

FORAGE VARIETIES FOR MICHIGAN IN 2005

Richard Leep, Tim Dietz, Doo Hong Min, and Christian Kapp

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 2.5 million acres of Michigan farmland is dedicated to forage production with a total value of the forage harvested or grazed from this land of approximately \$600 million. By acreage, forages are the number one crop in the state. Perennial forages help prevent soil erosion and protect water quality. 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, holds or declines. Increasing the profit margin requires good management and improved varieties to increase yields.

Michigan State University has established over twenty-five research trials in five locations across the state to evaluate management practices and varieties in an unbiased manner. Yield, persistence, and forage quality are the primary components that are compared in these trials. There are five primary locations for forage variety trials including: Chatham at the Upper Peninsula Experiment Station, Lake City at the Lake City Experiment Station, Saginaw at the Saginaw Bean and Beet Experiment Station, East Lansing at the Crop and Soil Science Teaching and Research Facility, and Hickory Corners at the Kellogg Biological Station.

2004 Conditions

Growing conditions in 2004 varied greatly across the state. Winter injury was evident throughout the southern portions of the state; likely caused by cold, snow-less periods. The south central portion through the thumb area of the state experienced a cool-wet spring and a very dry late-summer with precipitation levels 3-5 inches below normal for the period of Apr.-Sept. Lake City had near optimal rainfall which was much-needed following several summers with below-normal rainfall. Chatham (UPES) received below-normal rainfall in the months of June and July while seasonal temperatures were near-normal. Growers struggled to put up dry hay in the first and second cutting due heavy rainfall and cool temperatures, which resulted in a surplus of low-quality hay. Figure 1. contains rainfall data from each site where alfalfa varieties were evaluated.



EVALUATION OF ALFALFA VARIETIES

Michigan State University has evaluated more than 106 commercially available alfalfa varieties in its alfalfa variety trials since 1999. 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, Sandusky in the Thumb of Michigan, Saginaw in east central Michigan and Chatham at the Upper Peninsula Experiment Station (UPES).

Most of the varieties entered are evaluated at East Lansing and these trials are usually two to three times larger than trials in other sites in the state. Yield is expressed in dry matter tons per acre as an average over two or three years for 69 alfalfa varieties seeded at East Lansing from 1999-2002 and single year data is presented from the 2003 seeding (Table 1). Yield of 36 varieties seeded at Lake City from 1999-2003 is provided in Table 2, and 3-year yield averages of varieties evaluated at Sandusky are presented in Table 3 along with seeding year data from Saginaw. Table 4 contains yield results from varieties evaluated in 2001 and 2003 at the Upper Peninsula Experiment Station in Chatham.

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, this pest “rains” 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 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 additional 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 2000, 2002 and 2003 PLH-resistant variety trials established in East Lansing are presented in Table 5. No insecticide was applied to these trials.

Alfalfa Cutting Management

Selecting an appropriate alfalfa variety for an environment requires careful consideration. Yield and persistence of an alfalfa variety are only a part of establishing and maintaining an alfalfa stand. Good management practices are also important. Even the best alfalfa variety will not perform well under poor management conditions. Establish good stands on adequately drained soils. Adjust soil pH a full year prior to seeding. Fertilize before seeding 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.

Three cuttings per year:

Three cuts per year is the best cutting system in Michigan for long-term stands with good yields if fertilized adequately with potassium. Forage quality in a three-cut system should be adequate for beef cows, dairy replacement heifers and dry cows but may be too high in fiber (over 40% NDF) for high producing dairy cows. Alfalfa stands intended for long-term use, greater than five years, should not be cut more than three times per year. In addition, alfalfa stands in northern Michigan should not be cut more than three times per year. Recommended dates of the third and final cutting are different for northern and southern Michigan. Cutting schedules and approximate stages of maturity with three cuttings are:

Southern Lower and Central Michigan:

1st cutting -- June 1-5 (early bloom)

2nd Cutting -- July 10-20 (1/10 bloom)

3rd Cutting -- August 25-October 15 (1/10 to full bloom)

Upper Peninsula and Northern Lower Peninsula:

1st Cutting -- June 10-20 (late bud to early bloom)

2nd Cutting -- July 25 - August 15 (1/10 to 1/5 bloom)

3rd Cutting -- September 30 - October 15 (1/10 to full bloom)

Four cuttings per year:

Four cuttings per year are recommended for the highest yields of high quality alfalfa for three- to five-year stands in southern Lower Michigan. Four cuttings will usually produce 15 percent higher yields than the standard three-cut system and with higher forage quality. Best results are achieved with excellent drainage and high fertility of phosphorous and especially potassium. Four cuttings per year are not recommended for areas in northern Lower Michigan (north of Clare) or the Upper Peninsula. A four-cut harvest schedule in northern Michigan may result in lower yields, decreased stand life, and increased weed invasion after the first year. A four cut schedule will result in a more ideal forage quality of 20% crude protein, 30% acid detergent fiber, and 40% neutral detergent fiber (20-30-40). Alfalfa with a nutritive value of (20-30-40) is ideal for high producing dairy cows.

The cutting schedule for four cuts per year in Southern Michigan south of Clare is:

1st Cutting -- late May - June 5 (late bud to very early bloom)

2nd Cutting -- July 5-15 (early bloom to 1/10 bloom)

3rd Cutting -- August 15-25 (early to 1/10 bloom)

4th Cutting – follow this web site for new recommendations on the best time to take the fourth cutting

www.msue.msu.edu/fis/extension_documents/Alfalfafallcut.htm

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 risks 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). If this is found to be true it could extend the Michigan growing season for alfalfa. 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 1).

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. Table 6. contains a table of disease resistance ratings for varieties evaluated for yield at MSU and a brief description follows.

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 fungus 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 (*Ditylenchus dipsaci*) is a pest that is less common than the aforementioned but can potentially reduce older alfalfa stands. Stem nematode is a microscopic pest that occurs in the soil. Symptoms of nematode damage include stunted plants and club-like stems. Crop rotation is the best method for controlling stem nematode.

EVALUATION OF OTHER LEGUMES

Birdsfoot trefoil is a two-cut perennial legume that persists in heavy soils or soils that are poorly drained. Trials evaluating birdsfoot trefoil in Lake City and East Lansing were established in 1998, 1999, and 2001. Multi-year yield averages from this trial are presented in Table 7. Thirteen varieties of red clover were evaluated in Michigan from 2001 to 2004 in East Lansing and Lake City. Red clover is a good species for pasture renovation or works well as a short term hay or haylage crop. Red clover produces greater yield in the seeding year than alfalfa but tends to persist only for two years. Improved varieties under proper management may persist beyond three years. Table 8 contains dry matter yield and stand rating results for trials seeded in East Lansing and Lake City in 2001 and seeding year data from the 2004 East Lansing trial. Table 9 contains data from kura, ladino and white clover trials established in Chatham, Lake City and KBS. Kura, ladino, and white clover are perennial legumes that persist well under frequent grazing, however, graziers will need to be cautious with these clovers since they have a high potential to cause bloat.

EVALUATION OF COOL-SEASON GRASS VARIETIES

Perennial Grasses

Seven species of cool-season grasses were evaluated in four locations in Michigan for forage yield, palatability, and persistence. Grasses fill an important niche in Michigan animal agriculture, however, grass species/cultivar yield and persistence comparisons have only begun to be made in Michigan. The goal of this research is to provide an

unbiased evaluation of grass yield and palatability. Seven species of grasses predominate Michigan pastures. A brief description of each is provided below.

Festulolium (*Festulolium braunii*, K.A.) 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.) 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.) 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.

Perennial ryegrass (*Lolium perenne* L.) 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. 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 are using it as part of their pasture mix. Soils that are high in fertility and are moderately well drained are ideal for this species. Hot and dry conditions will cause perennial ryegrass to go dormant. Supplemental irrigation can increase perennial ryegrass yields.

Smooth brome grass (*Bromus inermis* Leyss.) 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 fescue (*Festuca arundinacea* Schreb.) 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.

Timothy (*Phleum pratense* L.) is a bunch grass that forms an open sod and persists well under high moisture conditions. It is best known for its winterhardiness and ability to survive when covered by ice. Timothy should be grown with a legume, such as alfalfa, red clover or birdsfoot trefoil. Long rest periods between harvest and grazing are required for timothy to rebuild carbohydrate reserves thus making it more suitable for a two-cut system of harvest.

During the late-summer of 2001, varieties of seven species of cool-season grasses were seeded at Chatham (Upper Peninsula Exp. Sta.), Lake City, and East Lansing. New variety trials were established in East Lansing and Lake City in 2003. Each of the grasses [i.e., festulolium (30 lbs./acre), orchardgrass (15 lbs./acre), timothy (6 lbs./acre), perennial ryegrass (30 lbs./acre), hard fescue (15 lbs./acre), and tall fescue (15 lbs./acre)] were seeded in a randomized complete block design using three (Chatham, Lake City) or four replications (East Lansing). One hundred-fifty lbs. of ammonium sulfate (34-0-0) was applied at green-up and following cuts 1-3. Dry matter yields (multiyear averages) and winter injury ratings are compiled in Table 10.

Livestock producers will be able to use results of this study to select grass species for pasture improvements. Festulolium cultivars appear to exhibit a good combination of the yield characteristics of fescue and palatability of ryegrass. Livestock producers should consider this new species in their seeding mixture when reseeding pastures.

Annual Grasses

In the spring of 2002, Michigan State University began testing annual ryegrass in East Lansing. Many producers in Michigan are including a forage crop in a corn-soybean rotation to improve soil tilth, reduce problematic weeds and breakup insects/nematodes. Annual ryegrass fits in well with this rotation as a “fast-starter” that can produce 5+ tons of dry matter.

A trial was established May 19, 2003 in East Lansing to evaluate forage yield and quality of eight annual ryegrass varieties. Varieties were seeded in 3 by 24 ft. plots arranged in a randomized complete block design at a seeding rate of 25 lbs./acre.

Nitrogen was applied at green-up (50 lbs N/acre) after it was apparent that all plots had survived the winter. The 2003 annual ryegrass variety trial was harvested one time in 2004 (Table 11).

Statistics Explained

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 preformed the best. The LSD or least significant difference (found below the mean) is the minimum value between varieties for a “real” difference to exist. The confidence level for all LSD’s expressed herein is 95%. Comparisons of varieties that were seeded in different years is not recommended due to differences in rainfall and temperatures between years.

Figure 1. Monthly Rainfall Total by Location

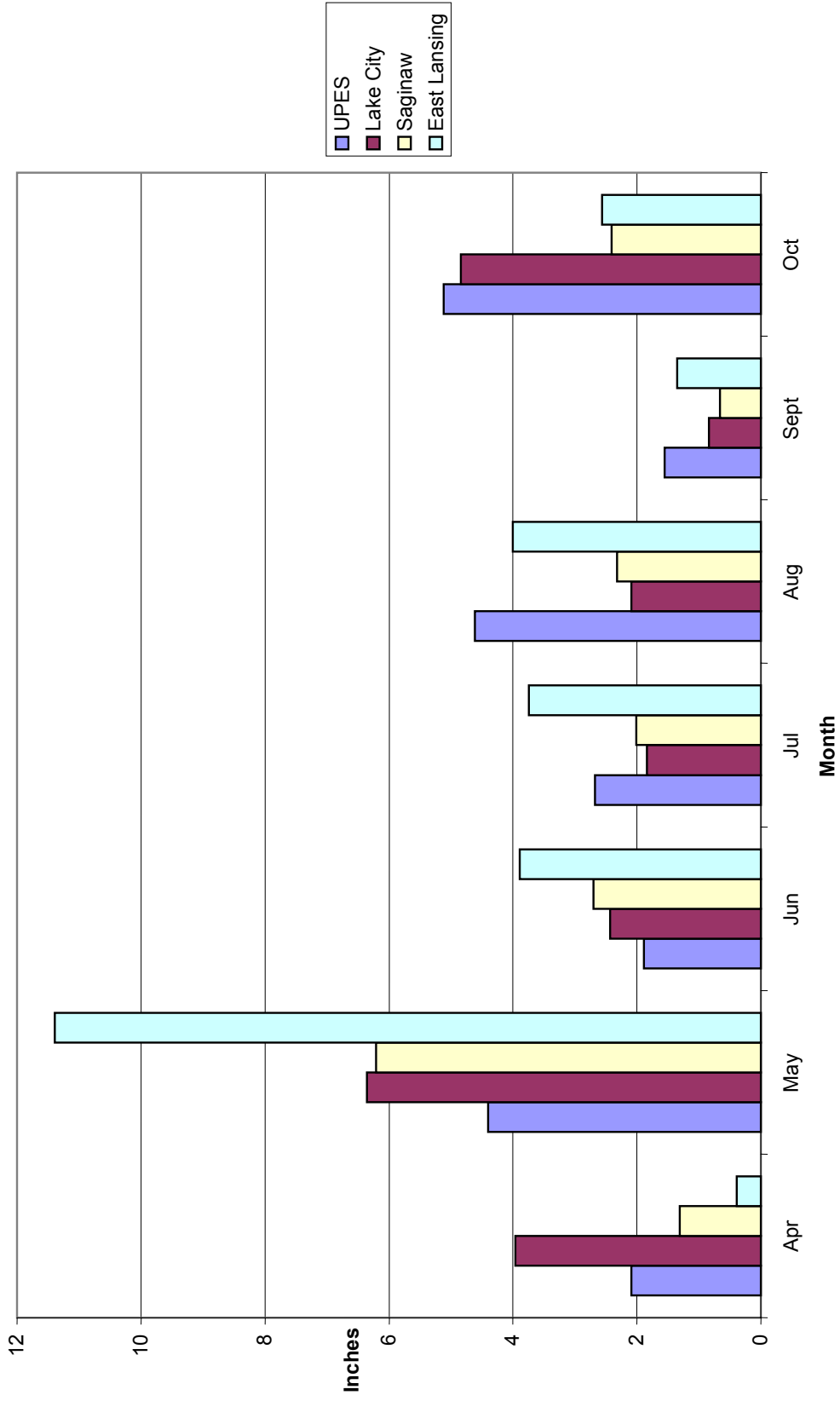


Table 1. East Lansing Alfalfa Variety Trials (dry matter tons/acre)

Variety	Marketer	3-yr. Ave			2-yr Ave 02 seeding	1-yr Total 03 seeding
		99 seeding	00 seeding	01 seeding		
4200	AV Seeds	-	6.91	-	-	-
9429	LG Seeds	-	-	6.73	-	-
9701	Geertson Seed	6.95	-	-	-	-
Abacus	Brett-Young Seeds LTD.	-	-	6.65	-	-
Abound	Monsanto	6.56	-	-	-	-
Abundance	BioPlant Research	-	-	7.14	-	-
Alfatar II	Steyer Seeds	-	-	-	-	7.98
Amerigaurd 302 +Z	America's Alfalfa	5.63	-	-	-	-
Ameristand 403T	America's Alfalfa	-	6.51	-	-	-
Award	Monsanto	6.54	-	-	-	-
Awesome	LG Seeds	6.58	-	-	-	-
Cimarron VL400	Great Plains Research	-	-	-	-	7.67
Dakota	Great Plains Research	-	-	-	-	7.84
DK134	Monsanto	6.50	7.23	-	-	-
DK140	Monsanto	7.07	-	-	-	-
DK141	Monsanto	6.49	-	-	-	-
DKA33-16	Monsanto	-	-	-	-	8.07
DKA42-15	Monsanto	-	-	7.29	-	-
DKA50-18	Monsanto	-	-	-	-	8.33
Enhancer	Arrow Seed	6.92	-	-	-	-
Everlast	Legacy Seeds	-	-	-	-	7.62
Extreme	LG Seeds	-	-	-	-	7.95
Feast+EV	Garst Seed Co.	-	-	6.70	-	-
Forecast 1001	Dairyland Seed Co.	7.19	-	-	-	-
Forecast 3001	Dairyland Seed Co.	7.37	-	-	-	-
FQ315	Mycogen Seeds	6.91	-	-	-	-
Garst 631	Garst Seed Co.	6.47	-	-	5.98	-
Garst 6415	Garst Seed Co.	-	-	-	-	8.41
Garst 6420	Garst Seed Co.	7.08	-	7.53	6.47	-
Geneva	Syngenta	-	7.03	-	-	-
GH744	Golden Harvest Seeds	-	-	-	6.12	-
GH788	Golden Harvest Seeds	-	6.71	-	-	-
GoldLeaf	BioPlant Research	-	6.96	-	-	-
Guardsman	Quality Seeds	-	-	6.78	-	-
HybriForce 400	Dairyland Seed Co.	-	-	7.10	6.26	-
HybriForce 420/Wet	Dairyland Seed Co.	-	-	-	-	7.73
LegenDairy YPQ	Croplan Genetics	-	-	7.32	6.59	-
Magnum V Wet	Dairyland Seed Co.	-	6.61	-	-	-
MagnumV	Dairyland Seed Co.	6.52	-	-	-	-
Nova	Great Plains Research	-	-	-	-	7.78
Oneida Ultra	Public	-	-	6.41	-	-
Phabulous	Trelay Seed Co.	-	6.61	7.09	-	-
Phabulous II	Trelay Seed Co.	-	-	-	-	7.85
Phirst	BioPlant Research	-	-	-	-	7.51
Pioneer 5312	Pioneer Hi-breds Int'l	6.57	6.35	-	-	-
Pioneer 53Q60	Pioneer Hi-breds Int'l	6.92	-	-	-	-

Table 1. East Lansing Alfalfa Variety Trials (dry matter tons/acre)

Variety	Marketer	3-yr. Ave			2-yr Ave 02 seeding	1-yr Total 03 seeding
		99 seeding	00 seeding	01 seeding		
Pioneer 54Q25	Pioneer Hi-breds Int'l	-	-	-	-	8.01
Pioneer 54V46	Pioneer Hi-breds Int'l	-	-	-	6.26	8.07
Pioneer 54V54	Pioneer Hi-breds Int'l	7.22	7.05	-	-	-
Platinum	Channel Bio Corp.	6.81	-	6.75	-	-
Pointer	Dahlco	7.20	-	-	-	-
Power 4.2	Power Seeds	-	-	-	-	8.2
Pristine	Trelay Seed Co.	-	6.92	-	-	-
Radiant	Ampac Seed Co.	-	6.88	-	-	-
Ripin	Dairyland Seed Co.	-	6.80	-	-	-
Rocket	Growmark	7.42	-	-	-	-
Root 66	Trelay Seed Co.	-	-	6.77	-	-
Saranac	Public	-	5.63	-	-	-
Skriveru	Latvia Univ.	-	-	-	-	5.7
Somerset	Syngenta	-	7.14	-	-	-
Starbuck	Pickseed Canada, Inc.	-	-	7.60	-	-
Target II plus	Producers Hybrids	-	-	-	-	-
Vernal	Public	5.34	6.23	6.43	5.29	6.58
Webfoot Supreme	Great Lakes Hybrid	-	6.31	-	-	-
WinterGold	Renk Seed Co.	7.07	-	-	-	-
WL319HQ	Mich. State Seed Sol./W-L Res.	-	-	-	6.27	-
WL327	Mich. State Seed Sol./W-L Res.	7.22	-	-	-	-
WL342	Mich. State Seed Sol./W-L Res.	-	-	7.53	-	-
WL357	Mich. State Seed Sol./W-L Res.	-	-	-	-	8.17
	Mean	6.77	6.70	6.99	6.16	7.76
	LSD (0.05)	0.70	0.55	0.59	0.56	0.58

Table 2. Lake City Alfalfa Variety Trials (dry matter tons/acre)

Variety	Marketer	3-yr. Ave.			2-yr. Ave. 02 seeding	1-yr. Total 03 seeding
		99 seeding	00 seeding	01 seeding		
A30-06	PGI Alfalfa	-	2.91	-	-	-
Abound	Monsanto	2.36	-	-	-	-
Ameristand 403T	America's Alfalfa	-	3.17	2.49	-	-
Award	Monsanto	2.18	-	-	-	-
DK 134	Monsanto	2.13	2.74	-	-	-
DK 140	Monsanto	2.37	-	-	-	-
DK 141	Monsanto	2.33	-	-	-	-
DKA42-15	Monsanto	-	-	2.51	-	-
FQ 315	Mycogen Seeds	2.52	-	-	-	-
Garst 620	Garst Seeds	-	-	2.49	2.99	-
Guardman	Quality Seeds	-	-	2.70	-	-
HybriForce-400	Dairyland Seed	-	-	2.50	3.00	-
HybriForce-420/Wet	Dairyland Seed					4.09
LegenDairy YPQ	Croplan Genetics	-	-	2.65	-	-
Magnum V Wet	Dairyland	-	2.81	-	-	-
Monument II	Geertson Seed	-	2.80	-	-	-
Multiplier III	Mycogen Seeds	-	2.76	-	-	-
Oneida	Public	-	2.99	-	-	-
Oneida Ultra	Public	-	-	2.62	-	-
Oneida VR	Public	2.05	-	2.46	-	-
Pioneer 5312	Pioneer Hi-breds Int'l	2.36	-	2.65	-	-
Pioneer 53Q60	Pioneer Hi-breds Int'l	2.59	-	-	-	-
Pioneer 54Q25	Pioneer Hi-breds Int'l	-	-	-	-	4.46
Pioneer 54H91	Pioneer Hi-breds Int'l	-	-	-	2.99	3.75
Pioneer 54V46	Pioneer Hi-breds Int'l	-	-	-	-	4.30
Pioneer 54V54	Pioneer Hi-breds Int'l	2.60	2.84	-	2.8	-
Pointer	Dahlco	-	2.84	-	-	-
Preferred	Public	-	-	2.39	-	-
Saranac	Public	2.31	-	2.62	-	-
Seedway 9558	Cornell Univ.	-	-	2.53	-	-
Skrivera	Latvia Univ.	-	-	-	-	3.92
Somerset	Syngenta	-	-	-	-	4.34
Starbuck	Pickseed Canada, Inc.	-	-	2.55	-	-
Vernal	Public	2.57	-	2.48	2.78	4.15
WL319HQ	Mich. State Seed Sol./W-L Res.	-	-	-	-	4.13
WL342	Mich. State Seed Sol./W-L Res.	-	-	-	2.68	-
	Mean	2.36	2.87	2.55	2.87	4.14
	LSD (0.05)	0.38	NS	0.38	NS	0.41

Table 3. Sandusky/Saginaw Alfalfa Variety Trials (dry tons/acre)

Variety	Marketer	3-yr. Ave 00 seeding	1-yr. Total* 04 seeding
Abound	Monsanto	5.99	-
ABT350	Allied Seed	6.08	-
Ameristand 403T	America's Alfalfa	6.46	-
Award	Monsanto	5.97	-
DK134	Monsanto	5.77	-
DK140	Monsanto	5.82	-
DK141	Monsanto	6.12	-
FQ314	Mycogen Seeds	6.38	-
Garst 631	Garst Seeds	6.25	-
Garst 6420	Garst Seeds	6.37	-
Geneva	Syngenta	6.20	-
Haygrazer	Great Plains Research	6.02	-
HybriForce 420/Wet	Dairyland Seeds	-	4.09
Multiplier III	Mycogen Seeds	6.31	-
OneidaVR	Public	5.74	-
Pioneer 5312	Pioneer Hi-bred Int'l	6.45	-
Pioneer 53Q60	Pioneer Hi-bred Int'l	5.97	-
Pioneer 54H91	Pioneer Hi-bred Int'l	-	3.75
Pioneer 54Q25	Pioneer Hi-bred Int'l	-	4.46
Pioneer 54V46	Pioneer Hi-bred Int'l	-	4.30
Pioneer 54V54	Pioneer Hi-bred Int'l	6.26	-
Platinum	Channel Bio Corp.	6.08	-
Rocket	Growmark	6.33	-
Saranac	Public	5.81	-
Skriveru	Latvia Univ.	-	3.92
TMF Multiplier II	Mycogen Seeds	5.90	-
TMF421	Mycogen Seeds	5.99	-
Vernal	Public	5.99	4.15
WL319HQ	Mich. State Seed Sol./W-L Res.	-	4.13
WL327	Mich. State Seed Sol./W-L Res.	6.16	-
	Mean	6.10	4.11
	LSD (0.05)	0.41	0.31

*Seeding year data from Saginaw

Table 4. Chatham Alfalfa Variety Trials (dry matter tons/acre)

Variety	Marketer	3-yr. Ave. '01 seeding	1-yr. Total '03 seeding
Ameristand		-	
403T	America's Alfalfa		4.33
Attention	Ampac Seed	-	4.41
Baralfa 32IG	Barenbrug USA	-	4.20
Baralfa 42	Barenbrug USA	-	4.39
Dynamic	Grassland Central	-	4.25
Extend	Spangler Seedtech	-	4.10
Garst 620	Garst Seed	-	4.39
Guardsman	Cornell Univ.	3.83	-
LHR100	Spangler Seedtech		4.21
Oneida Ultra	Public	3.77	-
Pioneer 5312	Cornell Univ.	3.81	-
Pioneer 54H91	Pioneer Hibred Int'l	-	4.60
Pioneer 54V46	Pioneer Hibred Int'l	-	4.31
Preferred	Cornell Univ.	3.90	-
Prolific	Bio Plant Research	-	4.41
Radiant	Ampac Seed	-	4.46
Saranac	Public	3.39	-
Skriveru	Latvia Univ.	-	3.39
Starbuck	Pickseed Canada,Inc.	4.11	4.42
Vernal	Public	3.44	4.02
WL 319 HQ	WL Research	-	4.32
WL 357 HQ	WL Research	-	4.72
WRV 931	Wolf River Valley Seed	-	4.05
	Mean	3.75	4.28
	LSD (0.05)	0.4	0.33

Table 5. East Lansing Potato leafhopper Resistant Alfalfa Variety Trials (dry matter tons/acre)

Variety	Marketer	3-yr. Ave '00 seeding	2-yr. Ave '02 seeding	1-yr. Total '03 seeding
4375LH	Mycogen Seeds	-	-	7.29
DKA37-20	Monsanto	-	5.82	-
Evergreen 2	Syngenta	-	-	7.99
Garst 631	Garst Seed	5.37	-	-
Garst 6310	Garst Seed	4.83	-	-
Garst 6325	Garst Seed	-	-	6.93
Garst 6420	Garst Seed	5.24	-	-
Multiplier III	Mycogen Seeds	5.47	-	-
Pioneer 5312**	Pioneer Hi-bred	5.37	5.21	-
Pioneer 53H81	Pioneer Hi-bred	5.38	-	-
Pioneer 54H91	Pioneer Hi-bred	-	5.72	7.37
Saranac**	Public	3.76	-	-
Vernal**	Public	4.88	4.66	5.50
WL 346 LH	W-L Research	-	-	8.00
	Mean	5.03	5.35	7.18
	LSD	0.60	0.38	0.54

**Non-PLH resistant checks

Table 6. Fall dormancy (FD) and disease resistance ratings* for alfalfa cultivars in MSU variety trials (*BW* = *Bacterial Wilt*, *PRR* = *Phytophthora Root Rot*, *AN* = *Anthraco*se, *VW* = *Verticillium Wilt*, *FW* = *Fusarium Wilt*, *APH*=*Aphanomyces*)

Variety	FD	BW	PRR	AN	VW	FW	APH	WSI†	Found in table
4200	4	HR	HR	HR	HR	HR	HR	-	1
4375LH	4	HR	HR	HR	HR	HR	HR	-	5
9429	4	R	HR	HR	R	HR	-	2.9	1
9701	3	R	HR	R	R	HR	-	-	1
A30-06	3	HR	HR	HR	HR	HR	HR	1.8	1
A 395	3	HR	HR	HR	R	HR	HR	-	1
Abacus	3	HR	HR	HR	HR	HR	HR	-	1
Abound	3	HR	HR	HR	HR	HR	HR	2.5	1,2,3
Abundance	4	HR	HR	R	R	HR	R	3.3	1
ABT 350	3	HR	HR	HR	HR	HR	HR	-	3
ABT 400 SCL	4	HR	HR	HR	HR	HR	HR	-	1
Affinity + Z	4	HR	HR	HR	HR	HR	R	2.8	1
Alfastar II	4	HR	HR	HR	R	HR	HR	-	1
Ameriguard 302+Z	3	HR	HR	HR	HR	HR	HR	-	1
Ameristand 403T	4	HR	HR	HR	HR	HR	HR	2.0	1,2,3
Attention	5	HR	R	R	R	HR	R	-	4
Award	4	HR	HR	HR	HR	HR	R	-	1,2,3
Awesome	4	HR	HR	HR	HR	HR	HR	-	1
Baralfa 32IQ	3	HR	HR	HR	R	HR	-	2.9	4
Baralfa 42IQ	4	HR	HR	HR	HR	HR	HR	1.9	4
Choice	4	HR	HR	R	HR	R	-	-	1
Cimarron VL400	4	HR	HR	HR	R	HR	HR	-	1
Dakota	4	R	HR	MR	MR	R	-	3.3	1
DK 124	3	HR	HR	HR	HR	HR	HR	2.8	1
DK 134	3	HR	HR	HR	HR	HR	HR	2.6	1,2,3
DK 140	4	HR	HR	HR	R	HR	HR	2.8	1,2,3
DK 141	4	HR	HR	HR	HR	HR	HR	-	1,2,3
DKA33-16	3	HR	HR	HR	HR	HR	HR	-	1
DKA37-20	4	HR	HR	HR	HR	HR	R	-	5
DKA42-15	4	HR	HR	HR	HR	HR	HR	2.5	1,2
DKA50-18	5	HR	HR	HR	HR	HR	HR	-	1
Dynamic	2	HR	HR	HR	HR	HR	HR	-	4
Emperor	4	HR	HR	HR	HR	HR	HR	2.6	1
Enhancer	4	HR	HR	R	R	HR	MR	2.5	1
Evergreen 2	4	HR	HR	HR	HR	HR	HR	-	5
Everlast	4	HR	HR	HR	R	HR	R	-	1
Extend	4	HR	HR	HR	HR	HR	HR	3.3	4
Extreme	2	HR	HR	HR	HR	HR	HR	-	1
Forecast 1001	4	HR	HR	R	R	HR	R	3.0	1
Forecast 3001	3	HR	HR	R	R	HR	R	3.1	1

Table 6. Fall dormancy (FD) and disease 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=Aphanomyces*)

Variety	FD	BW	PRR	AN	VW	FW	APH	WSI†	Found in table
FQ 314	3	HR	HR	HR	HR	HR	HR	3.0	1,3
FQ 315	3	HR	HR	HR	R	HR	HR	-	1,2
Garst 620	2	HR	HR	HR	R	R	R	2.7	2
Garst 631	4	HR	HR	R	R	R	MR	3.6	1,3,5
Garst 6310	3	HR	HR	HR	HR	HR	HR	-	5
Garst 6325	3	HR	HR	HR	HR	HR	R	-	5
Garst 6415	4	HR	HR	HR	HR	HR	HR	-	1
Garst 6420	4	HR	HR	HR	HR	HR	R	1.5	1,3,5
Garst Feast EV	3	HR	HR	HR	R	HR	HR	2.2	1
Geneva	4	HR	HR	HR	HR	HR	HR	2.8	1,3
GH 744	4	HR	HR	HR	HR	HR	HR	-	1
GH 788	3	HR	HR	HR	R	HR	HR	3.6	1
GoldLeaf	3	HR	HR	R	R	HR	R	2.9	1
Guardsmen	3	HR	HR	-	HR	-	-	-	1,2,4
HayGrazer	4	HR	R	R	R	HR	MR	-	3
HybriForce 400	4	HR	HR	R	HR	HR	-	2.8	1,2
HybriForce 420/Wet	4	HR	HR	R	R	HR	R	3.1	1
LegenDairy YPQ	3	HR	HR	HR	HR	HR	MR	-	1,2
LHR100	3	HR	HR	HR	HR	HR	-	-	4
Magnum V	4	HR	HR	R	R	HR	MR	3.1	1
Magnum V WET	3	HR	HR	R	R	HR	R	3.2	1,2
Mainstay	3	HR	HR	HR	HR	HR	R	-	1
Monument II	4	R	R	S	LR	HR	-	3.0	2
Multiplier III	3	HR	HR	HR	R	HR	HR	2.7	2,3,5
Nova	4	HR	HR	R	R	HR	R	-	1
Oneida	2	HR	HR	-	-	R	S	-	2
Oneida VR	3	R	MR	MR	HR	HR	-	-	2,3
Oneida Ultra	4	HR	R	R	HR	HR	S	-	1,2,4
Phabulous	4	HR	HR	HR	HR	HR	HR	-	1
Phabulous II	4	HR	HR	HR	HR	HR	HR**	-	1
Phirst	4	HR	HR	HR	R	HR	R	-	1
Pioneer var. 5312	3	HR	HR	HR	HR	HR	-	-	1-5
Pioneer var. 53H81	3	HR	HR	HR	HR	HR	HR	-	5
Pioneer var. 53Q60	3	HR	HR	HR	R	HR	R	3.1	1,2,3
Pioneer var. 53V63	3	HR	HR	HR	HR	HR	HR	-	1
Pioneer var. 54H91	4	HR	HR	HR	HR	R	LR**	3.0	5
Pioneer var. 54Q25	4	HR	HR	HR	HR	HR	R	-	1,3
Pioneer var. 54V46	4	R	HR	HR	HR	HR	HR	-	1
Pioneer var. 54V54	4	HR	HR	HR	HR	HR	MR	2.7	1,2,3
Platinum	4	HR	HR	HR	HR	HR	HR	-	1,3
Pointer	3	HR	HR	HR	R	HR	HR	-	1,2

Table 6. Fall dormancy (FD) and disease 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=Aphanomyces*)

Variety	FD	BW	PRR	AN	VW	FW	APH	WSI†	Found in table
Power 4.2	4	HR	HR	R	R	HR	HR	-	1
Pristine	4	HR	HR	HR	R	R	R	-	1
Prolific	3	HR	HR	HR	HR	HR	R	3.1	4
Radiant	4	HR	HR	HR	HR	HR	HR	-	1,4
Ripin	4	HR	HR	R	R	HR	-	-	1
Rocket	4	HR	HR	HR	HR	HR	HR	2.8	1,2
Root 66	4	HR	HR	R	HR	HR	HR	2.0	1
Saranac	4	R	-	-	-	-	-	-	1-5
Seedway 9558	3	HR	R	HR	HR	HR	-	-	1
Somerset	3	HR	HR	HR	HR	HR	HR	2.4	1
Spirit	3	HR	HR	R	R	HR	MR	-	1
Starbuck	3	HR	HR	HR	R	HR	HR	-	1,2,4
Target II plus	3	HR	HR	R	R	HR	MR	-	1
TMF 421	2	HR	HR	HR	HR	R	HR	-	4
TMF Multiplier II	3	HR	HR	HR	HR	HR	HR	-	3
Vernal	2	R	-	-	-	MR	S	2.0	1-5
Webfoot Supreme	4	R	R	R	R	R	LR	-	1
WinterGold	4	HR	HR	HR	HR	HR	HR	2.7	1
WL 232 HQ	2	HR	HR	HR	HR	HR	HR	2.9	1
WL 319 HQ	3	HR	HR	HR	HR	HR	HR	1.6	1
WL 325 HQ	3	HR	HR	HR	R	HR	R	3.0	1
WL 327	4	HR	HR	HR	R	HR	HR	-	1,3
WL 342	4	HR	HR	HR	HR	HR	HR	-	1
WL 346 LH	4	HR	HR	HR	HR	HR	MR	-	5
WL 357 HQ	5	HR	HR	HR	HR	HR	HR	2.1	4

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

** APH Race 1 and 2

† Winter survival index (U. of Wisc.): 1=superior winter survival 2=very good 3=good 4=adequate 5=low 6=no winter survival.

Table 7. Birdsfoot Trefoil Variety Results (dry matter tons/acre)

Variety	Marketer/Breeder	'98 seeding	'99 seeding	'01 seeding
		3-yr Ave. East Lansing	2-yr. Ave Lake City	3-yr. Ave. Lake City
AU Dewey	public	4.05	-	1.32
Viking	public	4.04	2.84	1.29
Leo	Werner Farm Seeds	3.66	2.71	1.28
OAC Bright	Univ. of Guelph	-	3.01	1.28
Norcen	public	3.91	2.75	1.28
Dawn	Deer Creek Seed	4.02	2.95	1.27
Mirabel	public	3.79	2.66	1.26
Empire	public	4.25	-	1.22
Georgia One	Deer Creek Seed	4.02	-	1.19
Pardee	Cornell Univ.	-	-	1.15
Maitland	public	4.29	-	-
AC Langille	public	4.01	-	-
Steadfast	Peterson Seed	3.41	-	-
Witt	Univ. of Wisconsin	3.66	2.83	-
Mean		3.93	2.82	1.25
LSD (0.05)		0.4	0.3	NS

Table 8. Red clover variety trials

Variety	Marketer	2003 stand rating East Lansing	dry matter tons/acre		
			'03 seeding 3-yr. Ave East Lansing	'03 seeding 3-yr. Ave** Lake City	'04 seeding 1-yr. total East Lansing
		1 to 9*			
Arlington	public	7.3	3.94	1.49	-
Cardinal	Mich. State Seed Sol./Seed Res. of OR	-	-	-	3.14
Cinnamon	FFR Cooperative	7.8	4.10	1.46	-
Common	public	5.8	3.15	1.43	3.20
Concorde	Quality Seeds, LTD.	6.0	3.87	-	-
Dominion	Mich. State Seed Sol./Seed Res. of OR	-	-	-	3.09
Emarwan	Turf-Seed, Inc.	7.3	3.77	1.46	-
FSG9601	Allied Seed	-	-	-	3.24
Marathon	public	8.5	3.86	1.46	-
Royal Red	FFR Cooperative	8.0	3.86	1.56	-
Star fire	AMPAC	-	-	-	2.97
Start	Barenbrug	-	-	-	1.87
Tyrant	Western Productions	7.8	4.10	1.52	-
Mean		7.1	3.83	1.48	2.92
LSD (0.05)		0.9	0.53	NS	0.16

* East Lansing Visual Rating 9= 90-100% stand; 1=0-10% stand

**Cutting history: One in 2001, two cuttings in 2002, one in 2003

Table 9. Clover variety trials (dry matter tons/acre) KBS and Lake City seeded: 2001, Chatham seeded 2002

Clover Type	Clover Variety	2002 KBS	2003 KBS	2002 Lake City	2003 Lake City	2003 Chatham	5-yr/loc Ave. yield
Kura	Endura	2.60	2.41	1.14	1.18	0.50	2.56
Red	Star Fire	3.11	3.16	1.35	1.16	2.42	3.53
Red	Start	3.28	2.77	1.55	1.23	2.33	3.51
Red	common	3.56	3.00	1.78	1.30	2.33	3.80
White	Kopu II	3.37	2.41	1.23	0.92	1.42	3.09
White	Alice	3.04	2.33	1.47	0.78	1.08	2.95
Ladino	Jumbo	3.43	2.20	1.40	0.86	1.01	3.01
Ladino	common	3.28	2.06	1.35	1.07	1.01	2.88
	Mean	3.07	2.54	1.41	1.06	1.51	3.17
	LSD	0.47	0.68	0.47	0.31	0.43	0.47

Table 10. Cool-season grass variety trials

Species	Marketer	Variety (ploidy)	dry matter ton/acre					2003		
			2001 2-yr. Ave	2001 3-yr. Ave Lake City	2001 3-yr. Ave. East Lansing	2003 1-yr. Total Lake City	2003 1-yr. Total East Lansing	2003 Winter Injury Chatham	2003 Winter Injury Lake City	
Festulolium	AMPAC Seed Co.	Duo	2.24	2.51	3.97	-	-	1.8	1.3	1 to 9*
Festulolium	DLF International Seed	Fojtan	-	-	-	1.68	-	-	-	-
Festulolium	DLF- Jenks	Hykor	3.03	3.19	-	-	-	1.3	1.0	-
Festulolium	Barenbrug	Kemal	-	-	4.05	-	-	-	-	-
Festulolium	DLF- Jenks	Lofa	-	2.36	4.55	-	-	-	-	3.8
Festulolium	AMPAC Seed Co.	PP14	-	2.43	5.19	-	-	-	-	2.0
Festulolium	Seed Solutions/Seed Res.of OR	Spring Green	-	2.64	4.02	-	-	-	-	2.0
Festulolium	Advanta Seeds	Tandem	-	-	4.11	-	-	-	-	-
Festulolium	Univ. of Wisc.	WFL-96	-	-	4.08	-	-	-	-	-
Hard Fescue	Ioka Farms, Inc.	Frazer	-	2.41	2.62	-	-	-	-	1.0
Hard Fescue	Ioka Farms, Inc.	Henry	-	1.98	1.95	-	-	-	-	1.3
Int. ryegrass	Smith Seed	Bestfor Plus (2n)	-	-	-	1.87	-	8.21	-	-
Orchardgrass	Deer Creek Seed	Albert	-	3.16	4.37	-	-	-	-	1.0
Orchardgrass	Mountain View Seeds	Alpine	-	-	-	0.98	-	4.92	-	-
Orchardgrass	DLF-Jenks	Amba	2.72	2.36	-	-	-	-	2.0	1.0
Orchardgrass	Cascade Int'l Seed	CAS-MG35	-	2.47	4.25	-	-	-	-	1.3
Orchardgrass	Seed Research of OR/Radix	Harvestar	-	-	-	1.48	-	7.47	-	-
Orchardgrass	Barenbrug USA	Intensiv	-	-	-	1.34	-	-	-	-
Orchardgrass	Mountain View Seeds	Lidacta	-	-	-	1.35	-	7.03	-	-
Orchardgrass	Turf-Seed Inc.	Megabite	-	2.64	4.14	-	-	-	-	1.0
Orchardgrass	DLF-Jenks	Niva	2.46	2.53	-	-	-	-	1.0	1.3
Orchardgrass	Seed Research of OR/Radix	OG9703	-	-	-	1.24	-	6.51	-	-

Table 10. Cool-season grass variety trials

Species	Marketer	Variety (ploidy)	dry matter ton/acre							
			2001 2-yr. Ave Chatham	2001 3-yr. Ave Lake City	2001 3-yr. Ave. East Lansing	2003 1-yr. Total Lake City	2003 1-yr. Total East Lansing	2003 Winter Injury Chatham	2003 Winter Injury Lake City	
Orchardgrass	Mountain View Seeds	Rushmore	-	-	-	1.45	-	7.07	-	-
Orchardgrass	DLF-Jenks	Sparta	2.54	2.87	-	-	-	-	1.0	1.0
Orchardgrass	Smith Seed Services	Takena	-	2.55	4.39	-	-	-	-	1.0
Orchardgrass	AMPAC Seeds Co.	Tekapo	2.70	2.57	3.97	-	-	-	1.3	1.0
P. Ryegrass	DLF-Jenks	Anton (4n)	-	2.17	3.47	-	-	-	-	2.0
P. Ryegrass	AMPAC Seed Co.	Aries (2n)	1.67	1.88	5.42	-	-	-	4.2	5.7
P. Ryegrass	Barenbrug	Barfort (4n)	-	2.17	-	-	-	-	-	3.0
P. Ryegrass	DLF-Jenks	Calibra (4n)	2.29	2.22	-	1.51	-	-	1.8	2.0
P. Ryegrass	Smith Seed Services	Grand Daddy (4n)	-	2.46	4.13	-	-	-	-	2.0
P. Ryegrass	Seed Sol./Seed Res. of OR	Herbie (2n)	-	-	3.18	-	-	-	-	-
P. Ryegrass	Barenbrug	Mara (2n)	3.01	2.80	-	-	-	-	2.0	2.0
P. Ryegrass	Cropmark	Matrix (2n)	-	-	-	-	-	5.10	-	-
P. Ryegrass	AMPAC Seed Co.	Maverick Gold (4n)	1.49	1.57	3.12	-	-	-	2.7	8.7
P. Ryegrass	Mountain View Seeds	MTV1 (4n)	-	-	-	1.61	-	6.53	-	-
P. Ryegrass	AMPAC Seed Co.	PP11	-	1.82	3.80	-	-	-	-	7.8
P. Ryegrass	AMPAC Seed Co.	PP12	-	2.24	3.70	-	-	-	-	2.0
P. Ryegrass	AMPAC Seed Co.	Quartet (4n)	1.82	1.87	5.09	-	-	-	2.7	7.2
P. Ryegrass	Latvia Univ.	Spidola (4n)	-	-	-	1.74	-	6.55	-	-
P. Ryegrass	DLF-Jenks	Storm (4n)	-	2.47	3.72	-	-	-	-	3.5
P. Ryegrass	AMPAC Seed Co.	Tonga (4n)	2.20	1.89	3.96	-	-	-	2.2	2.3
Tall Fescue	Barenbrug	Baroflex	2.83	2.13	-	-	-	-	1.0	1.3
Tall Fescue	AMPAC Seed Co.	Bronson	2.95	3.13	4.59	-	-	-	1.0	1.0

Table 10. Cool-season grass variety trials

Species	Marketer	Variety (ploidy)	dry matter ton/acre							
			2001 2-yr. Ave Chatham	2001 3-yr. Ave Lake City	2001 3-yr. Ave. East Lansing	2003 1-yr. Total Lake City	2003 1-yr. Total East Lansing	2003 Winter Injury Chatham	2003 Winter Injury Lake City	
Tall Fescue	Cascade Int'l Seed	CAS-MA54	-	2.73	4.55	-	-	-	-	1.3
Tall Fescue	Seed Solutions/Seed Res. of OR	Fawn	-	2.73	-	-	-	-	-	1.0
Tall Fescue	Pennington Seed	Jesup Max Q	-	-	-	1.14	-	5.67	-	-
Tall Fescue	AMPAC Seed Co.	K5666V	2.54	2.99	4.69	-	-	-	1.5	1.3
Tall Fescue	AMPAC Seed Co.	Kokanee	-	3.08	4.86	-	-	-	-	1.0
Tall Fescue	Turf-Seed, Inc.	Maximize	-	2.74	4.61	-	-	-	-	1.0
Tall Fescue	AMPAC Seed Co.	PP10	-	2.93	4.42	-	-	-	-	1.3
Tall Fescue	AMPAC Seed Co.	PP13	-	3.06	4.55	-	-	-	-	1.0
Tall Fescue	AMPAC Seed Co.	Resolute	-	2.24	2.89	-	-	-	-	5.5
Tall Fescue	Mountain View Seed	Teton	-	-	-	1.23	-	5.71	-	-
Timothy	Seed Solutions/Seed Res. of OR	Climax	-	2.45	4.04	-	-	-	-	1.7
Timothy	AMPAC Seeds Co.	Tuuka	-	2.42	3.89	-	-	-	-	1.3
Timothy	DLF-Jenks	Vega	-	2.57	3.62	-	-	-	-	1.0
	Mean		2.43	2.49	4.06	1.43	6.43	1.8	2.2	
	LSD		0.7	0.5	0.66	0.36	1.1	1.1	1.6	

*Winter Injury Visual Rating(1-9 scale; 1=least injury)

Table 11. 2003 Seeding of Annual ryegrass variety trial (dry matter tons/acre)

Variety	Breeder/Marketer	2004 Total Yield	2003 Total Yield
4X-LR ML*	Mich. State Seed Sol./Seed Research of OR	2.22	1.66
Aurelia	Mich. State Seed Sol./Seed Research of OR	3.28	2.01
Jivet	DLF-Jenks	3.26	2.03
Lolan*	DLF-Jenks	2.94	2.08
Max	Pickseed	3.44	2.10
Monarque	Mich. State Seed Sol./Seed Research of OR	2.82	1.54
NE/FL X2002 LRCT*	U. of FL	3.00	1.27
Zorro	DLF-Jenks	3.30	1.81
Mean		3.03	1.81
LSD 5%		0.55	0.36

*not released

This was harvested an additional year since all cultivars survived the winter.
Over 11 inches of rain fell in May.

2004 Marketers

ABI Inc.
1870 Backbone Rd. West,P.O. Box
404
Princeton,IL 61356
800 873-2532
www.abialfalfa.com/

Allied Seed
1108 Hilldale Dr.,
Macon,MO 63552
800-880-8127
www.alliedseed.com

Arrow Seed
Box 722,
Broken Bow,NE 68822
800-622-4727

Beck's Hybrids
6767 East 276,
Atlanta,IN 46031
800-937-2325
www.beckshybrids.com

Cascade International Seed Co.
8483 W. Stayton Rd.,
Aumsville,OR 97325
503-749-1822
www.grass-seed.com

Crow's Hybrid
PO Box 157,
Kentland,IN 47951
800-331-7201
www.crowshybrid.com

Advanta Seeds
33725 Columbus Street, SE,P.O.
Box 1044
ALBANY,OR 97321
541 967 8923
www.advantaseeds.com

America's Alfalfa
1870 Backbone Rd.,
Princeton,IL 61356
800-873-2532
www.americasalfalfa.com

AV Seeds
4333 Hwy 66,
Longmont,CO 80504
303-665-6642

Bio Plant Research
P.O. Box 320,
Camp Point,IL 62320
800-593-7708

Channel Biocorp
PO Box 278,
Kentland,IN 47951
219 474 6868
www.channelbio.com

Dahlco Seeds
888-324-5261
www.dahlco.com

AgriPro Seeds
330th St.,
Slater,IA 50244
888-464-2778
www.agripro.com

Ampac Seed Co.
P.O. Box 318,
Tangent,OR 97389
877-778-7880
www.ampacseed.com

Barenbrug USA
PO Box 239,
Tangent,OR 97389
800-547-4101
www.barusa.com

Brett-Young Seeds
Box 99,St. Norbert Postal Sta.
Winnipeg,MAN CAN R3V 1L5
800-665-5015
www.byseeds.com

Cropmark
057-1192 Main South Road,P O Box
16-574
Templeton,Christchurch New
Zealand
64-3-347-7950

Dairyland Seed Co.
P.O. Box 958,
West Bend,WI 53095
800-236-0163
www.dairylandseed.com

Deer Creek Seed
PO Box 105,
Ashland, WI 54806
715-278-3200

FS Growmark Inc.
1701 Towanda Ave.,
Bloomington, IL 61701
309-557-6000
www.growmark.com

Golden Harvest Seed Co.
27525 135th Ave. N.,
Cordova, IL 61242
309-654-2234
www.goldenharvestseeds.com

Ioka Farms, Inc.
13512 Doerfler Rd. SE,
Silverton, OR 97381
503-873-4464
www.iokafarms.com

LG Seeds
N8181 940th St.,
River Falls, WI 54022
800-752-6847
www.lgseeds.com

Midwest Seed Genetics
PO Box 518,
Carroll, IA 51401
800-369-8218
www.midwestseed.com

Mycogen Seeds
9330 Zionsville Rd.,
Indianapolis, IN 46268
800-692-6432
www.mycogen.com

DLF-International Seeds
P.O. Box 216,
Albany, OR 97321
800-445-2251
www.dlfusa.com

Garst Seed Co.
2369 330th St, P.O. Box 500
Slater, IA 50244
888-464-2778
www.garstseed.com

Great Lakes Hybrids
9915 W. M-21,
Ovid, MI 48879
800-257-7333
www.glh-seeds.com

Legacy Seed
E664 State Road 54,
Waupaca, WI 54981
866-791-6390
www.legacyseeds.com

MBS
225 West First St.,
Story City, IA 50248

Monsanto
3100 Sycamore Road,
Dekalb, IL 60115
800-768-6387
www.farmsource.com

Otilie Seed Farms
1462 Sanford Ave.,
Marshalltown, IA 50158
800-798-6884
www.otilieseed.com

FFR Cooperative
Lafayette, IN
www.ffrcoop.org

Geertson Seed Farms
1665 Burroughs Rd.,
Adrian, OR 98901
800-843-0390
www.geertsonseed.com

Great Plains Research
3624 Kildaire Farm Rd.,
Apex, NC 27502
919-362-1583
www.greatplainsresearch.com

Lewis Seed Co.
33820 Linn-West Dr.,
Shedd, OR 97377
www.lewisseed.com

Michigan State Seed Solutions
717 N. Clinton,
Grand Ledge, MI 48837
800-647-8873
www.seedsolutions.com

Mountain View Seed
8955 Sunnyview Rd.,
Salem, OR 97305
503-588-7333

Pennington Seed
PO Box 290,
Madison, GA 30650
800-285-7333
www.penningtonseed.com

Peterson Seed
Savage, MN
800-328-5898
www.abialfalfa.com/

PGI Alfalfa
2700 Camino del Sol,
Oxnard, CA 93030
866-744-5710

Pickseed Canada Inc.
1 Greenfield Rd.,
Lindsay, Ont. Canada K9V4S3
800-661-4769
www.pickseed.com

Pioneer Hi-bred International
PO Box 1150, 14171 Carole Dr.
Johnston, IA 50131
800-247-6803
www.pioneer.com

Producers Hybrid
PO Box C,
Battle Creek, NE 68715
888-675-3190
www.producershybrids.com

Proseeds Marketing
13963 Westside Ln. S.,
Jefferson, OR 97352
541-928-9999

Public Varieties
Various sources,

Quality Seeds LTD
8400 Huntington Rd.,
Woodbridge, ONT L4L1A5
877-856-7333
www.qualityseeds.ca

Renk Seed
6800 Wilburn,
Sun Prairie, WI 53590
800-289-7365
www.renkseed.com

Seed Research of Oregon
27630 Llewellyn Rd.,
Corvallis, OR 97333
800-253-5766
www.sroseed.com

Simplot
5300 W. Riverbend,
Post Falls, ID 83854
800-688-7333
www.simplot.com

Smith Seed Services
P.O. Box 288,
Halsey, OR 97348
www.smithseed.com

Spangler Seedtech
803 W. Racine St.,
Jefferson, WI 53549
800-284-1080
www.spanglerseed.com

Steyer Seed
6154 N. CO. RD. 33,
TIFFIN, OH 44883

Syngenta Seeds
7500 Olsen Memorial Hwy.,
Golden Valley, MN 55447
800-258-0498
www.nk.com

Trelay Farms
11623 State Rd. 80 N.,
Livingston, WI 53554
800-421-0397
www.trelay.com

Turf – Seed, Inc.
PO Box 250,
Hubbard, OR 97032
503 651-2130
www.turf-seed.com

United Suppliers Inc.
P.O. Box 538,
Eldora, IA 50627
800-782-5123
www.unitedsuppliers.com

Werner Farm Seed
3104 Millersburg Blvd.,
Dundas, MN 55019
507-645-7995

W-L Research
P.O. Box 8112,
Madison, WI 53708
800-406-7662
www.wlresearch.com

Wolf River Valley Seed
N2976 Hwy M,
White Lake, WI 54491
800-359-2480
www.wolfrivervalleyseeds.com