



FARM REPORT



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FROM THE PRESIDENT'S DESK – LOOKING TO THE FUTURE

In December of 2011, we rolled out our new five-year Strategic Plan. Our fundamental mission will be to link advanced crop management with efficient animal production to sustain our natural environment.

- Our education programs will showcase cutting-edge knowledge in agriculture and environmental science.
- Our research will evaluate advanced forage genetics and management strategies that optimize cow response and agronomic systems that enhance environmental stewardship.
- Our farming operations will demonstrate best management practices for crop, animal, and nutrient management.

Additionally, we will engage the farm and non-farm community on issues that cross-cut agriculture and society: food safety and security, environmental impacts of farming, and animal well-being.

organization will be able to actualize the crop-animal-environment system to the extent that Miner Institute will. It will remain our unique ability as well as our passion.

Strengthening our undergraduate education programs in agri-environmental science and dairy management over the next five years will be our top academic priority. Our educational programs will be regionally and nationally recognized for being hands-on and research-based, with a residential living and learning experience that complements the academic programs and prepares students to assume leadership roles in agriculture and environmental management. If all action plans are successful, undergraduate enrollment in Institute educational programs should be approximately 70 to 80 students annually. As a result of our previous educational efforts, approximately 50% of cows in Vermont and New York's North Country are directly impacted by graduates of our courses.

No other university or private research See **FUTURE**, Page 7



RUMINAL BACTERIAL COMMUNITY, COW SPECIFIC?

Why do cows, rather rumens, behave differently on the same diet?

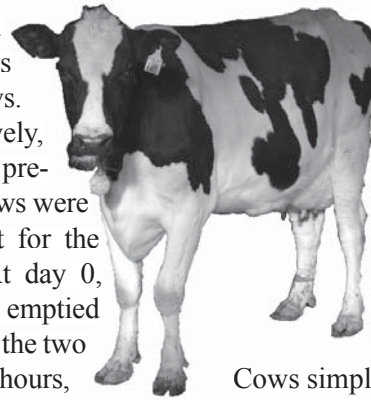
We know that animal differences (i.e. age, parity, DIM, genetic potential) and management factors (i.e. crowding, time budgets, facilities) greatly affect production and animal health. But even with paired animals fed the same diet such as in our tie-stall research trials, rumen pH and VFA profiles can differ drastically yet result in similar milk production. In some instances under similarly “controlled” circumstances, production and rumen parameters can vary.

We recently experienced this variation in cow response in our sand-bedded Pen 30: High production cows on a research trial all fed the same diet. Our herd was suffering from low milk fat and this group was the most notable exhibiting milk-fat depression (MFD). Individual cows in this group ranged from extreme MFD with milk fat-protein inversions, to those producing normal levels of milk fat and protein. Same diet for all, so what was the issue?

This varied individual cow response reminded me of a research trial conducted by Weimer, et al. (2010), at the USDA-ARS, US Dairy Forage Research Center in Madison, WI that could help explain such varied responses of cows to nearly identical feeding and management situations. Their work involved exchanging rumen contents between cows and documenting changes in rumen pH, VFA profile and the composition of the rumen bacterial population (referred to as ruminal “bacterial community composition” or BCC). The research involved 2 experiments using paired cows, that differed in their BCC as determined by means of genetic finger printing of the rumen bacterial population. In Experiment 1, the average ruminal pH

and VFA levels differed between the two cows (6.88 vs. 6.14 and 57 vs. 77mM VFA) respectively, as measured at 3 hours pre-feeding over 3 days. Cows were each fed the same diet for the entire 9-week study. At day 0, rumen contents were emptied and exchanged between the two cows. After only 24 hours, rumen pH and VFA profiles returned to the level of — the cow. In other words, Cow A received Cow B’s rumen contents, which originally had a pH of 6.88. Within 24 hours, Cow A with her new rumen contents had a ruminal pH that matched her original ruminal pH of 6.14 and vice-versa for Cow B. The ruminal bacterial populations showed significant change to that of the new host cow BCC profile after 14 days and was nearly complete after 61 days. Experiment 2 showed similar results with two different cows. It’s interesting to note that the ruminal pH and VFA levels returned to the host cows’ level in spite of the delay in change of the ruminal bacterial populations. This indicates that the cow truly has the greater role in managing rumen pH and VFA levels than the rumen microbial population. Through rumination, saliva production and rate of clearance of VFA the cow significantly influences her own rumen chemistry. Certainly not a new concept, but I thought diet and the BCC would have had more influence in determining ruminal pH and VFA levels than is indicated with this study.

The fact that BCC is unique to individual cows and actually controlled by cows is intriguing. Clearly there is a unique relationship between the host cow and the rumen microbial population that results in host specificity. The significance of this can be seen in the failed attempts to modify



ruminal microbial populations through the introduction of pure bacterial strains. This may also help explain the varied responses to other attempts at altering rumen fermentation through feed additives and rumen modifiers.

Cows simply have individualized and unique populations of bacteria in their rumens that may not all react alike. This concept should be considered when attempting to improve rumen fermentation through additives for improved digestive efficiency, nutrient utilization or possibly reduction of methane production.

What this has to do with our MFD, I’m not quite sure, other than it reminded me that cows and their rumen microbes are uniquely individual. However, regarding our MFD, we have returned to about 3.8% fat 3.2% protein for the whole herd. Not sure how, other than forage quality. It seems as though our MFD was a combination of events that may have included season (late summer-early fall), forage changes and the forage quality of feeding tails of silage piles. We tried adding peNDF via straw, via 2011 1st cut grass silage replacing high quality 3rd cut haylage, as well as decreasing unsaturated fats, all with minimal effects. In early November we finally got deep into all of our forages, and milk fat returned. Once again, forage quality, or some other unknown?

— Kurt Cotanch
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* Reference: Weimer, P.J. et al. 2010. Host specificity of the ruminal bacterial community in the dairy cow following near-total exchange of ruminal contents. *J. Dairy Sci.* 93:5902-5912.

REMEMBERING THE WEATHER OF 2011

The weather of 2011 is probably still fresh in many minds, especially those of farmers and others who experienced major property damage and loss. The property damage caused by the spring floods combined with the damaging effects of Irene and tropical storm Lee on field, forage, and vegetable crops was unprecedented and its legacy will be felt for years. While the early spring flooding in the Upper Midwest, Mississippi basin and the Northeast caused major damage, the effects of Irene were unprecedented in many states. Irene marked the tenth \$1 billion disaster of 2011. Our neighbors in Vermont and New England were hit particularly hard by Irene. A recent report by UVM extension summarized the impacts of Irene on Vermont agriculture. The total amount of Vermont cropland affected by Irene was over 9,000 acres with estimated farm economic losses of about \$20 million. Normally, the FDA prohibits the feeding of flood-damaged forage



A flooded horse pasture at Miner Institute in late April 2011.

crops to livestock. However, since the state implemented a sampling and monitoring plan to evaluate forage quality of flood-damaged crops, and developed protocols for storing and feeding affected forage crops, the Vermont Agency of Agriculture was able to convince FDA to allow the feeding of flooded forage crops. Some other good news in the report is that preliminary testing of forage and vegetable crops has shown no harmful levels of heavy metals, hydrocarbons, or pesticide

residues. The report can be found at: <http://www.uvm.edu/vtvegandberry/Pubs/ImpactIreneVermontAgriculture.pdf>

Nationwide, Irene caused 47 deaths and so far has resulted in over \$7.3 billion in damages. In NY, an estimated 145,000 acres of cropland were affected, with farm economic losses projected at \$45 million. Rivers in six northeastern states reached the 100-year flood stage, while some rivers in Schoharie and Greene counties (NY) reached the 500-year recurrence interval (e.g., flooding at this level expected once every 500 years on average). The economic and agro-ecological impacts on agriculture from the weather events of 2011 are profound and should challenge agriculture as a whole to think longer and harder about managing weather-related risks in the future.

— Eric Young
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NEW NATIONAL NUTRIENT MANAGEMENT STANDARD

The USDA-NRCS recently released its revised national nutrient management standard (590). The revised standard includes several important changes with respect to the current standard in New York (NY590). All CAFO farms and farms that receive funding for conservation programs must comply with the 590 standard. Important changes include tighter restrictions on manure application during adverse weather conditions, encouraging the use of manure management practices (e.g., injection, incorporation) that reduce nutrient losses to water and the atmosphere, and stronger consideration of practices aimed at

reducing runoff and erosion. While NRCS is not a regulatory agency, their recommendations are used by other regulatory agencies to develop policies. Over the next year states will determine how to implement the new standard and what if any additional regulations there will be for winter manure application. Stay tuned.

The new 590 standard can be found at: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1046177.pdf

— Eric Young
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TARDY HOLIDAY TIP

My daughter-in-law discovered an ingenious way to prevent her four children, ages 7 to 15, from shaking, poking, and peeking at their Christmas presents in their effort to discover or at least guess at the contents. She randomly numbered all the presents, no names, keeping a highly secretive list consisting of both donor and recipient. This stopped the shaking/poking/peeking, and drove her kids absolutely batty (which some parents may consider an added benefit since the shoe is so often on the other foot, so to speak). I believe the “Grinch” name was mentioned, but she was unmoved. This also prevented the often-frenzied ripping off of wrapping paper, tags, etc. on Christmas morning, with the process proceeding at a pace that she set since she was The Holder of The List.

— E.T.

FERTILIZER PRICE UPDATE

In the November Farm Report I noted that only once in the past 10 years has the price of fertilizer been lower at spring planting time than it was late the previous fall. In the article I commented that my crystal ball was a bit foggy but that I expected fertilizer prices to remain steady or perhaps strengthen a bit between fall 2011 and spring 2012. This was based in part on the almost certainty that 2012 U.S. fertilizer demand will be the highest in five years, increasing by about 7% compared to 2011.

I'm glad I included that "foggy" weasel word because developments far from the shores of the U.S. are influencing our fertilizer prices, with the most price pressure on UAN solutions. By spring, UAN prices could drop by as much as 10% compared to fall 2010. That

doesn't mean prices are certain to go down, but there's a very good chance of it. (Note that this reflects average U.S. retail prices, not what you'll pay at your local farm supply store. Price competition is still alive and well, thank goodness.) Longer term, there's a fair chance that nitrogen fertilizer could get cheaper in spite of increased demand because of a huge increase, led by the U.S., in the worldwide production of natural gas.

Urea prices may not decrease much (if at all) because of a surprise purchase by India that's tightening world supplies. India is one of the world's largest users of fertilizer, and has been rapidly increasing its use. China is also a big player in the global urea market. A big urea exporter in the past, China has been placing a 100% tariff on urea exports

during the spring and fall in an effort to have enough urea for its own farmers. During the spring and summer China has been reducing the tariff to only 10%. China can have a big impact on urea prices simply by fiddling with its tariff. Diammonium phosphate prices may decline by about 5% because of increased inventories. Saudi Arabia (!) is becoming a significant producer and exporter of DAP. Canada is still the world's largest producer of potash, but Russia and Belarus have become huge producers, representing up to 30% of total global potash production. If someone asked 100 U.S. farmers which countries are among those having the biggest impacts on global fertilizer prices, how many do you think would say Saudi Arabia and Belarus?

— E.T.

ALFALFA VARIETY TRIALS

Cornell University recently published its annual summary of forage variety trials it conducts around the state. NY farmers should be appreciative of these efforts, since it gives them the chance to find out how both new and old varieties perform under local conditions. One of the sites is in the plot area that Cornell maintains at Miner Institute, on soils quite similar to those on many other Northern NY dairy farms.

A few years ago I commented that while corn yields have enjoyed fairly steady increases over the years, such was not the case with alfalfa: Some 20-year-old alfalfa varieties were yielding about as well as the new ones. From looking at a three-year summary of alfalfa varieties planted in Chazy

in May 2008, this has changed: The top few varieties yielded at least 15% more than the check varieties (Pioneer 5312, Oneida VR, and the now-ancient Vernal), and almost all of the newer varieties outyielded each of the check varieties. Almost identical results were found in a similar trial planted in Ithaca. Furthermore, a bunch of alfalfa varieties entered as experimental by the various seed companies also performed very well, in many cases even better than the top currently-marketed ones. This certainly bodes well for the future.

The difference in annual yield between the best varieties and the older ones is about half a ton of alfalfa per acre. With alfalfa valued at \$150 per ton or

more, that's \$75/A per year or well over \$200 for three years. You can do the math, but obviously the added seed cost between "the best and the rest" is small compared to the value of the higher yield.

A final note on alfalfa varieties: If you look at trial results you might note that sometimes the entries are referred to as "varieties" and other times as "cultivars." I asked Julie Hansen, who is the Cornell plant breeder who manages these trials, the difference and she said that there really isn't any, though most seed company plant breeders prefer the latter term. Therefore, a cultivar is simply a variety with a Ph.D.

— Ev Thomas, thomas@whminer.com

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SIRE SELECTION PLAYS A ROLE IN MORTALITY & EARLY LACTATION CULLING

Many dairy producers monitor death loss and early lactation culling because they indicate compromised cow well-being and impact farm profitability. Nutritional and non-nutritional management practices that affect mortality and culling are commonly researched and frequently published in popular press magazines. In contrast, genetic selection practices that affect mortality and culling in early lactation have not been widely reported.

Dechow and fellow researchers from Penn State recently suggested that genetic selection for traits such as herd life may be one tool to reduce on-farm death losses and involuntary culling in early lactation. Reviewing records from 1467 herds, they found that the sire predicted transmitting ability (PTA) for productive life (PTAPL) and daughter pregnancy rate (PTADPR) were negatively associated with mortality and 60-day culling. Sixty-day culling was defined as cows

that left the herd (culled or death) from 21 days before the due date to 60 days in milk.

Cows were classified as belonging to herds with adverse cow survival environments ($\geq 4.4\%$ mortality rate and $\geq 7.1\%$ 60-day cull rate) or favorable cow survival environments ($< 4.4\%$ mortality rate and $< 7.1\%$ 60-day cull rate). The estimated mortality risk decreased from 2.8% to 2.1% for cows in favorable environments in the lowest and highest quartiles of sire PTAPL. The effect was greater for cows in adverse environments; estimated mortality risk decreased from 9.0% when cows were sired by bulls in the lowest quartile for PTAPL to 6.8% when cows were sired by bulls in the highest quartile for PTAPL. The estimated 60-day culling risk declined by 0.9% in favorable environments and 2.7% in adverse environments from the lowest to highest sire PTAPL quartile. In the adverse environment

herds, daughters of bulls in the highest PTADPR quartile had estimated mortality and 60-day culling risks of 1% and 1.5% less, respectively, than daughters of bulls in the lowest PTADPR quartile.

The study provides evidence that genetic selection plays an important role in mortality and early lactation culling. Selection of sires with high productive life evaluations was associated with lower mortality and 60-culling, especially for herds with poor environments.

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* *Reference:* Dechow, C. D., R. C. Goodling, and S. P. Rhode. 2012. The effect of sire selection on cow mortality and early lactation culling in adverse and favorable cow survival environments. *Preventative Veterinary Medicine* 103:228-233.

SOUTHERN EXPOSURE

I was guest speaker at a December meeting in a Pennsylvania Dutch smorgasbord restaurant in New Holland, PA attended by over 200 dairy farmers, primarily Mennonites and Amish. I've found that most meetings involving Amish farmers are well-attended; not sure whether it's because they have a thirst for knowledge and a hunger for information, or because they're thirsty and hungry. Those guys can really eat, and since teenage Amish boys are already an active part of the farm operation they often attend as well.

Speaking of food, I was having dinner at a Myrtle Beach steakhouse last month with a group of Southerners and

one of the guys mentioned how much he loves collard greens with ham. "Why with ham?" someone asked. Because, he replied, by itself collard greens don't have much flavor. "What about grits?" I asked, noting that I'd tried grits several times and found them all but tasteless. That caused one of our group to remark that grits closely resemble a combination of Elmer's Glue and kitty litter, but he was from Florida and many Southerners don't consider someone living very far south of Jacksonville to be a "true Southerner." This is understandable, considering that much of the Sunshine State has been colonized by retired Canadians. (How else to explain the

continued existence of two National Hockey League teams in the decidedly unfrozen tundra of Tampa Bay and Miami?) It was explained to me that nobody eats plain grits; you have to add butter, salt and pepper, or maple syrup. I think I'm beginning to detect one of the secrets of Southern cuisine: Start with something with little or no taste and then add seasonings until palatable.

Finally, regarding communications: Social networking is really neat, But I'm not on Twitter; I do not Tweet. So to reach me quickly or even at all, Send me an email or simply call.

— E.T. (Phone 518-570-7408)

TWO STEPS FORWARD, ONE LOOK BACK ...

As we head into a new year at Miner Institute our focus is on upcoming research projects, conferences, collaborations, and deadlines. Although we look ahead, a brief review of the last 25 years helps us see what profound, and relatively recent, changes have occurred in the world of dairy science and farming.

By 1986, researchers had only just established a standard body condition scoring system (E.E. Wildman; later to be refined by J.D. Ferguson), implemented DCAD diets in the prevention of milk fever (E. Block), and evaluated lactational responses to recombinant bST (D.E. Bauman), now marketed widely as Posilac. From 1986 to 1989, significant research contributions to dairy science and on-farm management included the development of bull fertility rankings (R.L. McCraw), recommendations to pre-dip to reduce mastitis infections (J.W. Pankey), and early research on embryo transfer (K.H. Lu). Similarly, early research with duodenally-cannulated cows was conducted and built upon to establish recommendations for feeding protein. Sexed-semen was introduced by USDA researchers and licensed for commercial development. These lasting research contributions have remained critical tools in modern dairy management.

Advancements in food science technology and engineering also kept pace during this time with dairy researchers. The 1980s saw the introduction of electronic milk metering systems, improved four-quarter milking units, economical membrane filtration technologies for purifying whey proteins and lactose, and even zip-packed, resealable cheese packaging by Sargento!

During the 1990s, national average milk production increased by 3,000 lb/cow, due in large part to advances in ruminant nutrition. Researchers D.G. Fox, C.J. Sniffen, L.E. Chase, P.J. Van

Soest, and J.B. Russell introduced dynamic modeling to improve diet formulation, laying the groundwork for today's ration formulation software. Concurrently, M.S. Allen reported on the importance of NDF digestibility (NFDd) in corn hybrids planted for silage, influencing commercial seed producers to incorporate NFDd into their hybrid selection programs. Improved recommendations for fiber intake, based on physical effectiveness, interactions with other feed ingredients, and animal attributes were developed by D.R. Mertens. Development of a forage particle separator was pioneered by researchers at Pennsylvania State University, and was later modified into the Penn State Particle Separator currently used to assess forages and TMRs on farm. Researchers also reported on the variability of NFDd and its interactions with feed intake and animal performance, highlighting the importance of forage fiber digestibility in ration formulation.

Bovine metabolic and reproductive health also benefited during the 1990s, with research into fatty liver by R.R. Grummer and J.W. Young and estrus cycling by J.R. Pursley and M.C. Wiltbank. Artificial insemination technologies advanced with the discovery that follicular waves and ovulation could be precisely controlled through a sequence GnRH and prostaglandin injections. Additionally, the human health benefits of milk consumption were explored by P.W. Parodi, who pioneered the study of bioactive and anticarcinogenic components of bovine milk. It is also interesting to note that in 1998, the first dairy science course was instructed over the internet by M.J. Hutjens.

At the turn of the century, consumer interest in animal welfare prompted continued research into cow comfort, behavior and management practices. Work by R.J. Grant investigated social

interactions, grouping strategies, and feeding behavior in relation to intake. D.M. Weary and M.A.G. von Keyserlingk studied management factors including feed bunk and freestall design, informing recommendations for improved cow comfort. M.C. Lucy and colleagues reported that intravaginal progesterone inserts (CIDRs) could be utilized to synchronize estrus and initiate cycling in anestrous cows. CIDRS were approved for use by the FDA in 2004, and were quickly integrated into the OvSynch protocol. Researchers also shed light on a critical producer concern: milk fat depression. The biohydrogenation theory (D.E. Bauman and J.M. Griinari) states that an altered rumen environment may produce specific fatty acids that directly inhibit milk fat synthesis. Another theory, hepatic oxidation theory (HOT), is currently being studied to improve fresh cow diets and maximize intake. Following the sequencing of the bovine genome in 2009, "trait loci" identify countless heritable conformation and functional traits. The potential application of newly-available genomic testing technologies is still being explored.

This brief historical perspective gives us a renewed sense of the relationship between science and practice. Dairy science has evolved at a lightning pace in the last 25 years. With many other theories, management strategies, and nutritional insights still on the horizon, looking back allows us imagine how radically dairy farming will have changed by 2037.

— Carolyn Kokko
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**Reference: ONE HUNDRED YEARS OF INQUIRY AND INNOVATION: AN ILLUSTRATED HISTORY OF THE AMERICAN DAIRY SCIENCE ASSOCIATION. Jones, Coleen M. (Ed.). Long Prairie, MN: Banta Publications, 2006.*

WHAT'S HAPPENING ON THE FARM

In December we heard a presentation given by Dr. Greg Bethard of G&R Dairy Consulting. He made some great points that got us thinking - the beginning and end of the year seem to be natural time for evaluation and review (although it is something that should be an ongoing part of management). We were challenged to rethink the numbers and benchmarks we monitor on the farm. The numbers we choose to monitor performance are pretty important because it is how we determine our success!

At Miner we have the capability to collect lots of data about the cows, crops, and feed in part because of the all research conducted at the farm. But regardless of the fact that our facility is built to accommodate dairy research, the available technology on commercial dairy farms these days provides the owner with sometimes an overwhelming amount of information about the farm. Most of the data is interesting stuff but we frequently

comment "So what...?" The information is useless unless we use it - to monitor and improve performance, trouble-shoot, track management changes, etc.

So what areas were we challenged to watch more closely?! Dr. Bethard stressed component production - we are paid on pounds of components shipped! (the Jersey folks are smiling!) We certainly have paid attention to components in the past but sometimes we get hung up on the percentage. This year we are going to focus more on pounds of components produced and be more aggressive in investigating and fixing the problem when components start to dip.

Another area of management on which we will focus in 2012 is the days in milk (DIM) of the herd. Throughout the past year the DIM has ranged from 163-197. This, of course, corresponds to reproduction. So if our goal is to keep our DIM between around 150-160, our

focus and effort must be toward getting cows bred back and pregnant. By selling cows or drying them off early, we could quickly lower the DIM of the herd, but we know there is room for improvement in reproduction in order to have more cows at peak milk production and fewer cows with extended lactations in the low production group.

Lest we get focused on one or two areas of management and forget the rest, Dr. Bethard's talk was a reminder to look at the big picture. What is working on the farm? In what areas does our team excel and where do we fall short? What part of the business is making a profit? It is too easy to have a narrow focus, get stuck in a routine and start to manage like a robot - doing that same thing day after day without asking "why." Put the "to-do" list down for a moment and look around!

— Anna Pape
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FUTURE, Continued from Page 1

The next five years will see us stand out uniquely, both regionally and nationally, as being willing and able to conduct high-quality, integrated research spanning the forage crop-animal-environment interface that will have immediate application to the industry. Dairy farmer and allied industry surveys confirm that this research will remain fundamentally important to the future success of the dairy industry. We intend to augment our efforts in the future even as some research organizations scale back their applied research programs. During the next five years our goal will be to consistently achieve \$500,000 in grant income annually and reach one million dollars. This level of funding will allow us to conduct the needed research to address the critical issues facing agriculture.



Miner Institute will be considered a premier source for technical information on agriculture and environmental issues by farmers, agribusiness, community leaders, and policy makers. In the next five years, we will implement cutting-edge technology to expand the farmer and allied industry audience impacted

by our demonstration and outreach programs. Industry feedback confirms that our program topics (crop-animal-environment) are high priority, but we must become more flexible in our delivery approaches, both regionally and nationally. We expect to reach at least 4,000 people annually with on-site outreach programs and access a much larger nationwide audience through our collaborative outreach and educational efforts.

As we look to the next five years, we expect Miner Institute to continue William Miner's original vision of science and technology promoting both agriculture and the environment in the Champlain Valley and beyond.

— Rick Grant, grant@whminer.com

“INTERESTING TIMES” FOR AGRICULTURE

There's an oft-cited Chinese curse, "May you live in interesting times," but there's no mention of this anywhere in Chinese literature. Some think that it's a very rough derivation of an actual Chinese quotation, "It's better to be a dog in a peaceful time than be a man in a chaotic period." Be that as it may, "interesting" and "chaotic" are both good adjectives for what farmers are facing in the 21st century. U.S. farmland prices have increased by 25% in the past year alone, and \$20,000 per acre cropland is no longer a dream (or nightmare, depending on whether you're a buyer or seller.) Some cropland in California's dairy region has been selling for \$30,000 per acre, and is being used as the reason (excuse) for why drive-over piles out there have such steep sides — to save room. Corn grain prices soared and looked like they'd crash through \$7 per bushel, but have since eased to \$6.50 or so. "Beans in the teens" are now about \$12. We're seeing more month-to-month variation in grain prices than we used to see from year-to-year. This sure is a good time to focus on forages!

grown forages is weather. Farmers in the Northeastern U.S., Miner Institute included, are being reminded of this each day as they try to deal with the forage quality problems resulting from the multiple disasters that defined the 2011 growing season. Climatologists say that 21st century weather conditions have changed and will not resemble the weather of the 20th century. This seems a bit dramatic, but the changes are significant enough that we're now seeing recommendations that farmers start planting corn hybrids of slightly later relative maturity. So if you've been used to planting 95 RM hybrids, perhaps moving to 97 or 100 RM. This will be well-received by the many farmers in the Northeast who are already pushing relative maturity to the max; a fact made obvious since there's far too much corn silage that's less than 30% DM. The climate may slowly be changing, but what we're more likely to encounter is greater variability (more storms, more frequent droughts) than big changes in the length of the growing season. So make changes in corn hybrid maturity slowly, and with caution.

A big problem with focusing on home-

— E.T.

QUESTION BOX

A few questions that recently crossed my virtual desktop. Responses in italics.

• Is controlled traffic (tram-line) cropping a good idea for dairy farms? *Almost never, for three reasons: Manure that needs to be incorporated for both nutrient management and weed control reasons, the modest size and scale of most dairy crop operations, and the need to rotate to hay crops, which would destroy controlled traffic paths.*

• What do you know about this seed company's corn hybrids? *Nothing at all. The company doesn't enter it's hybrids in any of the university hybrid testing programs in the Northeast, and without unbiased, comparative data it's another case of buying "a pig in a poke."*

• Why are tower silos often the only thing left standing many years after a farm has gone out of business? (This question obviously from a non-farmer.) *Because while steel silos will eventually rust away and concrete stave silos can be taken down, a poured concrete silo is as close to a permanent structure as you can find in farm country.*

— E.T.

NNY Crops Management School

Clinton/Essex Counties

Class date: Tuesdays, Jan. 31 — Mar. 6, 2012

Franklin County

Class date: Wednesdays, Feb. 1 — Mar. 7, 2012

St. Lawrence County

Class date: Thursdays, Feb. 2 — Mar. 8, 2012

Jefferson/Lewis Counties

Class date: Fridays, Feb. 3 — Mar. 9, 2012

Six weekly sessions are from noon until 3 p.m. in each location.

This program is geared toward farm owners and employees that are directly involved in the management of crops on the farm. It is designed for those who want to gain a better understanding of crop production principles and improve their farms cropping operation.

Registration is \$100 for all six weeks or \$30 per week for week 5 and/or 6. Please register by Jan. 20, 2012.

For more information and to register:

Clinton/Essex County: Contact Anita Deming, 518-962-4810

Franklin County: Contact Rick LeVitre, 518-483-7403

St. Lawrence County: Contact Brent Buchanan, 315-379-9192

Jefferson/Lewis County: Contact Mike Hunter, 315-788-8450 or Joe Lawrence, 315-376-5270

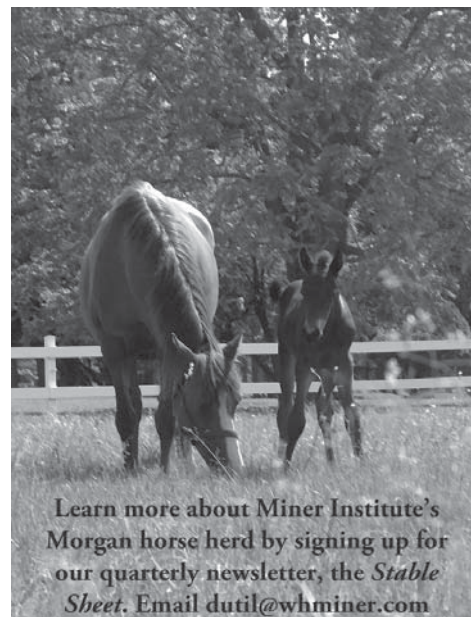
LEFT COAST MUSINGS

Last month the Crop Dude spent a week traveling up and down the Central Valley in California on a series of farmer meetings plus farm visits to some excellent, huge dairies. Landing in Los Angeles and on the way up to Bakersfield we actually hit snow at about 4000 feet, in the Tejon Pass. Snow in Southern California? Yecchh... All week the temperatures in the Central Valley were cooler than back in Virginia. Between the climate and almost wall-to-wall cows, mid-December in Central Valley does not make for a prime vacation destination. It seemed strange seeing a Christmas manger scene in the shade of a palm tree, but Bethlehem is located in what is now the West Bank, so palm trees are a lot more realistic than a snow-covered balsam.

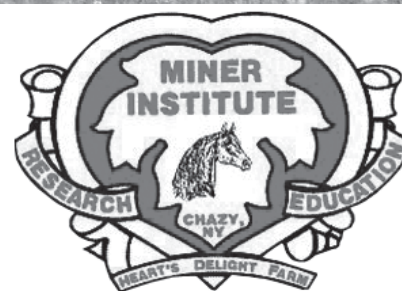
Nut orchards are challenging forage crops in some areas, and we saw a number of recently-planted orchards

— walnuts, pecans and almonds. Dairy farmers aren't thrilled because once land is in nut production it's likely to remain in trees for at least 30 years. Speaking of almonds: Some dairies feed almond hulls, and we saw great piles of them on several farms we visited. Almond hulls aren't a bad feedstuff, and test out a lot better than they look. Our host said that uniform quality was a concern, and when we looked at one of the piles of almond hulls we saw why — a number of twigs along with the hulls. You'd think that they'd be able to separate the twigs from the hulls, and you'd be right — they can, and do. However, our host said that if the almond hull dealer thinks he can get away with it he grabs a load from the "twig pile" and adds it to the almond hulls. I don't know this for a fact, but our host was serious about this bit of mischief perpetrated on unsuspecting farmers.

— E.T



Learn more about Miner Institute's Morgan horse herd by signing up for our quarterly newsletter, the *Stable Sheet*. Email dutil@whminer.com



CROP CONGRESS AT MINER INSTITUTE

Wednesday, February 22, 2012

Miner Center Auditorium, 586 Ridge Road, Chazy

Recertification Credits for Certified Pesticide Applicators - CCA Credits Available

9:30 a.m. – Registration and Industry Exhibits

10 a.m. – Welcoming remarks and research update, Eric Young, Miner Institute

10:15 a.m. – Alfalfa-grass management, Paul Peterson, Univ. of Minnesota

11:15 a.m. – Update on weed control in corn, Russ Hahn, Cornell University

12:15 p.m. – Hot Lunch available for \$5 and Door Prizes courtesy of our vendors

1:15 p.m. – Weather and crop production, Speaker TBA, Northeast Regional Climate Center

2:15 p.m. – Record keeping on farms, Anita Deming, Cornell Cooperative Extension

Free Admission!

Crop Congress is organized in collaboration with Cornell Cooperative Extension

Miner Institute is located in Chazy, NY on Route 191, 1 mile west of Interstate 87, exit 41. Travel time is approximately 1 hour south of Montreal, 20 minutes north of Plattsburgh, NY, 1.5 hours from Burlington, VT, or 3 hours north of Albany, NY.

Contact Eric Young, young@whminer.com or 518-846-7121, ext. 113 for more info.

ARE YOU CONSIDERING DIRECT-FED MICROBIALS FOR YOUR TRANSITION COW?

Direct-fed microbials (DFM) are a source of live, naturally occurring microorganisms used as feed additives in the dairy industry. DFM are primarily composed of beneficial bacteria and live fungi (yeast), and have been recommended for use in cattle to mitigate rumen dysfunction and the effects of being off-feed, and to improve feed efficiency, cow health, and production performance. Table 1 summarizes common bacteria and yeast in DFM products.

Dairy cows usually have decreased feed intake during the transition period, thereby experiencing a negative energy balance and rendering them more susceptible to pathogen invasion or to “opportunistic” pathogens. Dairy farmers typically switch cows to a higher grain diet immediately after calving to increase energy intake, contributing to a more acidic rumen environment. These scenarios may warrant the use of DFM. Table 2 summarizes four studies that used DFM in transition cows. A recent field study found that feeding a DFM had marginal improvements in milk yield and milk components and significantly reduced the need to treat cows with antibiotics in 2nd lactation cows after calving (Oetzel et al., 2008). Another study reported changes in rumen fermentation without effect on milking performance (Weiss et al., 2008). Two earlier studies found more obvious beneficial effects such as significantly increased feed intake and milk yield, and improvements in

Microorganism	Category	Active site	Function and effects
<i>Propionibacterium freudenreichii</i>	Gram+ bacteria	Rumen	Convert lactate and glucose to acetate, propionate and CO ₂ ; Improve energy balance status and feed efficiency
<i>Lactobacillus Acidophilus</i>	Gram+, tolerate low pH	Lower gut	Convert sugar to lactate; Inhibit colonization of pathogenic microbes and induce immune response
<i>Enterococcus faecium</i>	Gram+, tolerate low pH	Lower gut	Similar as <i>Lactobacillus Acidophilus</i>
<i>Saccharomyces cerevisiae</i>	Yeast	Rumen	Consume lactate, increase fiber digestion and feed efficiency

Table 1. Major microorganisms in DFM products and their category, function and main functional site in G.I. tract.

Study	DFM composition	Dose, cfu/head/d	Cow info	Period	Effect of DFM (compared with control)
Weiss et al., 2008	<i>Propionibacterium</i>	6×10 ¹¹	50 Holstein > 2 nd lactation	-14 d to 119 d	Changed prepartum ruminal acetate and propionate concentration; No effect on milking performance; Increased feed efficiency due to lower postpartum DMI.
Oetzel et al., 2008	2 strain of <i>Enterococcus faecium</i> and <i>Saccharomyces cerevisiae</i>	5×10 ⁹ of each component	366 Holstein	-10 d to 23 d	Increased milk fat (%) of 1 st lactation heifer and protein (%) of cows during 85 DIM; Decreased the antibiotic treatment
Nocek et al., 2006	Yeast and 2 strains of <i>Enterococcus faecium</i>	2×10 ⁹ of yeast 5×10 ⁹ of bacteria	44 Holstein	-21 d to 70 d	Increased peripartum DMI, MY (2.3 kg/d more), blood glucose postpartum; Decreased milk fat (%), BHBA pre-and postpartum;
Nocek et al., 2003	Yeast and 2 strains of <i>Enterococcus faecium</i>	2×10 ⁹ of yeast 5×10 ⁹ of bacteria	64 multiparous Holstein	-21 d to 70 d	Increased postpartum DMI, MY and milk protein (%), postpartum blood glucose and insulin; Decreased postpartum BHBA and NEFA;

Table 2. Summary of studies investigating effect of DFM supplementation on performance of transition dairy cows.

Abbreviations: DMI (dry matter intake), DIM (days in milk), MY (milk yield), BHBA (beta-hydroxybutyrate), and NEFA (non-esterified fatty acid).

metabolic profiles (Nocek et al., 2003, 2006). Despite validated successful use of DFM for early lactation cows, the magnitude of benefits is varied. In the four studies discussed above, different species and combinations of bacteria and yeast were used, and the difference of dietary starch content between close-up and lactation diets was much greater in the two earlier studies. This may have contributed to the greater beneficial response to DFM observed in these studies. Dairy farmers should consider the following points when making a decision whether to use DFM in diets for transition cows, such as:

- Get all the information about the composition of the DFM products, including strains of bacteria and recommended dosage.

- Understand whether the DFM product was evaluated by controlled research studies.
- Monensin targets gram positive bacteria, so inquire about the potential loss in effectiveness of DFM if you are using Monensin.
- Be sure to acknowledge the difference in starch content between your close-up diet and lactation diet.
- Some bacterium, such as *Propionibacterium*, is intolerant to low pH. Information about potential losses when mixing with low pH silage should be requested.

— Peng Ji, ji@whminer.com

*References available upon request.

HISTORICAL TIDBIT: MINER INSTITUTE GROWS ITS OWN PROFESSIONALS AS WELL AS CROPS

When Ev Thomas retired as the Institute's Agronomist after nearly 30 years of great service, our thoughts naturally turned to the qualities desired in a successor, for all agreed no one could replace him. Completing the Institute's crop-animal-environmental connection appeared to demand two professionals, an agronomist and an environmentalist. That presented a problem, for the Institute could afford only one position. Moreover, Rick Grant, his staff, and the Miner Institute Board agreed that the Institute needed a professional with the combined training of agronomist and environmentalist to integrate the decisions demanded by our "crops-animal-environmental mission."

A fruitless search soon provoked the common comment on the Institute campus, "great idea, but unrealistic" to find the human hybrid of agronomist/environmentalist. An exhaustive effort of ads, calls, and queries produced only one person who satisfied this demanding duality. That professor, though interested in the Institute and the position, decided to stay at a leading land-grant university. It appeared once again that universities with increasing specialization had not yet responded to changing needs. Divided by departments and disciplines, they failed to recognize the growing reality that the real problems of agriculture — as well as the world and the cosmos — rose increasing in the gaps between

the disciplines and departments. Universities laud the changes that they make to practical affairs, but react slowly to practical needs.

As weeks, then months, dragged on with no appointment, calls came from a busy staff. They conceded that the novel job description sounded fine for the future. But planning and planting required the hiring of one of the good agronomists who wants the job, even though they lack the environmental training and interest. We have tried for the ideal. Now is the time to abandon the impossible dream of an agronomist cum environmentalist, which increasingly seems like the "search for the golden unicorn."

This pressure for appointment, which preferred speed to satisfaction, recalls another of those tiresome but true Burke's Laws. "Only one thing is worse than not filling a vacant position: Making the wrong appointment." Happily, the Institute had to do neither.

As it turned out — as often happens — we search "far afield", when the answer to our aspirations lay "close to home." Eric Young represented our own home-grown "agronomist-environmentalist." He had received a bachelor's degree in Environmental Science at Plattsburgh State University, and did the residential semester at Miner Institute. Then, while working as a research technician on a fellowship at the Institute, he received his Master's

Degree in plant and soil science at the University of Vermont. After working as an extension agronomist and nutrient management planner, he received a Ph.D. from the State University of New York's School of Environmental Science and Forestry in soil science. Then he spent three years as a post-doctoral scientist at the University of Vermont researching phosphorous transformations in soils. So Eric became "an agronomist-environmentalist" before The Academy had given the position a name and determined its home department.

Finally, in June of 2009 we woke up, looked close to home, and hired Eric Young. Now he plans our crops, manages our nutrients, and researches the impact of agriculture on our Champlain Valley, bordered by beautiful Lake Champlain. Surely, William Miner must smile as our hybrid agronomist-environmentalist toils to fulfill William Miner's dream of combining productive agriculture and protected environment. Eric Young's appointment means more than connecting crops and environment in the Miner Institute's Mission. It shows that the Institute continues to produce its own professionals to meet its unique mission — teaching, researching, and demonstrating the necessity of the animal, crop, and environmental imperative.

— *Joseph C. Burke*
Board Chair, Miner Institute

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Closing Comment

A pessimist feels bad when he feels good for fear
he'll feel worse when he feels better.

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