

MARA NEWSLETTER

Sept. 2021

Commissioning of Agronomy Building & Aug Field Tour

MARA's first in-person event of 2021 was held on 4th August. In the morning, few guest speakers addressed the crowd after the commissioning of new agronomy building and crop walk was conducted after lunch. It was a great success with 100 participants.

“Every single thought is like a seed, it need to be sprouted with actions. A dormant seed would never become a giant tree...”

- Words by Din -

On-Farm Composting

Benefits of composting extend far beyond the crop field,

- ◆ Composting divert organic waste from landfills, replenishes soil, revitalizes water sources, foster food security and help reduce global warming.
- ◆ Enhance water infiltration and water holding capacity, thereby reduce run-off and soil erosion, nutrient loss/ pollution
- ◆ Reduce sedimentation in water bodies such as rivers and lakes which reduces flooding
- ◆ Drought resistant/ crops resilience for extreme weather
- ◆ Increases productivity of lands and remain soil functions active



Commissioning of MARA New Agronomy Building and Field Tour on 4th Aug 2021

In This Issue

- Commissioning of Agronomy Building/ Aug. field tour
- On Farm Composting
- Maintaining Quality of Cut Hay
- Cutting Drought Stressed Crops for Greenfeed & Silage

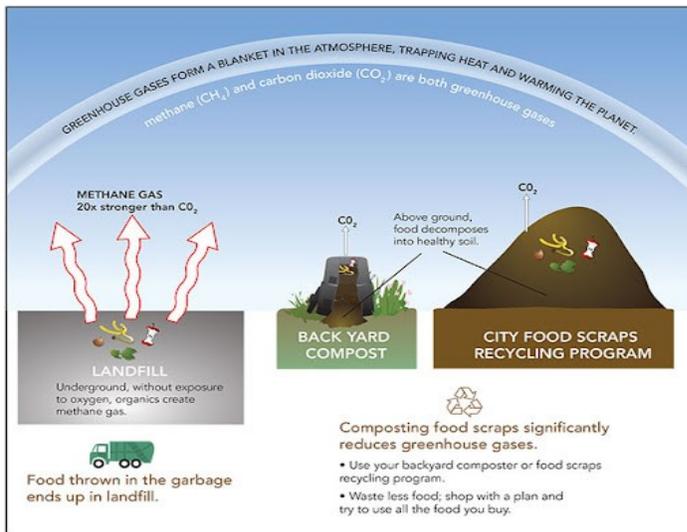


Photo Caption: Food Scraps Recycling by Metro-Vancouver

In-organic Fertilizers Vs Compost

- ◆ Compost : still need to manage properly, do your soil test to identify deficiencies, make your plan accordingly and have to apply products accordingly
- ◆ What is important to know is adding compost gives more than N, P & K. It produces a reservoir of essential plant nutrients, amino acids, lipids, and mineral nutrients vital for plant metabolism.

At a time of global climate change, with the increasing food and nutrition insecurity, with the negative impacts on human health and well being , it is a waste to throw them away to contaminate air, water & soil

Benefits of Compost

Give backWhat you take away.....

- ◆ **Improves soil physical properties of the soil:** by increasing soil moisture holding capacity, improve soil structure by decreasing bulk density which allows better root penetration, hold soil particles together to reduce soil loss through wind and water erosion
- ◆ **Improves chemical properties:** by adding valuable nutrients (N,P,K), micronutrients, increasing organic matter, help reduce synthetic fertilizer requirement, increasing pH buffering capacity and reducing impact of high salt
- ◆ **Improves biological properties:** by increasing microbial diversity and numbers that improve both physical and chemical properties

Enhancing microbial diversity in the soil :

- Help reduce the risk of soil borne diseases in crops
- Increase crop vigor by providing nutrients and enzymes released by soil microbes

Soil life is important for predator and prey interactions that responsible for 90% of the soil functions which makes above ground life is possible. Functions include but not limited to nutrient cycling, building structure, keeping the soil aerobic and a source of nutrients and making macro (N,P,K) & micro nutrients available for plant up-taking.

This improves nutrient density in the produce/ food, which enhances consumer satisfaction with improved health benefits.

Are you interested to learn more about how to make compost on-farm?

Recycling Council of Alberta (RCA), developed an on [Farm composting guide](https://recycle.ab.ca/on-farm-composting/). Check it out: <https://recycle.ab.ca/on-farm-composting/>

Webinar on Alberta on-farm composting operators by RCA :

<https://drive.google.com/file/>

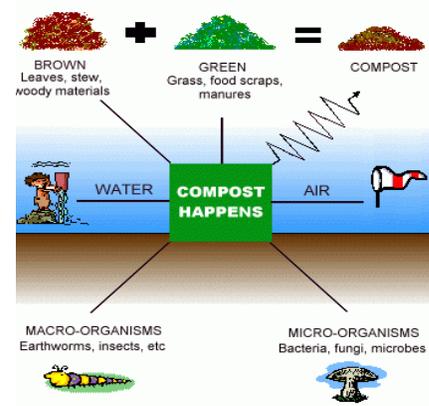


Photo Caption: Cleantechloops.com,- Home Composting

Composting Process:

1. Area for receiving and blending material: Yard waste, bio-solids, woody materials or agricultural waste, manure or other waste from farm, separate organic waste from residents or commercial waste. Need to prepare compost mixes for optimal composting: 40—60% moisture content, <700 kg/m³ bulk density
2. Bulking agent storage. Dense materials like wood chips, bark mulch & screened overs from the composting process
3. Curing
4. Screening & removal of non-compostable material
5. Storage of Finished compost
6. Process water capture

When planning a compost site, how will you protect ground and surface water?

Guidelines and Regulations to follow

Checkout webinars on **Introduction to on Farm composting by RCA:**

<https://drive.google.com/file/d/1GxkV-5Tq2iFSRq5YB-mqsn1XpOGqFwUn/view>

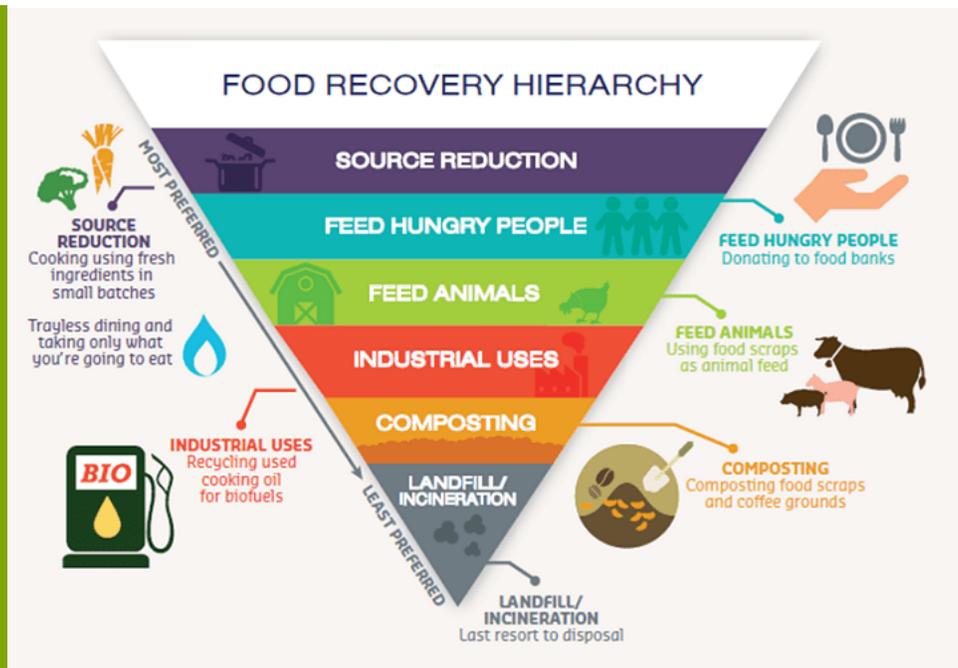


Photo Caption: Bio-Energy Consult: Waste Mgt. in Food Processing Industry

Maintaining Quality of Cut Hay

The hay is cut. Is it to be made into chopped / round bale silage or into dry hay?

There are advantages and disadvantages of each system and associated costs. How the hay is baled and stored will also impact overall quality. This article discusses some of the factors to consider.

Chopped haylage or silage removes most of the uncertainty caused by weather because the crop is harvested within a couple days. Moisture content for chopped silage should be 60 to 65% and 45 to 55% for round bale silage. With limited time in the swath, dry matter losses caused by respiration are lower than for dry hay. Leaf loss is generally reduced to 10% compared to 25% with dry hay. This results in higher quality feed with higher amounts of soluble sugars and protein in the silage or haylage compared to dry hay. With lower leaf loss, yield per acre can be 5 to 10% higher than for dry hay. Also, protein and TDN can 1 – 3% and 2 -4% higher respectfully.

With any type of silage, excluding oxygen (air) from the pit, pile, tube or wrapped bale to minimize aerobic bacteria growth is key to having a high-quality end product. Cover the pile or pit as soon as possible. At the end of the day, cover the portion of the pile or pit that is completed. Do not wait until all the silage is harvested. Bales need to be wrapped or placed into a tube within 12 hours of being made. Again, minimizing exposure to air is key. Cover with a minimum of 6 ml plastic for pits and piles, or multiple layers of plastic to obtain a 6 ml thickness for wrapped bales.

The safe moisture content for making dry hay depending on the size and type of bale. **Large square bales** are very dense and therefore **moisture content above 12%** can result in mould forming in the bale. Large hard core round bales are less dense than the large squares, and large soft-core bales are less dense than the hard-core bales. **Moisture** content can be as high as **16 to 17% in the soft-core bales**. The critical factor is that the hay must be cured before baling. This occurs when the moisture within the stem has evaporated and can take 5 to 8 days depending on weather condition conditions, crop yield, and field moisture.



Photo Caption: Chopped Haylage

Maintaining Quality of Cut Hay

Yield and quality losses occur when hay is cut, raked, baled and during storage. Cutting can result in a 2% yield loss. There is a 5% yield loss each time hay is turned. Baling losses increase in proportion to the time it takes to make a bale. A 12 foot windrow can have a 14% yield (shattering) loss. When 3 windrows are combined prior to baling, losses are reduced to 5%. It is the leaves and flowers that are lost. The parts of the plant that have the highest quality. Weather damage further reduces yield. One inch of rain on hay in the swath causes an 11.7% reduction in yield. It also reduces the digestibility of the hay by 6%.

Storing hay outdoors without any protection from the weather creates many problems. Dry matter losses due to shrink can be as high as 15% over the first winter. Bales made with sisal twine has double the loss than plastic twine (19 vs. 10%). Bales made with net wrap has a 7% loss compared to bales made with plastic twine. Having the net wrap cover the shoulder of the bale and 3 to 6 inches of the flat side of the bale helps to shed rain and reduces the losses to 4%. Wrapping dry hay in plastic or storing under a shed reduces shrink to 2%.

There are times when white mould is found in the silage or haylage or dry hay. This is caused by dirt contamination. Either the cutting bar or the pickup on the baler or silage cutter was set too low and this introduced dirt into the swath. Adjust the equipment so this does not occur.

Stacking Does Make a Difference...

Preventing moisture from migrating into the bales from rain or melting snow reduces bacteria, mold and fungi growth which reduces damage. Three common methods of stacking hay are compared. The pyramid stack creates the most damage. Moisture that runs down off the top bale migrates into the middle and bottom rows. Damage occurs where the bales touch.

Stacking Does Make a Difference

The mushroom stack results in less damage than the pyramid style. Moisture that runs off the top bale migrates into the upper end of the bottom bale creating damage. Increased soil to bale contact allows more moisture to enter the bottom of the lower bale.

Individual bales stacked in a row with 4 to 6 inches space between the bales results in the least amount of damage. Any rain that falls or snow

that melt can run off the bale surface minimizing damage.

Hard core bales with a high density (made tight) are able to shed water better than soft core bales or bales with lower density



Photo Cap: Pyramid Stack



Photo Cap: Mushroom Stack

Average Bale Spoilage Depth

It may appear to the eye that three or four inches of damaged hay in a 5 foot bale is not significant. Work done by Buckmaster (1993) found that 3 inches of spoilage impacts 17% of the hay and 4 inches impacts 22% of the bale.

Improving the physical characteristics of a bale and reducing weathering damage to stored hay can reduce bale shrink, quality loss and the overall cost of feeding the cow herd over winter.

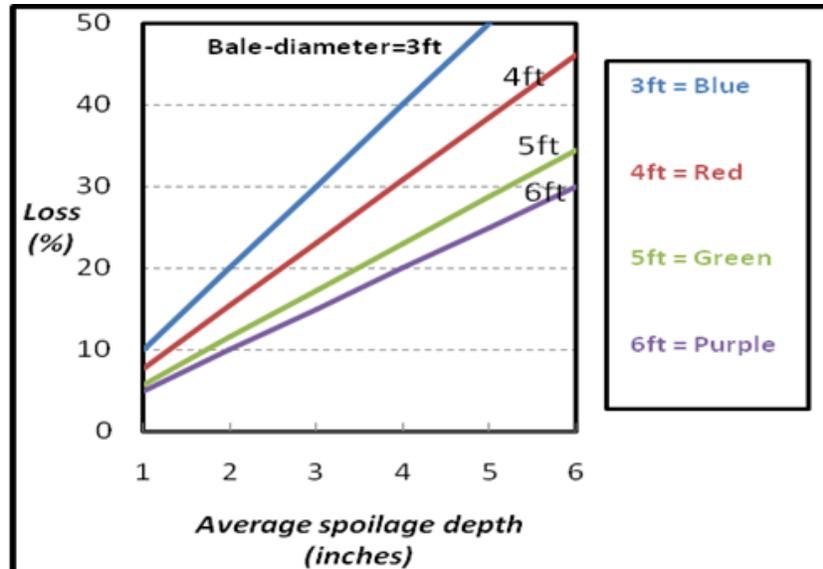


Photo Caption: Size of the Bale and Average Spoilage Depth



Photo Cap: Individual Bales

Cutting Drought Stressed Crops for Greenfeed and Silage

Different areas of the province are either in dry conditions or in a drought. Some cereal, legume (pea and lentil) and canola crops are under stress and are not likely to make it to harvest. These crops can be used as feed for ruminant animals.

Plants that are suffering from a lack of moisture and are experiencing hot conditions stop growing and try to produce a seed head no matter how small. They will mature up to six weeks earlier than normal. To conserve moisture, bottom leaves will dry up and drop from the stem (senescence). Seed bushel weights will be lower than normal. Canola plants will blossom, and if stress is sufficient, the flowers will turn orange and pods may not form or if they do form, many will be empty or contain very few seeds.

When plants undergo this stress, feed quality drops rapidly. Acid Detergent Fibre and Neutral Detergent Fibre levels increase which results in reduced energy content in the forage and can restrict the amount of feed an animal is able to consume. With leaf loss, protein content declines. The longer the plant is exposed to these conditions, the lower the quality.

The overall recommendation is to cut or graze the crops as soon as possible. If making silage, it will not take long after cutting to be in the 60 to 65% moisture range for chopped silage. Bale silage should be in the 45 to 55% moisture.

In previous years, we learned that cattle are very willing to eat canola either as greenfeed or silage. It may take a day or two for them to adjust to the taste of the feed, but it is something that is a viable alternative to hay.

Maintaining Quality of Cut Hay & Cutting Annual Crops for Livestock Feed by::

Barry Yaremciio

Yaremciio Ag Consulting Ltd.

Stettler, AB

403-741-6032

www.beefconsultant.com

Cutting Drought Stressed Crops for Greenfeed & Silage

There are a few concerns that need to be addressed:

Plants that are under stress can accumulate nitrate. Usually, levels are not high enough to prevent the cut feed from being used. If nothing else, test for quality and nitrate and the concerns can be addressed at that time.

Canola that received higher amounts of sulfur fertilizer may have higher levels than normal. A sulfur analysis should be included in the feed testing program.

Don't cut too close to the ground. White mould that is found in feed is generally caused by dirt contamination. When using a swather or discbine, cut at a level where some stubble is left standing. This should prevent dirt getting into the swath. Set the rake and pickup height so that they don't scratch the dirt.

Weeds that are present are a good source of nutrients. There are a few weeds that can contain anti-nutritional factors such as oxalates or nitrates but it is best to evaluate on a case by case basis.

Contact Us

Give us a call for more information about our services or Consultation;

Mackenzie Applied Research Association

5901, River Road
Fort Vermilion, AB T0H 1N0

Call: (780) 927-3776 or 780 285 0911

Email: re-
search@mackenzieresearch.ca

Visit us on the web at:

www.mackenzieresearch.ca

MARA Newsletter Sept. 2021

To Renew MARA Membership or Interested to Become a Member?

Click Here: <https://www.mackenzieresearch.ca/about-us/membership-forms>

Our Sponsors

