

NEW BOVINE GREENHOUSE

We're going to put up a 40' x 120' greenhouse, but instead of growing tomatoes we're going to grow calves and heifers up to breeding age. We have the site prepared behind the dairy barn, and will begin construction later this month. The greenhouse cost about \$8000, but by the time we're finished with concrete work, curtains, stalls, etc. we'll spend over twice that much. The fellow that sold it to us said that three men could erect it in a day. We'll see. Feel free to stop by at check on our progress. When it's all done we'll announce the fact and perhaps have an open house.

Nutrient Management on the Farm

Mining on the Farm

Spring is in the air. I've heard that in Pennsylvania, the magnolias are getting ready to bloom. Many of us are wondering what happened to the sugar'n season. Now a few of us are think about planting time. So what's this mining business?

Whether or not you have a permit those of us who plant crops are, in essence, mining. Growing plants extract soil nutrients for growth and reproduction. The amount of nutrients in the soil and the rate at which those nutrients can be taken up by the plant help determine plant yield. To complicate matters, plants have different growth phases which affect the quantity and rate of nutrient uptake. This is why we fertilize corn at planting, because the emerging and growing seedling requires a high availability of nutrients.

Through the course of the season the plant continues to grow. To achieve high yields we usually add commercial fertilizer or manure to the field. How much of those nutrients end up in the plant and how much remain in the soil is of environmental concern. Over-fertilization increases the potential for leaching and runoff of farm fertilizers (You knew I'd get around to that subject, didn't you?)

How efficient is the plant? Drs. Lanyon and Beegle from Penn State conducted a nutrient balance on a dairy farm in Pa. All fertilizer inputs and all harvested outputs were measured for corn (Table 1) and alfalfa.

Table 1. Annual corn plant nutrient inputs, outputs, and balances on a Pennsylvania dairy farm.

	N ^a	P
	---- lb/ac ----	
Inputs		
Fertilizer	180	8.9
Manure	327	57.9
Subtotal	507	66.8
Outputs		
Crop	124.7	24
Balance		
In - Out	382.3	42.8
% of Input	75%	64%

^a N = nitrogen, P = P₂O₅

If you recall the article I wrote concerning cow efficiency, this corn plant does not look much better than the cow did. There is little information concerning nutrient balances, crops, animals, or farms. Does this represent what is going on elsewhere? That is what some policymakers are asking.

What is the situation here in the North Country? Table 2 is the nutrient balance information for the 1993 corn crop at Miner Institute. Jim Knight, our

field crop manager, planted 152 acres of corn in 1993. This was harvested as either silage or high-moisture grain.

Which farm is representative? Certainly there are differences between the farms and crops but the magnitude of the differences is remarkable. Fertilizer inputs on the Pennsylvania farm were 507 lbs of N per acre. At Miner institute, our average N-inputs averaged 133 lbs per acre. Nitrogen retained on the farm in Pennsylvania was 75% of total inputs while here it averaged 23% over the two years, 1993 and 1994.

Table 2. Corn plant nutrient inputs, outputs, and balances Miner Institute in 1993.

	N ^a	P
	--- lb/ac ---	
1993		
Inputs		
Fertilizer	85	14
Manure	41	14
Subtotal	126	28
Outputs		
Harvested	95	19
Balance		
In - Out	31	9
% of Input	25%	32%

^a N = nitrogen, P = P₂O₅

That's all well and good, but what about this mining stuff? So far we are putting more on than we get off.

Alfalfa can be quite the miner of soil nutrients (*small play on words there!*). Let's take a look at the nutrient balance for a crop of alfalfa. Lanyon and Beegle performed a balance on an alfalfa field. The farmer in this case used no manure and only applied 17 lbs of P /ac.

The yield was 200 lbs N/ac and 20 lbs P/ac. Most of the N was not mined but was fixed from the atmosphere. How much was actually fixed and how much

was mined from soil reserves is open to question and can really muddle up a nutrient balance. However, P is only supplied by fertilizer or soil reserves. In this case they harvested 2.7 lbs more P than applied, 16% more than inputs.

At Miner institute our alfalfa acreage was 153 A. in 1994. The inputs, outputs and balance are presented in Table 3.

Although taking 10% more P out of the field then you put on may not seem like much, 1994 represented a management change. The decision was made to manure the alfalfa more heavily. Between 1993 and 1994 we increased our manure application rate on the alfalfa land by 10%.

Table 3. Annual alfalfa plant nutrient inputs, outputs, and balances Miner Institute in 1993.

	N ^a	P
	--- lb/ac ---	
Inputs		
Fertilizer	6.5	7.0
Manure	19.2	6.9
Subtotal	25.7	13.9
Outputs		
Crop	193	21.0
Balance		
In - Out	-167.3	-7.1
% of Input	-651%	-51%

^a N = nitrogen, P = P₂O₅

Nutrient balances provide us a mechanism by which we can make management decisions to improve nutrient use. Differences in a balance can be seen between regions as well as between management strategies. We must exercise care in determining which balance we will use to provide us that information.

- Bob Allshouse

SUMMER HEAT

Chris Yelle, the feed manager from Ashley's Farms, Chazy, and Jim Knight, crops manager, Don Phaneuf, feed manager and myself, all from Miner, attended an excellent meeting last Friday in Canton. The meeting was sponsored by the Northeast Dairy Producers Association (NEDPA) and Cornell. Terry Batchelder and Larry Chase led the seminar in a discussion on measurements that can be made to assess cow comfort. We then went to 2 farms to make measurements. The first Farm was NORCO Farms and the second was Brockways. Both of these places are excellent dairies. We had the opportunity to test out some of the ideas that Terry and Larry discussed in Canton. It was a learning day for us. Several of us had the opportunity to renew acquaintances from the feed manager meeting conducted by NEDPA earlier in the year.

I was really excited about some of the comments made. First we discussed air flow. We used a simple device called a Vaneometer which costs \$37.95 and can be purchased from Animal Environmental Specialists, 7870 Olentangy River Rd., Suite 300, Columbus, Ohio 43235, Tel (614) 888-4456. We measured the air velocity in the barns at the feeding area and near the free stalls. We are putting new fans in the barn and the holding area - I hope that we can get one of these so that we can place our fans properly. Terry was talking about how there can be areas with no air movement and the cows won't eat or will prefer not to lay down in those areas. We also used a relative humidity temperature pen that cost \$59.95 that can be purchased from the same place as the Vaneometer.

We took cows temperatures with those simple electronic thermometers that you can buy at the local pharmacy. Elevated temperatures provide us with an idea on the impact of the holding area and parlor on increasing heat stress. We also measured respiration rate of cows entering and leaving the parlor and at different areas in the barn.

According to a statistics card on animals that I carry with me, normal values for cows are

Cow Physiological Data ¹			
Item	Minimum	Average	Maximum
Body Temperature, °F	100	101.5	102.5
Respiration Rate, per min	10	20	30
Pulses, per min	40	60	80

¹ Armour-Baldwin Laboratories

presented in the following table. If you see cows on the upper end of these values then there is probably a heat stress problem.

Putting these measurements together provides us with a means to monitor the environmental conditions surrounding our cattle. Watch cattle movement patterns, including water drinking patterns. Using the above information along with your cow observations you can make short term adjustments to improve the environment and plan for longer term modifications in the barn.

Charlie Sniffen

PRESIDEDRESS NITRATE TESTS

Soil nitrate levels are running very low this year, due at least in part to all the rain we had just about the time we wanted to start planting. Farmers who applied nitrogen to corn fields preplant now know why we don't recommend the practice; we don't know where your N is by now, but it sure isn't in the top 12" of soil. We sent five PSNT samples to the University of Vermont Agricultural Testing lab, and the analyses came back very low. UVM and Cornell both report generally low PSNTs this year, and Ev's crop consultant son Matt says that most of the PSNTs he's done for St. Lawrence Co. farmers this year are surprisingly low, even from fields with a history of regular manure application.

One of the problems with running these tests is that they should be done as close as possible to nitrogen application, and it takes time to send the sample to the lab and get the results back. (We get terrific service from the UVM lab, but we deliver the samples

there to save time.) There's a do-it-yourself PSNT test available called the N-Check, sort of a home pregnancy test kit for corn. We tried it on duplicate samples of the ones we sent to UVM, with the following results:

Field	PSNT, ppm	
	UVM	N-Check
1	6	2
2	11	5
3	10	5-10
4	3	2
5	11	10

Since any reading below 21 ppm normally indicates a need for supplemental nitrogen, the N-Check performed acceptably for these samples. One problem is that you have to compare the color of a test strip to a color chart. This is a problem if you're red-green color blind since the colors are various shades of pink. Also, the chart is designed for testing water samples, so it's calibrated for very low nitrate levels and jumps from 20 to 30 ppm which is just where we need the greatest accuracy. We're going to try to dilute some samples to see if we can better adapt the test for PSNT. The test kit costs \$45 + shipping for 25 samples, so at least it's cheap, and Carl (who did all the work) reports that "It's pretty idiot-proof". UVM charges \$5.00 per sample, and Cornell charges the same as for a normal soil analysis, about \$15.00. It took Carl an hour to run five tests, but he's used to lab stuff and estimates that it would take a beginner about half an hour longer. What the N-Check won't do is take the soil samples for you, and pulling 12" deep cores from corn fields just when you want to make hay is areal pain.

Carl Majewski and Ev Thomas

Empire Farm Days Goes Dairy

Dairy farmers across the Northeast will not want to miss the new DAIRY PROFIT SEMINARS at Empire Farm Days on August 6, 7 and 8 in Seneca Falls, NY. Now in their second year, the DAIRY PROFIT SEMINARS are produced by HFW Communications, publishers of *Holstein World*, *The Western Dairyman* and the *Empire Farm Days Official Dairy Program*. DAIRY PROFIT SEMINARS offer the latest management and profitability strategies from those who know the business. Dairy producers, employees and industry experts will share information via individual presentations and in a roundtable format. Hear from milking parlor operators, calf

raising and heifer growing specialists and nutrition experts. Find out how to get the most from your consultants, learn about alternative approaches toward profitability while gaining a chance to win cash, prizes or gifts in the daily DAIRY PROFIT drawings.

HFW DAIRY PROFIT SEMINAR sponsors are Agway, Albers, Elanco, Kamar, Key Bank, LT Hampel, Northeast DHIA, Pharmacia & Upjohn Animal Health, Protiva, a unit of Monsanto Company and Sire Power.

Tues, Aug 6 - Dave Penkaskie, Agway River Valley, m.c.

11:00 AM Milking Parlor Efficiency, Learn the secrets of smooth operating procedures for the ultimate in parlor productivity. Dr Dave Galton, Cornell University, moderator.

12 NOON NY Commissioner of Ag & Markets, Dr Donald Davidsen

12:30 PM Heifer Raising/Body Condition Scoring, Dr Dave McClary, DVM, Elanco Animal Health and Dr Charlie Elrod, Cornell University address this often overlooked, yet crucial element to success in the dairy business.

Wed, Aug 7 - Dr Arden Nelson, DPC, Inc, m.c.

11:00 AM Dairy Profitability Roundtable featuring producers with various herd sizes and management styles. Dr John Ferry, DVM, Adams, NY, moderator.

12 NOON Hon. James T. Walsh (R-NY) Central NY congressman with the latest from Washington.

12:30 PM Rumen Management: Metabolic disorders, MUN and Manure Evaluation by Dr Mike Hutjens, Extension Dairy Specialist at the University of Illinois.

Thurs, Aug 8 - Dr L R Jones, Applied Computer Technologies, m.c.

11:00 AM A team management approach by Bob and Karen Kemmel, Odyssey Farm, Copake Falls, NY. Dr Charlie Sniffen, Miner Institute, Chazy, NY, moderator.

12 NOON Dr Charlie Sniffen discusses the bright future of dairying in the Northeast.

12:30 PM Calf Raising by Sherry Siemers-Peterman of Siemers Holsteins, Cleveland, WI. For more information contact Joel Hastings, 315-387-3441, ext 27.