The Co-op
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Hot Summer Edition!

The Co-op Agrodor

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# Keep the Best Forage for the Cows

*By Mathieu Benoit, Agr.*

With the drought hitting us this summer, it is possible that forage inventories are running low. A good option to overcome this situation will be to ensile more corn. However, we can expect to see many fields of immature corn in some regions, as evidenced by this picture taken on the week of August 1.

A good way to store immature corn silage is to use the Ag-Bag system. Indeed, the bagged forage can be used to feed the livestock with lower diet requirements, such as heifers and dry cows. As shown in Table 1, immature corn silage compares favorably with mature grass hay.

Table 1 shows the approximate bag capacity and the suggested recovery rate.

TABLE 1
Harvesting Immature Silage vs. Buying Hay

| Immature Corn Silage | 1st Cut Mature Hay |
|---|---|
| Theoretical analysis:<br>• Crude Protein: 10%<br>• ADF: 35%<br>• NDF: 50% | Theoretical analysis:<br>• Crude Protein: 10%<br>• ADF: 40%<br>• NDF: 62% |
| Cost:<br>• Bag 8' X 200' = $1250 (bag and machine)<br>• 180 tons X 34% DM = 61.2 tons of DM | Cost:<br>• 69 tons X $160/ton = $11 127.30<br>• 69 tons of hay at 88% DM = 61.2 tons of DM |
| Cost Difference:<br>$11,127.30 - $1250.00 = $9877.30 | |

Beware though: corn plants having grown in drought conditions may contain a high level of nitrate. It will be very important to get a wet chemistry analysis (protein, ADF, NDF and nitrate) prior to the elaboration of the dietary meal plan. Avoid adding urea if silage contains a high level of nitrate. Talk to your Ruminant Expert-Consultant.

TABLE 2
Ag-Bag Information

| | | Winter (October-April) | | Summer (May-September) | |
|---|---|---|---|---|---|
| Diameter (Foot) | Capacity (Ton/Foot) | Foot/Day | Ton/Day | Foot/Day | Ton/Day |
| 8` | 1 | 1 | 1 | 2 | 2 |
| 9` | 1-1.25 | 1 | 1 | 2-2.25 | 2.75 |
| 10` | 1-1.5 | 2 | 3 | 2-2.5 | 4 |

Source : Ag-Bag

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# Animal Production

By John Agnew
Dairy Consultant

## Tunnel Ventilation

On a hot summer day in 1842 Schoharie County dairy farmer Lester Howes noticed his cows gathered around a clump of bushes on the side of a hill in the pasture. Upon further investigation he discovered cool air seaping out of a hole in the ground. It was his cows that led Lester to the discovery of Howes Caverns, a popular tourist attraction near Albany N.Y. that the Howes family developped and can still be visited today.

What does Howes Caverns have to do with Tunnel Ventilation. Well Lester`s cows found that the air coming from the cave was a perfect 12 celsius and helped them keep cool on that hot summer day. Research has shown that the ideal temperature for milk production is 10 celsius. This is due to the fact that the major dairy breeds were all developped in northern temperate climates. Jerseys on the Jersey Islands, Ayshires in Scotland and Holsteins from the county of Friesland in Holland were the average winter temperature is 2-6 celcius and summer temperature is 17-20 celsius. As you know these are not our average temperatures.

Bray & Coll. (1993) established that milk production drops 5% at 20 celsius and 25% at 30 celsius. At air temperatures above 20 celsius a producing dairy cow must reduce heat input by reducing feed intake and therefore milk production. In 2002 southern Quebec and eastern Ontario had 93 days over 22 celsius and these past two summers have been as hot or hotter. Tunnel ventilation was first used in the poultry industry and around the year 2000 Cornell University started experimenting with it`s use for dairy cattle. Tunnel ventilation provides a beneficial wind chill effect that cools the cattle by convection. The net result is reduced heat stress, increased animal comfort and the ability to maintain production in hot weather. To achieve this wind chill we need to create air movement of 4-8 km/hr or 300 ft/min.

To calculate the CFM or cubic feet per minute needed to properly ventilate a barn you must calculate the cross sectional area of the barn and multiply by 300cfm. An example is a 40ft wide barn by 9ft high would require fans that generate 108,000 cfm.

**40ft x 9ft x 300ft/min = 108,000 cfm**

This air movement can be supplied by five 4ft fans of 21,600 cfm minimum or four 5ft fans of 27,000 cfm or three 6ft fans of 36,000 cfm rating. To calculate the size and type of fans needed consult with your ventilation equipment supplier but remember all fans of the same size do not necessarily generate the same cfms. Also for cows to be comfortable you must move 1000 cfm per cow so the results above would be adequate for 108 animal units. Remember the larger the barn the more air you must move to create the proper wind chill effect. High cathedral ceilings will also need fans to displace air within the barn as well as tunnel ventilation.

All your Co-op dairy consultants have access to a pocket weather meter pictured here. This device measures wind speed, temperature and wind chill. By taking readings at various locations in the barn we can evaluate the performance of your tunnel ventilation installation.

After having done many evaluations we have come to the conclusion that most barns have adequate fan capacity but lack proper air inlet surface. In general for every foot of fan diameter you must have a minimum of 13.5 square feet of inlet. I repeat – each foot of fan diameter needs 13 ½ sq ft of inlet. So an average 4ft fan needs 54 sq ft of opening to properly supply air to that fan so that it will work to it`s full capacity. That is an inlet that is 6 ft x 9 ft.

A 5 ft fan would need 68 sq ft and a 6 ft 81 sq ft, these are minimums so more is even better. Another way to calculate inlet area is you must have 2.5 sq ft of opening for every 1000 cfm of your fans. Example a fan that generates 36,000 cfm will need 90 sq ft of opening.

**36,000cfm / 1000 x 2.5 sq ft = 90 sq ft**

Another problem we encounter often is dirty screens or poorly adjusted louvers. These can rob a fan of as much as 30% of it's capacity. Screens should be keep clean and we recommend that louvers be fixed at 90degrees or removed for summer use while leaving a protective guard in place.

The presence of flies or a damp alleyway are indications of poor tunnel ventilation. By using the weather meter your Co-op consultant can locate and identify these dead or stale areas in your barn and recommend adjustments. Usually a simple air inlet modification will solve most problems.

Also remember that tunnel ventilation is primarily for the cows and not the farmer. The cows spend more time in the barn than you do so position your fans and inlets in line with your animals - air will take the shortest line from inlet to fan.

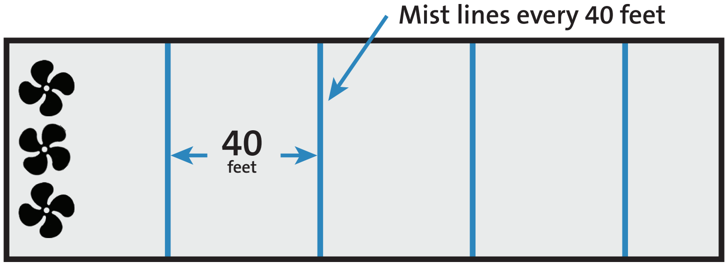
With climate change and more demands on summer milk production tunnel ventilation has gone in ten years from a luxury to a necessity so make sure that the money spent on your system is properly invested. The modern dairy cow no longer has the same options that Lester Howes` cows had so one way of keeping her cool is aproper installed tunnel ventilation system.

*By Dominic Bélanger, Agr.*

## To improve your tunnel ventilation

- Adding mist lines enables your to reduce the temperature by 2 or 3 degrees Celcius.
- The cost of equipment is $5500 for the compressor, sensors, filters, lines and nozzles.
- Installation cost is minimal (10-15 hours of labor).
- The mist lines are installed at every 40 feet, in parallel with the fan wall.
- In a tie stall, the use of mist-producing nozzles will prevent water build-ups under the cows.

The mist lines are installed at every 40 feet, in parallel with the fan wall. This system will keep the temperature more constant, from the air inlet to the fans.




## A Real Preservative!

During a heat wave, rations should always be kept fresh until the next meal, since the slightest stress can have double the impact. If your ration contains a good part of corn silage that was inoculated with Lactobacillus buchneri bacteria, then the air-exposed silage and total ration should last longer. This type of bacteria produces acetic acid (vinegar), which slows down the growth of yeasts and molds largely responsible for the deterioration of silage exposed to air. A little more expensive then conventional inoculants ($2/M.T.), you may choose to invest in this particular concept only on the part of the silo that is used in hot weather; therefore, 1/3 of one 18x60 represents one container of Enersil B (the first 100 tons), while a 20x80 will require two containers of Enersil B. The rest can be inoculated with a conventional inoculant (Enersil 5). The same concept can be applied to bunker silos.

**Inoculated with Enersil B**

**Uninoculated**

Test done on tightly closed jars after 3 days of exposure to air.

## Seeding Rate

*By Frederic Jasmin, Agr.*

I don't know if it's the same for everyone but I find it very difficult to determine the appropriate seeding rate to apply in the field. It is indeed very difficult to know whose advice to trust because in many cases, the information will vary depending on the source.

However, I recently came across an OMAFRA article on forage crops and related seeding rates. According to them, regardless of the forage mix, the seeding rate should always be between 12 and 18 pounds per acre. Additionally, to make things even easier, just remember that, for a 75% alfalfa and 25% timothy mix, a rate of 13 pounds per acre is absolutely adequate and it will ensure you proper seeding.

It's not that complicated to get the right seeding rate after all. Just remember the 13 pounds per acre rule and you'll be on your way to proper seeding without over planting!

**Do you have suggestions for articles or topics that you would like us to cover?**

Please contact
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# Crop Production

## Base Fertilisation principals of Alfalfa

Many of you have recently ordered your forage seed for next year by choosing high performing Alfalfa cultivars such as Ascend. But to have optimal yield, the work doesn't stop after your seed selection. You have to also make sure that it is not missing any fertilization elements (see Table for details).

Also, to insure an optimal yield (and a quality feed ration), it is important to fill in the nutrient requirements of the alfalfa. Here is a table that demonstrates the quantity of certain nutrients per ton of alfalfa on a dry matter basis.

According to the table, it is easy to see at what point alfalfa can be demanding on certain nutrient elements.

Out of all the nutrient elements above, normally two of them are the most often deficient. It's potassium and boron. Look at these illustrations so that you can know them.


**TABLE 1**
**Pounds of nutrients per ton of alfalfa on a dry matter basis**

| Nutrient | lb/t dry matter |
|---|---|
| Phosphorus | 6 |
| Potassium | 49 |
| Calcium | 30 |
| Magnesium | 6 |
| Sulfur | 6 |
| Boron | 0.08 |
| Zinc | 0.05 |
| Manganese | 0.12 |
| Copper | 0.01 |
| Iron | 0.33 |
| Molybdenum | 0.002 |

Kelling (2000)

### Illustrating laws of limiting factors

Also, this image demonstrates that the yield of a crop is limited by the fertilizer elements that are lacking to begin with. The principal is very simple; we can look at it like a chain. We all would like the strongest chain, but it just takes one weak link to cause all the chain links to be weak. As well, in crops, it's great to plant the best seed, but it just takes one insufficient nutrient for it to be unable to reach its full potential.


Source : http://fr.wikipedia.org/wiki/Loi_de_Liebig_sur_le_minimum

Now that we have seen the importance of their nutritional needs, here are some tricks to maximize your yield[1] :

1. Apply nitrogen when seeding at 45 to 65lbs/ac of urea. A field that contains more than 50% alfalfa does not need to be fertilized otherwise with nitrogen.
2. Fertilizer application at seeding is preferable before this one and better before incorporating it in the soil.
3. Fertilize immediately after harvesting $1^{st}$ cut to increase yield in $2^{nd}$ and $3^{rd}$ cuts. Or early in September to improve winter resistance.
4. Manure should not be applied on an established alfalfa stand because it stimulates the growth of other plants, reduces the quantity of protein in the ration and reduces the longevity of the alfalfa. If you have no choice, choose a field with more grass as possible and apply less than 3000 gallons/ac after harvesting is completed.
5. To prevent Boron deficiency, apply 0,9 to 1,8 lb/ac of granular Boron per year (depending on your soil analysis)

In summary, we have stated the importance of adequately fertilizing your alfalfa and tricks to help increase yield. Evidently this is only an introduction and for more details, I would suggest you to contact your expert advisor.



[1] Kelling (2000) Alfafa fertilization, University of Wisconsin, 7p