3.88	1.96	0.73	2.12	2.68	3.18	1.86	3.17
Sept	0.74	3.79	2.09	2.52	0.89	4.49	4.34	3.61	3.06	8.62	5.26	5.13	2.71	3.53	2.41	4.21
Oct	3.64	1.35	3.08	4.69	5.24	2.41	1.92	2.75	6.50	2.18	2.75	5.55	3.06	6.98	4.25	4.47
Total	29.16	20.17	27.30	18.14	31.72	25.53	28.46	22.90	25.61	27.87	20.63	25.09	21.50	28.49	20.97	23.48
	Lake City								Ithaca							
Apr	2.65	3.09	7.09	2.20	5.09	6.58	2.58	2.95	--	2.63	5.03	2.03	8.62	3.45	2.68	3.09
May	2.71	2.35	2.44	5.30	3.02	3.29	4.57	3.22	--	4.28	4.28	1.69	4.58	3.16	2.38	3.49
June	2.64	4.69	4.11	3.03	1.87	2.94	2.91	3.39	--	3.16	2.47	2.49	2.59	4.32	3.08	3.46
July	1.26	5.18	2.15	7.32	2.03	3.17	2.25	2.81	--	1.38	4.19	5.53	1.22	5.17	2.23	2.76
Aug	4.30	2.77	3.61	1.97	4.15	1.69	4.10	3.72	--	0.94	4.55	6.21	3.60	4.03	3.69	3.45
Sept	2.65	2.97	2.61	3.45	1.66	4.07	4.14	3.63	--	3.00	1.52	1.04	1.30	2.61	3.25	3.43
Oct	4.84	1.36	3.85	4.35	3.09	4.29	2.78	3.30	--	2.00	2.68	4.42	2.53	2.15	1.98	2.90
Total	21.05	22.41	25.86	27.62	20.91	26.03	23.33	23.02		16.68	24.72	23.41	24.44	24.89	19.29	22.58

Three-cut yields of the 2014 Conventional and Roundup Ready varieties at East Lansing averaged, respectively, 5.5 and 4.6 tons per acre in 2015. Average alfalfa yield of conventional varieties was 3.5 tons per acre with 3 cuttings at both Lake City and Chatham. Roundup Ready alfalfa average yields were 3.1 at Lake City and 3.7 tons per acre at Chatham in 2015. Grass variety trials were cut from 1 to 3 times in 2015, depending on species and location. Average grass yield in tons per acre with 3 cuttings of orchardgrass was 5.0, tall fescue was 4.3, perennial ryegrass was 2.8, brome grass was 4.0, and timothy was 4.5 at East Lansing in 2015. First-cut and total yield in 2015 at Chatham, respectively, was 1.3 for orchardgrass, 1.9 for tall fescue and 3.2 tons per acre for timothy. Average total yield (DM tons/acre) was 3.3 with two cuttings of orchardgrass, 4.2 with 2 cuttings of tall fescue, and 4.0 with 3 cuttings of timothy at Lake City in 2015. New trials of conventional and Roundup Ready alfalfa varieties and perennial grass varieties were established at East Lansing, Lake City, and Chatham in 2015, but seeding-year data for 2015 are not reported here.

ALFALFA VARIETY TEST

Michigan State University has evaluated more than 100 commercially available alfalfa varieties in its alfalfa variety trials since 2008. 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 2015 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 65 alfalfa varieties seeded at East Lansing (2007-2014) and as single-year yield for the 2014 seeding (**Table 4**). Yields of 41 varieties seeded at Lake City from 2007-2014 are provided in **Table 5**. Three-year average yields are reported from trials established in 2008, 2009, 2012, and two-year yields of varieties seeded in 2013 seeding at Chatham are in **Table 6**. Ten Roundup Ready alfalfa varieties were seeded at East Lansing in 2013 and 5 were seeded in 2014. Four varieties were seeded in 2013 and three in 2014 at Lake City. Three Roundup ready varieties were seeded in trials at Chatham in 2013. Roundup ready alfalfa variety trials were established at all 3 locations in 2015. Yields for Roundup Ready Alfalfa Varieties seeded at the 3 locations in 2013 and 2014 are listed in

Table 7. 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 8**. 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 and total yields for the conventional alfalfa trials East Lansing, Lake City, and Chatham for 2015 are in **Tables 15 to 22**. Yields for Varieties in the Roundup ready trials at the 3 locations are in **Tables 23 to 27**.

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 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 established plants are resistant, but 70 to 85% are susceptible. Therefore, a variety classified as resistant may still suffer damage from a disease, especially in the seedling stage. Moderate resistance is generally considered adequate for good alfalfa production. 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.

Anthraxnose (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 9**.

PERENNIAL COOL-SEASON GRASS TEST

Perennial cool-season grasses have been evaluated for yield and persistence. Commercially available and experimental entries of Orchardgrass, Tall Fescue, Meadow Fescue, Timothy, Perennial Ryegrass, Kentucky Bluegrass, and Festulolium have been seeded in trials at 3 locations since 2013. More than 50 varieties have been evaluated at East Lansing since 2011. Twelve varieties were planted in 2014 and more than 20 were planted in 2015 at both Lake City and Chatham. Each test was seeded as a randomized complete block design using four replications. Plots are at least 4 ft wide and the center 3 ft cut for yield determination. Nitrogen fertilizer was applied at green-up in early April and after each cutting. Dry matter yields, multi-year averages and first-year totals for trials seeded from 2006 to 2014 at East Lansing are presented in **Table 10**. Three-year average yields of a trial seeded in 2006 at Lake City and first-year yields of the grass varieties seeded at both Lake City and Chatham in 2014 are in **Table 11**.

A brief description of grass species with a summary of management recommendations is 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.

Brome grasses (*Bromus spp.*) are rhizomatous, sod-forming grasses that are high in forage quality and yield. **Smooth brome grass** is one of the most winter-hardy grasses in Michigan and can be grown on a wide range of soil types. Smooth brome grass 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

Annual grass trials were established in 2014 and 2015 at East Lansing. These trials were planted in plots 4 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 these trials and both were fertilized with N prior to first cutting and after cuts 1 and 2 in the seeding year. Varieties of Annual (Westerwold) and Italian ryegrass, 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 in the 2014 seeding. Yields for the annual grass trial planted in 2015 and the winter survival and residual

yield from one cutting in the 2014 seeding are reported in **Tables 12a and 12b.**

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 13** 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.

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 14**). Tests were conducted using the same methods as the alfalfa tests, but for a shorter time period.

STATISTICS

For completed 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	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
430 RR LH	4	2	RR	HR	HR	HR	HR	HR	HR	-	-	Farm Science
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
AlfaFour Supreme	4	2	-	HR	HR	HR	HR	HR	HR	R	R	CHS Seed
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
FF42.A2	4	1.9	-	HR	HR	HR	HR	HR	HR	HR	HR	Lacrosse
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 415 BR	4	2	-	HR	HR	HR	HR	HR	HR	R	-	Farm Science
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

Table 3. (Continued)

Variety	FD †	WSI ††	RR ‡	BW	PRR	AN	VW	FW	APH 1	APH 2	SN	Marketer
FSG 426	4	2	-	HR	HR	HR	HR	HR	HR	HR	-	Farm Science
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
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
Magnum 7 WET	4	1.6	-	HR	HR	HR	HR	HR	HR	R	HR	Dairyland Seeds
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 2014

Variety	Marketer	3-year average					2-yr 2013	1-yr 2014	(Number) †	% Vernal ††
		2007	2008	2009	2010	2011				
----- 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	-	-	-	-	-	6.33	-	(1)112	
AlfaFour Supreme	CHS Seed	-	-	-	-	6.79	-	-	(1)120	
AmeriStand 403T	America's Alfalfa	-	-	6.08	-	-	-	-	(1)125	
Ameristand 407TQ	America's Alfalfa	-	-	6.98	-	6.28	-	-	(2)127	
Caliber	Beck's Hybrids	-	-	-	-	-	-	5.65	-	
Chesapeake	Dahlco/AgReliant	-	-	6.79	-	-	-	-	(1)140	
Contender	Beck's Hybrids	-	-	-	-	-	6.21	-	(1)107	
DG 4210	Crop Production	-	-	-	6.56	6.23	-	6.29	(3)113	
DKA43-13	Monsanto	-	6.81	-	6.31	-	-	-	(2)121	
Everlast II	Legacy Seeds	-	-	6.06	-	-	-	-	(1)125	
Enduro Elite	Cisco Seeds	-	-	-	-	-	-	5.41	-	
Fierce	Beck's Hybrids	-	-	-	-	-	-	5.52	-	
ForageGold	Renk Seed	-	-	6.39	-	-	5.79	-	(2)116	
FSG 403LR	Forage First	-	-	-	-	-	6.51	-	(1)115	
FSG 424	Forage First	-	-	-	-	-	6.45	-	(1)114	
GA 409	Preferred Alfalfa Gen	-	-	-	-	-	-	5.24	-	
Genoa	NEXGROW	-	6.92	-	-	-	-	-	(1)129	
Gunner	Croplan Genetics	-	-	-	-	5.83	-	-	(1)103	
HybriForce 2400	Dairyland Seed	-	7.55	6.68	6.27	-	-	-	(3)131	
HybriForce 3400	Dairyland Seed	-	-	-	-	6.50	7.00	6.83	(2)117	
HybriForce 3400 QR	Dairyland Seed	-	-	-	-	-	6.63	-	(1)115	
HybriPro BR	Hyland Seeds	-	-	-	-	-	-	5.48	-	
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	-	(1)111	
LegenDairy 5.0	Croplan Genetics	-	-	6.64	-	6.12	-	-	(2)122	
LegenDairy XHD	Croplan Genetics	-	-	-	-	-	6.39	-	(1)113	
Magnitude	Allied Seed	-	-	-	-	-	6.49	-	(1)112	
Mariner IV	Allied Seed	-	-	-	-	-	6.31	-	(1)109	
Oneida VR	public	-	-	5.42	-	5.56	-	5.88	5.37	(3)105
PGI 459	Alforex	-	6.45	-	-	-	-	-	(1)121	
PGI 529	Alforex	-	-	-	-	-	6.88	-	(1)121	
PGI 557	Alforex	-	-	-	-	6.11	-	-	(1)108	
Pioneer 53H92	Pioneer	-	-	6.13	-	-	-	-	(1)126	
Pioneer 54Q14	Pioneer	-	-	-	-	-	-	5.55	-	
Pioneer 54Q32	Pioneer	-	-	6.50	-	6.03	-	-	(2)120	
Pioneer 54QR04	Pioneer	-	-	-	-	-	6.30	-	(1)111	
Pioneer 55Q27	Pioneer	-	-	-	-	-	6.63	5.62	(1)117	
Pioneer 55V12	Pioneer	-	-	6.78	-	6.23	6.08	-	(3)118	
Pioneer 55V48	Pioneer	6.42	7.07	7.28	-	-	-	-	(3)142	
Pioneer 55V50	Pioneer	-	-	-	-	6.85	6.95	7.04	(2)122	
Prolific II	Hyland Seeds	-	-	-	-	6.54	-	5.77	(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	6.31	-	(2)111	
Sonic	Nutech Seed	-	-	-	-	6.21	-	-	(1)110	
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	5.80	5.67	5.05	(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	-	-	-	5.59	5.79	-	-	(2)102	
Mean		5.93	6.71	6.38	6.13	6.19	6.00	6.40	5.48	116

† 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 5. Long-term yield averages (dry matter tons/acre) from MSU Alfalfa Variety Trials seeded in Lake City, Michigan from 2007 to 2014.

Variety	Marketer	3-yr. avg.						2-yr	1-yr	(Number) †
		2007	2008	2009	2010	2011	2012	2013	2014	% 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	-	-	-	-	3.51	(1)104
AmeriStand 407TQ	America's Alfalfa	-	-	3.81	-	4.65	-	-	-	(2)107
Ascend	Hyland Seed	3.21	-	-	-	-	-	-	-	(1)108
Chesapeake	Dahlco/AgReliant	-	-	3.81	-	-	-	-	-	(1)113
Cimarron VL410	Spink/Cimarron	3.12	-	-	-	-	-	-	-	(1)105
DG 3210	Crop Production	-	-	-	4.62	-	-	-	-	(1)107
DG 4210	Crop Production	-	-	-	4.87	4.63	-	2.90	3.45	(3)104
DKA43-13	Monsanto	-	-	3.73	-	-	-	-	-	(1)111
ForageGold	Renk Seed	-	-	-	-	-	3.89	-	-	(1) 95
FSG 329	Forage First	-	-	4.09	-	-	-	-	-	(1)122
HybriForce 2400	Dairyland Seed	-	-	-	4.87	-	-	-	-	(1)113
HybriForce 3400	Dairyland Seed	-	-	-	-	-	4.31	-	3.93	(1)106
L455HD	Legacy Seeds	-	-	-	-	-	-	3.14	3.92	(1)106
LegenDairy 5.0	Croplan Genetics	-	-	4.11	-	-	-	-	-	(1)122
Magnum 7 WET	Dairyland Seed	-	-	-	-	-	-	-	3.96	-
Mariner IV	Allied Seed	-	-	-	-	-	-	-	3.95	-
Oneida VR	Public	-	-	-	-	-	-	3.00	3.99	(1)101
Pioneer 53Q32	Pioneer	-	-	3.99	-	4.59	3.99	-	-	(3)105
Pioneer 54Q14	Pioneer	-	-	-	-	-	-	-	3.35	-
Pioneer 54QR04	Pioneer	-	-	-	-	-	-	2.90	-	(1)98
Pioneer 55H94	Pioneer	-	-	-	-	4.39	-	-	-	(1)95
Pioneer 55Q27	Pioneer	-	-	-	-	-	-	2.97	3.81	(1)100
Pioneer 55V12	Pioneer	-	-	3.52	-	4.36	3.98	-	-	(1)99
Pioneer 55V48	Pioneer	2.98	2.84	3.52	-	-	-	-	-	(3)108
Pioneer 55V50	Pioneer	-	-	-	-	4.80	4.09	3.15	4.09	(3)104
Prolific II	Hyland Seed	-	-	-	-	-	-	-	4.09	-
SolarGold	Renk Seed	-	-	-	-	-	3.90	-	-	(1)96
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	4.08	2.96	3.91	(7)100
WL 354HQ	W-L Research	-	-	-	-	-	-	-	3.53	-
5312	check	2.96	-	-	4.69	4.72	-	-	-	(3)104
DK140	check	3.20	-	3.46	-	-	-	-	-	(2)105
PLH-resistant	check	-	2.56	3.68	4.52	4.16	-	-	-	(4)103
Mean		3.09	2.79	3.76	4.81	4.54	4.03	3.00	3.81	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 6. Long-term yield averages (dry matter tons/acre) from MSU Alfalfa Variety Trials seeded in Chatham, Michigan in 2008, 2009, 2012 and 2013.

Variety	Marketer	3-yr average			2-yr avg	(Number) †
		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	-	-	-	3.95	(1)105
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	-	-	3.13	-	(1) 98
Mariner IV	Allied Seed	-	-	3.13	-	(1) 98
Pioneer 53H92	Pioneer	-	2.88	-	-	(1) 99
Pioneer 54Q32	Pioneer	-	3.28	-	-	(1)113
Pioneer 55V12	Pioneer	-	3.25	3.31	-	(2)108
Pioneer 55V48	Pioneer	3.42	2.96	-	-	(2)100
Pioneer 55V50	Pioneer	-	-	3.56	3.79	(2)106
SolarGold	Renk Seed	-	-	3.61	-	(1)113
Velocity	Nutech Seed	3.55	3.05	-	-	(2)103
Vernal	Public	3.50	2.90	3.19	3.76	(2)100
WL343HQ	W-L Research	3.55	-	-	-	(1)101
5312	check	-	3.27	-	3.70	(2)106
DK140	check	3.40	3.01	-	-	(2)100
Mean		3.52	3.08	3.32	3.80	103
† 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. Yields of Roundup Ready Alfalfa Varieties (dry matter tons/acre) seeded in 2013 and 2014 in East Lansing, Lake City, and Chatham, Michigan.

Variety	Marketer	East Lansing		Lake City		Chatham
		2013 † 2-year average	2014 †† 1-year total	2013 † 2-year average	2014 † 1-year total	2013 † 2-year average
----- dry matter tons/acre -----						
428RR	Allied Seed	6.33	-	-	-	-
6497R	NEXGROW	6.35	-	-	-	-
AmeriStand 455TQ RR	America's Alfalfa	6.19	-	-	-	-
RR Stratica	Croplan Genetics	6.31	-	-	-	-
WL 356HQ.RR	W-L Research	6.38	-	-	-	-
WL 372HQ.RR	W-L Research	6.22	-	-	-	-
Pioneer 54QR04	Pioneer	6.33	-	3.25	-	-
DKA41-18RR	Monsanto	6.08	-	3.23	-	3.93
DKA44-16RR	Monsanto	6.41	4.57	3.20	3.23	3.83
Yieldmaster RR	Monsanto	6.07	-	3.11	-	3.93
DKA40-51RR	Monsanto	-	4.45	-	3.00	-
Pioneer VR06	Pioneer	-	4.68	-	-	-
RR 501	Monsanto	-	4.62	-	-	-
DKA43-22RR	Monsanto	-	4.59	-	3.32	-
Mean		6.27	4.58	3.20	3.18	3.90
† Seedings cut 4 times per year at East Lansing, three times per year at Lake City and Chatham.						
†† 2014 Seeding at East Lansing cut 3 times in 2015						

Table 8. 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	Capac †††	(Number) †
		3-yr. avg. 2008 seeding	2-yr. avg. 2011 Seeding	% 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	-	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	-	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 1	check	6.39	-	(1)103
PLH-resistant 2	check	-	4.75	(1)91
Mean		7.33	5.46	

† 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 9. 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.

Variety	Marketer	3-yr. avg.					(Number) †
		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
‡ Currently Marketed Check variety - Not a PLH resistant variety



Alfalfa variety Trials, East Lansing, Michigan

Table 10. Long-term average yields (dry matter tons/acre) of perennial forage grasses seeded from 2006 to 2013, and 1-yr total from 2014 at East Lansing.

Sp †	Variety	Marketer	Three-year average				2-yr	1-yr	% species mean ‡
			2006	2007	2009	2011	2013	2014	
----- dry matter tons/acre -----									
FEST	SpringGreen(organic)	Rose Agri-Seed Inc.	-	2.68	-	-	-	-	(1)107
FEST	Becva	DLF International Seed	-	-	-	-	-	2.60	-
FEST	Barfest	Barenbrug Seed	-	-	-	-	-	2.41	-
FEST	Gain	Allied Seed	-	2.34	-	-	-	-	(1)93
FEST	SPECIES MEAN		-	2.51	-	-	-	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	4.13	-	-	-	-	-	(1)97
OR	Barlegro	Barenbrug Seed	-	-	-	-	-	5.31	-
OR	Bounty	Standish Milling	4.22	-	-	-	-	-	(1)99
OR	Echelon	DLF International Seed	-	-	-	3.79	-	5.27	(1)98
OR	Elsie	Rose Agri-Seed Inc.	-	3.75	-	-	-	-	(1)94
OR	Extend	Standish Milling	4.46	-	-	-	-	-	(1)105
OR	Harvestar	Columbia Seeds	4.22	-	-	-	-	-	(1)99
OR	Inavale	DLF International Seed	-	-	-	3.79	-	-	(1)98
OR	Intensiv	Barenbrug Seed	-	-	-	3.79	-	5.43	(1)98
OR	Megabite	Rose Agri-Seed Inc.	-	4.09	-	-	-	-	(1)103
OR	Persist	Smith Seed	-	-	3.58	4.12	-	4.43	(2)104
OR	Potomac	check	-	4.15	3.49	3.83	-	4.72	(3)101
OR	Warrior II	ProSeeds Marketing	-	3.95	-	-	-	-	(1)99
OR	SPECIES MEAN		4.26	3.99	3.54	3.86	-	5.03	
PR	Albion (4n) ††	Cisco Seed	-	-	-	-	-	-	-
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	-	-	-	-	2.59	-	(1)123
PR	Eurostar (2n)	Seed Research of OR	2.83	-	-	-	-	-	(1)99
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	1.61	2.76	(3)90
PR	Mathilda (4n)	DLF International Seed	-	-	-	2.50	-	-	(1)99
PR	Mara (2n)	Barenbrug Seed	-	-	-	-	-	3.01	-
PR	Maximo	DLF International Seed	-	-	-	-	-	3.07	-
PR	Quartermaster (4n)	Lewis Seed	3.05	-	-	-	-	-	(1)107
PR	Payday (4n)	Smith Seed	-	-	-	-	-	3.59	-
PR	Remington (4n)	Barenbrug Seed	-	2.78	-	2.81	-	3.10	(2)118
PR	Verano (4n)	Columbia Seeds	2.59	-	-	-	-	-	(1)91
PR	SPECIES MEAN		2.85	2.21	1.88	2.53	2.10	3.11	

Table 10. continued

Sp †	Variety	Marketer	Three-year average				2-yr avg	1-yr total	% species mean ‡‡
			2006	2007	2009	2011			
RC	Chiefton	check	3.61	-	-	-	-	-	(1)96
RC	Marathon	Standish Milling	3.89	-	-	-	-	-	(1)104
RC	SPECIES MEAN		3.75	-	-	-	-	-	
SB	Lincoln	Check variety	-	-	-	-	-	4.41	-
SB	Hakari (Alaska Brome)	Barenbrug Seed	-	-	-	-	-	3.55	-
SB	MBA	DLF International Seed	-	-	-	-	-	3.84	-
SB	SPECIES MEAN		-	-	-	-	-	3.93	
TF	BarElite	Barenbrug Seed	-	4.15	-	-	-	4.59	(1)91
TF	Bariane	Barenbrug Seed	-	-	-	-	-	4.43	-
TF	Brava	Allied Seed	-	-	-	-	-	4.92	-
TF	Cajun II	Smith Seed	-	-	-	-	-	4.48	-
TF	Cowgirl	Rose Agri-Seed Inc.	-	4.84	-	-	-	-	(1)107
TF	Enhance	Standish Milling	4.31	-	-	-	-	-	(1)105
TF	Fawn	Seed Research of OR	4.10	-	-	-	-	-	(1)100
TF	Flourish	Allied Seed	-	-	-	-	3.75	-	(1)98
TF	Goliath	Cisco Seed	-	-	4.06	-	-	-	(1)101
TF	Hymark	Fraser Seeds	-	-	-	4.42	-	-	(1)99
TF	Ky31 E plus	check	-	-	3.96	4.75	-	-	(2)102
TF	Ky 31 E minus	check	-	-	-	-	3.90	5.01	(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	-	-	-	-	-	5.32	-
TF	Verdant	Amer. Grass Seed Prod	3.87	-	-	-	-	-	(1)94
TF	SPECIES MEAN		4.09	4.54	4.01	4.48	3.83	4.69	
MF	Cosmonaut	Barenbrug Seed	-	-	-	-	-	4.04	-
MF	Pradel	Barenbrug Seed	-	-	3.15	-	-	4.23	(1)106
MF	Preval	Ampac Seed Company	-	-	2.78	-	-	-	(1)94
MF	SPECIES MEAN		-	-	2.97	-	-	4.14	-
Tim	BarPenta	Barenbrug Seed	-	3.94	-	-	-	-	(1)101
Tim	Climax	check	4.03	3.84	-	-	-	3.81	(2)93
Tim	Crest	Allied Seed	4.94	-	-	-	-	-	(1)107
Tim	Summit	Allied Seed	4.87	-	-	-	-	-	(1)106
Tim	Winnetow	DLF International Seed	-	-	-	-	-	-	-
Tim	Zenyatta	DLF International Seed	-	-	-	-	-	-	-
Tim	SPECIES MEAN		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

‡‡ Number of trials with at least 2 years data and % of the mean (released varieties)

Table 11. Forage yield (dry matter tons/acre) of perennial forage grasses seeded at Lake City in Northern Lower Michigan and at Chatham in the Upper Peninsula.

Sp †	Variety	Marketer	Lake City		Chatham
			3-year average	1-year total	1- year total
			2006	2014 †††	2014 †††
----- Dry matter tons/acre -----					
OR	Ambrosia	Amer. Grass Seed Prod	3.36	-	-
OR	Bounty	Standish Milling	3.61	-	-
OR	Echelon	DLF International Seed	-	3.20	1.22
OR	Extend	Standish Milling	3.37	-	-
OR	Harvestar	Columbia Seeds	3.18	-	-
OR	Intensiv	Barenbrug Seed	-	3.78	1.50
OR	Persist	Smith Seed	-	3.15	1.04
OR	Potomac	check	-	3.24	1.29
OR	SPECIES MEAN		3.38	3.34	1.26
PR	Albion (4n) ††	Cisco Seeds	-	-	-
PR	Eurostar (2n)	Seed Research of OR	2.05	-	-
PR	Mara (2n) ††	Barenbrug Seed	-	-	-
PR	Payday (4n) ††	Smith Seed	-	-	-
PR	Verano (4n)	Columbia Seeds	2.01	-	-
PR	SPECIES MEAN		2.03		
RC	Chiefton	check variety	2.25	-	-
RC	Marathon	Standish Milling	2.76	-	-
RC	SPECIES MEAN		2.51	-	-
TF	Bariane	Barenbrug Seed	-	3.83	1.66
TF	Enhance	Standish Milling	2.44	-	-
TF	KY31E+	check variety	-	4.32	2.02
TF	KY31E-	check variety	-	4.43	1.94
TF	Tuscany II	Forage First	-	4.38	2.05
TF	Verdant	Amer. Grass Seed Prod	2.44	-	-
TF	SPECIES MEAN		2.44	4.24	1.92
Tim	BarPenta	Barenbrug Seed	-	3.63	3.07
Tim	Climax	check variety	2.14	3.37	3.15
Tim	Crest	Allied Seed	2.44	4.59	3.13
Tim	Summit	Allied Seed	2.55	4.40	3.28
Tim	Winnetow ††	DLF International Seed	-	-	-
Tim	Zenyatta ††	DLF International Seed	-	-	-
Tim	SPECIES MEAN		2.38	4.00	3.16
KB	Ginger ††	check	-	-	-
SB	Lincoln ††	check variety	-	-	-
MF	Pradel ††	Barenbrug Seed	-	-	-

† KB=Kentucky bluegrass, SB=Smooth Bromegrass, OR=Orchardgrass, PR=Perennial ryegrass, RC=Reed canarygrass, TF= Tall fescue, MF= Meadow fescue, Tim=Timothy
 †† Varieties seeded in the 2015 grass variety trials at either Lake City or Chatham.
 ††† 2014 - 3 Cuttings of Timothy and 2 cuttings each of Tall Fescue and Orchardgrass at Lake City.
 1 cutting in late June for all 3 at Chatham

Table 12. MSU Annual Grass variety Trials seeded in East Lansing in 2014 and 2015.

Table 12a. Yield (DM tons per acre) of MSU Annual Grass variety Trial Seeded in May 2015.

Entry	Type/Species	Cut 1	Cut 1	Cut 2	Cut 3	2015 Total
		Maturity	July 24	Aug 24	Oct 23	
Dessie	Teffgrass	Headed	2.22	0.97	0.43	3.62
McKinley	Diploid Westerwold	Headed	1.97	0.60	0.38	2.95
Kodiak	Diploid Westerwold	Headed	1.92	0.71	0.21	2.84
DLFPS-LWT-14 ††	TetraPloid Westerwold	Headed	1.69	0.61	0.44	2.74
DLFPS-LMT-15 ††	Italian Ryegrass	Veg	1.38	0.64	0.40	2.42
Becva	Festulolium	Veg	1.43	0.60	0.31	2.34
Mean			1.77	0.69	0.36	2.82
LSD (0.05)			0.43	0.18	0.07	0.45
CV %			16.3	17.9	13.7	10.7

Table 12b. MSU Annual Grass variety trial seeded in July 2014 and evaluated for winter survival and residual yields from one cutting in the spring of 2015.

Entry	Type/Species	May 15, 2015		2014	
		% survival	Maturity	Cut 1	3-cut total
DLFPS-LMT 15 ††	Italian Ryegrass	70	Veg	0.42	3.15
Fox	Italian Ryegrass	70	Veg	0.36	2.97
Big Bang	Annual ryegrass	30	Veg	0.20	2.82
Fria	Annual ryegrass	30	Veg	0.16	2.70
CW 0604	Teffgrass	0	-	-	2.24
HiOctane	Triticale	60	Veg	0.91	2.15
Frankenmuth	Winter wheat	50	Veg	0.75	1.84
Wheeler	Winter Rye	70	Veg	1.06	1.70
Seten	Oats	0	-	-	1.37
Mean				0.55	2.32
LSD (0.05)				0.20	0.29
CV %				24.1	8.5

†† Experimental Variety



Winter Wheat and Rye Harvested for Silage Yield in 2013

Table 13. 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, 2014, and 2015.

Entry	Species ‡	Marketer	2015 Grazing and Persistence Data						2014 Grazing and Persistence Data					
			August 17			November 20			June 21			October 21		
			% Target sp ††	% Ground Cover	Graz pref †	% Target sp ††	% Ground Cover	Graz pref †	% Ground Cover	% Target sp ††	Graz pref †	% Target sp ††	% Ground Cover	
Ky31E-	Tall Fescue	Check	80.0*	87.5*	5.0	77.5*	92.5*	5.8*	87.5*	87.5*	3.3	88.8*	100*	
Savory	Tall Fescue	Check	76.3*	91.3*	4.3	76.3*	96.3*	3.8	81.3*	81.3*	2.5	91.3*	100*	
Harvestar	Orchardgrass	Columbia Seeds	42.5	60.0	5.0	45.0	77.5*	7.3*	37.5	20.0	6.8	66.3	97.5*	
Potomac	Orchardgrass	Check	76.3*	70.0	5.0	70.0	75.0	8.0*	45.0	51.3	7.0*	85.0*	100*	
BigBlue	K Bluegrass	Rose Agriseed	95.8*	68.8	8.0*	90.0*	90.0*	9.0*	78.8*	78.8	8.5*	93.8*	96.3*	
Ginger	K Bluegrass	Check	95.8*	92.5*	7.5*	90.0*	90.0*	9.5*	82.5*	82.5*	3.0	92.5*	98.8*	
Giant	RedTop Bentgrass	Rose Agriseed	13.5	81.3*	7.0*	67.5	90.0*	8.0*	73.8*	56.3	6.8	21.3	96.3*	
Narnia	Timothy	DLF Int'l	38.8	80.0	7.3*	27.5	92.5*	7.0*	76.3*	47.5	9.0*	35.0	95.0*	
Climax	Timothy	Check	32.5	70.0	7.8*	52.5	85.0*	9.0*	58.8	45.0	9.0*	60.0	92.5	
Calibra	P Ryegrass	Check	5.0	60.0	7.3*	8.8	82.5	8.3*	30.0	8.8	9.0*	25.0	72.5	
FullThrottle	P Ryegrass	Columbia Seeds	4.8	60.0	7.3*	11.3	82.5	8.0*	30.0	6.3	8.5*	17.5	82.5	
Fojtan	Fest (TF type)	DLF Int'l	91.3*	96.3*	3.3	81.3*	92.5*	5.8*	81.3*	81.3*	4.0	92.5*	100*	
Hykor	Fest (TF type)	DLF Int'l	88.8*	93.8*	2.5	80.0*	92.5*	4.5	81.3*	81.3*	4.3	96.3*	100*	
Gain	Fest (Not TF type)	Check	12.5	82.5	3.3	15.0	90.0*	5.3	38.8	4.0	8.8*	32.5	86.3	
Barmix1	Mixture	Barenbrug	96.3*	95.0*	3.3	95.0*	95.0*	5.3	80.0*	NA	3.5	NA	100*	
Barmix2	Mixture	Barenbrug	98.8*	95.0*	5.0	95.0*	95.0*	6.3*	76.3*	NA	7.5*	NA	100*	
Experimental Entries														
B8_0798	K Bluegrass	Blue Moon Seeds	99.0*	98.8*	8.3*	90.0*	90.0*	9.5*	80.0*	80.0*	7.8*	96.3*	98.8*	
AGRFA1521	Tall Fescue	AGRResearch LTD	82.5	95.0*	5.0	72.5*	92.5*	5.8*	87.5*	85.0*	2.5	88.8*	100*	
IS-Php1	Timothy	DLF Int'l	40.0	72.5	7.3*	40.0	90.0*	5.0	58.8	42.5	7.5*	55.0	95.0*	
Mean			61.6	81.6	5.7	62.4	89.0	6.9	66.7	55.2	6.3	66.9	95.3	
LSD 0.05			23.1	15.5	1.4	24.1	10.7	3.8	17.5	17.5	2.1	19.4	7.2	
CV %			26.4	13.4	17.6	27.2	8.5	38.8	18.5	22.2	23.2	20.3	5.3	

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

† Graz Pref = Grazing Preference Score, with 0= not grazed, and 10 = all plants grazed

†† Percent Target Sp - % Target species is a visual rating of 1 to 100, with 100 indicating indicating 100 percent stand of the intended species.

‡ 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.

Table 13. Continued

Entry	Species ‡	Marketer	2013 Grazing data				Hay production			
			June 13		October 23		Percent Ground Cover			
			% Ground Cover	Graz pref †	% Ground Cover	Graz pref †	Sept 2010	April 2011	June 2011	Dec 2012
Ky31E-	Tall Fescue	Check	83*	5.0	78*	5.0	90	100	100	83
Savory	Tall Fescue	Check	85*	5.3	89*	4.5	80	96	97	90
Harvestar	Orchardgrass	Columbia Seeds	73	4.0	80*	5.8	100	100	90	88
Potomac	Orchardgrass	Check	73	4.3	82*	5.5	100	100	90	93
BigBlue	K Bluegrass	Rose Agriseed	90*	6.5	85*	7.8*	56	86	73	100
Ginger	K Bluegrass	Check	90*	0.3	76	8.5*	60	90	87	95
Giant	RedTop Bentgrass	Rose Agriseed	73	5.5	80*	5.5	86	100	93	85
Narnia	Timothy	DLF Int'l	75	6.8*	70	7.5*	66	80	83	78
Climax	Timothy	Check	60	7.5*	59	8.0*	76	86	87	80
Calibra	P Ryegrass	Check	70	8.8*	50	8.5*	100	100	100	83
FullThrottle	P Ryegrass	Columbia Seeds	70	7.5*	58	7.5*	96	100	100	95
Fojtan	Fest (TF type)	DLF Int'l	85*	4.8	89*	4.3	96	96	80	93
Hykor	Fest (TF type)	DLF Int'l	80	4.3	68	7.0	100	100	97	85
Gain	Fest (Not TF type)	Check	40	7.5*	28	8.0*	96	96	90	55
Barmix1	Mixture	Barenbrug	78	2.8	75	7.5*	90	100	90	90
Barmix2	Mixture	Barenbrug	83*	6.5	75	7.5*	96	100	93	95
Experimental Entries										
B8_0798	K Bluegrass	Blue Moon Seeds	90*	7.3*	86*	8.8*	46	72	77	98
AGRFA1521	Tall Fescue	AGRResearch LTD	85*	2.8	83*	5.3	80	90	87	90
IS-Php1	Timothy	DLF Int'l	65	6.0	55	7.8*	86	100	83	80
Mean			76.0	5.4	72.0	6.8	84.0	94.0	89.0	87.0
LSD 0.05			8.0	2.1	12.0	1.4	22.0	12.0	5.0	10.0
CV %			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

† 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.

Table 14. 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 3-yr avg.	2004 4-yr avg.	2009 4-yr avg.	2010 3-yr avg.	
----- 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 15. 2015 Yield summary (DM tons/acre) of MSU Conventional Alfalfa Variety Trial seeded in East Lansing, Michigan in August 2012

Entry	2015					2014	2013	Grand
	May 20	July 6	Aug 17	Oct 2	Total	Total	Total	Total
HybriForce-3400 ††	1.87	2.11	1.87	1.31	7.15*	7.46*	6.39*	21.00*
Pioneer 55V50	2.01	2.23	1.94	1.22	7.41*	7.49*	5.94	20.84*
DSC03-BR †	1.81	2.13	1.85	1.29	7.08*	7.14*	5.86	20.08*
DSC08-5 †	1.74	1.93	1.75	1.25	6.67	7.18*	6.16*	20.01*
HybriForce-3400QR ††	1.74	1.89	1.69	1.14	6.47	7.01	6.42*	19.90
Magnitude	1.77	1.99	1.81	1.15	6.72	7.07*	5.68	19.47
Mariner IV	1.70	1.94	1.75	1.13	6.52	6.77	5.65	18.94
SolarGold	1.65	1.93	1.74	1.12	6.43	6.88	5.62	18.93
Contender	1.67	2.01	1.74	1.12	6.54	6.74	5.35	18.63
Pioneer 55V12	1.69	1.84	1.64	1.11	6.27	6.55	5.41	18.23
Vernal	1.48	1.67	1.55	1.01	5.72	6.18	5.50	17.40
ForageGold	1.47	1.64	1.53	0.97	5.61	6.10	5.67	17.38
Mean	1.72	1.94	1.74	1.15	6.55	6.88	5.81	19.23
LSD 0.05	0.13	0.15	0.14	0.13	0.46	0.46	0.32	1.01
CV %	5.1	5.4	5.4	7.6	4.9	4.7	3.9	3.7
† Experimental Variety								
†† Released variety seeded as an experimental.								
* Yield is not statistically different from the greatest value in the column								

Table 16. 2015 Yield summary (DM tons/acre) of MSU Conventional Alfalfa Variety Trial seeded in East Lansing, Michigan in August 2013

Entry	2015					2014	Trial
	May 21	July 15	Aug 14	Oct 2	Total	Total	Total
Pioneer 55V50	1.98	2.27	1.62	1.33	7.20*	6.88*	14.08*
PGI 529 ††	2.00	2.35	1.62	1.36	7.33*	6.43	13.76*
HybriForce-3400	1.78	2.20	1.63	1.27	6.88	6.78*	13.66*
DSD03-T †	1.84	2.18	1.59	1.18	6.80	6.70*	13.50*
Pioneer 55Q27	1.89	2.18	1.50	1.18	6.74	6.51*	13.25
DSD07-M †	1.75	2.18	1.61	1.28	6.82	6.20	13.02
FSG 403LR	1.76	2.13	1.46	1.20	6.55	6.46*	13.01
LS905 †	1.82	2.14	1.53	1.14	6.64	6.29	12.93
FSG 424	1.87	2.17	1.50	1.18	6.72	6.17	12.89
LegenDairy XHD	1.81	2.10	1.50	1.16	6.57	6.20	12.77
LS804 †	1.69	2.12	1.51	1.09	6.41	6.28	12.69
6585Q	1.81	2.06	1.57	1.16	6.59	6.06	12.65
Pioneer 54QR04	1.74	2.01	1.57	1.12	6.44	6.16	12.60
L 455 HD	1.68	2.07	1.46	1.09	6.30	6.30	12.60
DG4210	1.86	2.03	1.59	1.16	6.64	5.93	12.57
LS803 †	1.60	1.98	1.48	1.14	6.20	6.19	12.39
Oneida VR	1.40	1.77	1.22	1.05	5.44	6.32	11.76
Vernal	1.38	1.82	1.22	0.99	5.42	5.92	11.34
Mean	1.76	2.10	1.51	1.17	6.54	6.32	12.86
LSD 0.05	0.13	0.17	0.13	0.11	0.36	0.43	0.63
CV %	5.4	5.9	5.8	6.5	3.9	4.8	3.4

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

Table 17. 2015 Yield summary (DM tons/acre) of MSU Conventional Alfalfa Variety Trial seeded in East Lansing, Michigan in May 2014

Entry	2015				2014	Trial
	May 28	July 28	Sept 21	Total	Seeding yr	Total
AFXH 134089 †	2.31	2.22	1.26	5.79*	0.84*	6.63
Prolific II	2.38	2.03	1.36	5.77*	0.86*	6.63
Contender	2.32	2.04	1.25	5.62*	0.73	6.35
Caliber	2.27	2.12	1.25	5.65*	0.65	6.30
HybriPro BR	2.36	1.91	1.21	5.48*	0.82*	6.30
Pioneer 55Q27	2.28	2.14	1.19	5.62*	0.63	6.25
Fierce	2.15	2.17	1.2	5.52*	0.66	6.18
Pioneer 54Q14	2.24	2.11	1.2	5.55*	0.61	6.16
Enduro Elite	2.2	2.09	1.12	5.41*	0.62	6.03
Oneida VR	2.23	1.87	1.27	5.37*	0.63	6.00
AFX 095023 †	2.16	2.04	1.16	5.35*	0.57	5.92
GA-409	2.15	1.96	1.13	5.24	0.66	5.90
Vernal	2.14	1.74	1.17	5.05	0.74	5.79
Mean	2.24	2.01	1.21	5.46	0.69	6.19
LSD 0.05	0.2	0.23	0.14	0.44	0.10	
CV %	5.2	6.9	6.9	4.8	10.3	

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

Table 18. 2015 Yield summary (DM tons/acre) of MSU Conventional Alfalfa Variety Trial seeded in Lake City, Michigan in August 2012

Entry	2015				2014 Total	2013 Total	Grand Total
	June 9	July 30	Sept 23	Total			
HybriForce-3400 ††	1.93	1.34	0.60	3.86*	4.54*	4.53*	12.93*
Pioneer 55V50	1.99	1.25	0.56	3.80*	4.52*	3.95	12.27*
Vernal	1.90	1.26	0.57	3.73*	4.51*	4.00	12.24
Pioneer 54Q32	1.95	1.25	0.54	3.73*	4.40*	3.84	11.97
Pioneer 55V12	2.06	1.32	0.57	3.95*	4.14	3.85	11.94
Solargold	1.66	1.16	0.51	3.34	4.26*	4.10	11.70
ForageGold	1.75	1.18	0.50	3.42*	4.18	4.06	11.66
Mean	1.89	1.25	0.55	3.69	4.36	4.05	12.1
LSD 0.05	0.28	0.2	0.11	0.53	0.34	0.35	0.67
CV %	10.2	11.1	12.8	9.7	5.2	5.9	3.7

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

Table 19. 2015 Yield summary (DM tons/acre) of MSU Conventional Alfalfa Variety Trial seeded in Lake City, Michigan in July 2013

Entry	2015				2014 Total	Grand Total
	June 9	July 30	Sept 23	Total		
Pioneer 55V50	1.53	0.96	0.38	2.88	3.42	6.30
L 455 HD	1.49	1.02	0.36	2.87	3.41	6.28
LS804 †	1.42	0.97	0.36	2.76	3.42	6.18
Oneida VR	1.35	0.94	0.39	2.68	3.31	5.99
Pioneer 55Q27	1.47	0.92	0.31	2.69	3.24	5.93
Vernal	1.40	0.90	0.34	2.64	3.27	5.91
DG4210	1.42	0.94	0.33	2.68	3.12	5.80
Pioneer 54QR04	1.38	0.87	0.37	2.63	3.17	5.80
Mean	1.43	0.94	0.36	2.73	3.30	6.02
LSD 0.05	0.34	0.23	0.07	0.60 ns	0.45 ns	0.94 ns
CV %	16.4	16.9	13.0	15.1	9.4	10.6

† Experimental Variety.
* Yield is not statistically different from the greatest value in the column
ns - Total yield among varieties not statistically different



Crimson Clover Cover Crop

Table 20. 2015 Yield summary (DM tons/acre) of MSU Conventional Alfalfa Variety Trial seeded in Lake City, Michigan in July 2014

Entry	2015			Total
	June 9	July 30	Sept 23	
Prolific II	1.71	1.68	0.69	4.09
Pioneer 55V50	1.85	1.62	0.62	4.09
Oneida VR	1.74	1.59	0.66	3.99
Magnum 7 Wet	1.71	1.60	0.65	3.96
Mariner IV	1.71	1.58	0.67	3.95
HybriForce 3400	1.73	1.56	0.64	3.93
L 455HD	1.67	1.59	0.67	3.92
Vernal	1.74	1.58	0.59	3.91
Pioneer 55Q27	1.66	1.55	0.60	3.81
AFXA113010 †	1.62	1.49	0.57	3.68
AFX095023 †	1.55	1.44	0.61	3.60
AFX103009 †	1.57	1.38	0.58	3.53
WL 354HQ	1.54	1.42	0.57	3.53
Ameristand 403T	1.55	1.38	0.57	3.51
DG 4210	1.57	1.33	0.56	3.45
Pioneer 54Q14	1.60	1.25	0.50	3.35
Mean	1.66	1.50	0.61	3.77
LSD 0.05	0.34	0.47	0.21	0.98 ns
CV %	14.60	21.80	24.20	18.30

† Experimental Variety. ns - Total yield among varieties not statistically different

Table 21. 2015 Yield summary (DM tons/acre) of MSU Conventional Alfalfa Variety Trial seeded in Chatham, Michigan in August 2012

Entry	2015				2014 Total	2013 Total	Grand Total
	June 29	Aug 6	Sep 22	Total			
Solar Gold	1.97	1.13	0.57	3.67	3.77*	3.39	10.84
Pioneer 55V50	1.89	1.08	0.58	3.55	3.39*	3.73	10.68
Pioneer 55V12	1.88	1.04	0.56	3.49	3.05*	3.40	9.93
Vernal	1.87	0.89	0.50	3.26	3.22*	3.09	9.56
Mariner IV	1.95	1.08	0.59	3.62	2.71	3.06	9.39
Forage Gold	1.84	1.00	0.49	3.33	2.80*	3.25	9.38
Mean	1.9	1.04	0.55	3.49	3.16	3.32	9.96
LSD 0.05	0.23	0.15	0.08	0.41 ns	1.01	0.85 ns	2.04 ns
CV%	8.23	9.9	10.4	7.9	21.7	17.1	13.6

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

ns - Total yield among varieties not statistically different

Table 22. 2015 Yield summary (DM tons/acre) of MSU Conventional Alfalfa Variety Trial seeded in Chatham, Michigan in July 2013

Entry	2015				2014 Total	Two-year Total
	June 29	Aug 6	Sep 22	Total		
DG 4210	2.18	1.05	0.50	3.74*	4.15	7.89
Pioneer 55V50	2.18	0.99	0.50	3.66*	3.92	7.59
Vernal	2.00	0.90	0.44	3.34	4.18	7.52
Pioneer 5312	2.01	0.88	0.42	3.32	4.08	7.40
Mean	2.09	0.96	0.47	3.52	4.08	7.60
LSD 0.05	0.23	0.13	0.01	0.24	0.52 ns	0.61 ns
CV%	6.9	8.8	4.5	4.2	8.0	5.0

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

ns - Total yield among varieties not statistically different

Table 23. 2015 yield summary (DM tons/acre) of MSU Roundup ready Alfalfa Variety Trial seeded in East Lansing, Michigan in July 2013.

Entry	2015					2014	2013	Grand Total
	May 20	July 6	Aug 17	Oct 2	Total	Total	Seeding Year	
DKA44-16RR	1.68	1.88	1.71	1.01	6.28*	6.53	0.63	13.44
WL 356HQ.RR	1.68	1.89	1.69	1.00	6.26*	6.49	0.68*	13.43
6497R	1.69	1.85	1.68	1.01	6.23*	6.46	0.70	13.39
428RR	1.69	1.84	1.68	1.04	6.24*	6.42	0.68*	13.34
54QR04	1.70	1.82	1.68	1.00	6.19*	6.47	0.67*	13.33
RR Stratica	1.66	1.77	1.68	1.03	6.14*	6.48	0.68*	13.30
WL372HQ.RR	1.66	1.81	1.63	0.95	6.05*	6.38	0.72*	13.15
AmeriStand 455TQ RR	1.63	1.84	1.67	1.02	6.16*	6.22	0.63	13.01
DKA41-18RR	1.61	1.66	1.57	0.91	5.76	6.40	0.66	12.82
Yieldmaster RR	1.60	1.71	1.55	0.96	5.81	6.33	0.67	12.81
Mean	1.66	1.81	1.65	0.99	6.11	6.42	0.67	13.20
LSD 0.05	0.11	0.14	0.12	0.09	0.42	0.36 ns	0.05	0.72 ns
CV %	4.8	5.3	5.2	6.7	4.8	3.8	5.1	3.8

* Yield is not statistically different from the greatest value in the column
ns - Total yield among varieties not statistically different

Table 24. 2015 yield summary (DM tons/acre) of MSU Roundup ready Alfalfa Variety Trial seeded in East Lansing, Michigan in May 2014

Entry	2015				2014	Trial
	May 28	July 28	Sept 21	Total	Total	Total
Pioneer 55VR06	2.05	1.63	0.99	4.68	1.99*	6.67
DKA 43-22RR	2.16	1.52	0.91	4.59	1.86	6.45
RR 501	2.07	1.52	1.03	4.62	1.77	6.39
DKA 40-51RR	2.08	1.47	0.90	4.45	1.90*	6.35
DKA 44-16RR	2.11	1.54	0.92	4.57	1.65	6.22
Mean	2.09	1.54	0.95	4.58	1.84	6.42
LSD 0.05	0.35	0.28	0.25	0.81 ns	0.12	
CV%	8.9	9.6	13.7	9.3	4.4	

* Yield is not statistically different from the greatest value in the column
ns - Total yield among varieties not statistically different

Table 25. 2015 Yield summary (DM tons/acre) of MSU Roundup Ready Alfalfa Variety Trial seeded in Lake City, Michigan in July 2013

Entry	2015				2014	Two-year
	June 9	July 30	Sept 23	Total	Total	Total
Pioneer 54QR04	1.42	1.12	0.44	2.98	3.51	6.49
DKA41-18RR	1.41	1.12	0.41	2.94	3.51	6.45
DKA44-16RR	1.47	1.13	0.42	3.01	3.38	6.39
Yieldmaster RR	1.38	1.06	0.42	2.87	3.35	6.22
Mean	1.42	1.11	0.42	2.95	3.44	6.39
LSD 0.05	0.18	0.11	0.07	0.29 ns	0.26 ns	0.52 ns
CV %	7.8	6.4	9.5	6.3	4.7	5.1

ns - Total yield among varieties not statistically different

Table 26. 2015 Yield summary (DM tons/acre) of MSU Roundup Ready Alfalfa Variety Trial seeded in Lake City, Michigan in July 2014

Entry	2015			
	June 9	July 30	Sept 23	Total
DKA43-22RR	1.38	1.38	0.55	3.32
DKA44-16RR	1.44	1.34	0.46	3.23
DKA40-51RR	1.35	1.19	0.45	3.00
Mean	1.39	1.30	0.49	3.18
LSD 0.05	0.30	0.27	0.12	0.67 ns
CV %	12.6	11.9	15.1	12.2

ns - Total yield among varieties not statistically different

Table 27. 2015 Yield summary (DM tons/acre) of MSU Roundup Ready Alfalfa Variety Trial seeded in Chatham, Michigan in July 2013

Entry	2015				2014 Total	Two-year Total
	June 29	Aug 6	Sep 22	Total		
Yieldmaster RR	2.09	1.05	0.53	3.67	4.19	7.86
DKA 41-18RR	2.10	1.00	0.54	3.64	4.21	7.85
DKA 44-16RR	2.14	1.05	0.52	3.72	3.93	7.66
Mean	2.11	1.04	0.53	3.68	4.11	7.79
LSD 0.05	0.13	0.09	0.05	0.12 ns	0.63 ns	0.69 ns
CV%	3.8	5.2	6.5	1.9	8.9	5.1

ns - Total yield among varieties not statistically different

Table 28. 2015 DM yields (DM tons/acre) of the MSU Perennial Grass Trial seeded in East Lansing, Michigan in May 2013

Tall Fescue	2015				2014 Total	2013 Seeding yr	3-year Total
	June 3	Aug 7	Oct 22	Total			
AGRFA 179 ††	0.96	1.34	1.22	3.51*	4.75	1.00	9.27
AGRFA 200 ††	0.98	1.27	1.18	3.43*	4.70	1.03	9.16
GT 213 ††	0.97	1.17	1.13	3.27	4.68	0.97	8.92
KY 31 minus ‡	0.98	1.28	1.04	3.29	4.50	0.95	8.74
Flourish	0.88	1.19	1.01	3.08	4.42	1.02	8.52
Mean	0.95	1.25	1.12	3.32	4.61	0.99	8.92
LSD (0.05)	0.14 ns	0.08	0.10	0.23	0.36 ns	0.23 ns	0.60
CV %	9.4	4.3	5.4	4.5	5.0	14.8	4.4
Perennial Ryegrass	2015				2014 Total	2013 Seeding yr	3-year Total
	June 3	Aug 7	Oct 23	Total			
Elena DS	0.74	0.39	0.50	1.63*	3.55*	0.62	5.79*
RAD-MRF145 ††	0.80	0.32	0.44	1.57*	3.34*	0.53	5.43*
Linn ‡	0.50	0.33	0.20	1.02	2.20	0.37	3.59
Mean	0.68	0.35	0.38	1.40	3.03	0.51	4.94
LSD (0.05)	0.24	0.12	0.08	0.42	0.54	0.20	0.75
CV %	21.1	20.8	13.0	17.1	10.3	22.5	8.8

†† Experimental grass varieties. ‡ Check variety
 * Yield is not statistically different from the greatest value in the column
 ns - Total yield among varieties not statistically different

Table 29. 2015 DM yields (DM tons/acre) of the MSU Perennial Ryegrass Variety Trial seeded in East Lansing, Michigan in May 2014

Perennial Ryegrass	Plant Maturity †		2015			Total
	May 28	June 3	June 4	Aug 7	Oct 23	
DLFPS-LHT7 ††	32.5	52.5	2.18	0.54	0.98	3.70*
Payday	28.8	50.0	2.20	0.34	1.05	3.59*
AGRLP-157 ††	4.0	11.3	1.94	0.36	0.99	3.28
Remington	5.5	9.3	1.70	0.44	0.95	3.10
Maximo	37.5	62.5	1.79	0.52	0.76	3.07
Mara	2.0	16.3	1.76	0.32	0.93	3.01
AGRLP-156 ††	37.5	66.3	1.92	0.29	0.79	3.00
Linn ‡	46.3	72.5	1.86	0.25	0.64	2.76
Mean	24.3	42.6	1.92	0.38	0.88	3.19
LSD (0.05)	19.4	17.2	0.29	0.07	0.17	0.41
CV %	54.3	27.5	10.1	13.0	13.5	8.7

† 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 not statistically different

Table 30. 2015 DM yields (DM tons/acre) of two MSU Orchardgrass Variety Trials seeded in East Lansing, Michigan in 2014

Orchardgrass summer seeding	Plant Maturity †		2015		Total
	June 2	June 3	Aug 5	Oct 19	
Intensiv	47.5	2.47	1.51	1.45	5.43
Barlegro	32.5	2.24	1.58	1.50	5.31
Echelon	31.3	2.05	1.70	1.51	5.27
OG0506 ††	68.8	2.04	1.42	1.30	4.76
Potomac ‡	37.5	1.74	1.43	1.56	4.72
OG0604WH ††	62.5	2.03	1.37	1.28	4.68
Persist	82.5	1.71	1.31	1.41	4.43
Mean	51.8	2.04	1.47	1.43	4.95
LSD (0.05)	10.2	0.43	0.36	0.29	1.00 ns
CV %	13.2	14.2	16.3	13.8	13.7

Orchardgrass spring seeding	Plant Maturity †			Cut 1 †††
	May 20	May 28	June 3	
Intensiv	0.3	17.5	48.8	2.14*
Echelon	13.0	15.0	38.8	1.79
Barlegro	0.0	9.0	27.5	1.79
OG0506 ††	3.0	37.5	80.0	1.63
OG0604WH ††	16.8	33.8	78.8	1.63
Persist	43.8	36.3	76.3	1.45
Potomac ‡	10.0	26.3	48.8	1.43
Mean	12.4	25.0	57.0	1.69
LSD (0.05)	26.9	20.0	24.4	0.34
CV %	146.2	53.7	28.8	13.4

† Maturity Percent of Tillers with head visible. †† Experimental grass varieties. ††† 2014 Spring seeding - only 1 cutting in 2014 ‡ Check variety
 * Yield is not statistically different from the greatest value in the column
 ns - Total yield among varieties not statistically different

Table 31. 2015 DM yields (DM tons/acre) of the MSU Bromegrass Variety Trial seeded in East Lansing, Michigan in May, 2014

Bromegrass	Plant Maturity †			2015			Total
	May 20	May 28	June 3	June 4	Aug 7	Oct 26	
Lincoln ‡	6.8	32.5	85.0	2.83	0.74	0.86	4.41*
BAR BiF 1GRL ††	9.3	57.5	86.3	2.53	0.85	0.80	4.17*
BAR BcF 1FFRL ††	72.5	85.0	100.0	2.33	0.69	0.97	4.00*
MBA	41.3	78.8	100.0	2.33	0.52	0.99	3.84*
Hakari (Alaskan Brome)	14.0	23.8	62.5	2.18	0.59	0.77	3.55
Mean	28.8	55.5	86.8	2.44	0.68	0.88	3.99
LSD (0.05)	16.1	17.4	16.4	0.36	0.22	0.38	0.63
CV %	36.2	20.4	12.3	9.6	20.9	27.9	10.2

† 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 not statistically different

Table 32. 2015 DM yields (DM tons/acre) of the MSU Fescue (Tall, Meadow, and Festulolium) Variety Trial seeded in East Lansing, Michigan in May, 2014

Tall fescue	Plant Maturity †			2015			Total
	May 20	May 28	June 3	June 4	Aug 7	Oct 22	
Tower	0.5	25.0	62.5	2.18	1.44	1.69	5.32*
TF0705SL ††	8.0	41.3	85.0	2.06	1.72	1.38	5.16*
KY 31 minus ‡	6.3	70.0	93.8	2.29	1.33	1.39	5.01*
Brava	9.0	51.3	86.3	2.19	1.20	1.52	4.92*
Bar FAFL 118701 ††	0.8	48.8	77.5	1.92	1.47	1.38	4.77*
TF0402 ††	2.0	50.0	87.5	2.04	1.32	1.33	4.68*
MT 9301 ††	0.8	41.3	70.0	1.77	1.29	1.55	4.62*
BarElite	0.5	31.3	60.0	1.95	1.33	1.32	4.59*
Cajun II	11.8	41.3	85.0	1.91	1.27	1.30	4.48
Barienne	0.0	7.8	28.8	1.71	1.35	1.37	4.43
LSD (0.05) Tall Fescue varieties				0.29	0.27	0.23	0.73
Meadow fescue	May 20	May 28	June 3	June 4	Aug 7	Oct 22	Total
Pradel	0.8	35.0	80.0	2.06	1.13	1.04	4.23
Cosmonaut	1.0	46.3	86.3	2.14	1.02	0.88	4.04
LSD (0.05) Meadow Fescue varieties				0.60 ns	0.33 ns	0.21 ns	1.17 ns
Festulolium	May 20	May 28	June 3	June 4	Aug 7	Oct 22	Total
Becva	0.0	14.0	36.3	1.71	0.43	0.47	2.60
Barfest	0.0	18.3	31.3	1.61	0.33	0.47	2.41
LSD (0.05) Festulolium varieties				0.27 ns	0.10 ns	0.19 ns	0.21 ns
Mean	2.9	37.2	69.3	1.97	1.19	1.22	4.38
LSD (0.05) all	9.4	25.5	21.9	0.33	0.25	0.23	0.66
CV %	224.0	48.0	22.1	11.6	14.9	13.4	10.6

† 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 not statistically different

Table 33. 2015 DM yields (DM tons/acre) of the MSU Timothy Variety Trial seeded in East Lansing, Michigan in May, 2014

Timothy	Plant Maturity †		2015			Total
	May 28	June 3	June 4	Aug 7	Oct 26	
TM0801 ††	7.5	57.5	2.74	1.49	1.00	5.23*
TM0603 ††	0.3	0.0	2.43	1.16	0.75	4.34
Climax ‡	0.0	0.0	2.18	0.78	0.86	3.81
Mean	2.6	19.2	2.45	1.14	0.87	4.46
LSD (0.05)	6.3	5.0	0.11	0.11	0.12	0.18
CV %	140.3	15.1	2.6	5.6	8.1	2.3

† Maturity Percent of Tillers with head visible. †† Experimental grass varieties. ‡ Check variety
 * Yield is not statistically different from the greatest value in the column

Table 34. 2015 DM yields (DM tons/acre) of the MSU Perennial Grass Trials seeded in Lake City, Michigan in July 2014

Tall Fescue	2015		
	Cut 1 June 9	Cut 2 Sept 23	2-cut Total
KY 31 minus	2.53	1.90	4.43
Tuscany II	2.56	1.82	4.38
KY 31 Plus	2.29	2.04	4.32
Bariane	1.87	1.96	3.83
Mean	2.31	1.93	4.24
LSD (0.05)	0.39	0.53	0.85 ns
CV %	10.6	17.1	12.6

Orchardgrass	2015		
	Cut 1 June 9	Cut 2 Sept 23	2-cut Total
Intensiv	2.01	1.77	3.78
Potomac	1.59	1.65	3.24
Echelon	1.64	1.56	3.20
Persist	1.67	1.49	3.15
Mean	1.73	1.62	3.34
LSD (0.05)	0.48	0.60	1.03 ns
CV %	17.4	23.4	19.4

Timothy	Cut 1	Cut 2	Cut 3	3-cut
	June 9	July 30	Sep 23	Total
Crest	2.77	1.10	0.72	4.59*
Summit	2.92	0.74	0.74	4.40*
Barpenta	2.40	0.63	0.6	3.63
Climax	2.30	0.55	0.52	3.37
Mean	2.60	0.75	0.64	4.00
LSD (0.05)	0.36	0.34	0.22	0.77
CV %	8.7	28.1	21.6	12.1

‡ Check variety
 * Yield is not statistically different from the greatest value in the column
 ns - Total yield among varieties not statistically different

Table 35. 2015 DM yields (DM tons/acre) of the MSU Perennial Grass Trials seeded in Chatham, Michigan in June 2014

Tall Fescue	Cut 1 ††	Plant maturity †						
	June 29	June 11	June 16	June 18	June 22	June 24	June 26	June 29
Tuscany II	2.05*	13.8	43.8	68.8	100	100	100	100
KY 31 Plus	2.02*	13.8	37.5	75.0	100	100	100	100
KY 31 Minus	1.94*	15.0	50.0	75.0	100	100	100	100
Bariane	1.66	0.0	2.5	11.3	50.0	75.0	91.3	97.5
Mean	1.92	10.6	33.4	57.5	87.5	93.8	97.8	99.4
LSD (0.05)	0.23	10.1	16.3	11.6	ns	ns	2.0	2.3
CV %	7.4	59.2	30.6	12.6	0	0	1.3	1.5
Orchardgrass	Cut 1 ††	Plant maturity †						
	June 29	June 11	June 16	June 18	June 22	June 24	June 26	June 29
Intensiv	1.50*	8.8	15.0	20.0	22.5	22.5	22.5	23.8
Potomac	1.29	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Echelon	1.22	3.8	5.0	5.0	5.0	5.0	5.0	5.0
Persist	1.04	5.0	6.3	6.3	5.0	5.0	5.0	5.0
Mean	1.26	5.3	7.5	8.8	9.1	9.1	9.1	9.4
LSD (0.05)	0.16	5.0	3.8	5.3	3.8	3.8	3.8	2.3
CV %	7.9	59.2	31.4	38.1	26.4	26.4	26.4	15.4
Timothy	Cut 1 ††	Plant maturity †						
	June 29	June 16	June 18	June 22	June 24	June 26	June 29	
Summit	3.28	25	62.5	100	100	100	100	
Climax	3.15	0	3.8	27.5	56.3	93.8	100	
Crest	3.13	0	31.3	81.3	100	100	100	
Barpenta	3.07	0	0	0	0	6.3	20	
Mean	3.15	6.3	24.4	52.2	64.1	75	80	
LSD (0.05)	0.31 ns	ns	13.4	16.9	10	10	5.7	
CV %	6.1	0	34.4	20.2	9.8	8.3	4.4	

† Maturity Percent of Tillers with head visible †† One cutting in 2015 ‡ Check variety

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

Table 36. 2015 DM yields (DM tons/acre) of the MSU Forage Sorghum, Sorghum Sudangrass, and Sudangrass Trials seeded in Chatham and East Lansing, Michigan in July 2015

Chatham			East Lansing		
Seeded July 10, 2015			Seeded July 12, 2015		
Entry		Cut 1 Sep 24	Entry		Cut 1 Oct 14
EG 666	Sudangrass	1.62	Greengrazer V	Hybrid Sorghum Sudangrass	3.26
Piper	Sudangrass	2.31	Piper	Sudangrass	3.00
BMR Sudex	Forage Sorghum	1.90	EG 666	Sudangrass	2.75
AF 7101	Forage Sorghum	1.78	Mean (3 entries)		3.00
AF 7102	Forage Sorghum	1.89	LSD (0.05)		1.30 ns
AF 7201	Forage Sorghum	1.73	CV %		24.3
AF 7301	Forage Sorghum	1.69			
AF 7401	Forage Sorghum	1.63			
Mean (8 entries)		1.82			
LSD (0.05)		0.31			
CV %		11.6			

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
CHS Seeds	541-928-2393	www.chsseedresources.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
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.plantnexusgrow.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
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