2016 Northeast Pasture Consortium Annual Conference & Meeting Proceedings held at the Harraseeket Inn in Freeport, Maine, March 16-17

Twentieth Anniversary

The opening session, **Northeast Pasture Consortium Celebrates 20 years of Pasture Research & Advocacy**, was opened by Jennifer Colby, UVM Pasture Outreach Coordinator. This was retrospective look at the Northeast Pasture Consortium and the historic use of pasture since colonial days.

Jennifer Colby introduced James Cropper, Executive Director of the Northeast Pasture Consortium, as the first speaker of this session. His presentation was entitled: *Accentuating the Positive - Accomplishments for Pasture Research, Education, and Technical Assistance fostered by NEPC members since 1996*. He started out with a brief historical reference on how the Consortium got started so that newer members and others could see that it had support at both the federal and regional level. He first displayed the US Senate Appropriations Committee report in 1995 that said the following: "The Committee expects the Agricultural Research Service (ARS) to develop a Northeast Pasture Research Consortium involving the ARS facility in State College, Pennsylvania, nonprofit research institutions, and land grant colleges in the Northeast. This Consortium should promote applied pasture research, link existing resources, and foster continued state/federal and public/private partnerships for research in this area." In 1996, the Consortium also became a Multistate Research Coordinating Committee and Information Exchange Group of Northeast Regional Association of Agricultural Experiment Station Directors (NERA). The Consortium was setup to be a public and private sector partnership. Livestock producers, researchers, educators, and technical providers were convened in February 1996 to set goals, leadership structure, its mission, and membership structure. By the Fall of 1996, members were nominated and approved by the Experiment Station Directors. The first annual meeting was held in January 1997. A publication, Krueger, C. R., and H. B. Pionke, eds. 1998a. *Grazing in the Northeast: Assessing Current Technologies, Research Directions, and Education Needs*, NRAES-113. Ithaca, NY: Natural Resource, Agriculture, and Engineering Service. 218 p., was produced a year later.

Mr. Cropper then reported on what has been accomplished in the past twenty years. A four-book *Pasture-Based Livestock Production* Series was edited by Edward B. Rayburn, Extension Forage Agronomist, West Virginia University. The many chapters were authored by Consortium members. The four book titles are: *Animal Production Systems*, *Forage Production*, *Forage Utilization*, and *Managing and Marketing.* They are available at: http://palspublishing.cals.cornell.edu/nra_index.taf

Next, he informed the conference of the technical assistance available to pasture-based livestock producers from USDA, Natural Resources Conservation Service. Pennsylvania has area-wide grazinglands specialists. New York has two grazinglands specialists, one of whom is an animal scientist (dairy). The smaller states generally have someone on staff who is at least a part-time grazinglands specialist, except for Maryland. In West Virginia, most district conservationists have grazinglands training and experience as there is more pastureland than cropland in the State.

On the Extension side, he pointed out that Vermont is unique in that they have the Vermont Pasture Network (VPN). Started in 1996, it has been a collaboration between the Pasture Program at the UVM Center for Sustainable Agriculture, the USDA Natural Resources Conservation Service (NRCS)

Grazing Lands Conservation Initiative (GLCI), the Vermont Grass Farmers' Association (VGFA), and UVM Extension. They have three people on staff: Jennifer Colby, Program Coordinator; Kimberly Hagen, Grazing Specialist; and Juan Alvez, Technical Coordinator.

He pointed out that Rutgers University Equine Science Center, in 2005, developed the Ryders Lane Environmental Best Management Practices Demonstration Horse Farm. It is a working horse farm on the Cook campus that uses agricultural best management practices to provide solutions to many of the problems facing horse farm owners and stable managers today.

NHAES Organic Dairy Research Farm was the next major accomplishment he showcased. The organic dairy operation represents the first of its kind at a US land grant university, and is intended to help explore value-added opportunities for our regional dairy farmers.

He then went on to inform the attendees that the Agricultural Research Service's Pasture Systems and Watershed Management Research Unit at University Park, PA has become a key USDA research station being a member of the long term agro-ecosystem research (LTAR) network. It was one of the initial ten designated in 2012. It is also a part of the Northeast Climate Hub which delivers science-based knowledge, practical information and program support to farmers, ranchers, forest landowners, and resource managers to support decision-making related to the impacts of a changing climate.

He also told of the UMASS Crop and Animal Research and Education Center. It features Scottish Belted Galloway “oreo” cattle that graze pastures at the Center during the growing season.

He said there has been a proliferation of pasture organizations around the Region since 1996. In New England, there are the Granite State Grazers (NH), Maine Grass Farmers Network, New England Small Farm Institute's Conservation Partnership Initiative for Grazing in the Chicopee River Basin, MA, and the Vermont Grass Farmers Association. In the remaining Northeast States, there is the Appalachian Grazing Conference group in WV, Maryland-Delaware Forage Council, the New York Grazing Coalition, and the Pennsylvania Grazing Lands Coalition.

He focused on the Vermont Grass Farmers Association to tell about their mini-grant program that encourages their members to do innovative pasture practices. Thirteen grants have been approved since 2011. One farmer, for instance, raised geese on pasture to show its commercial feasibility.

Cornell University Organic Dairy Initiative was another success story. Currently, over 400 dairy farms in New York are certified organic. The Organic Dairy Initiative was created to provide research and extension to New York's Organic Dairy Industry.

The newest accomplishment was the start of the Wolfe’s Neck Farm Organic Dairy Farmer Training Program in Maine. It was made possible by a 3-year, $1,693,000 grant awarded to Wolfe’s Neck Farm from Stonyfield and the Danone Ecosystem Fund. The farm is a non-profit organization that promotes sustainable agriculture, education, and outdoor recreation. He reminded the audience of the upcoming tour of Wolfe's Neck Farm on Friday morning at 9:00 AM.

Lastly, he pointed out that grass-fed beef farms are becoming a fast growing business in the Northeast since the Pasture-based Beef Systems for Appalachia Project (Grass-fed beef) was sponsored by the Consortium. As examples, he gave the following farms or groups: Adirondack Grazers Cooperative in NY, Cold Spring Ranch in ME, All Natural Beef Company in PA, and Swift Level Farm in WV.

Looking ahead, Mr. Cropper said that the Northeast Pasture Consortium has applied for a five-year extension as a project of NERA. This project extension will run from October 1, 2016 to September 30, 2021.

Jennifer Colby then introduced the next speaker, Dr. Ed Rayburn, West Virginia University. His presentation was *Rebirth of Pasture; Past, Present, and Future*. He started his talk by quoting Mark Twain, "The reports of my death have been greatly exaggerated." He related this to pasture as a landuse. It is not dying but increasingly becoming more important again. Quoting Ed, "Pastures in the NE are alive and well depending on the ability of the managers and the weather." He also presented a historical perspective going back to 1492. He said that Native Americans burned land annually. A good burn needs about 3 years of fuel build-up. Slope and hydric soils determined area burned and recurrence interval as these fires were uncontrolled burns once started. The result was there were many areas of rather extensive grassland and savannas in eastern North America prior to Europeans arriving. As examples, Dr. Rayburn gave these:

- Verrazano in1524 found grasslands over 20 miles in size.
- Lawson in 1699 found grasslands 50 miles in size.
- Long Island Hempstead plains were over 93 sq. miles in size.
  (Peter Dunwiddie, Grasslands of Northeast North America)
- NY Finger Lakes had much open grassland as reported by soldiers in the Sullivan campaign 1779. (Tall Timbers Fire Ecology Proceedings.)
- Great Valley of Virginia (and Pennsylvania)
  Shenandoah, James, Roanoke, Cumberland, Lebanon, and Lehigh counties

With the arrival of European settlers, primarily beginning in the 1600's,

- Wide spread death of Native Americans due to:
  - Small pox
  - Listeriosis
  - Measles
  - Colds
- Open land occupied by Europeans
- Without fire, forests encroached abandoned farmland and changed character

With the arrival of Europeans,

- Some Native Americans integrated with Europeans,
- Some Europeans and Africans integrated with Native Americans,
- Natives adopted European technology,
- and Europeans adopted Native technology.

For instance, Lawson reported Paspatank Indians raising cattle in 1700 near the North Carolina coast.

In those early days, livestock and pasture management consisted of 9 basic principles as fencing was labor intensive and fencing materials were heavy or in short supply, or climate influenced choices:

- Open range with crops fenced in
- Penning used for fertilizer
- Penning used for finishing livestock
- Necks of land along the Atlantic Coast estuaries fenced off for livestock
- Livestock put on islands for pasture
- In North, hay production for winter feed from marshes
- In South, out-wintering on native grass
- Cool water and weather allowed dairying in North (numerous small cheese plants)
- Warm winters encouraged beef and hogs in the South, some household dairying

Over time livestock and pasture management evolved as European settlement continued, European grasses came in by chance and on purpose. Many forbs came in as garden and medicinal herbs. Uncontrolled grazing in summer and winter killed off or reduced many native grasses and forbs that were good livestock feed. Hogs uprooted, ate, and killed native vegetation (grass, forbs, trees). Based on time and location pastures were fenced off from cropland and roadways. Lime and fertilizers were used on pastures beginning in the late 19th and early 20th centuries. Late 19th to early 20th century pasture was its height as a landuse in the Northeast. Sheep and small dairy were dominant livestock enterprises.

After the Civil War, Digression of Agriculture in the Northeast led to these changes:

- Agriculture in Midwest increased
- Agriculture in Northeast declined
- Dairy production for the urban areas
- Cropland became hayland
- Hayland became pasture
- Pasture became woodland
- Repeat or becomes housing and commercial development.

In 1950's, World War II Chemical Industry turned to agriculture. This was the response:

- Nitrogen fertilizer production increased
- Herbicides and insecticides developed
- Increased corn production (no longer in a crop rotation with forage legumes, except on dairies)
- Use of farm machinery increased at even greater rate than before
- Increase in confinement feeding with more corn available for feeding.

Improved pasture infrastructure technology and grazing management evolved since the 1950's. Fencing went from woven and barbed wire to electrified high tensile wire on low impedance chargers. Low cost water troughs and pipelines became available. This made it more feasible to do rotational grazing as these inventions made it easier to allocate forage based on daily forage allowances rather

than on a seasonal basis. Herbicides were improved to get better brush and noxious weed control. Multi-species grazing also became a tool to get brush and weed control without herbicides. Recently, teaching cattle to eat some weeds has also lessened herbicide use and/or renovating pastures.

Scientific pasture research started in early 20th century, increasing and peaking by mid-century. The improved pasture infrastructure lagged behind but came into being in a big way by the 1980's. D. B. Johnstone-Wallace of Cornell University did a lot of pasture research during the 1920' and 1930's. His book, *Pasture Improvement and Management*, and Roy Blaser's (Virginia Tech) books, *Forage-Animal Management Systems* and *Managing Forages for Animal Production*, may be out of print but are not out-of-date due to their basic pasture management concepts.

Organized research groups and conferences continue to spread the word on pasture management. Three prominent national ones are the American Society of Agronomy, Crop Science Society of America, and the American Forage and Grassland Council. The predecessor to the Consortium, the Northeast Pasture Coordinating Committee, published a book, *Pasture in the Northeast Region of the United States, a workshop proceedings*, edited by J. B. Cropper in 1988. Ten years later, the Northeast Pasture Consortium, published *Grazing in the Northeast, Assessing Current Technologies, Research Directions, and Education Needs*. The Northeast Pasture Consortium continues to be unique in being a regional force for pasture-based agriculture by coordinating research among universities and ARS and promoting the use of this research by Extension and NRCS specialists to help pasture-based farmers utilize that information to its fullest.

The future of pasture research and extension are hampered by:

- Diminishing research dollars
- Increasing competition for research dollars
- Loss of people with pasture expertise
- Diminishing extension dollars
  - fewer state and county specialists

Economics will determine pasture use:

- Internal farm economics
- External regional economics
  - County, state, national, world
- Government policies impact economics
  - Subsidies, tax breaks, regulations

Each of us is empowered and constrained by:

- Background (ongoing)
  - culture, social, economic, education, experience
  - underlined items we can modify
- Knowledge, skills, abilities
  - determined by background
- Ignorance

- what we know we don't know
- what we think we know that is incorrect

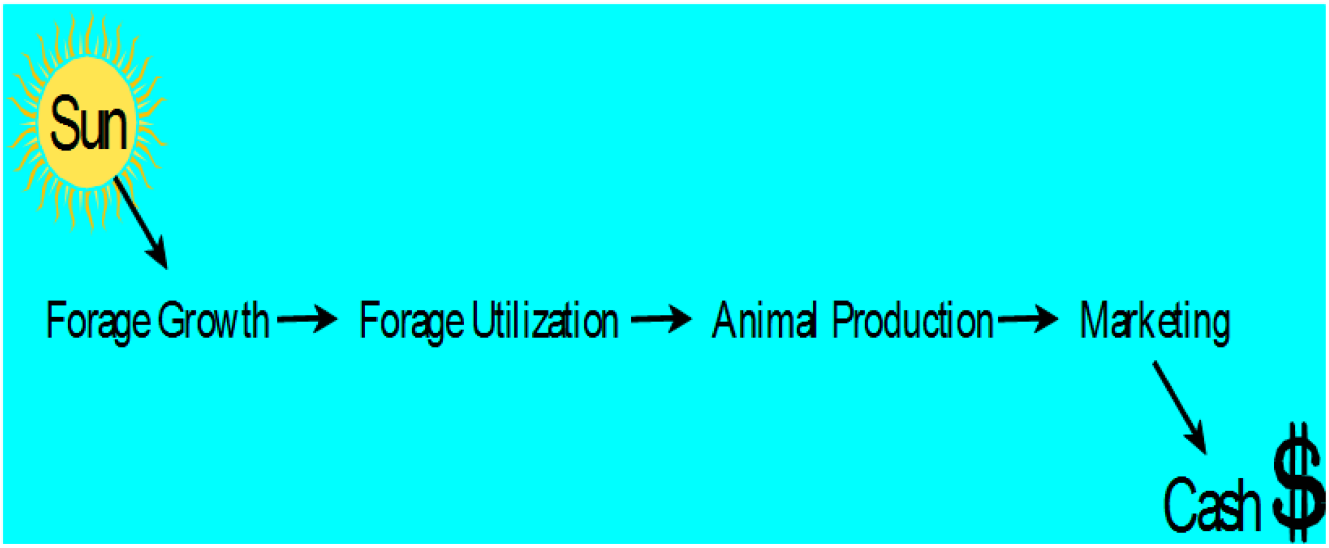
- Viewpoint
  - outcome that we feel or think is best

This too will effect the fate of pasture as a landuse. Good information is available to make good informed decisions on using pasture to feed livestock. Web sites are:

- *NEPC Grazing Guide*
  - http://grazingguide.net/
- *On Pasture*
  - http://onpasture.com/
- Extension Web Sites Such as WVU's
  - http://anr.ext.wvu.edu/forage

Northeast Pasture Consortium books are: *Grazing in the Northeast, Assessing Current Technologies, Research Directions, and Education Needs,* and the four-book *Pasture-Based Livestock Production Series - Animal Production Systems*, *Forage Production*, *Forage Utilization*, and *Managing and Marketing*. Three other good references are: *Managing Pasture as a Crop* by Darrell L. Emmick, *Southern Forages* by D. M. Ball, C. S. Hoveland, and G. D. Lacefield, and *Management-Intensive Grazing* by Jim Gerrish. For animal nutrient requirement books, the following books are available through the National Research Council: Nutrient Requirements of Dairy Cattle, Nutrient Requirements of Beef Cattle, Nutrient Requirements of Goats, Nutrient Requirements of Horses, and Nutrient Requirements of Sheep.

Life is solar energy driven with nutrients cycled. Pastures can be a conduit for using this paradigm to convert solar energy into cash provided all the steps are done wisely.



Biology and environment determine what happens in the pasture. Management can direct the biology, energy flow, and nutrient cycles to achieve desired production and ecological goals. Learn correct

principles and govern yourselves. Principles teach why management practices work the way they do. However, management that works in one environment may or may not work in a different environment.

First, let us start out with Farm Economics 101:

- Profit = Gross receipts – Marginal Cost – Fixed cost
  - Living wage part of fixed cost
- Gross receipts = Market price x Volume
- Opportunity costs and alternative opportunities
  - money, land, time, effort
- Business plan
- Drought management plan
- Flood management plan

Risk management and climate change go hand in hand:

- Too wet
- Too dry
- Too hot
- Too cold

The drought and flood management plans address two of those climatic extremes. Too hot and too cold require staying on top of forages' climatic preferences and possibly shift to species that can tolerate those extremes. In the western US states, drought management plans have always been necessary on rangelands, but are also needed in the eastern US. Even short term droughts can make a shamble of a rotational grazing plan. Farms on wet soils or floodplains really need flood management plans when the skies open up as pastures may not always flood, but are too wet (water-logged) to graze without messing them up severely.

Using mob grazing as an example of knowing the environment that you are in before making choices in grazing management, Ed shows what can happen if the grazing technique does not fit all situations.

Under mob grazing paradigm I, this is how it got started:

- Greg Judy developed a pasture-beef system based on rented pasture.
- Livestock trailed from pasture to pasture.
- Long rest interval needed due to management constraints (grasses more mature as a result).
- Tall fescue is intolerant to long rest intervals.
- Forbs and native grasses do well with long rest intervals.

Under mob grazing paradigm II, this was the long term outcome in that local environment:

- Toxic tall fescue decreased (That is OK, if you have it in your pastures).
- Nutritious forbs and native grass increased (Also OK, if the seed bank is there to fill-in sod).
- Livestock performance improved.
- Treaded grass increases soil organic matter (SOM) (unanticipated side benefit).
- SOM increases water infiltration and water holding capacity (side benefit, due to above).
- Soil health, plant growth, and animal health (not all livestock types) and growth improve.

Under mob grazing paradigm III, it migrated to places where it was ill-suited:

- Mob grazing taken Nationally.
- People jump on band wagon.
  - Humans are herding animals just like cattle
- Mob grazing used in other environments without regard to biological principles.
  - Plant growth habit and life history (varies greatly over a wide range of pasture plant species)
  - Nutritional impact on dairy cattle versus beef (dairy forage intake and quality requirements much higher).

What can we learn from the Mob Grazing Paradigm?

- Mob grazing started as a near perfect pasture system for the local business plan & environment.
- There were unexpected side benefits.

- Band wagon affect took it Nationally.
- But, it was applied without understanding biology - hammer looking for a nail.
- Negative consequences occurred where not appropriate.

How does the mob grazing paradigm work in the Northeast?

- In the cool environment of the Northeast most of the benefits of Mob Grazing can be achieved with well-managed rotational grazing with shorter rest intervals that provide higher quality forage for dairy cattle and fattening beef cattle.
- For the cow-calf herd requiring lower nutrition it should work fine and could be an improvement, especially if toxic tall fescue exists. One has to hope the seed bank has other good forages to replace the fescue. Otherwise, overseeding may be necessary to achieve a good stand of grass and forbs.

Pasture has many positive attributes inherent as a feed source for livestock, in the food it produces, and ecosystem services provided:

- Pasture products have health benefits.
- Local foodies want pastured products.
- Pasture production can be cost-effective.
- Pastures can be sustainable through nutrient cycling.
- Pastures can sequester carbon.
- Pastures can benefit livestock health.
- Pastures can maintain species and habitat diversity.

Pasture management needs to be applied artfully based on the local environment, biology, and economics. With its many positive attributes to the environment and local farmers and consumers, pastures in the NE will be alive and well depending on the ability of the managers, the economy, and the weather.