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Masoud Hashemi, Editor
Center for Agriculture
Univ. of Massachusetts
Amherst, MA. 01003-9294

For further information:
(413) 545-5221

cdle@umext.umass.edu

www.extension.umass.edu
/cdle

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Twilight Meeting Recap – Stillman Farm

Mallory Ottariano

As the heat began to dissipate on one of the hottest days July had seen yet, over fifty dairy farmers, state agency representatives, and agricultural specialists gathered at a serene central Massachusetts farm; Stillman Dairy Farm in Lunenburg for a summer Twilight Barn Meeting organized by the Central Massachusetts Dairy Producers Association and the University of Massachusetts Extension. Despite storm warnings and violent weather scattering the state, attendance was still high with attendees from as far west as Greenfield in Franklin County, and as far east as Lexington in Middlesex county. Also in attendance were several folks from the North Shore area although most came from Worcester County. Many farms were being represented by multiple generations of family members.

The Stillmans were excellent hosts, providing their guests with delicious home-made baked goods, from their farm store which they operate at their farm location, coffee, and of course their very own deliciously rich milk in a wide array of flavors. Shaw farm of Dracut MA provided ice cream for the event from their dairy farm.

The meeting's agenda featured several informative and inspirational speakers. Post farm-visit, during which Bud Stillman showed the group around the farm and explained a bit about their enterprise and their facilities, Stephen Herbert of the Stockbridge School of Agriculture at UMass spoke about the changes in academic programming within UMass' Stockbridge School. As he explained, the Dept. of Plant Soil and Insect sciences, as well as Extension will now fall under the Stockbridge School, creating more cohesion within agricultural programs. There are also plans for a new Agricultural Learning Center which will house all sorts of agricultural field examples for student use from possible grass-fed beef to sample turf greens that will be used only for learning purposes, and not research unlike the UMass Experiment Stations, located across the state which are currently the only examples of such agriculture.

Next, Gerry Palano of MDAR spoke about the MA Farm Energy Program which was of extreme interest to those attending. His presentation addressed ways to increase energy efficiency within dairy farming operations. He spoke about farm audits to determine where and how efficiency can be increased and the major hurdle to increasing efficiency: cost. As Gerry explained, there are several ways and opportunities for farms to get funding for energy projects and he has seen grant funding for as much as $.90 to the dollar! It was exciting to hear that increasing energy efficiency while reducing costs is more easily achievable than most would think.

Both Brad Mitchell and Henry Gillet spoke about a more political side of dairy farming and agriculture in general. Brad presented bills and policies that are currently up for vote by the state. Some bills, such as new bills the Dept. of Public Health is attempting to pass relating to slaughtering regulations and meat processing, will introduce new challenges and obstacles to farmers. Certain humane bills, such as one proposed bill to ban veal crates, may lead to more harmful policies that will make business more difficult for farmers. In relation to Brad's presentation, Henry then spoke about the importance of having a local political voice as a farmer.

Continued….

He advised that all must be aware of current legislation, and future legislation and push for what you as a dairy farmer want to see and need to see for your business to succeed. He stressed the importance of knowing your state and county representatives and making sure they know you so that they are better able to cater to your needs and create fair agricultural policies that work.

Stillman Dairy Farm
Twilight Metting

Lastly, Kyle Bostrom of Bostrom Farm in Greenfield as well as the UMass Research Farm offered information on an environmentally sustainable component to farming; recycling. As Kyle explained, the Franklin County Solid Waste Management District is awaiting a grant that will fund an agricultural plastics recycling program. Waste products such as greenhouse and hoophouse film as well as baleage wrappings are proposed recyclable items. Whether or not the project will be funded is to be determined in September, but he advised all to be on the lookout for the program and to hold onto agricultural plastics in anticipation.

The meeting not only served as an informational event, but also as an empowering community event. As the sunset graced the Stillman's pastures with a beautiful orange and pink glow, folks chatted with each other far past the scheduled adjourning time, sharing with each other successes and challenges of their dairy enterprises, catching up with each other, and discussing the future of Massachusetts dairy farming in this economy.

Exciting Time at the Stockbridge School of Agriculture

Dr. Wesley R. Autio

As many of you know, the Stockbridge School of Agriculture has always offered exciting programs. However, Over the last couple of months, significant changes have occurred which will make it even better than before. These changes are born out of a committee appointed to review agricultural education at UMass and develop approaches to strengthen all agricultural work at UMass. A refocus of agricultural efforts is now the main effort as a result of this review.

The approach that we began about 1.5 years ago was to elevate the Stockbridge School of Agriculture to a full academic unit with a faculty, education offered at all levels from A.S. to Ph.D., and research and outreach responsibilities. It was difficult for the University's system of governance to accept an academic unit with the title of "School" situated within a college, the College of Natural Sciences in our case, since schools usually referred to large units like the School of Public Health, the School of Engineering, and the Isenberg School of Management. So before anything could happen, the rules needed to change. Thankfully, our efforts were supported by all levels of administration, and they found a way to change the rules, creating a new designation, a "school within a college." The large schools are destined to change their names to colleges. The new rules were approved in February of this year. At that point, we submitted a number of proposals related to the "new" Stockbridge School of Agriculture. They moved through the University's Faculty Senate in record time with final and enthusiastic approval coming at a May 3 Faculty Senate Meeting.

As of July 1, the Stockbridge School of Agriculture was reborn, not out of the ashes of its former self, but out of a healthy and forward-thinking Stockbridge. So, what's new?

- The Stockbridge School of Agriculture is an academic unit. Previously, it was an administrative, degree-granting unit that oversaw the Associate of Science degree programs, but those programs resided in departments. Likewise, all research and outreach resided in other academic units. The School now encompasses all of the pieces necessary to make

it among the best agricultural education units in the country. We have everything necessary to control our destiny!

- The Stockbridge School of Agriculture has a faculty for the first time in its 94-year history. Currently, 26 individuals have joined the Stockbridge faculty include fruit, vegetable, turf, greenhouse, and equine specialists and soil scientists, agronomists, plant physiologists, molecular biologists, plant pathologist, entomologists, and animal physiologists. These individuals bring active and vibrant teaching, research, and outreach programs to the Stockbridge School of Agriculture. Further, they also bring extensive graduate education at the M.S. and Ph.D. levels.
- Proposals are pending which will create three new Bachelor of Science degrees in the Stockbridge School of Agriculture, namely Sustainable Food & Farming, Sustainable Horticulture, and Turfgrass Science & Management. These proposals received approval at all levels of UMass Amherst and now have moved to the UMass Trustees, after which they will be reviewed by the Massachusetts Board of Higher Education. They should receive final approval by the end of the year. If all goes well, the first students will begin entering the Stockbridge B.S. majors in the Spring Semester of 2013.
- Because of this collection of changes, the position of "director" was changed to be one that oversees not only A.S. degree programs but B.S., M.S., and Ph.D. degree programs as well as agricultural research, outreach, and 25 faculty members. So, I was appointed as director with these responsibilities. Bill Mitchell is still prominent within the Stockbridge School of Agriculture as Dean of Undergraduate Affairs, responsible for all aspects of our A.S. and B.S. degree, an expanded version of his previous job.

These changes are big, and some might worry that we will lose something in the process. Our objective, however, is to retain everything that has made Stockbridge great.

- The Associate of Science degrees will continue to be an integral part of our educational program, and we will manage students' Stockbridge experience with the same care and personal approach that many have appreciated in the past. We hope also to extend that care to students at the Bachelor of Science and graduate levels.
- We will work hard to improve the relationships between respective A.S. and B.S. degrees. We want students to see the continuation of their education from the A.S. degree to the B.S. degree to be seamless and efficient.
- We will help our A.S. and B.S. majors evolve as the needs of agriculture evolve. These degree programs will be future focused and produce individuals who contribute significantly to agriculture now and for many years to come.
- We will maintain a real connection to hands-on education. As an example, we are in the process of developing a new Agricultural Learning Center. This facility will be at the north side of the UMass campus, providing easy access for our students for hands-on agricultural education and great visibility for agricultural programs at UMass.

So, in our case, "Exciting Times" means "Big Changes," but these are wonderful changes, ones that will strengthen our agricultural education, our research benefit, and our outreach effectiveness. The Stockbridge School of Agriculture has been a wonderful contributor to the fabric of New England agriculture for 94 years. That contribution will continue and grow in value in the next 94 years, helping us realize "Stockbridge Forever!"

-Dr. Wesley R. Autio, Director,
Stockbridge School of Agriculture

UMassAmherst

Undergraduate Agricultural Learning Center

Foundation

The University of Massachusetts Amherst's plans to open an Agricultural Learning Center ("ALC") as a hands-on living "classroom" or field laboratory for undergraduates, graduate students and residents of Massachusetts to pursue active learning about all of the forms of agriculture in the Commonwealth. The Agricultural Learning Center will provide experiential learning opportunities in a wide variety of farming, horticultural, nursery and landscape industries. By having small areas devoted to livestock, fruits, vegetables, turf, and landscape crops, the Center for Agriculture and Stockbridge School will be able to offer a broad array of agricultural topics to both UMass students and the general public. The next generation of farmers will be well-educated at UMass Amherst.

Academic Programs

The creation of the Agricultural Learning Center will return student participation in farming, an important part of agricultural education, to a location within walking distance of the heart of the campus. At a time when many people are rediscovering the importance of local food and local agriculture, and when farming is once again of interest to young college-age people, the Learning Center will bring the state's agricultural focus to Amherst.

This concept takes advantage of the scientific and intellectual resources of the University, its faculty and students. In the future, the UMass Amherst Agricultural Learning Center will be known as a learning destination for those interested in food, farming, landscape and other natural-resource-based enterprises. Also, as a community Agricultural Learning Center it will draw visitors from across the Northeast to workshops, courses, demonstrations and conferences. The Agricultural Learning Center will be organized around units that will be integrated into labs associated with applied agricultural classes.

Horse Barn, circa 1894. This is the last barn on campus from the days of "Mass Aggie."

Today the "good bones" of this graceful structure are still strong. Tomorrow, this renovated barn incorporating three classrooms, will bring new vitality to agricultural education at UMass Amherst, true to its roots.

Site and Buildings

The ALC will be located at the UMass Wysocki Field at 911 North Pleasant Street in Amherst, MA. Future plans include preserving two historic buildings to be moved onto Wysocki Field. One is the beloved Horse Barn (the last remaining barn on campus) and the second is Blaisdell House, the original farm manager's house. The Horse Barn will retain the exterior appearance when it was built in 1894, as a once a proud showplace for Massachusetts Agricultural College. The interior will be renovated and reused as classrooms for students with one large space created for larger gatherings, including public workshops. Blaisdell is likely to become offices and/or a farm manager's house.

For more information contact:

Stephen J. Herbert, Assoc. Dean, and Director UMass Center for Agriculture. Email: sherbert@cns.umass.edu; Phone: 413-545-2890, or

Sandra F. Thomas, Project Manager, sfthomas@cns.umass.edu 413- 545-6325.

Center for Agriculture
University of Massachusetts Amherst

A Closed Loop System: Anaerobic Digestion in Massachusetts

Mallory Ottariano

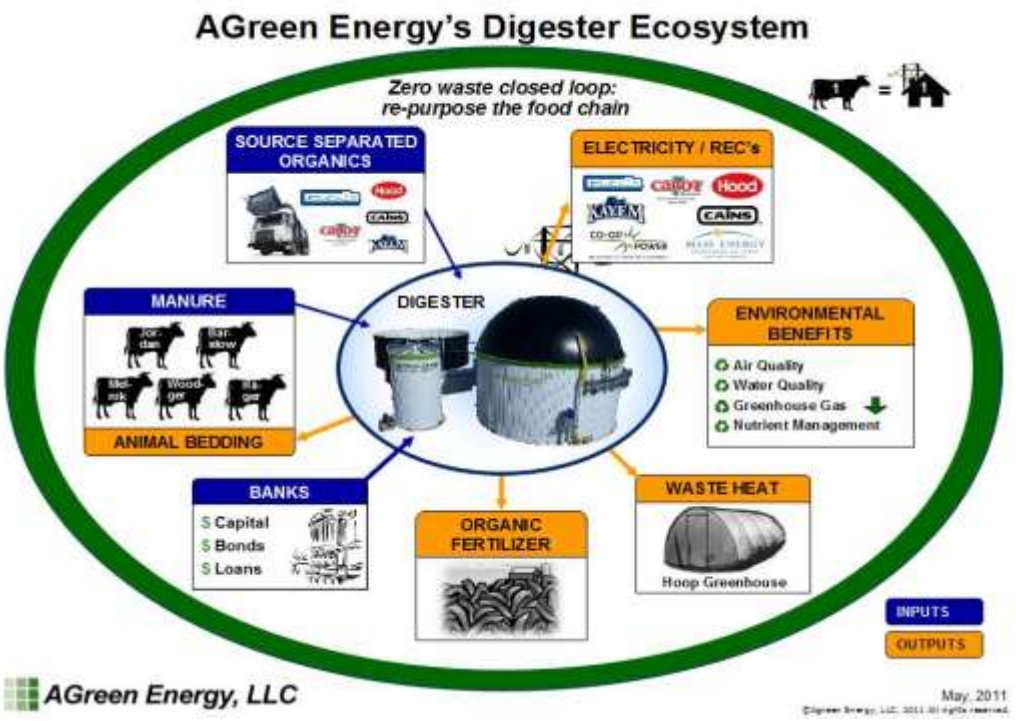
On a quiet dirt road in Rutland you will find views of quaint New England properties lined with aged stone walls painting a picture of a simple and historic American farming town. But as you travel down the road it becomes apparent that this particular farming community is keen on propelling themselves into the technological future of farming and energy production making them anything but simple.

Through a cooperative partnership fostered by AGreen Energy, consisting of New England Organics (a division of Casella Waste Systems), Quasar Energy Group and five Massachusetts dairy farms, huge advances are being made towards decreasing the costs of dairy farming, keeping those farms still in business alive, and making the planet a cleaner place. The first of five anaerobic digesters involved in the project has been installed in Rutland at Jordan Dairy Farm, a fourth generation farm with Central MA roots. Within the next year, the remaining four digesters will be installed across western Massachusetts at Barstow's Longview Farm in Hadley, Barway Farm in South Deerfield, Hager Brothers Farm in the Berkshires, and Rockwood Farm in Granville.

Shannon Carroll, System Operator

Because the entire system is computerized, Shannon Carroll the operator of the system and New England Organics employee can remotely monitor the entire system of digesters at once.

The Digester is quite a massive project, costing roughly $3.5 million to install and implement, and taking roughly four years to complete from design to construction. When standing next to the project, its scale is quite evident. A 500,000 gallon processing tank looms overhead and holds the waste as it is digested. Bi-product from the digestion process then travels to a 1,000,000 gallon holding tank where it is kept until used for fertilizer on the Jordan's corn crops.



The way in which the digester works is quite simple. It converts liquid waste to energy through anaerobic activity of bacteria which digest the waste into 'biogas', capturing the off-gassing of the manure and liquid waste and using this captured methane to generate power. Since this process takes place in an enclosed holding tank there is no harmful off-gassing of methane released into the environment, all is used to generate power. And quite some power it generates! The Jordan digester's generator requires about 15% of the generated power to run itself, and is able to produce roughly 7000 kWh of power daily resulting in about 3.7 million kw of power per year!

That's enough to power the entire farm plus an additional 300 homes. The Mass Clean Energy Center, who provided Jordan Dairy Farms with $360,000 for the project, provides an interesting way to look at the scale of energy generation: **one cow can power one home for an entire year!** A daily input of 45 tons of source separated organic material (liquid food waste) and 25 tons of manure into the digester produces this power.

Where does the source separated organic (SSO) material come from? The Jordan Farm has a 1.3 million gallon on-site lagoon where manure waste from their dairy barns is deposited. From there, the waste travels from the lagoon to the digester. The SSO comes from 10 distributors across the state including Hood, Cains, Cabot, and Kayem.

Digester and Manure Lagoon

Impressive huh? How about the benefits? Manure's unpleasant odor is now non-existent for the immediate residences because waste is being contained and used to generate power; less waste is going to landfills (food scrap waste makes up about 17% of the amount of waste sent to landfills annually), and above all it is a source of renewable energy. The amount of clean energy generated daily by the digester is enough to offset 5,500 lbs of CO_2 emissions, the biggest contributor to global warming!

The Jordan's farm also reaps numerous benefits from the digester. They now have better manure management than previously, their farm is now more diversified, and the farm can also use the manure 'waste' from the digestion process as fertilizer saving them money on chemical fertilizers they would otherwise need to purchase for their fields. In addition to the digesters being installed under the AGreen Energy project, another Massachusetts digester has been independently installed at Pine Island Farm in Sheffield, the largest dairy farm in Massachusetts milking over 650 cows. This digester, designed by DVO Inc., operates in a similar fashion to the Jordan digester, but runs only on manure waste from the farm's cows, at least for the time being. It produces roughly one third of the power generated by the Jordan digester, but also runs a smaller generator. The Pine Island Farm's digester has been both privately funded and grant funded, receiving a sizeable grant from Massachusetts Clean Energy Center.

What does the future hold for the AGreen Energy project? For the cooperative, the installation of the remaining four digesters is in the near future. Within the next 6 months, the Jordan digester will be receiving a more powerful generator (it currently runs a 300 kW generator) which will allow the input of waste to increase. The four remaining digesters will also have a larger generator installed initially. The generator, in addition to producing power, also generates heat. For the Jordan Digester, New England Organics is hoping to eventually use this heat to heat on-site greenhouse where produce will be grown.

This project takes great strides towards improving the impact our generation has on the planet and its resources but most importantly, it is a project that helps to build a better future for generations to come.

Local Profile – Valley Malt, Hadley

Andrea and Christian Stanley

Mallory Ottariano

A few weeks ago, as part a new segment I have added to the newsletter profiling local farmers and growers, I had the chance to visit Valley Malt in Hadley, owned and operated by husband and wife team Andrea and Christian Stanley. As I walked into the malthouse, I could hear Andrea's muffled voice coming from the back of the facility, over the loud whir and hum of massive, yet cutting edge malting equipment. An incredibly busy woman and mother of three, Andrea was standing knee-deep in barley within one of the malting vessels tending to the daily task of turning several tons of the germinating grain, a physically demanding duty! She had an afternoon visitor all the way from Montana yet was able to sit down with me for a few moments and share some information about Valley Malt, a truly unique operation, which she and Christian started 2 years ago, and are currently the sole operators of.

Valley Malt, the only malthouse of its kind in the Northeast, is working around the idea of a "boutique malthouse", malting very selectively and intentionally thus putting itself on the radar of beer enthusiasts and locavores alike. A Micro-malthouse, the Stanley's operation malted 100,000 lbs of grain last year but hopes to triple that number this year with the help of a new system that allows them to malt 4 tons of grain at once; twice as much as their previous system allowed. Their personal passion is barley, yet they will malt nearly everything; wheat, rye, spelt, buckwheat, triticale, oats, emmer and corn. Andrea tells me they look for any unique grain varieties that will result in interesting and flavorful beers.

Andrea, turning germinating barley

Andrea and Christian's malthouse grew out of a passion for local food systems, and a desire to fill a gap between growers and consumers. "We really wanted to contribute to the local food system" said Andrea. Over ten years of experience with homebrewing didn't hurt either. As their homebrews became more refined, they began looking for ways to incorporate local grains but soon realized the absence of local malt due to the lack of area malthouses. It was in their kitchen in 2009 that Andrea and Christian first tried malting. Being a mechanical engineer, Christian was able to devise a contraption to produce their first batch of malt. During that winter, they wrote a business plan, refined their malting techniques and began to lay the groundwork for what would become Valley Malt.

What makes their business stand out within the industry is their effort exerted towards working with the local community. The husband and wife team have fostered some very strong and supportive relationships with local farmers over the past few years. They work collaboratively with primarily Hadley growers from planting to harvesting, exchanging valuable information on growing and malting practices and creating a knowledge flow between themselves and those they work with. Because they assist with all facets of the growing process, from planting all the way to malting, they know everything there is to know about the life and production of the product they are distributing. They distribute their malt primarily to

Valley Malt's new malting equipment

breweries in Massachusetts, but also to a few brewers in the surrounding New England states. As a result of working with other farmers, they have begun to grow their own barley. This year they planted 10 acres of barley and 9 acres of oats on fields they lease both in Northampton and behind the malthouse, and had a rewarding first crop. They also have 17 acres of buckwheat planted as a cover crop where they will seed winter barley in September.

What's their biggest passion? "Barley!" said Andrea emphatically "and its community. It sounds corny, but beer really does create community". She explains that while farmers are passionate about growing grain they, like most of us, are also interested in the end result. She hopes that the local malthouse can foster a connection between brewers and growers, strengthening that community and defining its future.

As with any new venture, there are challenges to overcome. This year, they lost 16 acres of barley they had planted in Hatfield. "There is a steep learning curve", Andrea explained, "and mistakes are expensive". On the plus side, they are becoming more and more productive. Their business, although very young, is beginning to turn a profit, and with their new larger malting equipment, they hope to see this number continually rise. Andrea has given up her prior career in social work to manage Valley Malt full-time, and for the meantime Christian still works as a mechanical engineer in addition to working at the malthouse.

When asked what she hopes the future will bring for Valley Malt, Andrea answered that she wishes to see the malthouse become a viable, local agricultural business as agriculture is a large part of Hadley's history. She also stresses the importance of the growers throughout the entire process, and hopes that there will always be profit on the growers end. "We want to be recognized not just as a local business, but as a local business that produces a high quality product". A textbook depiction of a "local business", Valley Malt is well on its way to not only achieving this goal, but preserving it while strengthening local agricultural infrastructure along the way.

Effectively Reseeding Pasture

Dr. Sarah Weis, Dr. Masoud Hashemi, Dr. Stephen Herbert

Introduction:

A productive pasture is contingent upon a good plan, careful management, and clear goals. Reseeding can be necessary to increase nutritional value, eradicate weeds, fill in bare spots, and improve the stand after disease problems or poor management. It is important to determine the reason behind the need for reseeding. For example, if perennial weeds caused a significant reduction in the stand then the weeds must be controlled before reseeding. Similarly, if soil pH or nutrient status is low then these things need to be corrected. Successful reseeding depends on several factors; field characteristics, soil fertility, time of seeding, plant species selection, animal species being grazed, and grazing management style. A plant's adaptation to the pasture depends on winter hardiness as well as soil type, drainage, fertility, and pH. If all of these factors are considered and managed correctly, then your pasture forage can provide all nutritional requirements for your grazing animals. A healthy pasture means healthier animals with better nutrition and fewer diseases and parasites.

Site Considerations:

The topography of the land, and the soil's water holding capacity, can greatly affect the success of seeding by potentially limiting equipment access, therefore affecting the application of amendments. Soil characteristics often differ with the contour of the land, greatly affecting the growth habits of the plant species in the pasture.

Soil Fertility

Soil should be tested to determine pH, and extractable nutrients so treatment recommendations can be made. Soil samples may be sent to the UMass Amherst Soil and Plant Tissue Testing Laboratory to be analyzed: (http://www.umass.edu/plsoils/soiltest/). In pastures, the optimal pH range is between 6.5 and 7.0. Add lime according to your soil test prior to seeding. Incorporating the lime into the soil will give a faster initial increase in pH. It is recommended that lime be added 6 months to a year before the desired change in soil pH. Exploration of the soil for nutrients is confined mostly to the root zone in the top 12 inches of the soil. Certain nutrients (P and Ca) do not move much in soil and so correction of these nutrients with fertilizer, manure and lime is best done before tillage.

Legume and grass pasture

Choosing the Best Mixture:

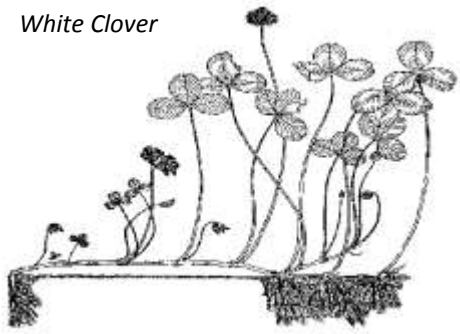
The most productive and highest quality pastures are those that contain a mixture of grass species with one or more legume species. When selecting species for pasture, it is important to understand both grass and legume growth habits and match them to the soil characteristics and climate. Different fields have different soil types, thus planting the same mixture in each field is not advised.

The following factors will influence your choice of forage species:

- The type and age of livestock to be grazed
- The time of year desired for pasture availability
- The seasonal distribution of pasture growth
- Soil type, drainage, water holding capacity, fertility, and pH

Legumes provide plentiful protein and compliment grasses improving the quality of the pasture. Legumes also add nitrogen to the soil nitrogen fixing bacteria making it indirectly available to grasses. Clover can add 90-140 lbs N/ac/yr, while alfalfa is capable of adding considerably more. In order for N fixation to occur, the legume seed must be inoculated with the correct bacteria, or it must be seeded into a previously inoculated field. Legumes may cause bloat in ruminants, so they should not be seeded alone for grazing.

White Clover



Grasses provide roughage for the animals, increasing their fiber intake. Grazing animals need adequate fiber however, if grasses are permitted to grow for long periods of time, especially during spring, they may become fibrous resulting in reduced animal intake and growth. Grasses are either sod forming or bunch types. Sod forming and those that form many tillers compete better with weeds than other types.

Climate Considerations

There are two categories of forage species: cool season species and warm season species. Cool season pasture species include, but are not limited to, tall fescue, orchard grass, perennial ryegrass, Kentucky bluegrass, white clover, red clover, and alfalfa. Warm season species are not usually pastured in Massachusetts because of late growth and lower
quality compared to cool season species. Some cool season species, such as alfalfa, red clover and reed canarygrass are active in the summer, except on hot dry days. Reed canary grass, although a good summer pasture grass, has been placed on the invasive species list and therefore, cannot be further seeded in Massachusetts.

Methods of Planting: consider the erosion potential for every field. Different planting methods may be more appropriate for some fields than others.

- **Till-** Sometimes referred to as conventional seeding, due to the specific tillage practices implemented such as plowing, disking, harrowing, etc. Tilling of soil allows for aeration, alleviation of compaction, elimination of existing vegetation and residues, and incorporation of lime and fertilizer into the soil. Tilling also provides a smooth surface for seeding and the occasional harvest. Take care not to destroy the soil stucture by overworking the seedbed.

- **No-till-** Helps to reduce soil erosion, conserve soil moisture, and reduce fuel and labor requirements. A specialized planter is required to insure good seed to soil. No-till performs best on sandy or silt loam soils. Planting in both directions in a grid can increase the stand density.

Seeding Rate:

The rate at which you seed depends on the species being planted, method and time of planting, climate conditions, type and number of grazing animals and intent of reseeding. If using coated seed, the planter may need to be recalibrated to account for the extra weight. Many companies sell seed as blends of several species and the usual seeding rate of a premixed blend is 25 lbs/acre. For recommended seeding rates of individual species see the Natural Resources Conservation Service (NRCS) Specification Guide Sheet for Pasture and Hay Planting:

(**http://efotg.nrcs.usda.gov/references/public/ID/512.pdf)**

Time of Seeding:

Seeding both legumes and grasses to eliminate existing species:

- **Late summer/early fall-** is considered the best time to seed if a blend of species will be planted. When seeding late in the summer, soil moisture tends to become an issue but weeds are less competitive. Time your seeding accordingly so that soil moisture is available.

Seeding legume into an existing grass pasture:

- **Late winter/early spring-** is the best time to seed legumes into an existing stand of grass that is productive. Seeding should take place in mid-March to mid-April depending on soil conditions and method of planting. An early seeding will aid in the competition with weeds and grasses. No-till and frost seeding are options.

Management During Establishment:

A strong root system must be established prior to grazing. The roots systems in perennial forages are where food reserves are stored. If the roots are not strong enough, then there are not enough reserves for the plant to survive winter. Therefore, animals should only be allowed to graze on well- established plants.

- Never graze new stands during wet periods, especially on tilled seedbeds.
- Test for root development by grasping a handful of desired plant material and tugging on it. If it is easily uprooted, then the root system is not sufficient established and another cycle of mowing and regrowth should be allowed.
- Do not graze plants lower than 3-4 inches.
- Graze only when soil surface is firm and dry.
- Implement rotational or intensive grazing management practices for efficient use of pastures. After grazing, pastures should rest for a period of 24- 30 days.

Weed Control:

- Controlling weeds in newly seeded pastures is one of the most important aspects of pasture establishment.
- Grow a companion crop such as oat to help prevent weed growth in spring.

Cows happily grazing

- Increase seeding rate if weeds are expected.
- Apply broad spectrum herbicides, prior to no-till seeding.
- Rotationally graze and mow or clip pastures if needed to remove seedheads and ungrazed excessive growth. Never let weeds go to seed.

Mowing- is a good weed management practice because it helps develop hardy root systems, suppress weeds, promotes uniform grazing, and removes pasture plants of low palatability. Take care not to mow too early. Ifpreformed too early, only the tops of the weeds will be eradicated, leaving the active buds, which will produce new growth. Mow pastures at a height of at least 3-4 inches.

Conclusion:

Evaluate all pastures on a consistent basis to ensure proper management. Adopting practical and environmental management techniques will ensure productive and healthy pastures for a long time.

Weed Management for Pasture and Hayfields: Part 1 - An Overview

Randall G. Prostak, UMass Extension weed specialist

Weeds are common pests of pastures and hayfields. Weeds can often result in a reduction of pasture quality and quantity. Some weeds can be poisonous to livestock may result in sickness or death of animals. Some weeds can be grazed or hayed and have good nutritional value, however when compared with cool-season pasture grasses and other desirable forages, weeds have low recovery potential after summer stress and wear, have low productivity, and do not provide winter cover. Weeds are strong competitors and can cause pasture renovation and establishment projects to fail.

A critical first step in the development of a pasture and hayfield weed management program is to scout and identify all weed species that are present. Pasture managers should get into the habit of scouting for weeds on a regular basis and/or every time they are in their pastures and hayfield. Special attention should be given to those weeds that might be new or those that are potentially toxic. All weeds should be correctly identified and their life cycle recorded. Regular scouting and accurate weed identification will enables producers to plan and implement appropriate management strategies and evaluate the long-term effectiveness of those strategies. Producers routinely monitor their pasture/hayfields have the opportunity to take the necessary actions can prevent and reduce the chances of having heavily weed-infested pastures and hayfields.

Cultural practices are an important part of an effective weed management program for pastures and hayfields. The best defense against weeds in a pasture is a dense, healthy sward of desirable pasture species. A discussion of cultural practices and preventative strategies will be featured in Part 2 of this article series in an upcoming newsletter.

Weedy pasture unfit for grazing

Well-managed pasture

Equine Pasture Management

Dr. George R. Howe

Pastures have a two-fold purpose: to provide feed and to provide space for exercise. Good space for exercise should be sufficiently dry and free of obstacles that might cause injury. Ideally, there should be access to salt, clean water, shelter from adverse weather and nutritious forage free of harmful plants.

Knowledge of the horse's grazing behavior is helpful to maximize the pasture benefit for the horse. The amount of time horses devote to grazing varies with changes in their environment, such as, severe weather (hot or cold), forage availability, companionship and insects (especially flies). In addition, variation commonly occurs with individuals. Mature domestic and feral horses that are on pasture with ample forage and no other feed during mild weather may spend 40-60% of a 24-hour period (60-80% during daylight hours) grazing. Lastly, horses are selective grazers based on forage availability and individual palatability.

The horse will eat, trample or damage forage in an amount equivalent to at least 1000 lbs of hay per month. In most areas, forage production of pasture occurs during a 5 to 7 month period. During this production period, one acre of good pasture with optimum moisture may yield 5-7 tons (10,000-14,000 lb) of high quality forage and be able to support two mature light breed horses. In contrast, 30-60 acres of dry range typical of that in the Great Plains might be needed to support a single horse for one year.

For maximum forage production, horses should not be on pasture during or shortly after precipitation to minimize trampling, plant injury, and soil compaction. The total annual water needed for optimum pasture forage growth is 24-36 inches.

Once the pasture forage is eaten down to the proper level, all grazing animals should be removed. Overgrazing should be prevented in that the short-term gain from overgrazing is more than offset by the long-term loss of decreased forage growth. As a result, an increased amount of more expensive feed must be fed. In addition, overgrazing slows or prevents forage growth, which allows weeds to invade the pasture. As a preventative, the forage preferred by the horse should not be grazed to less than 2 inches in height. Feeding additional feed and leaving the horses on the pasture will not prevent overgrazing. When horses are on a pasture of quality forage for only a few hours a day, they will eat about 0.33 lb/100 lb of body weight (i.e. 3.3 - 4.0 lb per 1000-1200 lb horse).

If there is adequate pasture available, the greatest benefit can be obtained by dividing it into two to four similar size pastures and using rotational grazing. Ideally, each pasture should be just large enough so that the animals will consume all of the forage in 10-14 days during plant growing seasons. Following this grazing period the pasture should have about a month's rest for new forage growth. Although pasture can usually be divided easily using electric wire, tape or cord, if several pastures are not available then rotational grazing is not possible which results in patchy grazing. Patchy grazing can be minimized using intermittent grazing. The most important factors for minimizing pasture weeds are not overgrazing and proper fertilization. Additional weed control includes mowing early in the Spring before perennial weeds bud and before annual weeds seed.

Rotational grazing

Good pasture management

Cover Crop Management for Maximizing Nitrogen Recovery from Fall Applied Manure

Dr. Masoud Hashemi and Dr. John Spargo

In Massachusetts as well as some other New England states, manure storage facilities for dairy operations are designed to only hold manure produced in a 6 month period. Dairy farmers traditionally empty their manure storage and apply it to their crop fields in fall right after harvesting corn silage. At this time, soil temperature is still warm enough for significant microbial activity and organic N in manure and soil organic matter continue to be released through mineralization and the subsequent production of nitrate nitrogen. Nitrate nitrogen is water soluble and highly mobile in soil; if it is not taken up by plant roots, it is prone to leaching with fall rainfall. Using cover crops is a viable option to conserve soil nitrate, thus reducing its loss through leaching. Cover crops also help reduce runoff and erosion losses and improve soil quality by increasing organic matter. The effectiveness of a cover crop in nutrient recovery and maintaining or improving soil and water quality depends on several management factors including species selection and time of planting.

Cover crop species selection in northeastern states is limited due to the short growing season remaining after corn silage harvest, and relatively early harsh winter condition. It is well documented that cereal grain cover crops are much more aggressive in collecting nitrogen released by mineralization than legume species. For example in a study it was shown that N recovery by grasses was ranged from 29% to 94% in comparison to 6% to 48% for legumes. Winter rye has been used widely in colder regions of North America due to its ability to germinate and grow quickly in cool weather, providing a greater opportunity for a deep fibrous root system to reduce nitrate leaching. The recovered nitrate can in turn be used by the subsequent crop.

Cover crop seeding date is important for producing adequate biomass and to ensure good root development before the cool weather slows or inhibits growth. The ability of cover crops to absorb nitrate nitrogen from soil is affected by the depth and density of their roots. In Massachusetts, seeding dates after mid-September often result in less than adequate leaf growth reducing the ability of the plant to dissipate the force of raindrops and flowing water, and a small root system with limited capacity to stabilization of soil or conserve nutrients. We conducted a comprehensive survey in 2006 and found that only 17 percent of dairy farms plant cover crops before September 15th. The mid-September seeding date in Massachusetts is considered standard for cover crops for effective erosion control.

We conducted research from 2004 – 2010 at the UMass Agronomy Farm in South Deerfield and on several Massachusetts farms to assess the ability of winter rye cover crop planted at different dates to scavenge N after corn harvest and its N contribution to a successive corn crop. Results of this work indicated that the time of planting for winter rye is a critical factor to maximize N recovery. Earlier planting dates of winter rye produced the highest biomass and thus the highest nitrate accumulation. Averaged over 3 years, the N accumulation in winter rye at the earliest time of planting was 60 lb per acre which otherwise would have been lost to the environment (Table 1). When residual N in the soil is high, for example in fields with a long history of manure application, cover crops have the capacity to remove even higher amounts of N from the soil. The soil nitrate level at all sampling depths in plots with and without cover crops reached almost zero before the ground was frozen. However, in plots with no cover

crops we assumed that the nitrate was lost to the environment mainly through leaching while in plots with cover crops, N was taken up by plant roots and accumulated in cover crop tissues. We also found that winter rye cover crops in provided N to the subsequent corn crop. Corn silage yield, with no added fertilizer, was 34% higher when planted after rye cover crop, compared with no cover crop treatment (Table 2).

In summary, multi-year and multi-location research studies by the University of Massachusetts have shown that well-established cover crops, planted by September 1 (achieving 1100 GDDs) can accumulate more than 100 lb N per acre. Therefore, we are encouraging farmers to plant their corn as early as possible along with using shorter-season corn hybrids so when combined can provide the opportunity for maximizing N recovery after corn and fall manure application.

Table 1: Nitrogen accumulation in winter rye cover crops (lb/acre) seeded at different dates.

Year	Cover crop Planting Date	Winter Rye Cover crop	
		Late Dec.	Early spring
2004	Sept 2nd	119.2	111.9
	Sept 15th	78.1	71.4
	Sept 29th	21.6	48.3
	Oct 10th	5.7	9.3
Trend		Q	L
r^2		0.95	0.92
2005	Sept 2nd	32.0	47.4
	Sept 16th	30.1	42.8
	Sept 30th	9.9	30.5
	Oct 14th	2.4	25.4
Trend		L	L
r^2		0.77	0.70
2006	Sept 1st	28.7	33.8
	Sept 15th	24.1	29.8
	Sept 29th	22.8	27.3
	Oct 6th	16.4	22.9
Trend		L	L
r^2		0.60	0.32

• L, Q = Linear and Quadratic, respectively

Table 2: Effect of cereal rye cover crop planting date on subsequent silage and ear corn yield. (No additional N was applied to corn)

Planting Date	After Rye		After no Cover Crop	
	Silage † (tons/acre)	Ear ‡ (tons/acre)	Silage (tons/acre)	Ear (tons/acre)
Sep.2	15.8 a	2.4 a	10.8	1.7
Sep.16	14.6 b	2.3 a	-	-
Sep.30	13.2 c	2.1 b	-	-
Oct. 14	13.2 c	2.2 b	-	-

--In each column, values followed by same letter are not statistically different--

† Silage yield adjusted to 70% moisture.

‡ Ear yield adjusted to 25% moisture.

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Upcoming Events for Fall 2012

September 14: New England Green Pastures
Award Ceremony
@ Eastern States Exposition, W. Springfield
Contact: Carrie Chickering-Sears
ccsears@umext.umass.edu

September 15: Lecture/Discussion with Michael Page
4:00-7:00pm @ UMass Hadley Farm
Contact: January Arkle
jarkle@cns.umass.edu
(413)244-3103

October 27: Open Schooling Horse Show
@UMass Hadley Farm
Contact: January Arkle
jarkle@cns.umass.edu
(413)244-3103

October 31 – December 12:
UMass Extension's Green School
Turf, Landscape, Arboriculture, and Vegetable Courses
@Holiday Inn, Marlborough MA
http://extension.umass.edu/landscape/education/umass-extensions-green-school
Contact: eweeks@umext.umass.edu
(413) 545-0895

November 8-11:
Equine Affair
@ Eastern States Exposition, W. Springfield
Contact: (740) 845-0085
http://www.equineaffaire.com/massachusetts/