

# **FORAGE VARIETIES FOR MICHIGAN IN 2012**

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Forage is defined as “edible parts of plants, other than separated grain, that can provide feed for animals, or that can be harvested for feeding.” Over 3.5 million acres of Michigan farmland is dedicated to forage production with an estimated value of the forage harvested or grazed from this land at \$650 million. Alfalfa hay and haylage production occupies 990,000 acres with an annual yield of 3.1 million tons. By acreage, forages (hay and pastureland) are the number one crop in the state. Forages benefit the environment by reducing soil erosion, improving soil structure, and reducing fertilizer applications. In addition, forages add an eye appealing green landscape and open space across the state of Michigan.

Many Michigan farmers are faced with equipment, land and labor costs that are increasing exponentially, while the value of the products sold off the farm gain slowly, hold or decline. An increase in profit from greater yields requires good management and improved varieties.

Michigan State University has established a total of 79 variety trials since 2000 to evaluate alfalfa, clovers, and cool-season grasses in an unbiased manner. Yield, persistence, and forage quality are the primary components that are compared but, animal preference may also be monitored in grazing trials. Testing locations for forage variety trials include: Chatham at the Upper Peninsula Experiment Station, Lake City at the Lake City Experiment Station, North Branch at the Howland Farm, East Lansing at the Crop and Soil Science Teaching and Research Facility, and Hickory Corners at the Kellogg Biological Station (KBS).

## **2011 Weather Conditions**

In the Lower Peninsula, large snowfalls provided excellent cover on forage crops resulting in very good crop survival in the early spring. Wetter than normal conditions were prevalent during April and May resulting in delayed plantings for much of the state. Harvesting was also delayed for first cutting due to the wet spring in much of the state. The harvest trigger of 750 growing degree days (GDD), base 42 °F had been reached at East Lansing, North Branch, and Capac by June 3 and 7 days later in Lake City, and June 23 at Chatham. Most producers had to wait until mid-June to put up dry hay.. A dry August and early September provided a good harvest window but declining soil moisture did reduce yields in many areas of the State especially the Central and Western U.P. This resulted in only 2 cuttings in Chatham. Above-average temperatures and moisture were reported in the fall resulting in 4 cuttings in the southern sites.

## **EVALUATION OF ALFALFA VARIETIES**

Michigan State University has evaluated more than 70 release alfalfa varieties in its alfalfa variety trials since 2006. Plant breeders, developers, and marketers submit both commercial and experimental alfalfa varieties to MSU for testing. Varieties in these trials are evaluated for yield and persistence for at least three years. Alfalfa trials have been established at East

Lansing in southern Lower Michigan, Lake City in central northern Michigan, North Branch and Capac in the thumb region and Chatham in the north central Upper Peninsula.

Yield is expressed in dry matter tons per acre as a total over years for 57 alfalfa varieties seeded at East Lansing from 2008-2009 and total single-year production for 2010 and 2011 seedings (Table 1). Yields of 29 varieties seeded at Lake City from 2008-2009 and total single-year production for 2010 and 2011 seedings are provided in Table 2. The North Branch trial (3 year total) and Capac trial (1 year total) are presented in Table 3. Table 4 contains yield results from varieties established in 2008 and 2009 at Chatham (Alger Co.) in the Upper Peninsula. A percentage of the check variety (Vernal) is presented in each table as a means for comparison. Vernal is an old variety with fall dormancy of 2 and has little disease resistance, but many producers are familiar with it, and it is often the lowest price seed available.

### **Potato Leafhopper Resistant Alfalfa Varieties**

Potato leafhopper (PLH) is an insect that reduces alfalfa yield each year in Michigan. It is the most damaging insect to alfalfa in Michigan. It is carried by the gulf-stream air currents, causing this pest to “rain” down on alfalfa fields in mid to late June. It damages alfalfa by injecting a piercing mouth-part (stylet) into the stem and petiole of alfalfa. The insertion of the stylet and subsequent injection of toxic saliva girdles the plant. The result is a decreased flow of nutrients and eventually stunting. “Hopperburn” is the term used for the yellowing that occurs from leafhopper damage. Yield can be reduced greatly when sufficient numbers of PLH exist. For information on insecticide control of potato leafhopper in alfalfa consult your local extension office.

In 1997, several alfalfa seed marketers released potato leafhopper-resistant (PLHR) alfalfa varieties. The resistance levels of varieties released in 1997 varied greatly but most were under 25% resistant plants. Growers that were expecting protection or resistance in the early released PLHR varieties were very disappointed. Most PLHR alfalfa varieties released in the last 2 years have populations that exceed 75% resistance, which has, through several university studies, proven to be an adequate level of resistance. Even though alfalfa varieties are resistant to potato leafhoppers, they may benefit from insecticide applications especially in the establishment year. Iowa State University has suggested that growers scouting new PLHR varieties use new economic thresholds of treatment of 4 times the previous threshold. Yield data from the East Lansing 2008-2011 PLH-resistant variety trials are presented in Table 5. These trials are managed for hay production; however, insecticide is not applied. A top-yielding, non- PLHR check was selected from the insecticide-treated (standard) trial and was included in the PLHR trials beginning in 2008 to evaluate the advantage of resistance. A top-yielding PLHR variety was also included in the standard East Lansing and North Branch trials to compare yield potential of newer resistant to conventional non-resistant varieties when insecticide is applied.

### **Alfalfa Cutting Management**

Selecting an appropriate alfalfa variety for an environment requires careful consideration. Yield and persistence of an alfalfa variety are important in variety selection. Good management practices are also an important part of establishing and maintaining an alfalfa stands. However, even the best alfalfa variety will not perform well if poorly managed. Establish good stands on adequately drained soils, adjust soil pH a full year prior to seeding, and fertilize before planting and broadcast annually with phosphorous and potassium as

recommended by soil tests. The appropriate cutting management system depends on the location, yield goal, forage quality desired, and desired stand life.

## **Selection of an Alfalfa Variety**

### **I. SELECTION FOR SHORT-TERM STANDS -- UP TO FIVE YEARS.**

Most alfalfa stands in Michigan are left for three- to four-years. Varieties selected for short-term stands should be: 1) at least moderately winterhardy, 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.

### **II. SELECTION FOR LONG-TERM STANDS -- OVER FIVE YEARS.**

Winterhardiness is of primary importance for long-lived 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 stands but are usually higher yielding after about five years, especially in northern Michigan.

Select high-yielding winterhardy varieties resistant to PRR for long-lived stands. Varieties in dormancy group 2 are more likely than moderately hardy varieties (dormancy groups 3 and 4) to establish "permanent" cover, but will not yield as well.

### **III. SELECTION FOR PASTURES**

Alfalfa varieties used in pastures should be selected for long-lived stands with resistance to *Phytophthora* root rot. Allowing adequate rest periods of 30-35 days between grazing cycles will enhance longevity of alfalfa for pastures. In addition, allowing a rest period in the fall will allow the alfalfa crop to store up needed carbohydrates and proteins for better winter survival. Several commercial varieties are being marketed with improved tolerance to grazing. Alfalfa-grass mixtures in pastures will usually result in better meat and milk gains compared to grass monocultures. The grass component will reduce the risk of bloat in ruminant animals as well. In addition, alfalfa will provide needed nitrogen for the grass through nitrogen fixation.

## **Winterhardiness and Fall Dormancy Ratings**

Fall dormancy (FD) ratings are determined by the amount of regrowth after a mid-September cutting. New breeding efforts by some companies may have broken the link between FD and winterhardiness. Trials in Wisconsin have shown FD 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 ratings FD 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 evaluating winter-survival (WSI) of several commercial varieties which is reported in (Table 6).

## **Important Alfalfa Diseases in Michigan**

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 6. A brief description follows and additional information and pictures are can be found at <http://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 1/3 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.

## EVALUATION OF COOL-SEASON GRASS VARIETIES

### Perennial Grasses

Cool-season grasses were evaluated in two locations in Michigan for forage yield and winter injury. A brief description of each grass evaluated is provided below.

Festulolium (*Festulolium braunii*, K.A.) (seeding rate: 30 lbs/acre) is a cross between meadow fescue and either perennial ryegrass or Italian ryegrass. This cross combines the persistence of fescue with the palatability of ryegrass. Legume/ festulolium compatibility studies are currently underway at four locations across the state.

Kentucky bluegrass (*Poa pratensis* L.) (seeding rate: 10 lbs/acre) is a sod-forming perennial grass that is very palatable. It persists under frequent, close grazing and is very winterhardy. This is the lowest yielding grass species, due to shallow rooting habits which make the plant less drought tolerant.

Orchardgrass (*Dactylis glomerata* L.) (seeding rate: 15 lbs/acre) is a high-yielding perennial bunch grass that grows rapidly in the early spring and will out compete most other forage species in Michigan. Orchardgrass is ideal for soils with moderately poor drainage although it grows well on a wide range of soil types. Tillering occurs throughout the growing season enabling quick re-growth following harvest or grazing. Orchardgrass has similar nutritive characteristics to timothy and smooth brome grass and should be harvested during the vegetative stages of growth prior to heading. Alfalfa and orchardgrass are often grown together in Michigan. Late maturing varieties of orchardgrass are preferred when mixed with alfalfa.

Ryegrass (*Lolium perenne, hybridum* L.) (seeding rate: 30 lbs/acre) is a bunch grass that is high in forage quality but somewhat lower in total yield. Perennial ryegrass will persist under intensive rotational grazing and multiple harvests for hay or haylage, but it is susceptible to injury when grazed as frozen forage. This species is not as winter hardy compared to other cool season grasses, however, because of its high forage quality, many farmers include it as part of their pasture mix. Intermediate ryegrass (hybrid) is a cross between Italian (annual) and perennial ryegrasses. It will often out-yield perennial ryegrass but does not persist as well as perennial ryegrass. Soils that are high in fertility and are moderately well drained are ideal for this species. Hot and dry conditions will cause dormancy in ryegrasses; therefore, supplemental irrigation can increase yields.

Hybrid, Meadow, or Smooth brome grass (*Bromus spp.*) (seeding rate: 22 lbs/acre) is a rhizomatous, sod-forming grass that is high in forage quality and yield. Smooth brome grass is one of the most winter hardy grasses which can be grown on a wide range of soil types. Smooth brome grass is commonly used for grazing, hay production, and green chop. Alfalfa and red clover are legumes that are compatible with smooth brome grass. Careful consideration needs to be made when grazing or cutting smooth brome to prevent a reduction in tillering. Smooth brome grass should not be grazed or cut during stem elongation and early heading.

Tall or Meadow fescue (*Festuca* spp.) (seeding rate:15 lbs/acre) is a sod-forming grass that is known for good fall growth. Tall fescue persists on many soil types and may produce short rhizomes and tillers when grazed frequently. It has a high relative nutritive value when closely grazed. All varieties tested are endophyte-free. Tall fescue is a species that persists under heavy traffic from vehicles or animals.

Grass variety trials were established in East Lansing in 2009. Each of the grasses were seeded in a randomized complete block design using four replications. One hundred-fifty lbs. of ammonium sulfate (34-0-0) was applied at green-up and prior each subsequent harvest. Dry matter yields (multi-year averages) are presented in Table 8.

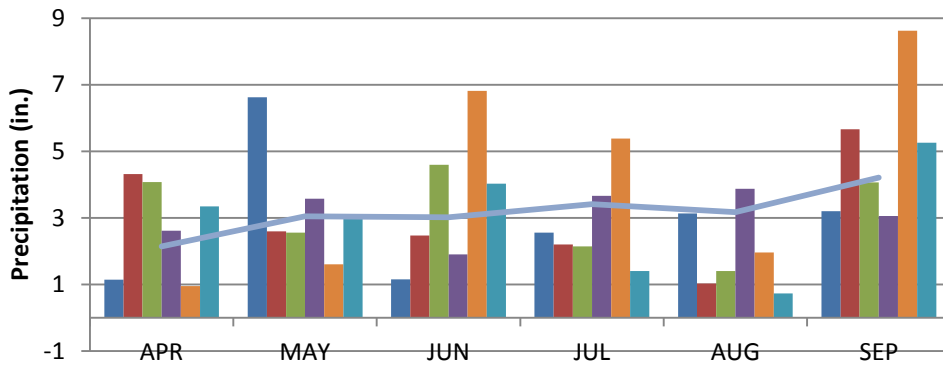
### **Pasture Mixtures**

Pastures are usually seeded as mixtures of grass species or grasses and legumes, while most variety trials are monocultures, pure seedings of grass or legume varieties. In 2010, a mixed pasture trial was established at the Kellogg Biological Station, Hickory Corners, MI. Seed companies and forage breeders were solicited for mixtures or single specie entries that they recommend for managed, intensively-grazed pastures. Fifteen entries (six mixtures and nine monocultures) were established in a Kalamazoo loam on March 31, 2010. Four replications of two plots per entry enabled harvest of one plot for yield determination, while one was left for preference ratings. A separate block for grass-legume mixtures allowed application of 2,4-D to the grass only entries for weed control of broadleaf weeds, while mixtures were clipped to reduce weed competition. Nitrogen was applied at 150 lbs of nitrogen per acre to grass only plots in 50 lb./acre increments about three-weeks prior to each harvest. The 2 year total expressed in dry matter yield and dairy heifer preference ratings are presented in Table 9.

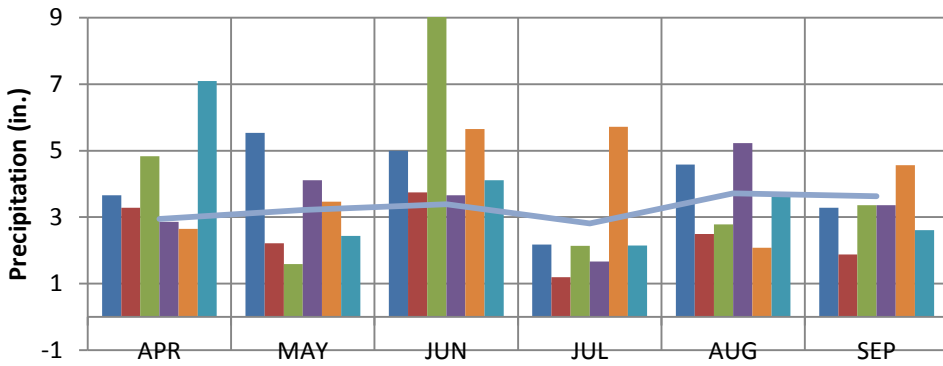
### **Statistics**

The statistic that may be most useful is the average or mean. Comparing selected varieties to the mean is a simple way to determine which performed the best. The LSD (Least Significant Difference) is used to compare values *within* a column and is the minimum difference between two values for a “real” difference to exist. The alpha level for the LSD in these trials was 0.05 or 5%, which means, we are 95% certain that values differing by more than the LSD are not due to chance. Comparisons of varieties that were seeded in different years are not recommended due to differences in rainfall and temperatures between years.

### Chatham

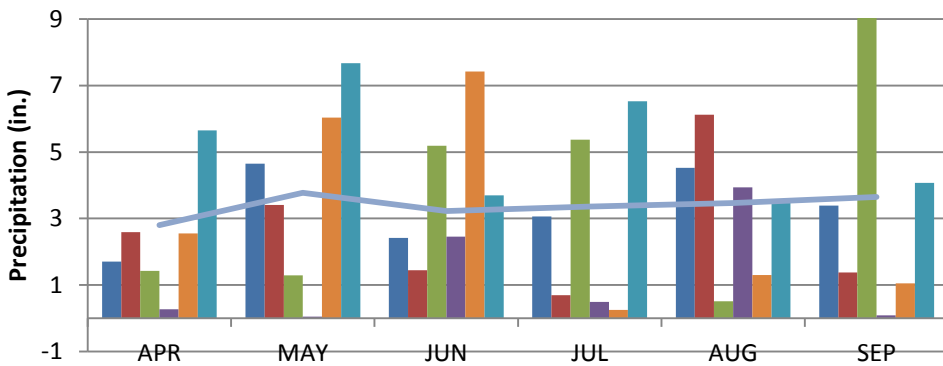


### Lake City

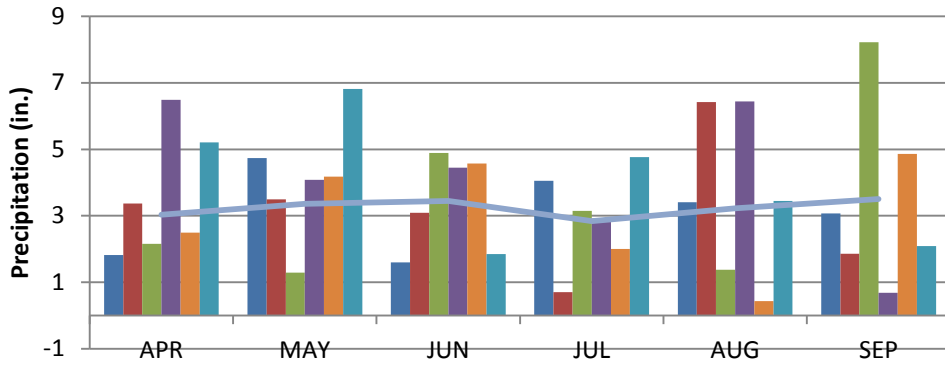


- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- Normal

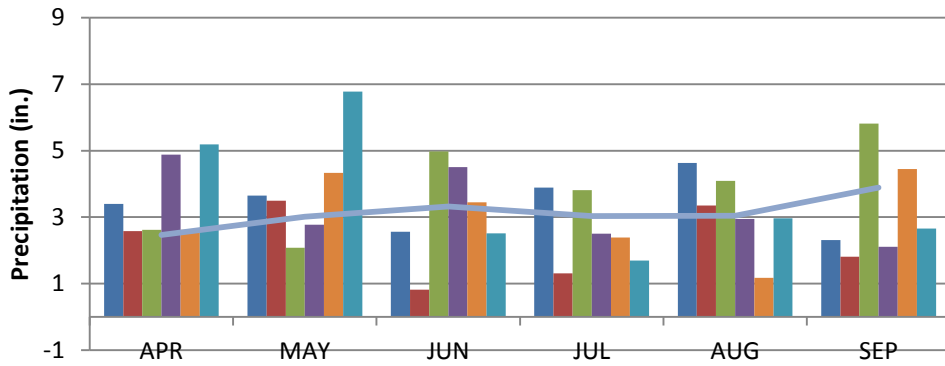
### Hickory Corners



### East Lansing



### North Branch



### Capac

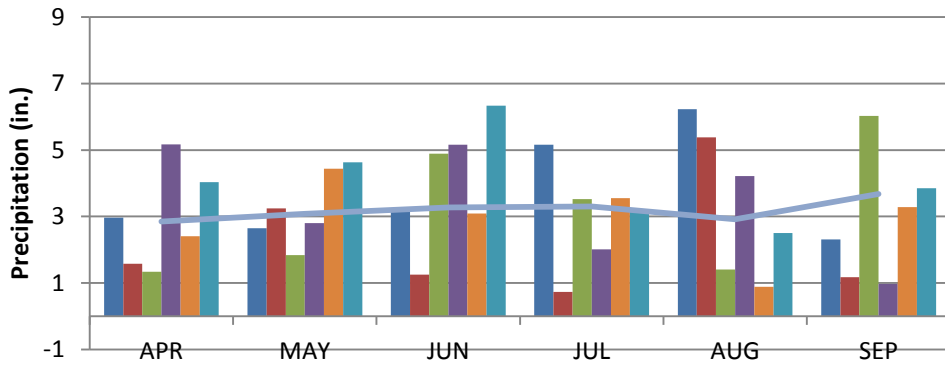




Table 1. East Lansing Alfalfa Variety Trial yields (dry matter tons/acre) for seedings established in 2008, 2009, 2010 & 2011

Variety	Marketer	3-yr tot.	2-yr tot.	1-yr tot.	1-yr. tot.***	% of Check**
		'08 seeding	'09 seeding	'10 seeding	'11 seeding	
		tons/acre				
403T	Athens Seed	--	--	--	2.28	100
4S417	Mycogen Seeds	21.91	16.88	12.83	--	131
AmeriStand 403T Plus	America's Alfalfa	--	16.35	--	--	135
AmeriStand 407TQ	America's Alfalfa	--	18.22	--	2.61	133
Chesapeake	Dahlco Seeds/ AgReliant	--	17.92	--	--	148
CW064004*		--	--	--	2.38	105
CW044026*		--	16.09	--	--	132
DG 4210	Crop Production Services	--	--	12.25	2.14	103
DK140	check	--	16.61	--	--	137
DKA43-13	Monsanto	20.42	--	11.93	--	118
DSA08-M*		--	--	13.77	--	126
DSB08-M*		--	--	--	3.03	134
DSB-45*		--	--	--	1.85	82
Everlast II	Legacy Seeds	--	15.60	--	--	128
FG 46M126*		--	--	11.84	--	109
FG 46M328*		--	--	12.21	--	112
FG 46M329*		--	--	12.56	--	115
FG 46M446*		--	18.46	--	--	152
FG 45M116*		23.01	--	--	--	143
FG 45M322*		23.95	--	--	--	149
Garst 6415	Garst Seed Co.	19.10	--	--	--	119
Garst 6417	Garst Seed Co.	21.18	--	12.36	--	123
Garst 6431	Garst Seed Co.	20.80	--	--	--	129
Garst 6552	Garst Seed Co.	19.38	--	--	--	121
Genoa	Syngenta/NK	20.75	--	--	--	129
GH727	Golden Harvest Seeds	20.22	--	--	--	126
Gunner	Croplan Genetics	--	--	--	2.01	89
HybriForce 2400	Dairyland Seed Co.	22.65	18.20	12.22	--	134
HybriForce 807exp*	Dairyland Seed Co.	--	16.64	--	--	137
KingFisher 243	Byron Seed	--	15.74	--	--	130
Kingfisher 4020	Byron Seed	--	--	12.24	--	112
L333HD	Legacy Seeds	18.89	--	--	--	118
L447HD	Legacy Seeds	20.77	--	--	--	129
LegenDairy 5.0	Croplan Genetics	--	17.20	--	2.40	124
msSunstra-807*		21.47	--	--	--	134
msSunstra-803*		--	--	--	2.73	120
msSunstra-901*		--	18.05	--	--	149
Oneida VR	public	--	14.28	--	2.18	107
PGI 459	Producer's Choice Seed	19.35	--	--	--	120
PGI 557	Producer's Choice Seed	--	--	--	2.36	104
Pioneer 5312	check	17.38	15.29	11.83	--	114
Pioneer 5454	check	--	17.06	--	--	140
Pioneer 54Q32	Pioneer Hi-breds Int'l	--	16.89	--	2.14	117
Pioneer 55V12	Pioneer Hi-breds Int'l	--	18.17	--	2.42	128
Pioneer 55V48	Pioneer Hi-breds Int'l	21.20	18.64	--	2.73	135
PLH-resistant check	check	--	17.20	11.91	2.73	124
Prolific II	Dairyland Seed Co.	--	--	--	2.98	131
Radiance HD	Legacy Seeds	--	18.12	--	--	149
Rebound 6.0	Croplan Genetics	--	--	--	2.06	91

Sonic	Nutech Seed	--	--	--	2.71	119
Syngenta 6422Q	Syngenta	--	19.04	--	2.31	129
TS 4013	Producer's Choice Seed	--	--	--	2.25	99
Velocity	Nutech Seed	21.02	15.79	--	--	130
Vernal	public	16.06	12.15	10.88	2.27	100
WL 343HQ	W-L Research	--	--	11.54	--	106
WL 354HQ	W-L Research	--	--	--	2.42	107
WL 363HQ	W-L Research	21.00	18.13	12.53	--	132
	<i>Mean</i>	20.53	16.91	12.19	2.41	
	<i>LSD (0.05) †</i>	1.70	2.50	1.13	0.56	

\*denotes experimental entries

\*\*Percentage yield of Vernal. Average used for multi-year entries.

\*\*\*Seeding year total yield

† 95% certain that yields separated by a number greater than the LSD are different

Table 2. Lake City Alfalfa Variety Trial yields (dry matter tons/acre) for seedings established in 2008, 2009, 2010 & 2011

Variety	Marketer	3-yr tot.	2-yr tot.	1-yr tot.	1-yr. tot.**	% of Check*
		'08 seeding	'09 seeding	'10 seeding	'11 seeding	
<b>tons/acre</b>						
403T	Athens Seed	--	--	6.93	--	112
4A415	Mycogen Seeds	--	--	7.27	--	118
4S417	Mycogen Seeds	--	8.80	6.95	--	113
AmeriStand 403T plus	America's Alfalfa	--	8.25	--	--	107
AmeriStand 407TQ	America's Alfalfa	--	8.77	--	1.26	156
Chesapeake	Dahlco Seeds/ AgReliant	--	8.78	--	--	114
DG 3210	Crop Production Services	--	--	5.78	--	93
DG 4210	Crop Production Services	--	--	6.14	1.40	147
DK140	check	--	7.80	--	--	101
DKA43-13	Monsanto	--	8.52	--	--	111
FSG 329	Standish Milling/Allied Seed	--	9.51	--	--	124
Garst 6417	Garst Seed Co.	--	--	5.85	--	95
Garst 6431	Garst Seed Co.	9.50	--	--	--	132
HybriForce 2400	Dairyland Seed Co.	--	--	6.47	--	105
LegenDairy 5.0	Croplan Genetics	--	9.02	--	--	117
Pioneer 5312	check	--	--	6.57	1.28	96
Pioneer 53H92	Pioneer Hi-breds Int'l	7.67	--	--	--	107
Pioneer 54Q32	Pioneer Hi-breds Int'l	--	9.12	--	1.28	119
Pioneer 55H94	Pioneer Hi-breds Int'l	--	--	--	1.26	85
Pioneer 55V12	Pioneer Hi-breds Int'l	--	8.14	--	1.36	106
Pioneer 55V48	Pioneer Hi-breds Int'l	8.53	8.15	--	--	112
Pioneer 55V50	Pioneer Hi-breds Int'l	--	--	--	1.50	101
PLHR Check	check	--	8.76	--	--	114
PLH-resistant check	check	--	--	6.43	1.36	98
Sonic	Nutech Seed	--	--	--	1.37	93
Syngenta 6305Q	Syngenta	--	--	6.31	--	102
Syngenta 6422Q	Syngenta	--	9.34	--	--	121
Velocity	Nutech Seed	8.91	8.84	--	--	119
Vernal	public	7.18	7.70	6.19	1.48	100
<i>Mean</i>		8.36	8.63	6.44	1.36	
<i>LSD (0.05) †</i>		1.00	NS	0.94	0.34	

\*Percentage yield of Vernal. Average used for multi-year entries.

\*\*Seeding year total yield

† 95% certain that yields separated by a number greater than the LSD are different

Table 3. Thumb Area Alfalfa Variety Trial yields (dry matter tons/acre) for seedings established in 2008 in West Branch & 2011 in Capac.

Variety	Marketer	3-yr tot.	1-yr. tot.**	% of Check*
		'08 seeding	'11 seeding	
		tons/acre		
AmeriStand 407TQ	America's Alfalfa	23.53	3.28	108
Ascend	Hyland Seeds	22.59	--	121
DG 4210	Crop Production Services	--	3.47	96
DK140	check	21.47	--	115
DKA43-13	Monsanto	21.58	--	115
FSG 351	Standish Milling/Allied Seed	21.83	--	117
FSG 406	Standish Milling/Allied Seed	22.31	--	119
FSG 408DP	Standish Milling/Allied Seed	21.42	--	115
FSG 505	Standish Milling/Allied Seed	23.67	--	127
FSG 528SF	Standish Milling/Allied Seed	21.55	--	115
Garst 6417	Garst Seed Co.	21.85	--	117
Garst 6552	Garst Seed Co.	22.91	--	123
Genoa	Syngenta/NK	22.41	--	120
Gunner	Croplan Genetics	--	3.16	87
HybriForce 2400	Dairyland Seed Co.	--	3.53	97
LegenDairy 5.0	Croplan Genetics	--	3.33	92
PGI 459	Producer's Choice Seed	23.14	--	124
Pioneer 5312	check	20.36	3.31	100
Pioneer 54Q32	Pioneer Hi-breds Int'l	--	3.00	83
Pioneer 55V12	Pioneer Hi-breds Int'l	--	3.02	83
Pioneer 55V48	Pioneer Hi-breds Int'l	23.71	--	127
Pioneer 55V50	Pioneer Hi-breds Int'l	--	3.20	88
PLH-resistant check	check	19.18	3.12	94
Prolific II	Dairyland Seed Co.	--	3.88	107
Rebound 6.0	Croplan Genetics	--	3.53	97
Sonic	Nutech Seed	--	3.59	99
Velocity	Nutech Seed	21.72	--	116
Vernal	public	18.69	3.63	100
WL 343HQ	W-L Research	22.88	--	122
WL 354HQ	W-L Research	--	3.16	87
WL 363HQ	W-L Research	22.86	3.12	104
<i>Mean</i>		21.98	3.33	
<i>LSD (0.05) †</i>		2.44	0.59	

\*Percentage yield of Vernal. Average used for multi-year entries.

\*\*Seeding year total yield

† 95% certain that yields separated by a number greater than the LSD are different

Table 4. Upper Peninsula Alfalfa Variety Trial yields (dry matter tons/acre) for seedings established in 2008 & 2009.

Variety	Marketer	3-yr tot.	2-yr. tot.	% of Check*
		'08 seeding	'09 seeding	
		tons/acre		
AmeriStand 403T	America's Alfalfa	--	6.71	103
AmeriStand 407TQ	America's Alfalfa	10.36	6.54	100
DK140	check	10.21	6.43	98
DKA33-16	Monsanto	11.09	--	106
DKA43-13	Monsanto	--	6.89	106
EverGreen 3	Syngenta/NK	9.70	--	92
Garst 6417	Garst Seed Co.	11.19	--	107
Garst 6431	Garst Seed Co.	10.93	--	104
4A421	Mycogen Seeds	--	6.65	103
Pioneer 5312	check	--	6.96	107
Pioneer 53H92	Pioneer Hi-breds Int'l	--	6.45	99
Pioneer 54Q32	Pioneer Hi-breds Int'l	--	6.52	100
Pioneer 55V12	Pioneer Hi-breds Int'l	--	7.03	108
Pioneer 55V48	Pioneer Hi-breds Int'l	10.26	6.49	99
Velocity	Nutech Seed	10.65	6.60	102
Vernal	public	10.49	6.49	100
WL 343HQ	W-L Research	10.64	--	101
<i>Mean</i>		10.55	6.65	
<i>LSD (0.05)†</i>		NS	NS	

\*Percentage yield of Vernal. Average used for multi-year entries.

† 95% certain that yields separated by a number greater than the LSD are different

Table 5. East Lansing Potato Leafhopper Resistant Alfalfa Variety Trial yields (dry matter tons/acre) for seedings established in 2008, 2009, 2010 & 2011

Variety	Marketer	3-yr tot.	2-yr tot.	1-yr tot.	1-yr. tot.***	% of Check**
		'08 seeding	'09 seeding	'10 seeding	'11 seeding	
<b>tons/acre</b>						
403T	Athens Seed	--	--	--	2.19	107
AmeriStand 409LH	America's Alfalfa	--	--	--	1.94	95
Commercial Check†	check	19.20	--	--	--	179
EverGreen 3	Syngenta/NK	17.33	--	--	--	162
FG 44H375*		--	12.84	--	--	124
FSG 420LH	Standish Milling/Allied Seed	--	13.36	--	--	129
Garst 6426	Garst Seed	17.84	--	10.87	--	139
non-PLH-R check†	Check	--	14.28	11.33	2.00	118
Pioneer 53H92	Pioneer Hi-breds Int'l	18.04	13.52	11.28	--	139
Pioneer 5454	check	--	12.12	--	--	117
Pioneer 55H94	Pioneer Hi-breds Int'l	--	--	--	2.31	113
Syngenta 6422Q	Syngenta	--	--	--	2.16	106
Syngenta 6475H	Syngenta	--	--	10.45	2.73	121
Vernal	public	10.73	10.33	9.65	2.05	100
WL 353LH	W-L Research	--	13.02	--	2.33	120
<i>Mean</i>		16.63	12.78	10.72	2.21	
<i>LSD (0.05)†</i>		2.62	1.44	0.75	0.30	

\*denotes experimental entries

\*Percentage yield of Vernal. Average used for multi-year entries.

\*\*Seeding year total yield

† 95% certain that yields separated by a number greater than the LSD are different

Table 6. Fall dormancy (FD) and resistance ratings\* for alfalfa cultivars in MSU variety trials (BW = Bacterial Wilt, PRR = Phytophthora Root Rot, AN = Anthracnose, VW = Verticillium Wilt, FW = Fusarium Wilt, APH<sup>1</sup>=Aphanomyces race one unless <sup>2</sup> present for race two, SN=Stem nematode)

Variety	FD	BW	PRR	AN	VW	FW	APH <sup>1</sup>	SN	WSI†
4A415	2	HR	HR	HR	HR	HR	HR, R <sup>2</sup>	HR	2.0
4A421	4	HR	HR	HR	HR	HR	HR	-	2.5
4P424	4	HR	HR	HR	HR	HR	-	-	-
4S417	4	HR	HR	HR	HR	HR	HR	-	2.0
Ameristand 403T	4	HR	HR	HR	HR	HR	HR	MR	2.0
Ameristand 407TQ	4	HR	HR	HR	HR	HR	HR,R <sup>2</sup>	MR	2.0
AmeriStand 409LH	2	HR	HR	HR	HR	HR	HR	-	2.0
Ascend	3	HR	HR	HR	HR	HR	-	-	-
Chesapeake	3	HR	HR	HR	HR	HR	HR,HR <sup>2</sup>	R	2.0
Cimarron VL410	4	HR	HR	R	R	HR	MR	R	-
DG 3210	3	HR	HR	HR	HR	HR	HR	R	1.0
DG 4210	4	HR	HR	HR	HR	HR	HR	R	1.0
DK140	3	HR	HR	HR	HR	HR	HR	-	-
DKA33-16	4	HR	HR	HR	HR	HR	HR	-	2.0
DKA43-13	4	HR	HR	HR	HR	HR	HR	-	2.0
Evergreen 3	4	HR	HR	HR	HR	HR	HR	R	2.0
FSG 329	3	HR	HR	HR	HR	HR	HR	HR	2.0
FSG 351	3	HR	HR	R	R	HR	R	R	2.0
FSG 400 LH	4	HR	HR	HR	HR	HR	HR	-	-
FSG 406	4	HR	HR	HR	HR	HR	HR	-	2.0
FSG 408DP	4	HR	HR	HR	HR	HR	HR	R	1.0
FSG 420 LH	4	HR	HR	HR	R	HR	R	R	2.0
FSG 505	5	HR	HR	HR	HR	HR	HR	R	2.0
FSG 528 SF	5	HR	R	HR	HR	R	R	-	2.0
Garst 6200HT	2	HR	HR	HR	HR	HR	HR	MR	2.5
Garst 6415	4	HR	HR	HR	HR	HR	HR	-	2.0
Garst 6417	4	HR	HR	HR	HR	HR	HR	-	2.0
Garst 6420	4	HR	HR	HR	HR	HR	R	R	1.5
Garst 6426	4	HR	HR	HR	HR	HR	HR	HR	2.0
Garst 6431	4	HR	HR	HR	HR	HR	-	-	2.0
Garst 6552	5	HR	HR	HR	HR	HR	HR	-	-
Genoa	4	HR	HR	HR	HR	HR	-	R	2.0
Gunner	4	HR	HR	HR	HR	HR	HR	-	1.2
GH 727	4	HR	HR	HR	HR	HR	HR	R	2.0
HybriForce 2400	4	HR	HR	HR	HR	HR	HR	-	1.8
KingFisher 243	5	HR	HR	HR	HR	HR	HR	-	2.0
KingFisher 4020	4	HR	HR	HR	HR	HR	HR	-	-
L333HD	3	HR	HR	HR	HR	HR	HR	-	2.0
L447HD	4	HR	HR	HR	R	HR	HR	-	2.0
LegendDairy 5.0	3	HR	HR	HR	HR	HR	R	MR	3.0

Magnum VI	4	HR	HR	HR	HR	HR	HR	-	-
Mountaineer 2.0	5	HR	HR	HR	R	-	-	-	-
PGI 459	4	HR	HR	HR	HR	HR	R	-	-
PGI 557	5	HR	HR	HR	HR	HR	HR	HR	-
Pioneer var. 5312	3	HR	HR	HR	HR	HR	-	-	-
Pioneer var. 53H92	3	HR	HR	HR	HR	HR	HR	R	-
Pioneer var. 53Q30	3	HR	HR	HR	R	HR	HR	-	-
Pioneer var. 5454	4	R	HR	HR	HR	HR	LR	MR	-
Pioneer var. 54Q32	4	HR	HR	HR	HR	HR	HR	LR	-
Pioneer var. 54V46	4	R	HR	HR	HR	HR	HR	MR	-
Pioneer var. 55H94	5	HR	HR	HR	HR	HR	HR	R	-
Pioneer var. 55V12	5	R	HR	HR	HR	HR	HR	R	-
Pioneer var. 55V48	5	HR	HR	HR	R	HR	HR	R	-
Pioneer var. 55V50	5	HR	HR	R	HR	HR	HR	R	-
Prolific II	4	HR	HR	HR	HR	HR	HR	-	2.0
Radiance HD	4	HR	HR	HR	R	HR	HR	-	2.0
Radiant AM	4	HR	HR	HR	HR	HR	HR	HR	-
Rebound 6.0	4	HR	HR	HR	HR	HR	HR	R	1.0
Red Falcon BR	4	HR	HR	HR	HR	HR	HR	-	2.0
Springgold	5	HR	HR	HR	R	HR	HR	R	-
Syngenta 6305Q	3	HR	HR	HR	HR	HR	HR	-	1.0
Syngenta 6422Q	4	HR	HR	HR	HR	HR	HR	-	1.0
Syngenta 6475H	4	HR	HR	HR	HR	HR	HR	-	2.0
Velocity	4	HR	HR	HR	HR	HR	HR	-	2.0
Vernal	2	R	S	S	S	MR	S	S	2.0
WL 343 HQ	4	HR	HR	HR	HR	HR	HR	MR	1.5
WL 353 LH	4	HR	HR	HR	HR	HR	HR	R	2.0
WL 354 HQ	4	HR	HR	HR	HR	HR	HR	HR	1.0
WL 363 HQ	5	HR	HR	HR	HR	HR	HR	HR	2.0

\* 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=none



Table 7. Forage grass yields (total dry matter tons/acre) for East Lansing (EL) established in 2009.

Species*	Variety (ploidy)	Marketer	3-yr. total.
			'09 EL tons/acre
B	Macbeth	CISCO Seed	9.12
B	Montana	Seed Research of OR	8.41
KB	Ginger	check	8.35
KB	BigBlue	Rose Agri-Seed, Inc.	6.37
OR	Persist	Smith Seed	10.02
OR	Potomac	check	10.13
OR	RAD LCF25	Radix Research	9.73
PR	RAD CPS211	Columbia Seed	5.74
PR	Calibra (4n)	check	5.25
PR	Linn (2n)	check	4.92
TF	Goliath	CISCO Seed	11.87
TF	KY31E+	check	11.03
MF	Pradel	check	9.60
MF	Preval	Ampac Seed Company	8.73
		<b>Mean</b>	8.52
		<b>LSD (0.05)</b>	1.05

\*B=Brome, Fest=Festulolium, KB=Kent. bluegrass, OR=Orchardgrass, PR=Perennial ryegrass, RC=reed canary, TF= Tall fescue, MF= Meadow fescue



Table 8. Forage dry matter yield (tons/acre) and preference of pasture species seeded March 2010 at Hickory Corners, MI.

Cultivar(s)	species	2-yr	Preference**		
		Total	cut 1	cut 2	cut 4
		tons/acre			
AC Knowles	Hybrid Brome	4.88	3.3	2.0	2.4
Feast II	Ital. Ryegrass	5.75	4.4	2.4	3.0
Grass Master mix	TF, OR, PR, Fest	6.77	2.8	3.4	3.1
Jump Start mix	PR,Fest, Ital.Ryegrass	5.92	3.9	2.3	2.0
MacBeth	Meadow Brome	4.79	2.9	3.0	2.0
Maxigraze_Haymate	Alfalfa, OR	7.89	3.4	3.0	3.5
Midwestern Grazer mix	OR,Fest,PR, MRC,WC	7.63	3.1	2.1	3.4
Oasis	chicory	5.39	3.4	2.3	1.4
Persist	OR	5.78	3.6	2.6	3.4
Persist_ladino	OR, Ladino WC	6.85	3.0	2.8	2.6
Potomac	OR	8.14	3.0	3.4	2.9
Power	PR, Fest, Ital.Ryegrass	4.88	4.3	2.3	3.8
Pradel	Meadow Fescue	4.83	3.1	4.8	3.0
Preval	Meadow Fescue	4.62	2.4	4.4	2.1
RADLCF25	OR	6.85	3.3	3.4	2.5
Zorro	Ital. Ryegrass	7.24	3.8	2.0	2.5
<b>Mean</b>		6.14	3.3	2.9	2.7
<b>LSD (0.05)†</b>		1.30	0.5	1	1.3

\*\*Visual rating after 24 hrs of grazing (5=best)

† 95% certain that values which are separated by a number greater than the LSD are different

OR:orchardgrass, PR:perennial ryegrass, Fest:festulolium, TF:tall fescue,

MRC:medium red clover,WC:white clover

# Marketers

Allied Seed	866-325-6671
America's Alfalfa	800-873-2532
Amer. Grass Seed Prod.	800-247-7815
Ampac Seed Co.	800-547-3230
Barenbrug USA	800-547-4101
Blue River Hybrids	800-370-7979
Byron Seed	888-836-3697
Cimarron USA	800-874-7945
CISCO Seed	800-888-2986
Columbia Seed	541-757-1468
Crop Productions Services	559-436-2941
Croplan Genetics	888-295-3011
Cropmark Seeds NZ	64-3-347-7950
Dahlco Seeds	888-324-5261
Dairyland Seed Co.	800-236-0163
DLF-International Seeds	800-445-2251
FFR Cooperative	765-589-3123
Garst Seed Co.	888-464-2778
Hyland Seed	800-265-7403
Legacy Seed	866-791-6390
Lewis Seed Co.	541-491-3700
Midvalley Ag Prod.	541-752-2408
Monsanto	800-768-6387
Mycogen Seeds	800-692-6432
Nutech Seed	641-581-3350
Pioneer Hi-bred Int'l	800-247-6803
Producers Choice	888-675-3190
ProSeeds Marketing	541-928-9999
Renk Seed	800-289-7365
Rose Agri-Seed	503-651-2130
Seed Research of Oregon	800-253-5766
Smith Seed Services	888-550-2930
Spink Seed Co.	517-745-5804
Standish Milling	989-846-6911
Syngenta/NK Seeds	800-258-0498
Winfield Solutions	989-845-2093
W-L Research	800-406-7662

**Michigan State Alfalfa Variety Trial Yield (DM tons/acre)**  
**Upper Peninsula Exp. Sta., Chatham**  
 Sown Aug 2008  
 Non-irrigated

Entry	17-Jun	28-Jul	2011	2010	2009	total
Garst 6417	2.15	1.21	3.36	4.37	3.46	11.19
DKA33-16	2.20	1.23	3.42	4.29	3.38	11.09
Velocity	1.89	1.15	3.04	4.26	3.35	10.65
Garst 6431	2.07	1.30	3.37	4.12	3.44	10.93
Vernal	1.85	1.13	2.98	4.09	3.43	10.49
WL343HQ	2.07	1.15	3.22	4.33	3.09	10.64
DK140	1.86	1.08	2.94	3.94	3.34	10.21
Pioneer 55V48	1.89	1.21	3.11	4.04	3.11	10.26
AmeriStand 407TQ	2.12	1.14	3.27	4.06	3.04	10.36
Evergreen 3	1.86	1.01	2.87	3.78	3.05	9.70
Mean	2.10	1.16	3.16	4.13	3.27	10.6
CV%	12	15	13	10	14	12
LSD 5%	NS	0.25	NS	NS	NS	NS

Location: Upper Peninsula Exp. Sta., Alger Co.  
 Design: RCB, plot size: 3 x 24 (3 x 21 harvested)  
 Seeded: 8/1/08, 20 lbs. PLS/acre  
 Soil Type: Eben Very Cobbly Sandy Loam  
 Cuttings: three in 2009 & 2010  
 Fertility: 0-84-252 /acre

**Michigan State Alfalfa Variety Trial Yield (DM tons/acre)**  
**Upper Peninsula Exp. Sta., Chatham**  
 Sown July 2009  
 Non-irrigated

Entry	20-Jun	28-Jul	2011	2010	Total
5312	1.41	1.26	2.67	4.29	6.96
Pioneer 55V12	1.48	1.35	2.82	4.21	7.03
Pioneer 54Q32	1.53	1.26	2.41	4.11	6.52
Ameristand 403T	1.44	1.23	2.67	4.04	6.71
DKA 43-13	1.51	1.35	2.86	4.04	6.89
Pioneer 53H92	1.38	1.08	2.45	4.00	6.45
Mycogen 4A421	1.47	1.26	2.73	3.92	6.65
DK140	1.36	1.25	2.61	3.83	6.43
Velocity	1.51	1.26	2.77	3.83	6.60
Vernal	1.44	1.23	2.67	3.82	6.49
Pioneer 55V48	1.49	1.19	2.67	3.82	6.49
AmeriStand 407TQ	1.49	1.26	2.75	3.80	6.54
Mean	1.46	1.25	2.67	3.97	6.65
CV%	10	16	10	9	9
LSD 5%	NS	NS	0.43	NS	NS

Location: Upper Peninsula Exp. Sta., Alger Co.  
 Design: RCB, plot size: 3 x 20 (3 x 17 harvested)  
 Seeded: 7/30/09, 20 lbs. PLS/acre  
 Soil Type: Eben Very Cobbly Sandy Loam  
 Cuttings: three in 2010  
 Fertility: 0-84-252 /acre

**Michigan State Alfalfa Variety Trial Yields (DM tons/acre)**  
**Lake City, Missaukee Co., Mich. State Univ.**  
 Sown August 2008  
 Non-irrigated

Entry	8-Jun	8-Jul	24-Aug	2011	2010	2009	total
Garst 6431	1.49	0.62	0.71	2.82	4.60	2.09	9.50
Velocity	1.53	0.61	0.53	2.66	4.44	1.81	8.91
Pioneer 55V48	1.34	0.56	0.61	2.51	4.25	1.77	8.53
Pioneer 53H92	1.28	0.45	0.55	2.28	3.75	1.64	7.67
Vernal	1.24	0.53	0.58	2.35	3.42	1.41	7.18

Mean	1.38	0.55	0.59	2.52	4.09	1.74	8.36
CV%	26	13	18	16	11	11	8
LSD 5%	0.56	0.11	0.17	0.63	0.70	0.31	1

Location: Lake City Exp. Station, Lake City  
 Design: RCB, plot size: 3 x 25'(3 x22' harvested)  
 Seeded: 6-Aug-08  
 Cuttings: three in 2009, four in 2010  
 Soil Type: Nester sandy loam  
 Fertility: 0-65-195 + 2.5 boron lbs./acre  
 Insects: dimethoate applied prior to cut two

**Michigan State Alfalfa Variety Trial Yields (DM tons/acre)**  
**Lake City, Missaukee Co., Mich. State Univ.**  
 Sown April 2009  
 Non-irrigated

Entry	8-Jun	8-Jul	24-Aug	2011	2010	2009	total
FSG329	1.95	0.94	0.98	3.87	4.92	0.72	9.51
Syngenta 6422Q**	2.02	0.88	0.86	3.77	4.80	0.76	9.34
Pioneer 54Q32	2.01	0.96	0.96	3.94	4.48	0.70	9.12
LegenDairy 5.0	1.35	0.89	1.01	3.25	5.10	0.67	9.02
Velocity	1.85	0.93	0.92	3.70	4.46	0.68	8.84
4S417	1.61	0.81	0.96	3.38	4.79	0.63	8.80
Chesapeake	1.72	0.86	0.82	3.41	4.58	0.79	8.78
AmeriStand 407TQ	1.79	0.83	0.79	3.41	4.69	0.66	8.77
PLHR Check	1.63	0.83	0.88	3.34	4.56	0.86	8.76
DKA4313	2.00	0.87	0.90	3.78	4.12	0.63	8.52
AmeriStand 403T plus	1.48	0.69	0.70	2.87	4.68	0.71	8.25
Pioneer 55V48	1.73	0.81	0.78	3.32	4.29	0.54	8.15
Pioneer 55V12	1.53	0.76	0.87	3.16	4.36	0.61	8.14
DK140	1.55	0.69	0.73	2.96	4.20	0.63	7.80
Vernal	1.56	0.70	0.84	3.10	3.99	0.61	7.70
Mean	1.72	0.83	0.87	3.42	4.53	0.68	8.63
CV%	25	20	16	17	15	33	16
LSD 5%	0.63	0.23	0.20	0.86	1.10	NS	NS

Location: Lake City Exp. Station, Lake City  
 Design: RCB, plot size: 3 x 25'(3 x22' harvested)  
 Seeded: 24-Apr-09  
 Cuttings: two in 2009, four in 2010  
 Soil Type: Nester sandy loam  
 Insects: dimethoate applied prior to cut one and two  
 \*\*Seeded as an experimental cultivar with breeder selected seed



**Michigan State Alfalfa Variety Trial Yields (DM tons/acre)**  
**Lake City, Missaukee Co., Mich. State Univ.**  
 Sown May 2010  
 Non-irrigated

Entry	8-Jun	12-Jul	24-Aug	2011	2010	total
4A415	2.99	1.29	1.29	5.57	1.70	7.27
4S417	2.87	1.25	1.28	5.40	1.54	6.95
403T	2.62	1.30	1.25	5.18	1.75	6.93
5312	2.52	1.29	1.23	5.04	1.53	6.57
HybriForce-2400	2.89	1.12	1.19	5.20	1.27	6.47
PLH-resistant check	2.60	1.17	1.21	4.98	1.45	6.43
Syngenta 6305Q	2.69	1.13	1.15	4.97	1.35	6.31
Vernal	2.58	1.17	1.18	4.94	1.25	6.19
DG4210	2.55	1.12	1.10	4.77	1.37	6.14
Garst 6417	2.40	1.03	1.23	4.66	1.19	5.85
DG3210	2.43	1.12	1.14	4.69	1.09	5.78
Mean	2.65	1.18	1.21	5.04	1.41	6.44
CV%	8	18	17	9	17	10
LSD 5%	0.31	NS	NS	0.66	0.35	0.94

Location: Lake City Exp. Station, Lake City  
 Design: RCB, plot size: 3 x 25'(3 x 22' harvested)  
 Seeded: 17-May-10  
 Soil Type: Nester sandy loam

**Michigan State Alfalfa Variety Trial Yields (DM tons/acre)**  
**Lake City, Missaukee Co., Mich. State Univ.**  
 Sown May 2011  
 Non-irrigated

Entry	12-Jul	24-Aug	2011
Pionner 55v50	0.40	1.10	1.50
Vernal	0.31	1.17	1.48
DG4210	0.30	1.10	1.40
Sonic	0.29	1.08	1.37
PLH-resistant check	0.35	1.01	1.36
Pioneer 55V12	0.35	1.01	1.36
5312	0.45	0.83	1.28
Pioneer 54Q32	0.29	0.98	1.28
Pioneer 55H94	0.32	0.94	1.26
AmeriStand 407TQ	0.31	0.94	1.26
<hr style="border-top: 3px double black;"/>			
Mean	0.34	1.02	1.36
CV%	25	19	17
LSD 5%	0.12	0.29	0.34

Location: Lake City Exp. Station, Lake City  
 Design: RCB, plot size: 3 x 25'(3 x22' harvested)  
 Seeded: 4-May-11  
 Soil Type: Nester sandy loam

**Michigan State Alfalfa Variety Trial Yield (DM tons/acre)**  
**North Branch, Lapeer Co.**  
 Sown Apr 2008  
 Non-irrigated

Entry	6-Jun	30-Jun	2-Aug	30-Aug	2011	2010	2009	total
Pioneer 55V48	2.41	1.44	1.89	1.23	6.96	8.31	8.44	23.71
FSG505	2.60	1.49	1.93	1.28	7.30	8.22	8.16	23.67
Ameristand 407TQ	2.33	1.53	1.97	1.19	7.01	8.07	8.45	23.53
PGI 459	2.23	1.49	2.02	1.28	7.02	8.33	7.80	23.14
Garst 6552	2.18	1.52	1.94	1.21	6.84	8.12	7.95	22.91
WL343HQ	2.49	1.51	1.91	1.21	7.12	7.84	7.92	22.88
WL363HQ	2.31	1.50	1.87	1.20	6.88	8.03	7.96	22.86
Ascend	2.16	1.48	1.96	1.22	6.81	7.81	7.97	22.59
Genoa	2.33	1.54	1.91	1.15	6.93	7.91	7.57	22.41
FSG406	2.41	1.38	2.02	1.16	6.96	7.43	7.93	22.31
Garst 6417	2.23	1.42	1.81	1.11	6.56	7.53	7.76	21.85
FSG351	2.02	1.27	1.79	1.25	6.33	7.57	7.93	21.83
Velocity	2.18	1.45	1.78	1.14	6.55	7.43	7.73	21.72
DKA43-13	2.17	1.46	1.68	1.02	6.33	7.64	7.61	21.58
FSG528SF	2.08	1.32	1.68	1.10	6.17	7.52	7.86	21.55
DK140	2.21	1.29	1.70	1.09	6.29	7.24	7.95	21.47
FSG408DP	2.27	1.26	1.84	1.19	6.56	7.50	7.36	21.42
5312	2.14	1.10	1.45	1.07	5.76	7.07	7.53	20.36
PLH-resistant check	2.06	0.97	1.52	0.79	5.33	6.32	7.53	19.18
Vernal	2.02	0.83	1.31	0.97	5.13	6.66	6.90	18.69
Mean	2.24	1.36	1.80	1.14	6.54	6.95	7.81	21.98
CV%	11	12	12	15	10	8	8	8
LSD 5%	0.38	0.22	0.30	0.25	0.94	0.89	0.84	2.44

Location: Chris Howland Farm  
 Design: RCB, plot size 3 x 25' (3 x 22' harvested)  
 Seeded: 4/24/2008  
 Cuttings: four cuttings in 2009, five in 2010  
 Soil Type: Brookston Loam  
 Fertility: 0-78-234 + 3 boron lbs/acre  
 Insects: Dimethoate applied after cut 1

**Michigan State Alfalfa Variety Trial Yield (DM)**  
**Capac, St. Clair Co.**  
 Sown May 2011  
 Non-irrigated

Entry	15-Jul	22-Aug	2011
5312	1.69	1.62	3.31
Pioneer 54Q32	1.61	1.39	3.00
PLH-resistant check	1.68	1.44	3.12
Pioneer 55V12	1.62	1.40	3.02
Pioneer 55v50	1.76	1.44	3.20
AmeriSta	1.77	1.51	3.28
DG4210	1.89	1.58	3.47
Gunner	1.75	1.40	3.16
HybriF	2.06	1.47	3.53
Legendar	1.92	1.42	3.33
Prolific	2.18	1.70	3.88
Rebound6	2.09	1.44	3.53
Sonic	2.09	1.50	3.59
Vernal	2.01	1.62	3.63
WL354HQ	1.71	1.45	3.16
WL363HQ	1.72	1.40	3.12

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Mean	1.85	1.49	3.33
CV%	13	15	12
LSD 5%	0.33	0.31	0.59

Location: Stuever Farm  
 Design: RCB, plot size 3 x 25' (3 x 22' harvested)  
 Seeded: 5/7/2011  
 Soil Type: Miami-Dighton sandy loam  
 Insects: Warrior applied prior to cut 1

**Michigan State Alfalfa Variety Trial Yield (DM tons/acre)**  
**East Lansing, Ingham Co.**  
 Sown Aug 2008  
 Non-irrigated

Entry	31-May	28-Jun	1-Aug	14-Sep	2011	2010	2009	3-yr. total
FG45M322	2.14	1.90	1.44	1.64	7.13	9.02	7.81	23.95
FG45M116	2.05	1.81	1.26	1.49	6.62	8.24	8.15	23.01
HybriForce 2400**	1.84	1.59	1.24	1.72	6.39	7.74	8.52	22.65
4S417**	1.85	1.62	1.14	1.53	6.14	7.60	8.17	21.91
msSunstra 807	1.95	1.56	1.11	1.62	6.25	7.26	7.96	21.47
Pioneer 55V48	1.89	1.49	1.10	1.46	5.94	7.48	7.79	21.20
Garst 6417	1.86	1.79	1.26	1.40	6.31	7.40	7.47	21.18
Velocity	1.82	1.61	1.13	1.43	5.99	7.58	7.45	21.02
WL363HQ	1.87	1.62	1.14	1.55	6.17	7.37	7.46	21.00
Garst 6431	1.67	1.58	1.14	1.67	6.06	7.04	7.70	20.80
L447HD	1.69	1.52	1.11	1.44	5.76	7.05	7.96	20.77
Genoa	1.87	1.52	1.13	1.51	6.03	7.57	7.15	20.75
DKA4313	1.74	1.53	1.12	1.56	5.95	7.12	7.34	20.42
GH727	1.78	1.38	1.04	1.49	5.69	7.33	7.20	20.22
Garst 6552	1.65	1.58	1.07	1.48	5.78	6.96	6.64	19.38
PGI 459	1.67	1.57	1.05	1.41	5.70	6.72	6.93	19.35
Garst 6415	1.73	1.44	0.98	1.29	5.44	6.86	6.81	19.10
L333HD	1.57	1.46	1.03	1.53	5.59	6.03	7.28	18.89
5312	1.57	1.25	0.87	1.45	5.13	5.61	6.64	17.38
Vernal	1.44	1.22	0.86	1.38	4.90	5.25	5.92	16.06

Mean	1.78	1.55	1.11	1.50	5.95	7.16	7.42	20.53
CV%	7	13	11	11	8	8	7	6
LSD 5%	0.18	0.27	0.16	0.22	0.63	0.77	0.68	1.70

Location: Mich. State Univ. Exp. Station, East Lansing  
 Design: RCB, plot size 3 x 25' (3 x 22' harvested)  
 Seeded: 8/5/2008  
 Soil Type: Capac loam, tile drainage  
 Cuttings: four in 2009, five in 2010  
 Fertility: 0-78-234 + 3 boron lbs/acre  
 Insects: dimethoate applied prior to cuts two and three

\*Experimental Cultivar

\*\*Seeded as an experimental cultivar with breeder selected seed

**Michigan State Alfalfa Variety Trial Yield**  
**East Lansing Potato Leafhopper-Resistant Alfalfa Trial**  
 Sown Apr 2008  
 Non-irrigated

Entry	DM tons/acre								% of
	31-May	28-Jun	1-Aug	14-Sep	2011	2010	2009	total	Vernal
Commercial Check†	1.94	2.31	1.57	1.05	6.87	7.75	4.58	19.20	179
Pioneer 53H92	1.84	1.85	1.33	0.86	5.89	6.57	5.59	18.04	168
Garst 6426	1.60	2.03	1.40	0.81	5.84	6.59	5.40	17.84	166
Evergreen 3	1.67	1.83	1.26	0.87	5.63	6.35	5.35	17.33	162
Vernal	0.94	1.12	0.85	0.52	3.43	3.87	3.43	10.73	100
Mean	1.60	1.83	1.28	0.82	5.53	6.23	4.87	16.63	
CV%	10	10	15	19	11	11	10	10	
LSD 5%	0.23	0.29	0.30	0.24	0.89	1.10	0.77	2.62	

Location: Mich. State Univ. Exp. Station, East Lansing  
 Design: RCB, plot size 3 x 25' (3 x 22' harvested)  
 Seeded: 4/28/2008  
 Soil Type: Capac loam, tile drainage  
 Cuttings: four in 2009, five in 2010  
 Fertility: 0-78-234 + 3 boron lbs/acre  
 Insects: moderate PLH pressure in 2011  
 † Commercially avail., non-PLH resistant check

**Michigan State Alfalfa Variety Trial Yield (DM tons/acre)**  
**East Lansing, Ingham Co.**  
 Sown May 2009  
 Non-irrigated

Entry	2-Jun	1-Jul	4-Aug	6-Sep	2011	2010	2009	3-yr. total
Syngenta 6422Q**	1.92	2.20	1.93	1.59	7.65	8.15	3.24	19.04
Pioneer 55V48	2.17	1.96	1.85	1.59	7.56	7.90	3.18	18.64
FG 46M446*	1.96	2.00	1.85	1.52	7.33	8.24	2.90	18.46
AmeriStand 407TQ	1.83	2.11	1.90	1.59	7.43	7.64	3.15	18.22
HybriForce 2400	1.98	1.96	1.69	1.50	7.13	7.31	3.76	18.20
Pioneer 55V12	2.03	2.14	1.66	1.47	7.30	7.35	3.52	18.17
WL363HQ	1.89	1.98	1.90	1.50	7.27	7.65	3.21	18.13
Radiance HD**	1.78	2.00	1.82	1.52	7.12	7.74	3.26	18.12
msSunstra-901*	2.12	2.07	1.67	1.47	7.32	7.42	3.31	18.05
Chesapeake	1.89	1.93	1.81	1.43	7.06	7.53	3.34	17.92
LegenDairy 5.0	1.82	1.96	1.73	1.53	7.04	7.19	2.97	17.20
PLH-resistant check	1.70	1.87	1.56	1.30	6.42	7.05	3.72	17.20
5454	1.80	2.01	1.44	1.33	6.57	7.20	3.28	17.06
Pioneer 54Q32	1.69	2.03	1.59	1.37	6.69	7.23	2.97	16.89
4S417	1.77	1.94	1.47	1.42	6.60	7.00	3.28	16.88
HybriForce 807exp*	1.80	1.82	1.57	1.34	6.53	6.75	3.36	16.64
DK140	1.79	1.64	1.64	1.34	6.42	6.84	3.36	16.61
AmeriStand 403T Plus	1.85	1.96	1.47	1.32	6.60	6.70	3.05	16.35
CW044026*	1.80	1.81	1.52	1.37	6.50	6.94	2.64	16.09
Velocity	1.67	1.64	1.62	1.26	6.19	6.79	2.81	15.79
KingFisher 243	1.74	1.89	1.61	1.29	6.52	6.75	2.47	15.74
Everlast II	1.68	1.62	1.59	1.31	6.21	6.58	2.81	15.60
5312	1.78	1.72	1.52	1.40	6.42	6.12	2.75	15.29
OneidaVR	1.64	1.66	1.32	1.19	5.81	5.91	2.55	14.28
Vernal	1.47	1.45	1.25	1.30	5.47	4.70	1.98	12.15
Mean	1.82	1.89	1.64	1.41	6.77	7.07	3.07	16.91
CV%	10	17	12	10	9	12	17	10
LSD 5%	0.26	0.46	0.26	0.20	0.86	1.10	0.75	2.50

Location: Mich. State Univ. Exp. Station, East Lansing  
 Design: RCB, plot size 3 x 25' (3 x 22' harvested)  
 Seeded: 5/12/2009  
 Cuttings: three in 2009, five in 2010  
 Soil Type: Capac loam, tile drainage  
 Fertility: 0-78-234 + 3 boron lbs/acre  
 Insects: dimethoate applied after cut 1

\*Experimental Cultivar

\*\*Seeded as an experimental cultivar with breeder selected seed

**Michigan State Alfalfa Variety Trial Yield**  
**East Lansing Potato Leafhopper-Resistant Alfalfa Trial**  
 Sown May 2009  
 Non-irrigated

Entry	DM tons/acre								% of Vernal
	2-Jun	1-Jul	4-Aug	6-Sep	2011	2010	2009	total	
non-PLHR check†	1.67	1.61	1.55	1.36	6.18	7.04	1.06	14.28	138
Pioneer 53H92	1.53	1.42	1.41	1.39	5.76	6.41	1.35	13.52	131
FSG420LH	1.50	1.44	1.52	1.47	5.93	6.36	1.07	13.36	129
WL353LH	1.50	1.44	1.45	1.34	5.73	6.33	0.96	13.02	126
FG44H375	1.35	1.42	1.45	1.45	5.68	6.00	1.16	12.84	124
5454	1.43	1.37	1.29	1.15	5.24	6.26	0.62	12.12	117
Vernal	1.25	1.08	1.30	1.11	4.73	5.18	0.42	10.33	100
Mean	1.46	1.39	1.42	1.33	5.61	6.23	0.95	12.78	
CV%	9	11	9	12	7	10	32	8	
LSD 5%	0.19	0.22	0.19	0.24	0.58	0.81	0.45	1.44	

Location: Mich. State Univ. Exp. Sta., East Lansing  
 Design: RCB, plot size 3 x 25' (3 x 22' harvested)  
 Seeded: 5/12/2009  
 Cuttings: two in 2009, five in 2010  
 Soil Type: Capac loam, tile drainage  
 Fertility: 0-78-234 + 3 boron lbs/acre  
 Insects: moderate PLH pressure in 2011

\*percent yield of Vernal

† Commercially avail., non-Potato leafhopper resistant check



**Michigan State Alfalfa Variety Trial Yield (DM tons/acre)**  
**East Lansing, Ingham Co.**  
 Sown April 2010  
 Non-irrigated

Entry	2-Jun	1-Jul	4-Aug	6-Sep	2011	2010	2-yr. Total
DSA08M*	2.43	1.97	1.84	1.70	7.95	5.81	13.77
4S417	2.20	1.85	1.75	1.71	7.52	5.32	12.83
WL363HQ	2.22	1.90	1.77	1.58	7.46	5.07	12.53
PLH-resistant check	2.03	1.71	1.63	1.52	6.90	5.01	11.91
HybriForce-2400	2.06	1.84	1.63	1.59	7.13	5.09	12.22
Garst 6417	2.26	1.87	1.76	1.60	7.48	4.88	12.36
5312	2.11	1.74	1.64	1.57	7.06	4.77	11.83
Kingfisher 4020	2.27	1.84	1.70	1.56	7.37	4.87	12.24
WL343HQ	1.94	1.79	1.65	1.50	6.88	4.67	11.54
FG 46M329*	2.26	2.06	1.84	1.69	7.85	4.71	12.56
DG 4210	1.98	1.96	1.86	1.68	7.49	4.76	12.25
FG 46M126*	2.03	1.91	1.78	1.53	7.26	4.58	11.84
FG 46M328*	2.16	2.00	1.84	1.59	7.60	4.61	12.21
DKA4313	2.07	1.96	1.76	1.62	7.42	4.51	11.93
Vernal	2.12	1.56	1.42	1.44	6.54	4.34	10.88
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Mean	2.14	1.86	1.73	1.59	7.33	4.87	12.19
CV%	16	5	5	7	7	7	7
LSD 5%	0.49	0.14	0.12	0.15	0.72	0.49	1.13

Location: Mich. State Univ. Exp. Station, East Lansing  
 Design: RCB, plot size 3 x 25' (3 x 22' harvested)  
 Seeded: 4/2/2010  
 Cuttings: three in 2010  
 Soil Type: Capac loam, tile drainage  
 Fertility: 0-78-234 + 3 boron lbs/acre  
 Insects: dimethoate applied prior to and after cut 1

\*Experimental Cultivar

\*\*Seeded as an experimental cultivar with breeder selected seed

**Michigan State Alfalfa Variety Trial Yield**  
**East Lansing Potato Leafhopper-Resistant Alfalfa Trial**  
 Sown Apr 2010  
 Non-irrigated

Entry	DM tons/acre							% of Vernal
	1-Jun	1-Jul	4-Aug	6-Sep	2011	2010	Total	
Pioneer 53H92	1.84	1.72	1.66	1.34	6.56	4.72	11.28	117
Garst 6426	1.62	1.72	1.66	1.44	6.43	4.44	10.87	113
non-PLH-R check†	2.06	1.77	1.77	1.46	7.06	4.26	11.33	117
Syngenta 6475H	1.67	1.57	1.69	1.38	6.31	4.15	10.45	108
Vernal	1.89	1.43	1.39	1.17	5.88	3.77	9.65	100
Mean	1.82	1.64	1.64	1.36	6.45	4.27	10.72	
CV%	19	4	5	5	6	6	5	
LSD 5%	0.50	0.11	0.12	0.11	0.60	0.40	0.75	

Location: Mich. State Univ. Exp. Sta., East Lansing  
 Design: RCB, plot size 3 x 25' (3 x 22' harvested)  
 Seeded: 4/2/2010  
 Cuttings: three in 2010  
 Soil Type: Capac loam, tile drainage  
 Fertility: 0-78-234 + 3 boron lbs/acre  
 Insects: moderate PLH pressure in 2011

† Commercially avail., non-potato leafhopper resistant check

**Michigan State Alfalfa Variety Trial Yield (DM tons/acre)**  
**East Lansing, Ingham Co.**  
 Sown June 2011  
 Non-irrigated

Entry	1-Aug	7-Sep	total
DSB08-M	1.26	1.77	3.03
Prolific	1.18	1.81	2.98
PLH-resistant check	1.13	1.60	2.73
msSunstra-803	0.99	1.74	2.73
Pioneer 55v50	1.11	1.61	2.73
Sonic	0.98	1.73	2.71
AS407TQ	1.14	1.47	2.61
WL354HQ	0.87	1.55	2.42
Pioneer 55V12	0.87	1.54	2.42
LegenDairy 5.0	0.90	1.50	2.40
CW 064004	0.90	1.48	2.38
PGI 557	0.91	1.45	2.36
Syngenta 6422Q	0.86	1.45	2.31
403T	0.85	1.43	2.28
Vernal	0.83	1.44	2.27
TS4013	0.78	1.47	2.25
Oneida VR	0.79	1.39	2.18
DG 4210	0.78	1.36	2.14
Pioneer 54Q32	0.78	1.36	2.14
Rebound 6.0	0.74	1.32	2.06
Gunner	0.73	1.28	2.01
DSB-45	0.68	1.17	1.85
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Mean	0.91	1.50	2.41
CV%	28	12	16
LSD 5%	0.37	0.25	0.56

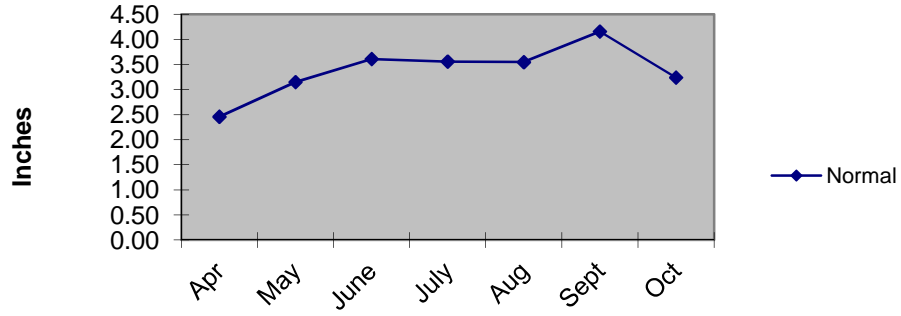
Location: Mich. State Univ. Exp. Station, East Lansing  
 Design: RCB, plot size 3 x 25' (3 x 22' harvested)  
 Seeded: 6/2/2011  
 Soil Type: Capac loam, tile drainage  
 Insects: Warrior applied prior to cut 1  
 \*Experimental Cultivar  
 \*\*Seeded as an experimental cultivar with breeder selected seed

**Michigan State Alfalfa Variety Trial Yield**  
**East Lansing Potato Leafhopper-Resistant Alfalfa Trial**  
 Sown June 2011  
 Non-irrigated

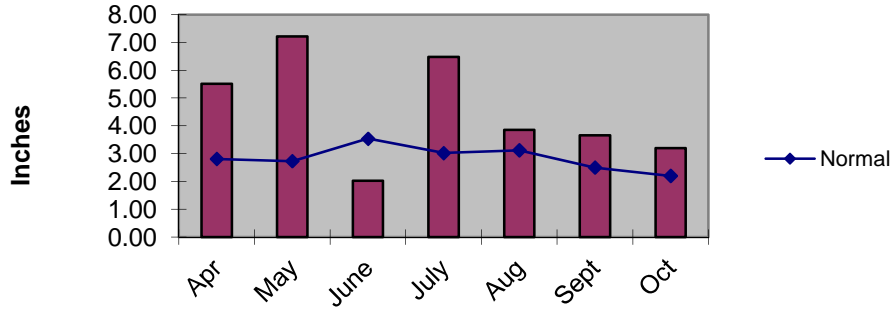
Entry	DM tons/acre			% of Check*
	1-Aug	7-Sep	Total	
403T	0.68	1.51	2.19	107
Pioneer 55H94	0.89	1.43	2.31	113
non-resistant check†	0.63	1.38	2.00	98
AmeriStand 409LH	0.70	1.24	1.94	95
Syngenta 6475H	1.17	1.55	2.73	133
Syngenta 6422Q	0.82	1.34	2.16	106
Vernal	0.62	1.43	2.05	100
WL353LH	0.67	1.65	2.33	114
Mean	0.77	1.44	2.21	
CV%	18	8	9	
LSD 5%	0.19	0.19	0.30	

Location: Mich. State Univ. Exp. Sta., East Lansing  
 Design: RCB, plot size 3 x 25' (3 x 22' harvested)  
 Seeded: 6/2/2011  
 Soil Type: Capac loam, tile drainage  
 Insects: moderate PLH pressure in 2011  
 \*percent yield of Vernal  
 † commercially avail., non-Potato leafhopper resistant

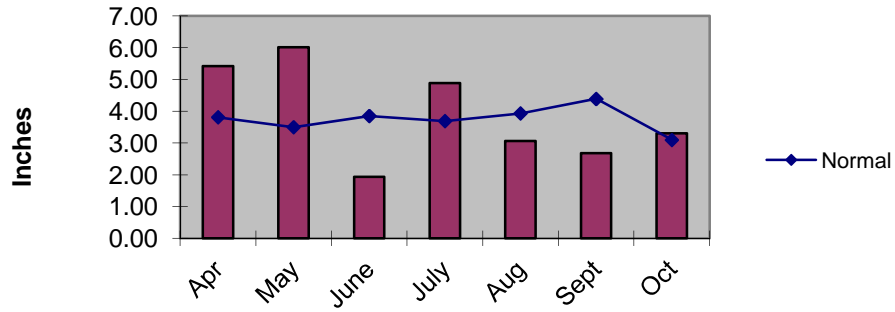
### Chatham Rainfall 2011



### East Lansing Rainfall 2011



### KBS Rainfall 2011



**Forage yield of perennial grass species seeded May 2009 in East Lansing, MI without irrigation.**

<i>Species/Marketer</i>	<i>Cultivar</i>	cut 1	cut 2	cut 3	2011	2010	2009	total
<i>Kentucky bluegrass</i>		DM tons/acre						
check	Ginger	2.48	0.71	0.59	3.78	4.29	0.29	8.35
Rose Agri-Seed, Inc.	Big Blue	2.05	0.71	0.58	3.33	2.99	0.06	6.37
<i>Meadow / Tall fescue</i>								
CISCO Seeds	Goliath (TF)	1.52	1.47	0.95	3.94	6.05	1.89	11.87
check	KY31E+ (TF)	1.41	1.38	0.91	3.70	6.11	1.21	11.03
check	Pradel (MF)	1.73	0.79	0.54	3.06	5.03	1.51	9.60
AMPAC Seed	Preval (MF)	1.70	0.57	0.49	2.76	4.72	1.26	8.73
<i>Meadow/hybrid brome</i>								
CISCO Seeds	MacBeth	1.30	0.73	0.70	2.73	5.06	1.33	9.12
check	Montana	1.17	0.64	0.60	2.41	4.52	1.49	8.41
<i>Orchardgrass</i>								
check	Potomac	1.09	1.12	0.90	3.11	5.57	1.34	10.02
Smith Seed	Persist	1.16	1.12	0.99	3.27	5.48	1.38	10.13
Radix Research	RAD LCF25	0.58	1.39	0.97	2.93	5.42	1.38	9.73
<i>Perennial Ryegrass</i>								
Columbia Seed	RAD CPS211	1.03	0.72	0.60	2.35	2.28	1.11	5.74
check	Calibra	1.12	0.61	0.50	2.22	2.21	0.81	5.25
check	Linn	1.59	0.39	0.48	2.45	1.71	0.76	4.92
	Mean	1.42	0.88	0.70	3.00	4.39	1.13	8.52
	CV%	40	15	21	19	10	25	8
	LSD (0.05)†	0.82	0.19	0.21	0.81	0.6	0.4	1.05

Design: RCB, plot size 3 x 25 (3 x 22 harvested), w/o irrigation

Seeded/Soil Type: 5/13/09 Capac loam, tile drainage

Fertilizer: 200 lbs N/a. (50 lbs/A at green-up, 50 lbs/A after cuts 1, 2, and 3)

Cuttings: three in 2009, four in 2010

† 95% certain that values which are separated by a number greater than the LSD are different

**Forage yield and grazing preference of pasture species seeded March 2010 in Hickory Corners, MI.**

Cultivar(s)	species	24-May	21-Jun	25-Jul	16-Aug	2011	2010	2-yr Total	Preference**		
									cut 1	cut 2	cut 4
Potomac	OR	1.63	2.14	1.61	1.19	6.58	1.56	8.14	3.0	3.4	2.9
Maxigraze_Haymate	Alfalfa, OR	1.83	2.01	1.20	1.45	6.49	1.40	7.89	3.4	3.0	3.5
Midwestern Grazer mix	OR,Fest,PR, MRC,WC	1.25	2.10	0.97	1.42	5.73	1.90	7.63	3.1	2.1	3.4
Zorro	Ital. Ryegrass	1.54	1.73	0.54	0.91	4.72	2.52	7.24	3.8	2.0	2.5
RADLCF25	OR	1.04	2.16	1.28	0.93	5.41	1.44	6.85	3.3	3.4	2.5
Persist_ladino	OR, Ladino White Clover	1.30	2.10	1.33	1.23	5.95	0.90	6.85	3.0	2.8	2.6
Grass Master mix	TF, OR,PR,Fest	Smith See	2.45	0.85	1.01	5.34	1.43	6.77	2.8	3.4	3.1
Jump Start mix	PR,Fest, Ital.Ryegrass	Smith See	2.08	0.91	0.53	4.44	1.48	5.92	3.9	2.3	2.0
Persist	OR	check	1.61	0.83	1.32	5.02	0.76	5.78	3.6	2.6	3.4
Feast II	Ital. Ryegrass	0.70	1.29	1.36	0.80	4.14	1.61	5.75	4.4	2.4	3.0
Oasis	chicory	0.71	1.75	1.82	1.11	5.39	.	5.39	3.4	2.3	1.4
Power	PR,Fest, Ital.Ryegrass	0.55	1.61	1.30	0.52	3.97	0.91	4.88	4.3	2.3	3.8
AC Knowles	Hybrid Brome	0.93	1.34	0.82	1.04	4.13	0.75	4.88	3.3	2.0	2.4
Pradel	Meadow Fescue	0.79	1.37	0.96	0.63	3.75	1.08	4.83	3.1	4.8	3.0
MacBeth	Meadow Brome	0.98	1.19	0.89	1.08	4.14	0.65	4.79	2.9	3.0	2.0
Preval	Meadow Fescue	0.89	1.38	0.62	0.60	3.48	1.14	4.62	2.4	4.4	2.1
	Mean	1.08	1.77	1.08	0.99	4.92	1.29	6.14	3.3	2.9	2.7
	CV%	27	20	28	32	17	19	14	11	24	35
	LSD (0.05)†	0.42	0.50	0.43	0.44	1.20	0.38	1.30	0.5	1	1.3

Design: legume/grass mixtures in separate block, RCB for grass only, plot size 3 x 25ft

Seeded/Soil Type: 3/31/2010, Kalamazoo loam

Fertilizer: 150 lbs N/a. (50 lbs/A at emergence, 50 lbs/A after cuts one and three)

Cuttings: three in 2010

\*Visual rating (6/8/2010) based on percentage of ground cover of planted species (5=best)

\*\*Visual rating after 24 hrs of grazing (5=grazed close, 1= not grazed)

† 95% certain that values which are separated by a number greater than the LSD are statistically different

OR:orchardgrass, PR:perennial ryegrass, Fest:festulolium, TF:tall fescue, MRC:medium red clover,WC:white clover

**Forage yield of annual ryegrass species seeded**

May 2011 in East Lansing without irrigation.

Breeder/Marketer	Entry	6-Jul	9-Aug	13-Sep	Total
DM tons/acre					
DLF	ISLWT13	1.35	1.15	1.11	3.62
DLF	ISLWT20	1.42	1.12	1.04	3.58
Smith Seed	Verdure	1.27	1.09	0.97	3.33
Smith Seed	Ed	1.59	0.88	0.63	3.10
check	Feast	0.19	0.18	0.22	0.59
Mean		1.16	0.88	0.80	2.84
CV%		15	15	21	12
LSD (0.05)†		0.27	0.21	0.25	0.56

Design: RCB, plot size 3 x 25' (3 x 22' harvested)

Seeded: 5-May-11

Soil Type: Colwood-Brookston, tile drainage

Fertility: 150 lbs N/a. (50 lbs/A following emergence, 50 lbs/A after cuts 1-2)

† 95% certain that values which are separated by a number greater than the LSD are statistically different



**Red clover yield (tons dry matter/acre) in East Lansing, seeded in May 2009**

Cultivar	Marketer	9-Jun	13-Jul	17-Aug	2011	2010	2009	total
Emerald*	Calwest	2.78	0.93	0.82	4.53	7.98	2.95	15.47
Starfire II	AMPAC	2.53	0.85	0.84	4.22	7.68	2.83	14.72
Arlington	Olds Seed	2.07	0.52	0.85	3.44	7.73	2.64	13.81
Dominion	Olds Seed	2.53	0.63	0.83	3.99	7.51	2.78	14.28
Cardinal	Olds Seed	2.62	0.61	0.74	3.97	7.47	2.67	14.11
RC0005*	FFR	2.69	0.81	0.80	4.29	7.26	2.69	14.24
RC0303G*	FFR	2.72	0.89	0.83	4.44	7.19	2.62	14.25
RC0004*	FFR	2.38	0.72	0.79	3.89	7.10	2.48	13.47
Michigan common	public	1.66	0.39	0.70	2.75	6.50	2.10	11.34
<b>Average</b>		<b>2.44</b>	<b>0.71</b>	<b>0.80</b>	<b>3.95</b>	<b>7.38</b>	<b>2.64</b>	<b>13.97</b>
<b>CV</b>		<b>12</b>	<b>18</b>	<b>15</b>	<b>10</b>	<b>7</b>	<b>8</b>	<b>6</b>
<b>LSD (0.05)</b>		<b>0.41</b>	<b>0.19</b>	<b>NS</b>	<b>0.56</b>	<b>0.76</b>	<b>0.32</b>	<b>1.35</b>

Location: Mich. State Univ. Exp. Station, Ingham County

Design: RCB, plot size 3 x 25' (3 x 22' harvested)

Seeded: 5/12/2009

Soil Type: Capac, tile drainage

Cuttings: three in 2009, four in 2010

\*Released cultivar seeded with experimental seed

\*\* 1 to 5 with 5 being 80-100% stand

**Red clover yield (tons dry matter/acre) in East Lansing,  
seeded in Apr 2010**

Cultivar	9-Jun	13-Jul	17-Aug	2011	2010	Total
Cinnamon +	2.58	1.09	1.36	5.04	4.36	9.39
DFRC3	2.51	1.25	1.39	5.15	4.29	9.44
DFRC1	2.29	1.25	1.21	4.75	4.14	8.89
Marathon	2.71	1.17	1.16	5.04	4.07	9.11
DFRC4	2.62	1.28	1.23	5.13	3.98	9.11
DFRC5	2.36	1.13	1.21	4.70	3.91	8.61
DFRC2	2.80	1.07	1.15	5.02	3.65	8.67
MI common	2.20	1.10	0.71	4.01	3.49	7.49
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Average	2.51	1.17	1.18	4.85	3.99	8.84
CV	12	11	11	8	7	6
LSD (0.05)	0.43	0.2	0.19	0.59	0.43	0.78

Location: Mich. State Univ. Exp. Station, Ingham County  
 Design: RCB, plot size 3 x 25' (3 x 22' harvested)  
 Seeded: 4/2/2010  
 Soil Type: Capac, tile drainage  
 Cuttings: three in 2010