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2010 A New Year, a New Change...

As the New Year brings among us many changes, the Crops, Dairy, Livestock, and Equine extension team has been experiencing just that. Dr. Stephen Herbert, who served as leader for the team has accepted new positions as Associate Dean for the College of Natural Sciences and Director for the Massachusetts Center for Agriculture. Although Dr. Herbert has taken on new appointments, he will remain an active member of the CDLE team. Dr. Masoud Hashemi will fulfill the role as team leader. Dr. Hashemi has been avidly working with UMass Extension, specifically the CDLE team, for the past ten years. His expertise in nutrient management and crop physiology provides assistance to farmers and opportunities for research. Please join us in congratulating both on their new positions here at UMass.

2010 Farmer Research Meetings

March 31st in Hadley and April 7th in West Brookfield

Please join the CDLE team and your fellow farmers for a research meeting to share our past year's research results and contribute your input and participation in upcoming on-farm research. Some of the topics to be discussed include; corn hybrid evaluation trial on both silage and grain, evaluation of pasture blends, cover crop for maximum nutrient recovery, and biofuels comprising of oil seed rape, soybean, sunflower, grain corn as a source of heating, and switchgrass. The meeting will also feature two farmers' first year experience with producing a new agricultural commodity on their farm, as well as a presentation given by Carlos Gradil DVM., from UMass Amherst, entitled, "Bovine Reproduction Management and Synchronization Systems". Jim Talvy, from Double J Farm in West Brookfield, will be discussing the process of transitioning from dairy to beef cows, particularly, marketing availability of grass-fed beef. Wayne Goulet will address the topic of employing an entire soybean-feed operation on the farm. The first meeting will be held on **March 31st at Cooks Farm on 1 East Hadley Rd. in Hadley.** The second meeting takes place on **April 7th at Double J Farm on 138 North Main St. in West Brookfield.** Both meetings will begin at 10:30 a.m. and continue until 1:30 p.m. with lunch provided.

We hope that many farmers will be able to attend. In the past, our attendance has been sporadic, so this year, look out for an "Attendance Postcard", which will be sent out a few weeks prior to the actual meeting. We encourage your involvement, as it is you, the farmers, who enable us to perform the research we do.

2010 Mass Aggie Seminar "Home Garden and Small Farm Series"

Enclosed, you will find the brochure for the upcoming Mass Aggie seminars. The CDLE team is hosting the first seminar of the series entitled, "Small-scale Pasture & Manure Management", which will be held February 20th, from 9 a.m. till 2:30 p.m. at the Topsfield Fair Grounds in Topsfield, MA. Registration is required for all seminars. For more information visit: <http://www.umass.edu/fruitadvisor/massaggie/index.html>

"Equine and Livestock Barnyard Management"

On March 16th, 2010 from 7 p.m. till 9 p.m., the Hatfield Agric. Advisory Committee will be sponsoring a presentation from the CDLE team. The focus of the seminar will be on successful management practices including manure and mud management, two very important topics that are directly related to environmental quality. The presentation will be held in the cafeteria of Smith Academy on School Street, in Hatfield, MA. For more information about this event contact: Bob Wagner, Phone: 413-586-9330 Ext. 12, Email: bwagner@farmland.org

2009 Corn Hybrid Evaluation in Massachusetts

Stephen J. Herbert and Masoud Hashemi

Corn silage hybrids were tested at the University of Massachusetts Crops Research and Education Center Farm, in South Deerfield, Massachusetts in 2009. Hybrids were divided into three groups based on relative maturity (RM) provided by the seed companies; group I, early maturity group (78-89 days), group II, mid maturity group (90-100 days), and group III, full season group (101-117 days). In Massachusetts we are encouraging farmers to use shorter season corn hybrids in conjunction with earlier planting, so that together they allow for early planting of cover crops, which maximizes nitrogen retention 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 4th. 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 32,000 seeds per acre in 30 inch rows. Plots consisted of 3 rows with a length of 25 feet and replicated 4 times. The site received 600 lb/acre of 15-8-12 prior to planting. Pre-sidedress nitrate test (PSNT) taken on June 17 indicated a deficient level of nitrogen therefore, 75 pounds of N per acre in the form of Calcium Ammonium Nitrate (27% N) was applied to all plots. Weeds were controlled by pre-emergence application of 2 quarts of Bicep II Magnum per acre.

Corn hybrids were harvested by hand at different dates; group I on September 1, group II on September 8, and group III on September 15. Harvested hybrids were evaluated for yield of silage and ear, percentage ears, and moisture content. Ten feet of the central row from each plot was harvested for yield estimation. Silage yields were adjusted to 70% moisture and ear corn yields to 25% moisture. Moisture content is reported as a percentage of corn harvested as silage.

Table 1: Climate Data for 2009 in South Deerfield, MA.

| | GDD ¹ | | | Rainfall (inches) | | |
|---------------|-------------------------|-------------|--------------|--------------------------|--------------|---------------|
| | 2009 | Norm | Deviation | 2009 | Norm | Deviation |
| May (27 days) | 196 | 262 | - 66 | 4.27 | 3.81 | + 0.46 |
| Jun | 412 | 533 | - 121 | 5.16 | 3.75 | + 1.41 |
| Jul | 521 | 697 | - 176 | 9.88 | 3.91 | + 5.97 |
| Aug | 603 | 638 | - 35 | 6.43 | 4.10 | + 2.33 |
| Sep | | | | | | |
| Group I | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 |
| Group II | 92 | 109 | - 17 | 0.00 | 0.85 | - 0.85 |
| Group III | 164 | 199 | - 35 | 0.50 | 1.79 | - 1.29 |
| Total | 1988² | 2349 | - 361 | 26.24³ | 20.24 | + 6.00 |

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

² Total GDD for group III maturity groups. Total GDD for groups I and II were 1732 and 1896, respectively.

³ Total rainfall for group III maturity group. Total rainfall for groups I and II was 25.74 inches.

Climate data for the evaluation site is presented in Table 1. In 2009, the corn crop experienced exceptionally cool condition during the entire growing season. For example, just in the first three months of May, June, and July, the 2009 growing season collected 363 GDD below normal, and for the entire growing season the total GDDs were 398, 415, and 433 below normal for maturity groups I, II, and III, respectively (Table 1). Also, from planting time (May 4th) until September 1st, the site received about 25.74 inches of

precipitation which is 10.2 inches more than the norm for this location. The exceptional combination of cool and wet weather throughout the growing season in general and early vegetative growth stages in particular in 2009, reduced silage and ear yield potential in all tested hybrids (table 2 and table 3). Reduction in ear yield was more severe relative to stover yield therefore; ear% was significantly lower than previous seasons for this location.

Summary of mean comparison of yield, ear %, and ear %, for the three maturity group hybrids is shown in Table 2. Silage yield and ear percentage for all hybrids tested in 2009 are presented in Table 3.

Considering the unusual weather conditions throughout almost the entire growing season, the yield performance of majority hybrids was satisfactory. However, the early maturity hybrids in general did not performed as well as the full season maturity groups. Perhaps this is because full-season hybrids took advantage of the better growing conditions after fertilization.

Table 3: Yield, moist%, and ear percentage for all hybrids planted on May 4th, 2009 and harvested at 50% milk line.

| Brand | Hybrid | Maturity Group | Silage ¹ T/ac | Moist % | Earcorn ² T/ac | Emoist % | Pctear % | Silk DAP |
|---------------------|--------------|----------------|-----------------------------|-----------|------------------------------|-----------|-----------|-----------|
| Seedway | E197RR | I | 18.9 | 68 | 4.5 | 51 | 60 | 82 |
| Seedway | SW2170 | I | 22.8 | 72 | 5.1 | 53 | 56 | 83 |
| Seedway | E224RR | I | 23.6 | 68 | 5.7 | 53 | 60 | 82 |
| Doebler's | P253X | I | 22.4 | 70 | 5.0 | 56 | 56 | 83 |
| Doebler's | P333X | I | 26.2 | 70 | 5.6 | 55 | 54 | 83 |
| Agrisure(NK) | N20R-GT | I | 23.5 | 72 | 4.8 | 54 | 51 | 84 |
| Mean | | | 22.9 | 70 | 5.1 | 54 | 56 | 83 |
| DEKALB | DKC 55-44 | II | 22.8 | 71 | 5.6 | 53 | 62 | 84 |
| DEKALB | DKC 48-37 | II | 23.6 | 68 | 5.9 | 48 | 63 | 82 |
| DEKALB | DKC 48-46 | II | 25.3 | 69 | 6.3 | 51 | 62 | 81 |
| DEKALB | DKC 45-82 | II | 24.6 | 68 | 3.1 | 50 | 62 | 82 |
| Dairyland | HidF-3195Q | II | 26.0 | 69 | 6.2 | 51 | 60 | 86 |
| Mycogen | TMF2L414 | II | 26.4 | 71 | 5.9 | 53 | 55 | 88 |
| Mycogen | TMF2N494 | II | 21.0 | 71 | 4.7 | 58 | 56 | 88 |
| Mycogen | TMF94 | II | 21.8 | 70 | 5.0 | 56 | 57 | 89 |
| Doebler's | 362GR | II | 23.4 | 65 | 6.0 | 49 | 64 | 82 |
| Mean | | | 23.9 | 69 | 5.7 | 52 | 60 | 85 |
| DEKALB | DKC 67-87 | III | 31.7 | 69 | 6.9 | 51 | 55 | 92 |
| DEKALB | DKC 61-66 | III | 26.1 | 68 | 6.5 | 49 | 63 | 87 |
| DEKALB | DKC 52-59 | III | 27.3 | 66 | 7.1 | 48 | 65 | 88 |
| DEKALB | DKC 54-49 | III | 24.5 | 66 | 6.2 | 45 | 63 | 85 |
| DEKALB | DKC 63-42 | III | 33.0 | 67 | 8.3 | 46 | 62 | 87 |
| Dairyland | HidF- 3110 | III | 32.3 | 71 | 6.3 | 51 | 49 | 92 |
| Dairyland | STEALTH-8208 | III | 31.8 | 71 | 6.7 | 52 | 52 | 90 |
| Agrisure(NK) | N53W3 | III | 28.9 | 67 | 6.9 | 46 | 60 | 87 |
| Mycogen | TMF2R521 | III | 28.8 | 67 | 7.3 | 45 | 64 | 84 |
| Mean | | | 29.4 | 68 | 6.9 | 48 | 59 | 88 |
| Overall Mean | | | 25.4 | 69 | 5.9 | 51 | 58 | 85 |
| CV (%) | | | 12.8 | 2.4 | 14.0 | 5.4 | 4.8 | 1.7 |

¹Silage @ 70% moisture

²Earcorn @ 25 % moisture

Table 2: Mean comparison of yield, ear %, and moist %, for three maturity group hybrids planted on May 4th, 2009 and harvested at 50% milk line.

| Maturity | Silage ¹ T/ac | Earcorn ² T/ac | Pctear % | Silking days ³ |
|-----------|-----------------------------|------------------------------|----------|---------------------------|
| Group I | 22.9 a [†] | 5.1 a | 56 a | 83 a |
| Group II | 23.9 a | 5.7 a | 60 b | 85 b |
| Group III | 29.4 b | 6.9 b | 59 b | 88 c |

¹Silage @70% moisture

²Earcorn @ 25% moisture

³Days after planting

[†] Means with the same letter within each column are not significantly different at $P \leq 0.05$

UMass Equine Reproduction Program

The Equine Reproductive Program here at UMass Amherst, is both reputable and comprehensive and offers educational and research opportunities for students, horse owners, veterinarians, and researchers throughout New England. As part of the College of Natural Sciences, the program directly assists and supports the research and clinical teachings of the Department of Veterinary and Animal Sciences. The Equine Reproduction Program facilities and offices are located at the Hadley Farm in Hadley, Massachusetts.

Education through hands-on experiences and observation allow students participating in the Department of Veterinary and Animal Science to work directly with faculty and staff on research, clinical procedures, and care and maintenance of both clientele and resident horses. Maintaining a resident herd of horses permits students to execute classroom-learned skills. An exchange program is offered by Tufts University Veterinary Program, in which undergraduates regularly visit and learn about the work of professionals in their area of study. Outreach opportunities to horse owners are presented through workshops and seminars at the Equine Affair in Springfield, MA and at regional professional associations of veterinarians and technicians' annual symposia.

The focal point of the program's research is in identification of infertility causes and treatments, as well as enhancing assisted reproductive technologies (ART). For example, recent research has shown that a certain family of enzymes within stallion sperm may be an essential marker indicating infertility. The assisted reproductive services offered by the Equine Reproduction Program are some of the most advanced in the region, with specific techniques aimed to improve the reproduction potential of fertile horses and increase fertility among sub-fertile horses. Services provided by the ERP include, fertility check-ups, breeding management, and semen collection, which is used for analysis, cool shipments (visit www.umass.edu/vasci/eqreproctr to view stallions utilized), semen cryopreservation. Special reproductive assistance, such as oocyte transfer, embryo transfer, gamete intrafallopian transfer (GIFT), and intracytoplasmic sperm injection (ICSI) are granted, in collaboration with other fertility centers, to performance stallions and mares to help



improve their reproduction potential while continuing to train and compete.

The Hadley Farm is home to many groups of horses, including, tenant registered Hannoverian brood mares, a herd of Morgans, UMass Amherst Police horses, and visiting horses for equine events and reproductive health issues. The resident horses are utilized for breeding and research purposes. Specifically, the Morgans are employed to train professional riders, trainers, and equine instructors, while the Hanoverians are used for intercollegiate sports such as jumping and dressage. The facilities on the farm premise include: box stalls, which feature automatic waterers, individual lighting and outlets, and foaling stalls complete with web cams; a breeding shed and fully equipped laboratory; paddocks that can house up to eighty horses; an indoor arena, and plentiful lush pastures with sheds.

For further information regarding the Equine Reproduction Program, contact:

Dr. Carlos Gradil
 Veterinary and Animal Sciences
 661 N Pleasant St. ISB 427U
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 Phone: (413) 577-2214
 Fax: (413) 545-6326
 Email: cgradil@vasci.umass.edu
<http://www.umass.edu/vasci/eqreproctr>

Livestock Got Stress?

Establishing a connection with your livestock and understanding their behavior is important for maintaining a stress reduced environment and peaceful relationship, both of which are critical in aiding productivity. For over the past twenty years, Dr. Temple Grandin, has been researching issues of animal behavior as related to their humane treatment in handling facilities. A professor of Animal Sciences at Colorado State University, she has developed a specific design for holding facilities with the intent of providing the upmost humane treatment. Dr. Grandin's designs are implemented in the livestock industry throughout the world. The following is a summary from Dr. Grandin's article entitled "Behavioral Principles of Livestock Handling" The article can be accessed at <http://www.grandin.com/references/new.corral.html>

It is through comprehension of animal behavior that will enhance the overall performance of the animal as well as provide for humane and safe handling. Certain behavioral characteristic such as vision, auditory senses, flight zone, herd mentality, breed differences, environment stimulus, and presence of handler authority, will influence the handling of livestock.

Vision: Livestock have a wide angle of vision. Pigs and cattle have a 300-degree view, while sheep range from 190 to 300 degrees plus, depending on the amount of wool obstructing. Thus, it is important to control vision barriers, for smooth transport. Balking is caused by anything obstructing the animal's view. This could be drains or slates in the floor, flaps or moving objects. Shadows can cause unease. Minimize view of distractions from all aspects of handling, as they cause stress. Livestock have color perception and have dichromatic eyes. Humans are trichromatic, meaning we can see the entire color spectrum. Dichromats, like livestock, are sensitive to yellow-green and blue-purple light. Restrict sight in areas of handling to reduce stress. Animals will move toward areas with greater light. Shine lights in area of desired movement.

Auditory senses: Animals are more sensitive to noise than are humans. A humans hearing ranges from 1000 - 3000 Hz, while sheep can hear up to 7000 Hz and cattle up to 8000 Hz. Avoid sudden auditory stimuli, as it causes stress. White noise, however, sounds like a radio, has proved to help in preventing stress and in some cases, even helped to gain weight. When interacting with livestock, use a soft tone of voice, as this is the most calming. An animal's ear position will indicate its sense of attention. Animals can become accustomed to certain environments. When animals are kept in an auditory stimulating environment, with sounds and human interaction, they become more trusting of their

surroundings. Livestock thus become aware of such noises and will be less stressed when encountering them suddenly.

Flight zone: Each animal has a personal space. When the space is encroached upon, the animal will begin to back away. The flight zone for a broadly raised cow is about 160 feet, while a feedlot cow is 6 to 26 feet. Consistent and kind management will facilitate reduced stress and injury, as well as decrease the flight zone. Handlers should work just along the edge of the flight zone. When the handler is outside of the animals' zone, they are at a safe distance, and allow for the animal to become accustomed to the handler. Certain techniques can be employed to maneuver the animal

in the desired direction. To the right is a diagram depicting specific viewpoints and areas of movement.

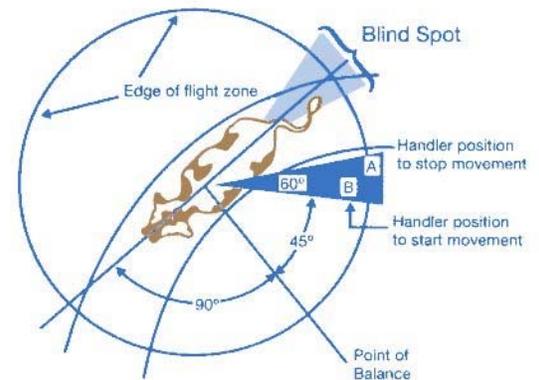


Diagram courtesy of Dr. Temple Grandin

Herd

animals: All livestock are herd animals. There is not a single species of livestock that would want to be isolated from its group. Therefore, placing animals in isolation is not recommended, unless of course there is a health issue. Behaviorally, livestock animals need to be with a herd, and perform better when with one. Isolating animals may cause physiological damage. In researching isolation, with pigs, it weakened their immune system, and increased bacteria count in cow's milk. Within the herd there will always be a leader. It is best for handlers to focus on the leader to accomplish the task at hand; the others will follow.

Breed differences: There are behavior differences in all genetics. Some breeds may be more excitable than others. Be aware of behavior characteristics when choosing a breed and select for desired traits. When dealing with untamed animals, it is best to omit the use of prodding devices, as they cause stress. Instead, use gentle handling and a calm stern voice.

Sensitivities: Animals are curious creatures. They are more likely to approach something if given the chance, rather than it forced upon them. Animals can be trained to accept restraint if given the time and rewards needed. Dr. Grandin herself has successfully trained sheep to voluntarily enter a squeeze tilt table for a food reward. Training animals to

perform certain tasks is very valuable because it lessens the stress on both the animal and handler, providing for a more pleasant experience. Animals are smart and will remember past experiences. For example, if they had a bad experience with a veterinarian in a white coat when they were young, that same animal now may always feel threatened by any person in a white coat. Because of this, handlers must always be aware of their actions. Animals respond best when slowly approached by soft tones.

Establishing Dominance: In order to maintain a good relationship with your livestock, it is important for the handler to establish dominance within the herd. First by observing the herds' behavior, the handler can then exert acquisition for the top role. In doing so, the handler gains

the respect of its animals and creates a safer and enhanced treatment for the both.

The key to successful handling of livestock is to diminish the amount of stress. Stress signals are best learned through particular behaviors displayed. Take note next time your cow's ears are pointing in a certain direction, she may be telling you something. Reducing stress allows for optimal performance by increasing animal welfare and handler safety. It also helps with handler safety and animal welfare.

Want to learn about other livestock behavioral characteristics during handling? In March 2010, come see Dr. Temple Grandin speak at one of several locations in New England. For a complete listing, visit our web page at: www.umass.edu/cdl/news.html

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:

Carrie Chickering-Sears, Extension Educator, Crops, Dairy, Livestock and Equine Team
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Pasture Blends for New Plantings in Massachusetts

Twenty eight pasture blends and mixtures were seeded at the UMass Crop and Animal Research and Education Center (CAREC) in South Deerfield, MA in late August 2007, and replicated 4 times. Our hypotheses are (i) that improved information on forage species and varieties will increase economic benefit to farmers, and (ii) that this can be integrated into farm practices through participatory research with farmers, complementing outreach and education. Seeds were obtained from commercial companies. Seed mixtures varied from 2 to 7 species, sometimes with more than one variety within a species. Pastures were rotationally grazed with beef cattle. Four of the blends were also planted at commercial farms on a variety of soils.

Report on forage yields at CAREC for the first two years of the project, 2008 and 2009 follows. In the early life of a pasture, yield would be expected to increase from the first to the second year of grazing. This was not the case in the CAREC plots (Figure 1). The summer of 2009 was unusually wet and cold. Many crops, including corn (grain and silage), as well as vegetables did not yield well in 2009.

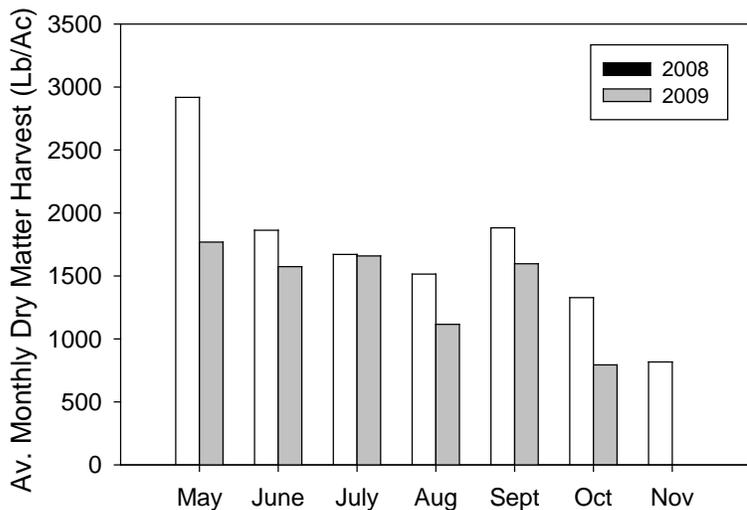


Figure 1. Average monthly forage yields including all 28 blends

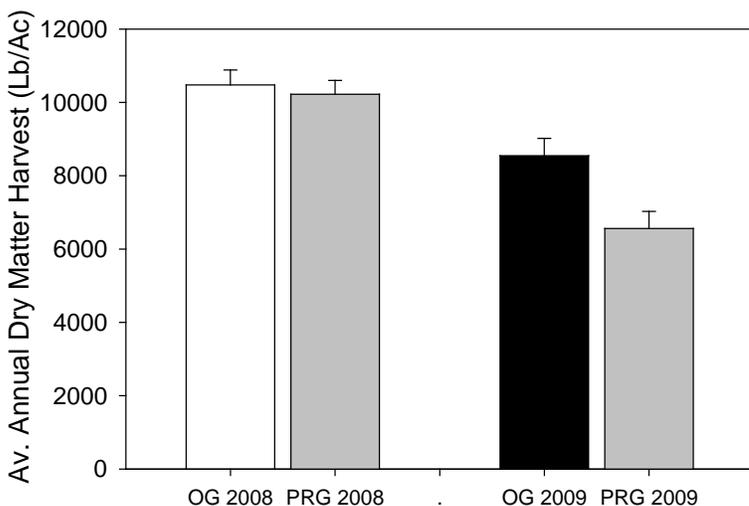


Figure 2. Yield comparison of blends including white clover with either Orchardgrass (OG) or Perennial Ryegrass (PRG).

Forage yield was estimated by clipping measured squares in the plots once a month just before the cattle were grazed. In 2008 six cattle were grazed one day a month from May through November, approximately 24 hours on each of the four 70ft x 100 ft areas of 28 plots. In 2009 nine cattle were grazed, generally for less than a full day. Animals were removed from the plots when forage height approached 4 inches. Note that this intensive grazing system allows the pasture maximum recovery time for regrowth without animals trampling on the pasture.

After only 2 years' grazing, it is too early to make specific blend recommendations, but one observation made was that the 5 mixes of Orchardgrass plus the same white clover outperformed the 5 mixes of Perennial Ryegrass plus white clover in the cool, wet summer of 2009 (Figure 2). Yield differences had been negligible in 2008. Blends including several different species will likely perform best over seasons with varying weather conditions. Reports will continue as the pasture matures.

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Outreach Activities and Upcoming Events

Feb. 20: "Pasture and Manure Management for Small-scale Livestock and Equine" Hosted by the CDLE Team.
Location: Topsfield Fair Grounds 9 a.m. - 2:30 p.m.
Contact: Masoud Hashemi Phone: 413-545-1843
Email: masoud@psis.umass.edu

Feb. 4 – March 4: "Exploring Your Small Farm Dream" presented by NESFI and MDAR. A 4 session course offered in two locations in MA. Amherst session Thursday, Feb. 4, 11, 25 and March 4th, with a possible extra/snow day Feb. 18. Contact: Rick Chandler, MDAR. Phone: 413-548-1905
rick.chandler@state.ma.us

March 1-4: "Principles of Livestock Behavior"- Dr. Temple Grandin will be speaking throughout New England.
For more information visit:
www.umass.edu/cdl/News/Temple_Grandin2010.pdf

March 15-16: New England Renewable Energy Conference
www.uvm.edu/vtvegandberry/meetings/FarmEnergy_Co_nf3-10.html

March 16: "Equine and Livestock Barnyard Management" CDLE Team presents in Hatfield, MA. 7-9 p.m.
Contact: Bob Wagner
Phone: 413-586-9330 Ext. 12
Email: bwagner@farmland.org

March 27: "MA. Blue Ribbon 4-H Calf Sale" Clinics at 10 a.m., Sale at noon. Location: Eastern States Exposition- Mallory Complex, West Springfield.
Contact: Carrie Chickering-Sears Phone: 413-549-3257 Email: ccears@umext.umass.edu

March 27: "Mane Event" hosted by NEECA at the Athol Orange Elks Club, Rt. 2A, Orange, MA.
Contact: Melissa Truehart Phone: 978-249-5362

April 23-25: "3- Day Centered Riding Clinic with Susan Harris" Presented by NEECA. Location: Windswept Farm, 233 North Main St., Petersham, MA
Contact: Caroline Mansfield Phone: 978-249-2813
Email: brycarmansfield@aol.com