UMass Extension

CROPS, DAIRY, LIVESTOCK, & EQUINE NEWSLETTER

Vol. 14:1 Fall 2010

Fall is nearing and winter is soon upon us. As we wrap up this year's research experiments and lay the farm to rest, we reflect on the growing season. While the early cool weather was detrimental to some crops, the hot arid summer proved to be prosperous for other crops like corn, but with little rain fall, challenging at times to keep both crops and animals cool and comfortable. We hope everyone had a successful growing season, and continue to do so if your operation is extending their season.

In This Issue…

2010 "New England Green Pastures" Awarded to Elmhurst Dairy Farm

The Elmhurst Dairy Farm, owned and operated by the Pearson family of Millbury, MA was selected as the Massachusetts recipient of the"2010 New England Green Pastures Dairy Farm Award" for their excellence in management and diversification of their dairy farm model. The award is given out every year to a deserving dairy farm from each New England state and presented at the Big Exposition in Springfield, MA. *(Continued on page 8)*

Milling Up Old Wheat Cultivars in a New Time

As interest in local food burgeons, the market for locally grown wheat has opened up new opportunities for growers in Massachusetts. Both vegetable and field crop growers are noting the interest in organically grown wheat among artisan bakers and consumers, and are considering how to introduce wheat into their crop rotations. However, the lack of commercially available wheat varieties adapted to New England's weather and organically managed soils limits our competitive edge. U.S. wheat varieties are bred for conventionally managed fields in the Midwest or are bred in Canada for climate and soils vastly different from ours, and are dependent on agrochemicals for nutrients as well as disease and pest protection. Traits important to organic wheat production have been lost from the gene pool of modern wheats, such as height for weed competition and extensive root systems that better scavenge nutrients from the soil. Nutrition and flavor are not key traits in modern cultivars but are important for the value-added organic markets. The wheats best adapted to New England's organic farms are from European countries with climates closer to ours.

In response, UMass has established an organic wheat project to meet this new market niche. The project is coordinated by the UMass Extension team of Ruth Hazard and Maoud Hashemi in collaboration with Eli Rogosa, an organic farmer and wheat specialist who has joined the team bringing years of experience working with Mideastern and European cereal gene banks and wheat breeders. Funding has been contributed by Northeast SARE and the Massachusetts Society for Promoting Agriculture. *(Continued on page 9)*

The Crops, Dairy, Livestock, & Equine Newsletter is a quarterly publication of the CDLE Team, UMass Amherst Extension. Inquiries about agricultural related topics can be addressed to the appropriate team members. If you are interested in receiving copies of this newsletter in electronic or hard copy form, please send your information to cdle@umext.umass.edu.

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2010 Silage and Grain Corn Evaluation

Masoud Hashemi and Stephen J. Herbert

Corn silage hybrids were evaluated for silage and grain yield at the University of Massachusetts Crops and Animal Research and Education Center, in South Deerfield, Massachusetts. Hybrids were divided into three groups based on relative maturity (RM) provided by the seed companies; group I, early maturity group (85-94 days), group II, mid maturity group (95-100 days), and group III, full season group (101-115 days). In Massachusetts we are encouraging farmers to use shorter season corn hybrids along with earlier planting so that together these management practices can provide the opportunity for early planting of cover crops, which maximizes N recovery after corn and fall manure application. Our multi-year research studies have shown that well-established cover crops, planted by September 1 (achieving 1100 GDDs) can accumulate more than 100 lb N per acre.

All hybrids were planted on May 6th. A cone type distributor mounted on a double disc opening corn planter was used in a conventionally prepared seed bed. Plots were planted at the rate of 33,000 seeds per acre in 30 inch rows. Plots consisted of 3 rows with a length of 50 feet and replicated 4 times. The site received 660 lb/acre of 15-8-12 prior to planting. Pre-sidedress nitrate test (PSNT), taken on June 15, indicated that a sufficient level of nitrogen existed in the research site therefore no sidedress N was applied. Weeds were controlled by pre-emergence application of 2 quarts of Bicep II Magnum per acre.

Ten feet of the central row was harvested by hand at 50% milk line for evaluation of silage yield. Group I hybrids were harvested on August 30 and groups II and III were harvested only 4 days later which, compared to the norm for this location, is considered early. The early harvesting of groups II and III was mainly due to the relatively dry condition that occurred during the month of August with only 1.72” precipitation compared to the norm in this location which is 4.10” (Table 1). Harvested hybrids were evaluated for silage and ear yield, percentage ears, and moisture content. Silage yield was adjusted to 70% moisture and ear corn yield to 25% moisture.

In October, another ten feet was harvested from the central row of each plot to evaluate grain yield of all corn hybrids. Ears were handpicked on October 7, October 11, and October 14 for group I, group II, and group III, respectively. Ears were dried in a forced-air oven before they were shelled by hand. Harvested hybrids were evaluated for grain yield, cob to ear ratio, and grain moisture content at harvest. Grain moisture was measured using a Dickey John ® mini GAC grain moisture tester. Grain yield was adjusted to 15.5% moisture.

Climate data for the evaluation site is presented in Table 1. In 2010 the corn crop experienced drier conditions, especially in August, which coincides with grain filling stage. The late dry condition had less negative impact on shorter-season hybrids compared to full-season hybrids. As a result, the shorter-season maturity hybrids in general performed better compared to full-season maturity groups. Shorter-season hybrids produced about 5% higher percent ear which can be translated as higher silage quality. Our past evaluations in 2007-2009 indicated that when corn is planted for grain production, the late maturity hybrids most often out yield shorter-season hybrids. In 2010, as mentioned above, due to dry conditions that occurred during grain filling stage, shorter-season hybrids on average performed as well as the mid and late maturity groups.

Summary of mean comparisons of silage and grain yield, ear percentage, and grain moisture content for the three hybrid maturity groups is shown in Table 2. The result of silage and grain yield, ear percentage, grain moisture, and silking date for all hybrids tested in 2010 are presented in Table 3.

Table 1: Climate data for 2010 in South Deerfield, MA.

	GDD[1]			Rainfall (inches)		
	2010	Norm	Deviation	2010	Norm	Deviation
May (25 days)	286	253	33	2.07	3.79	- 1.72
Jun	568	533	35	3.90	3.75	+ 0.15
Jul	741	697	44	4.13	3.91	+ 0.22
Aug	635	638	- 3	1.72	4.10	- 2.38
Total	**2230**	**2121**	**109**	**11.82**	**15.55**	**- 3.73**

[1] Growing Degree Days was calculated as: $GDD = \sum(T_{max} + T_{min})/2 - 50$

Table 2: Mean comparisons of silage and grain yield, ear %, and grain moisture, for three maturity group hybrids planted on May 6th, 2010 and harvested at 50% milk line (for silage) and about 20% grain moisture for grain production.

Maturity	Silage[1] T/ac	Earcorn[2] T/ac	Pctear %	Grain Bu/ac[3]	Grain moisture	Cob/Ear %	Silk Date DAP[4]
Group I	29.4 ab[†]	7.3 a	62.3 a	189.3 a	18.2 b	11.7 a	69.4 c
Group II	28.3 b	6.8 b	59.8 b	185.6 a	20.3 a	10.6 b	71.3 b
Group III	30.4 a	7.0 b	57.1 c	182.3 a	20.6 a	11.4 a	73.9 a

[1]Silage @70%moisture [2]Earcorn @ 25% moisture [3]grain @ 15.5% moisture
[4]Days After Planting
[†] Means with the same letter within each column are not significantly different at $P \leq 0.05$.

Table 3: Silage and grain yield, ear %, and grain moisture, for three maturity group hybrids planted on May 6th, 2010 and harvested at 50% milk line (for silage) and about 20% grain moisture for grain production.

			SILAGE				GRAIN		
Brand	**Hybrid**	**Maturity group**	**silage[1] T/ac**	**earcorn[2] T/ac**	**pctear %**	**silk[4] DAP**	**grain[3] Bu/ac**	**grain moisture %**	**cob/ear %**
TA Seeds	TA290-11 (CB/LL)	I	29.5	7.7	65	67	208	18	13
Dairyland	ST-9789 (RR)	I	30.0	7.7	64	70	208	19	9
Agrisure (NK)	N20R-GT	I	28.6	6.6	58	72	152	18	13
Mean			**29.4**	**7.3**	**62.3**	**69.4**	**189.3**	**18.3**	**11.7**
TA Seeds	TA501-161	II	30.3	6.5	53	76	183	21	11
Dairyland	ST-3195Q (RR)	II	27.8	6.3	56	74	172	20	10
DEKALB	DKC 46-07	II	28.2	7.3	66	71	206	20	9
DEKALB	DKC 46-6	II	26.0	6.1	58	69	193	21	10
DEKALB	DKC 49-94	II	27.8	6.5	58	73	181	21	12
DEKALB	DKC 45-52	II	30.1	7.8	65	67	181	19	11
DEKALB	DKC 48-37	II	27.8	6.9	62	70	183	20	11
Mean			**28.3**	**6.8**	**59.8**	**71.3**	**185.6**	**20.3**	**10.6**
TA Seeds	TA788-13 (YGVT3)	III	28.2	6.3	56	72	164	23	13
Dairyland	ST- 9703Q	III	29.2	6.4	54	74	182	20	11
DEKALB	DKC 52-59 (VT3)	III	26.9	6.5	60	75	162	18	13
DEKALB	DKC 54-16 (VT3)	III	31.8	7.6	59	75	192	19	10
DEKALB	DKC 57-50 (VT3)	III	29.5	6.7	56	75	174	24	13
DEKALB	DKC 59-64	III	33.3	7.2	54	75	185	21	11
DEKALB	DKC 61-69	III	32.4	7.3	56	74	199	21	11
DEKALB	DKC 63-42	III	32.2	7.2	56	75	187	23	11
DEKALB	DKC 63-84	III	32.0	7.1	55	77	183	21	11
DEKALB	DKC 50-35	III	28.0	7.2	64	68	195	17	10
Mean			**30.4**	**7.0**	**57.1**	**73.9**	**182.3**	**20.7**	**11.4**
Overall Mean			**29.4**	**7.0**	**59.7**	**71.5**	**185.7**	**19.8**	**11.2**
CV (%)			12.3	14.3	4.6	3.4	15.2	7.9	8.6

[1]Silage @70%moisture [2]Earcorn @ 25% moisture [3]grain @ 15.5% moisture [4]Days After Planting

Meningeal Worms in Camelids

Stephen R. Purdy

The meningeal worm *Parelaphostrongylus tenuis* is the most serious health hazard to alpacas and llamas wherever they live in close proximity to white-tailed deer(WTD), putting any camelid (alpaca, llama, vicuna, or guanaco) living in the eastern US at risk of infection. The parasite is carried by and passes through the WTD, *Odocoileus virginianus* (definitive host), without harming it in most cases. The worm becomes lost in the spinal canal of the camelid or other aberrant host (red deer, moose, or other wild ungulates) causing damage to the spinal cord and/or brain during its migration. This may result in paralysis or death of the infected animal.

The first sign seen in a llama or alpaca is usually a hind leg weakness or lameness. The parasite can also cause disease in sheep and goats, although this is uncommon. In 29 years of large animal practice, I have never seen a clinical case in either a sheep or a goat, even in animals living in close proximity to affected camelids. Why not? Alpacas and llamas are much more susceptible to meningeal worm disease than ruminants such as goats and sheep. UMass Amherst and Cornell University are exploring the reasons for these differences by examining other avenues of immuno-parasitology with the goal of developing a preventative vaccine.

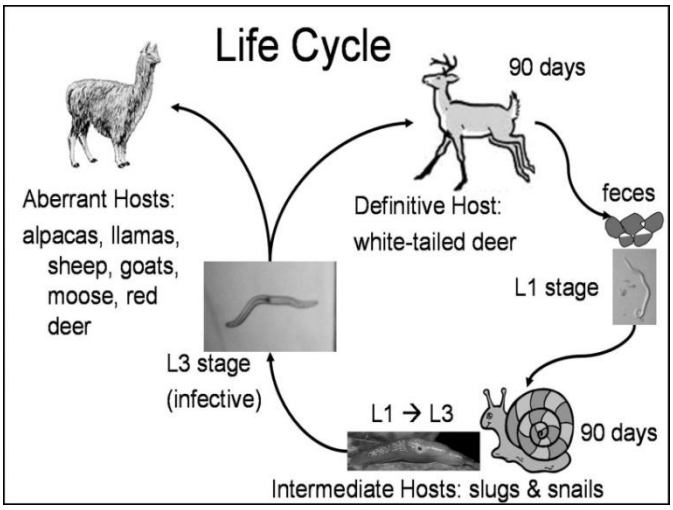

Figure 1: Life Cycle of Meningeal worm, (P. tenuis).

P. tenuis Life Cycle in White-tailed Deer

Adult Female worms deposit eggs into venous blood vessels on the surface of the brain. The eggs travel in the blood stream, are encysted in the pulmonary circulation, and hatch in capillaries of the lungs into the first stage larvae (L1).The L1 enter the small airways of the lungs, are coughed up, swallowed, and then passed in the feces (~3 months after initial infection).Slugs and snails acquire the L1 through penetration of their footpad as they move over ground contaminated with WTD feces. After about 30 days in the slug or snail, the larvae develop into an infectious third stage (L3). Approximately 90 to 100 days after entry the infective larvae (L3) are excreted in the mucus trail. WTD consume the L3 or infected gastropods, the L3 penetrate the stomach, and then they travel upwards to the spinal canal. They further develop in the dorsal horns of the spinal cord gray matter, migrate to the subdural space, and develop into adult worms where they lodge on the surface of the brain to repeat the life cycle.

White-tailed deer infected with adult *P. tenuis* do not become re-infected when additional L3 are consumed. Why? Most likely this is related to the deer immune system preventing reinfection at the level of the stomach or spinal cord. Thus, the deer creates a type of vaccination.

P. tenuis Infection of Camelids

Some species of either slugs or snails are the intermediate hosts and carry the infective stage of the parasite. These animals inhabit primarily wet areas and are found under dead leaves, branches, and trees. The gastropods are infected by the L1 while moving over deer dung piles. A camelid is most probably infected by consuming vegetation contaminated by the gastropod slime trail containing the L3. The L3 are very resistant to environmental factors and survive freezing. The L3 migrates upwards from the stomach to the spinal cord or possibly to other areas of the body. The actual pathway taken by the worm or worms in the central nervous system determines the portion of the brain or spinal cord that is damaged and the severity of the neurologic signs observed. The early phase of the meningeal worm life cycle in aberrant hosts parallels that in white-tailed deer. Meningeal worm larvae tend to be unusually active and damaging in neural tissue of aberrant hosts. Some larvae fail to leave the neural

parenchyma which results in damage as the larvae matures and migrates, while other larvae reinvade the spinal cord or brain after maturation. Multiple infections on the same farm do occur. Most of the clinical cases occur in the winter, but they can occur at any time of the year. Migrating larvae may not take the direct route from the GI tract to the spinal fluid over 4 to 6 weeks in camelids as they do in the WTD. They may possibly migrate for months since clinical cases often occur months after the disappearance of slugs and snails in the fall. Warm weather in early winter and the accompanying lack of snow cover may allow for animals to browse among dead leaves and be at risk of becoming infected by consuming the infective L3.

Clinical Signs of Meningeal Worm Disease in Camelids

Any neurologic signs in a camelid should make you question meningeal worm disease. Signs may include: lameness, incoordination, weakness, inability to get up, circling or drifting gait, head tilt, depression, or blindness. Initial signs may vary between a mild "lameness" to acute paralysis and blindness. The abnormal clinical signs are most often asymmetric.

Treatment of MWD in Camelids

Early, aggressive treatment of all neurologic cases in alpacas and llamas where meningeal worm disease is suspected maximizes the chances of obtaining a successful outcome. A successful, protocol I have used includes: anti-inflammatory drugs (dimethylsulfoxide (DMSO) orally, every other day for three treatments, and flunixin meglumine (Banamine®) by intramuscular injection once daily for five days; and anti-parasitic drugs (ivermectin - Ivomec® by subcutaneous injection every other day for three treatments, plus fenbendazole (Panacur® or Safeguard®) equine paste orally once daily for five days).

Prognosis

Animals under my supervision have responded well to this protocol initially, only to acutely fail with complete paralysis and blindness later. If an animal becomes unable to get up even with assistance, the prognosis for recovery is poor. Acupuncture and chiropractic treatment have been helpful in some cases. Physical therapy and good nursing care are essential to prevent muscle contracture and pressure sores and subsequent infection. Many animals are euthanized at this stage. A pregnant alpaca or llama may abort from the stress of the disease or the treatment. I have treated pregnant animals and had them recover however. Recovered animals are often left with some neurologic deficit, including weakness and/or incoordination. The productivity of some animals may be compromised, affecting the life of breeding or working animal, balance, and competition for food. These factors must be considered when making decisions about future feeding and housing accommodations. 50% of alpacas and llamas that are infected will die or be euthanized unless treated aggressively early in the course of the disease.

Prevention of MWD

In my opinion, the only proven prevention program against this disease is still the administration of injectable ivermectin monthly during snail and slug season (May to December in the northeastern US). Oral ivermectin paste and liquid, pour on ivermectin, oral fenbendazole paste or liquid, and daily Strongid C® pellet feeding are not effective. Some owners are using the injectable drug Dectomax® at longer intervals than monthly. This has proven disastrous in some instances where the disease has been observed. It is claimed to be longer acting in cattle than Ivomec® for treatment of intestinal parasites. This could be interpreted as being more toxic. Using Dectomax® at the monthly frequency could compound the potential toxicity of the drug to camelids, and might hasten the emergence of drug resistant intestinal parasites. Widespread and continued use of MWD prevention drugs has played a part in the emergence of drug resistant intestinal parasites. These types of drugs are also known to be environmental contaminants with negative impact on beneficial microarthropods and worms in the soil since ivermectin and doramectin are passed in active form in the feces and urine.

Management changes for prevention of MWD include fencing animals away from swampy areas, streams, and ponds to limit their exposure to snails and slugs. Deer proof fences and gravel paths around camelid enclosures have also been used to limit exposure to the parasite. If you have seen an infected animal you would never take a chance with anything other than the best available prevention program.

UMass Equine Reproduction Program

The Equine Reproduction Program serves horse owners, veterinarians, students, and researchers throughout New England. Part of the College and the Environment at the University of Natural Resources at the University of Massachusetts Amherst, the Equine Reproduction Program is based at the Hadley Farm and supports applied research and clinical teaching in the Department of Veterinary and Animal Sciences.

Assisted Reproduction Services for Client Horses

The Equine Reproduction Program's assisted reproduction services provide the region's most advanced reproduction techniques. To maximize the reproduction potential of fertile horses and to restore the fertility of subfertile and infertile horses, the program offers:

- Fertility work ups
- Semen collection (sperm analysis, cooled shipment, semen freezing)
- Breeding management
- Services for performance stallions & mares

To learn more about the Equine Reproduction Program's referral services for owners and veterinarians, contact:

Dr. Carlos Gradil
Veterinary and Animal Sciences
(413) 577-2214
cgradil@vasci.umass.edu
www.umass.edu/vasci/eqreprodctr

Greener Grass *(Continued from page 1)*

The farm was first established in 1719, by Solomon Holman and in time was passed down to his son Col. Jonathan Holman after the Revolutionary War; the original farm of 3,000 acres was a land grant from the King of England. The Fjellman Brothers bought the farm in the late 1920s, it was then passed down to their sons and eventually purchased by Robert and Barbara Pearson in 1987.

With the help of their sons, Bob and John, daughter Cindy, John's wife Fran and their children Brittany and Cody, they assumed full operational control and ownership, and have been running the farm for over 23 years. Prior to the purchase of the farm, Robert's parents, Oscar and Easter Pearson, started a milk processing plant in 1934, using milk from the neighboring Fjellman farm. The Pearsons delivered milk to nearby communities and still continue to do so today as both the processing plant and milk route are still fully operational. In addition to processing milk, the Pearsons make 26 flavors of delectable ice cream, which they sell in their retail store. Built in 1930, the current milking facility is a traditional tie stall barn that houses 60 milking cows with a pipeline system and rotational grazing. The Pearsons raise all of their own replacement heifers for a herd made of equal parts Holstein and Milking Shorthorn with an average of 3.8% butterfat. Currently the farm consists of 300 acres, of which 70 acres are hay fields, and 35 acres are cornfields, which in the winter are converted to a cover crop of winter rye. In addition, the Pearsons have a Christmas tree farm and harvest maple syrup annually.

In 1990, the Pearsons placed 263 acres of the land into the Agriculture Preservation Restriction Program (APR). For the last 15 years the Pearson's have participated in a program with the local elementary school system in which the school adopts a baby calf for the school year. The children visit the farm monthly to view the growth and development of the baby, and to learn more about farm life and agriculture. Additionally, the Pearson family is very involved with the county and state 4-H programs.

They have been leasing high quality show heifers to 4-H youth as well as supporting the state calf sale by consigning animals yearly. This year, the Pearsons had the Grand Champion of the Massachusetts State Milking shorthorn show. In addition to the Pearsons commitment to their dairy cattle, they have been dedicated to land preservation and environmental concerns.

In 2008, the Pearson family was chosen to receive a grant from the Massachusetts Technological Corporation to build solar panels on the roof of the barn in order to generate electricity for the farm. Currently the photovoltaic cells produce 7,000 kilowatt hours per year which is 1/5 of the farm's annual energy use. The dairy farm has been consistently recognized for its high quality milk and dairy products and low somatic cell counts.

This year Elmhurst Farm was recognized by the State of Massachusetts as one of the top 1,000 places to visit in Massachusetts, or 1 of 136 in Central Massachusetts.

Help us in congratulating the Pearson family for their great achievement.

To nominate a farm for the 2011 "Green Pastures Award" please send an email to cdle@umext.umass.edu indicating why the farm of your choice is "Green Pasture" worthy. Nominee must be from MA.

Bring back grain *(Continued from page 1)*

Our goals are to breed wheat varieties uniquely adapted to New England, to investigate how to best integrate wheat in small-scale diversified farms typical in our region, and to maintain a seedbank to conserve, evaluate and disseminate European whet varieties. We will also be looking at how to adapt growing practices that have been developed for organic wheat in other regions such as northern New England, Quebec, and northern Europe to the conditions of central and southern New England and to the needs of heritage wheat varieties.

We are focusing on winter wheats that compete well with spring weeds. We have seen good success in our trials with broadcasting a low-growing clover over the wheat beds in early spring to control weeds. Winter wheats should be planted by mid September for strong root growth and crop establishment in the fall that will lead to vigorous spring growth.

We are excited to report that after two years of trialing European organic wheats and heritage varieties grown-out from genebank collections, we have identified several wheat varieties that have out-yielded the commercially available conventionally-bred wheats, and a rare species, emmer *(T.dicoccon)* that is highly resistant to fusarium and resilient to weather extremes.

We are seeking farmer-cooperators to grow and evaluate the best wheats from our trials on your own farm. Please email Eli Rogosa: growseed@yahoo.com or phone 413. 624. 0214, if you are interested in conducting organic wheat trials on your farm.

Livestock and Equine Survey

The mission of CDLE team is to provide assistance and initiate research in regard to the needs of the citizens in Massachusetts related to the subjects within our division. In order to carry out our mission more effectively and efficiently, we have developed a short 5 minute survey for livestock and equine owners. Your participation in this survey will help to dictate research and/or workshop offerings. All response will remain anonymous. Please, only one survey per farm. We are trying to reach as many farms as possible, so please share this survey with anyone who may be interested.

The "Livestock Survey" may be accessed at: http://www.surveymonkey.com/s/JR8WJ6D

The "Equine Survey" may be accessed at: http://www.surveymonkey.com/s/D7FNN7Q

If you have questions or concerns regarding this survey, please contact:

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Winter/Spring 2010-2011 Upcoming Events

Dec. 15: New England Farmers Union Annual Meeting: New England Farmers are Different.
Location: Doyle Conservation Center, Leominster, 5-9 PM
Contact:Cayte@NewEnglandFarmersUnion.org or 413.625.3051
www.newenglandfarmersunion.org

Jan 7: 'Sustainability Standards and Commonwealth Quality Seal', presented by MA Fruit, Veg., & Berry Growers' Assn.
Location: Sturbridge Host Hotel, Sturbridge, 9:20 AM- 4:00 PM
To see a promo on Commonwealth Quality go to www.mass.gov/agr/.
Separate checks for both - Meeting registration $30: includes lunch and printed materials. Made payable to NEV&BGA. Commonwealth Quality $50(if you choose to apply).

Jan. 8: Pioneer Sheep Breeders Meeting
Location: Elmers in Ashfield, 6:30 PM
Contact: Alice Newth
newth@vasci.umass.edu

Jan. 15: NOFA/Mass Annual Winter Conference
Location: Worcester Technical High School, Worcester.
www.nofamass.org/conferences/winter/index

Feb. 12: Pioneer Sheep Breeders Meeting.
Location: Manor House, UMass Hadley Farm, Hadley, 6:30 PM
Contact: Alice Newth
newth@vasci.umass.edu

March 5: Pioneer Sheep Breeders Meeting
Location: Manor House, UMass Hadley Farm, Hadley, 6:30 PM
Contact: Alice Newth
newth@vasci.umass.edu

April 1-2: The North American Alpaca Show
Location: The Big E, Springfield.
http://www.thebige.com/fair/agriculture/agriculture.asp

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