**BIOL 416: Weekend (Sept 30-Oct 1) farm visit field trip reflections**

Saturday: What were the two most interesting ideas you learned on either the ***Forman*** and/or the ***Salt of the Earth*** farm visits, and why were they so interesting to you?

Sunday: What were the two most interesting ideas you learned on either the ***Donaldson*** and/or the ***Ironwood Organics*** farm visits, and why were they so interesting to you?

**Please think deeply, but keep your answers concise.**

**1. A.** On Saturday, the most interesting idea I learned at the Forman farm was the scale and general process of the cash crops industry. I think it was the most interesting to me because I’ve passed by thousands of fields of corn and soybeans but there doesn’t seem to be enough livestock to feed all the crops to. I have always wondered what happens to the rest of the corn and soybeans. I had not realized the extensive yields and massive surplus in this area end up in the Prescott grain elevators which I used to drive by almost every day. I learned about the disconnect between sellers and buyers, where farmers have no idea what is being done with their product. There are essentially companies stockpiling massive amounts of famers’ grains, soybeans and corn products and can sit on them, sell them wherever because there will always be grain demands. It is a bizarre system to me that seems completely disconnected from farmer to user and produces a farming system that doesn’t contribute to the community food supply. The most interesting thing I learned at Salt of the Earth farm was the emphasis on drainage and tiling. This farm was recently tiled, and it was talked about extensively. This was so interesting to me because having enough water for plants is talked about way more than having too much water. Many farmers in this area have too much water and are would rather drain their field then try to conserve water and waterlog their crop. It is also underground, so it’s easy to forget about the drainage systems that probably underly most fields in this area. It makes me wonder how increasing the drainage in the field will affect the soil structure, where it could possibly increase organic matter decomposition by increasing oxygen and washing away certain nutrients and clays through increased water flow velocity.

**B.** On Sunday, the most interesting idea I learned from the Donaldson farm was the importance of using manures from within the farm. Collecting manure extensively from their dairy cows, they were able to fertilize almost all their fields. This seemed to be a more sustainable way of fertilizing if someone already has the livestock, compared to chemical fertilizers. This was highlighted by the two massive manure pits that were built on the property, which cost hundreds of thousands of dollars. Clearly manure collection is important for soil health and farm economics or a small dairy farm would not put that much money into what is essentially just a manure pit. The sheer size of these pits is what really surprised me. The most interesting idea I learned from Ironwood Organics was how regenerative farming practices can improve soil instead of just maintaining it. Using planting soil enriching cover like clover and other techniques like minimal tilling, this farm was able to double their organic soil content. That goes against modern farming, where there is a constant loss of organic matter in soil and nutrients is always sucked into that year’s crop, and fertilizers are needed to restore it. I think this was interesting because it goes against the paradigm of farming that we have seen at many other places. It showed that you don’t have to go through a cycle of taking and restoring in your soil, but you can ensure healthy crop and soil together through different practices.

**2. A.** I found the idea of various practices to maintain soil for farming to be interesting. One practice was crop rotation. I’ve heard about the practice before, but I didn’t know exactly what it meant. Now, I understand that it means planting different crops on the same land every year to avoid nutrient depletion as well as to increase soil organic matter. Also, there are considerations the farmer has before planting a specific species, such as soybeans not having enough organic matter or not planting soybean after canola. I thought it was interesting to know that plots of land have different things in them every year. It also made me consider that planting a crop requires long-term thinking about the soil in order to be sustainable. Another practice is tiling, which is a drainage system that uses a tube to remove excess water from soil. I have never heard of tiling before, so it was all quite novel to me. It was interesting because it showed me how something I thought was as unchangeable as soil moisture could actually be controlled using simple physics. A big problem for agriculture has been solved by humans! Together, these practices were interesting to me because they show how terrestrial ecosystem processes and soil composition could in fact be manipulated through human ideas and technologies. Simply put, we have the capacity to change so much about soil for better or for worse.  A completely different interesting thing I learned from the first day was the extent of soybean in Ontario. I had a vague idea that soybean was grown in Ontario, but I didn’t know that it was the #1 cash crop in Ontario. I also didn’t know it could be used as airplane fuel. These facts were interesting to me because I really like soybean products such as soy sauce and tofu. However, this showed me how much agricultural trends are connected to profits. While I know agriculture is a business like everything else, the ubiquity of soybeans comes from the continued manufacturing of the crop into any possible marketable product in order to grow more and make more money off of it, rather than just being a commonly used food product.

**B.** The entire Donaldson farm experience was quite interesting because I’ve never been on a dairy farm before. The concept I thought was interesting was preventing disease through vaccination in livestock rather than curing disease through treatment. It never occurred to me that animals could have vaccines as well. It also makes sense in terms of reducing antibiotic usage and the risks that could come with that. This was interesting because it informed me how animal welfare was taken seriously on a farm that is otherwise a large producer of dairy. It shows how people are capable of raising animals for animal products in a relatively ethical manner, but elsewhere, it could be disregarded if there isn't any regulation because some people would want to cut all costs associated with it. But overall, being ethical and caring towards animals isn’t the opposite of being a successful farm.  I thought the last farm was the most fascinating of them all because the principles behind farming practices were so different compared to the others. Rather than using many techniques to increase yields, this farm had the motto “diversity, stability, resiliency, and sustainability.” The thinking behind it was to become more sustainable by promoting a diverse ecosystem, which includes reducing usage of fertilizer and other substances. I thought this was an interesting idea because while some of the other farms were interested in having the most yields by adding whatever could help (which does make sense because of the sheer expense associated with farming), this farm is deliberately trying different farming ideas. This demonstrates how having sustainability as a priority in agriculture is not just a buzzword but could be represent the future of agriculture.

**3. A.** The most interesting things I learned on the field trip was firstly, the opinion that the beef industry is the most sustainable form of farming. It was proposed that cattle can be used to till the land, their manure can be used for fertilizer, and both of those can be used to grow the food that they themselves eat. This was very though provoking for me because from previous knowledge and media, I was under the impression that the beef industry was one of the most pollutive industries in North America, with its high methane production, and the manure seeping into water systems and causing algae blooms in Lake Erie. I even have a close friend of mine who refuses to eat beef because of the industry’s supposed impact. A second interesting thing was on the second farm, where it was said that approximately 50% of the food is produced by just 2% of the farms. This was interesting to me because I did not think that the production of food was so imbalanced between farmers. I was under the impression that the produce made by farms was relatively evenly spread between each farm. Knowing this now, it is clearer to me how much control grocery companies have on the farmers as highlighted in the documentary we watched earlier.

**B.** The most interesting things I learned on the second day was firstly, the fact that the dairy farm hardly used any antibiotics. This came as a shock to me because having read scientific papers and media articles on the issue of antibiotic resistance in cattle, it seemed like every farm with cattle used antibiotics and they were constantly battling antibiotic resistance. I was not aware that the use of vaccines was a viable option for use on cows, which seems like a much more cheap and viable option, rather than continuously buying more and more antibiotics. A second interesting thing I learned, was how the largest issue on most of the farms, was the removal of water, not the lack of water. I have always been curious as to how the crops on most farms grow, despite not typically having large sprinkler systems to water the crops. This is why it was a great surprise to me, to learn that most of the farms had installed underground tiles to make the water run off easier and to prevent pooling. I was unaware that most farms in Ontario, especially north of Kingston, had issues with flooding of the crops.

**4. A.** I thought the technique that was used at the Forman Farm to efficiently grow tomatoes in the greenhouse was incredibly interesting. The various interconnected components that all played a vital role in growing the tomatoes was fascinating as the pellet mill was able to heat the greenhouse in the winter, while the little white tags were scattered throughout the tomatoes and used to keep pests away while the bumblebees were used to pollinate. It became clear that tomatoes are very temperature sensitive and finnicky so the fact that one person was doing 90% of the work just goes to show how Charles had mastered the art of growing tomatoes and created a very organized system. I found Charlie’s tile drain improvement project at the Salt of the Earth Farm to be the other most interesting learning outcome on Saturday. Learning about how much water it actually takes to successfully grow crops was shocking and the benefits of this huge investment in addition to the increased land value were extensive (less runoff, less crop stress from waterlogged conditions, more efficiency when using nitrogen fertilizers, etc). It also goes to show the importance of networking and creating good connections as he used his neighbors land to grow his produce while the project was underway.

**B.** I had several takeaways from the Donaldson Farm, but my favorite was the technology they had implemented to get the most/highest quality milk from their cows (breeding cows with higher fat content and using robotic milking machines which not only milked the cows but also collected data to help them make management decisions). They clearly had a super effecient system as they also were also able to collect the manure and use it to fertilize their crops. It proved that their outlook of treating their cows as "athletes" was useful in getting the most milk from the cows but also ensuring longevity and sustainability within their system which leads me to my final learning outcome! At the Ironwood Organics Farm, everything that we had learned over the past two days was tied together with their motto which is four words: diversity, stability, resiliency, and sustainability – in that specific order. As we learned, a system will collapse from a lack of diversity, which must be able to stabilize even when a disturbance has occurred, and subsequently maintain critical functions, which ultimately results in sustainability.  Overall, it was an undeniably huge learning experience and lots of fun ϑ

**5. A.** From the Salt of the Earth farm visit, the most interesting idea was learning about tile drainage. It fascinated me because it's a crucial yet often overlooked aspect of agriculture that can significantly impact crop yield and land management. Understanding the importance of proper drainage systems in farming was eye-opening. From the Forman Farms visit, the idea that stood out was their focus on providing local farming services alongside their produce and products. This concept of a farm as a multifaceted resource for the local community, beyond just food production, was intriguing and demonstrated the potential for farms to serve as hubs for sustainable agriculture and community development.

**B.** During the visit to Donaldson Farm, the most interesting idea was their commitment to dairy farming and the large number of cows they had. It highlighted the importance of animal husbandry in sustainable agriculture and how dairy farming can be an integral part of local food production and the agricultural ecosystem. At Ironwood Organics, the emphasis on open-pollinated and landrace seeds, along with organic farming practices, was particularly captivating. This approach not only preserves genetic diversity but also promotes sustainable farming methods that are beneficial for the environment, community, and overall food system. It showcased a holistic approach to sustainable agriculture. Overall, my biggest shock was how every single farmer talked about how they know they don't get paid a lot and they know it's a hard job, but they all do it not because they feel forced too. They do it because they all want to make the world a better place. One of them said something like you live poor and die rich stuck with me the most. Just cool to see.

**6. A.** At Charlie’s farm, I was very surprised to see how he grew the tomatoes. Although I was standing in the back and therefore could not hear much of what he was saying, I have observed the long stems of the tomatoes and how he used wires for the stem to climb on or attach to. I feel like this is a very brilliant strategy as it saves so much space compared to how we would usually grow tomatoes in the ground. He has also mentioned that by growing tomatoes indoors, he is able to hire someone year-round to take care of the tomatoes. In my opinion, he is not just considering how to make the best profit, but he also wants to provide a stable job for whoever is needed. This made me think that agriculture and farming are not just about crops and hard work, it is also about providing lots of job opportunities for people, as well as providing healthier food for the community. At Charles’s farm, I have learned the geology of the farmland he owns. The topography is so different in such a short range of distance; hence he can grow very different crops due to the differences in the soil composition. He also had an interesting point of view that consuming a lot of vegetables and fruits may not necessarily be considered because they consume a lot of water and energy as well, in some cases more than livestock. This is a new concept that I have never considered before, which I find interesting and perhaps will do more research on my own.

**B.** At Charles’ dairy farm, I was able to see the amazing cooperation between farmers and technology. I was a little worried about the ethics in terms of using robots and technology on livestock before visiting the barn, but seeing how the machines constantly move to push the livestock feces, made me feel more assured of the ethicality of the livestock. I can sense that this family genuinely cares about the cows, they have created quite a good environment for them, as well as they have observed and learned their behaviours. One thing that interested me was that I did not know cows do not like the sun, and hearing about it on Sunday kind of blew my mind a little, but I am also very glad that the farmers observed this and compromised with it. Chris’ farm was eye-opening, in a sense of “what I can do with my university degree”. He is a very knowledgeable person and he really used what he has learned in terms of farming. I feel like I have learned quite a bit from him, for example when he said that we can’t really buy the soil on the ground, so it is important especially when investing in land, that soil composition should be considered. He is keen on making the soil healthy; therefore, the crops can grow strong and healthy in the future.

**7. A.** I found that the most interesting aspect of the field trip for me was learning about the agricultural history of the region. The first idea relevant to this is that there have been a series of paradigm shifts that have largely been shaped by what is profitable for the farmers to sell. The most prominent paradigm shift that I learned about was how there was a transition from small – scale independent dairy farming and cheese production to largely monoculture cash crops such as soy and corn. It was interesting learning about how this transition has affected not only the agricultural landscape but also the structure of agricultural communities, and how the transition to cash crops has changed the jobs available in the area. The second idea that I found most interesting is the notion that agriculture in North America post colonization is largely an experiment. Because we lack the agricultural and cultural history that is present in older established countries such as those in Europe and Asia, North American and specifically Canadian agriculture is more susceptible to change from the influence of local and international markets. I found this interesting because historical context for agriculture is often overlooked, and yet is a crucial aspect of having a holistic understanding of the cause and effect that shapes North American agriculture.

**8. A.** One of the most interesting things I learned from visiting the Forman and Salt of the Earth Farms was the farmers perspectives on sustainable livestock farming. Charlie Forman explained that by having animals such as cows on the farm, he can maintain his pastures through their grazing without the use of fossil fuel powered equipment, and this grazing also allows the cows to be self-sustaining. I found this particularly interesting because I used to be opposed to livestock agriculture and attempted to limit my meat consumption as much as possible. However, after learning about the contents and environmental impacts of meat alternatives, I understand that it is more sustainable to eat Canadian sourced meat products instead. However, I think it is important to consider the scale of the production. The farms we visited were rather small in scale, so raising and consuming livestock associated with these kinds of farms is far more sustainable than the livestock from a mass-production farm with poorly controlled conditions and consumption of resources. Another interesting thing I learned from these visits is the practice of tiling. This is a method of soil drainage which allows farmers to optimize the use of their land. It involves installing drainage tiles below the ground which directs excess water out of the soil and reduces flooding. I learned that in the Kingston area, a few acres of land can have multiple different soil compositions, and that tiling in certain areas can greatly increase farmer’s yields. Although it takes heavy machinery to install the tiles, Charlie Summers mentioned that they will last multiple generations. When considering the other environmental impacts of tiling, the process of installation must cause the loss of a lot of carbon and other nutrients from the soil, resulting in the need for fertilizer use. I found this method of drainage interesting because I did not know that excess water was such an issue for so many farmers. I had always considered water as a valuable resource that should be used consciously. However, understanding that excess water creates other problems for farmers, I now understand that it is not a limiting resource.

**B.** Something that I found particularly interesting from the Donaldson farm is that milk consumption is decreasing by 1% per year and I considered how this might be due to the increasing consumption of milk alternatives. I found this interesting because I have previously considered cow’s milk to be bad for the environment, due to the mass number of resources required to produce it. Because of this, I switched to almond milk years ago and oat milk more recently. However, they demonstrated that by growing their own cow feed that is highly nutritionally efficient, their farm is self-sustaining. They also brought up the fact that milk alternatives are often produced from nuts that are sourced in other countries and go through processing in other countries as well. It becomes more evident that consuming Canadian cow’s milk that is farmed locally may be more environmentally conscious than consuming alternative products sourced from further away due to the higher use of fossil fuels for processing and transportation. What I found particularly interesting from the Ironwood Organic’s farm is the idea of regenerative agriculture. I deeply agreed with this farm’s philosophy of putting back into the soil what they take from it. I had never considered that effective farming could be done through co- opting the benefits of biodiversity to control factors such as wind, temperature, and nutrient composition. Using this method instead of synthetic fertilizers ensures for an entirely natural production of crops and uses the land in a way that stabilizes it and promotes resilience and allows it to be self-sustaining without a great deal of human intervention. I found this to be interesting because I appreciate the farm’s commitment to their values over their production or income. By farming the way they do, they not only produce useable crops, but also educate current and future generations about the importance of sustainability in agriculture.

**9. A.** The Forman farm introduced the idea of visual false productivity, the way that the farm looks productive whilst you are driving down the road but the reality being far from perfect. I found this to be something that the farmer wouldn't want to generally be known and found it interesting that he made a large point for that fact to be know. The Salt of the Earth farm brought up the commercial use of oil seeds such as canola, rape seed, soybeans, and sunflower seeds to fuel airlines, I found it interesting that most of the food is created not for consumption (a necessity) but instead it is used for luxury by humans.

**B.** The Donaldson farm brought up the issue of what is being demanded by consumers of dairy products and how that influences what products are made and how much milk they can sell, this also brought up the issue of concentration amounts of protein and the fact that if the protein level is too high no one will want to buy it. I didn't know this and found it very interesting that humans can be this picky about a perfectly good product. The Ironwood Organics farm thrives on genetic diversity for their stable yields, and this brought up the issue of agricultural practices and their 4 principles that they apply to their practice, diversity, stability, resilience, and sustainability. I found it interesting that there is a local farmer that chooses to grow their crops this fashion as well as I really enjoy the 4 principles of their practice and found it interesting that it allowed for no use of herbicides, fungicides, pesticides, or fertilizer.

**10. A.** The most interesting thing l learned on the trip was what it means to farm organically. I was unaware of what it meant to farm organically in Ontario and was certainly unaware that every type of plant needed to be investigated and approved to be able to label it organic! (not to mention that according to Charles it costs quite a bit of money to get these certifications). What I also found interesting was Charles' take on this system; that in his opinion his produce was just as safe and healthy as organically labeled produce. This tied back into our conversation in class about what the term organic means, in which none of us really had a clue so it was interesting to hear first-hand what it means to someone in the field. The second most interesting idea I learned was the methods of crop rotation Charlie uses at his farm. I found it interesting how he would often plant certain crops before/after each other intentionally, due to how each crop leaves the soil for the following year. I was previously unaware of the effects soya beans have on the soil, and thus the ability to farm on the land it grows on in following year. I found this interesting as soya beans are becoming a more and more important crop as many diets are evolving to contain less animal products.

**11. A.** During my visit to Salt of the Earth Farm, I was really impressed by Charlie's take on sustainable farming. Despite what we often hear in the media about the environmental impact of cattle farming, Charlie made a compelling case for pasture cattle farming. He explained how letting the cows graze on natural pastures, using available resources, and taking care of themselves could be a game-changer. What caught my attention was the simplicity of the idea. It seemed like a practical, common-sense approach that could significantly reduce the need for heavy machinery and large-scale factories, which are major contributors to carbon emissions. Charlie's approach while maybe unattainable for feeding the masses, felt grounded and down-to-earth, offering a glimpse into a more sustainable and practical future for farming. At Salt of the Earth Farm, Charlie delved deeply into the concept of laying tile pipes, which I found incredibly intriguing. In our class discussions, we learned about how different regions have distinct parent materials, leading to diverse soil types with varying drainage capabilities and nutrient retention capacities. What fascinated me was the practical application of this knowledge: using tile pipes to enhance drainage in flood-prone areas. This technique not only prevents flooding but also enables farmers to maximize land utilization and boost crop productivity. It was a clear example of how understanding the local soil properties could lead to innovative solutions with real impact on agriculture.

**B.** The concept of selectively breeding crops and livestock is not new, it has been a common practice throughout human history to actively breed the best livestock while investing minimal efforts in breeding less prosperous ones. During my visit to the Donaldson farm, I was fascinated by the advanced nature of this system. I found it intriguing how sophisticated the process has become over time. At the farm, I learned that the best cattle are meticulously evaluated through a milking robot, which assesses various traits such as minimal movement, high milk production, and the ability to produce milk with the highest butterfat content, among others. What amazed me was that these cows are judged by this machine, and based on this evaluation, selective breeding occurs. Cows possessing the best traits are not only impregnated but also have their embryos implanted into lower quality cattle. This innovative approach enhances the quality of the offspring, ensuring that desirable traits are passed down to future generations. Visiting Ironwood Organics was truly eye-opening. I was captivated by their back-to-basics farming approach, reminiscent of an era when traditional methods were the norm. What struck me was their commitment to nature over profit, a rare mindset in today's agricultural landscape. What fascinated me the most was their innovative technique of enriching soil quality without resorting to chemical fertilizers. They simply buried organic matter beneath the topsoil, allowing it to naturally decompose and nourish the soil, mirroring the way forests accumulate surface litter. This approach felt deeply connected to nature, reminding me of the harmony we can achieve with the land when we work hand in hand with it.

**12. A.** The first interesting thing I learned on Saturday was on the Forman farm. I found it really cool that this farm (and the others, but this one really opened my eyes) used so much input from scientific research. It shouldn't have been so surprising, but it makes sense. New methodology means new innovative ways to make some more profit. In a business where profit margins are slim, anything that gives you a leg up is good. Charlie really reminded me of my grandad (who was a farmer before he became an engineer), and he always is looking for new information that can help him out in his business and is pretty open-minded when it comes to learning new techniques. The second interesting thing I learned came from the Salt of the Earth farm. Charles introduced the idea that oil cakes (the sludge byproduct from oilseed processing) are eventually made into meat alternatives. This really made me think about how plant-based meat alternatives are likely not as healthy as they are marketed. Are they even better for the environment than meat products at this point? Growing more soy or corn for meat alternatives might have a worse impact on the environment than sticking with the meat production that we have currently.

**B.** On Sunday, I learned the first interesting thing on the Donaldson farm. It was the idea of treating their dairy cows like elite athletes. I had no idea that one cow could produce up to 70 liters of milk every day, that was crazy to try and wrap my head around. But once I did, it made complete sense as to why the cows have to be maintained the same way athletes do, with a great diet etc.. This way of thinking was completely different from the picture that Food Inc. had presented in their documentary, and I thought it was an interesting contrast that forced me to really reflect on how media can completely addle perspectives. ( I also had the opportunity to speak to Robin for a while and she was lovely when answering all of my questions!) The second interesting thing I learned at Ironwood Organics. The flood variety of fife was astounding to me. I had always thought that selecting favorable traits in plants would take multiple generations and even years to have successful yields. But the fact that this variety of flood-tolerant/resistant fife was able to be extremely productive only 3 years after it was selected for that trait completely changed my perception of how humans domesticated plants to our liking over history.

**13. A.** I was genuinely intrigued by an insightful conversation at the Salt of the Earth farm. We discussed how organic phosphorus fertilizer is essentially the same crushed stone as conventional fertilizer, however it doesn't undergo the treatment process involving sulfuric acid that enhances nutrient bioavailability. This discovery left me wondering, as it appears counterintuitive to the principles often associated with organic farming. In the long run, this organic approach may require a substantially greater use of fossil fuels due to the heightened demand for mining these stone-based fertilizers and increased transportation, all while offering less nutrient availability per gram. This revelation has reminded me of the importance of exercising caution and conducting thorough research when it comes to the agricultural industry.  At the Salt of the Earth farm, I was also particularly fascinated by the recent tiling work that had been completed. Previously, I had perceived farming as a water-intensive practice, and I associated dry fields with poor soil health. However, this experience shed light on the significance of proper drainage and the advantages of having a drier top layer of soil. It also made me appreciate the infrastructure and costs involved in implementing such systems. Intrigued by this newfound knowledge, I inquired about the tiling systems at both farms the following day, driven by my genuine interest in understanding their respective approaches to soil management.

**B.** I learned a lot of very interesting information on Ironwood Organics farm about the importance of ecological diversity on farms. I watched a documentary called “The Biggest Little Farm” about 2 years ago and have since been obsessed in a diverse and natural way of farming. I think that Ironwood Organics Farm had a lot of similarities to this documentary and made me very inquisitive to whether most of our farms should be implementing these practices. One thing that really stuck with me was his use of a natural grass field and a slow movement of it across his farming field. He explained the importance of how this may help preserve insects that have multiyear burrowing phases. This made me think more deeply about the land mass we have converted and continue to disrupt on periods much shorter than one year. The Ironwood Organics Farm also taught me about the use of small areas of forest surrounding fields to act as both a windbreak and a diversity center. Chris explained that these areas prevent a lot of wind disturbance and help with snow deposition, this made me think about how their implementation may aid larger scale farms when it comes to severe wind events. I also was astonished about the ability of it to act as an ecotone spreading diversity back into the fields after they have been tilled or harvested and supplying many nutrients and protection to a variety of species that all influence the great biodiversity of the farm. This made me think about the importance of different ecotones and protective area for local species.

**14. A.** One of the most interesting ideas from Saturday to me was how livestock farming was said to be one of the most sustainable farming practices. My view of livestock farming was tainted by things I’ve seen through social media but hearing this other perspective and how it really can be a sustainable answer opened my eyes. By growing your own food for the animals and in return getting manure for your fields, you can mostly provide what is needed for yourself and ensure you’re feeding your animals what is best. Another interesting idea from Saturday was the qualifications to be certified an organic farm and how limiting they are. I never thought the use of fertilizer wouldn’t be allowed in organics, I know over-use of fertilizer and run-off is a big issue and there should be regulations around its use but you’re adding important nutrients back into the soil for your plants. Although I think it is super important for regulations surrounding what can be considered organic, the lack of regulations around non-organics make it much easier to grow them rather than organics.

**B.** An interesting idea from Sunday was the new demand for higher fat percentage in milk. I was already aware that consumers constantly change the demands for farmers, but I was unaware that fat percentage demand was changing. For most of my life I’ve drank milk alternatives, so I don’t necessarily pay attention to fat percentage in milk, nor did I understand how it changes milk. Changing demands like this can make it difficult for farmers to keep up with them and produce what is wanted at that moment. Another idea I learned was that apparently people tend to trust the Canadian organic label more than the American one. The man from Ironwood Organics mentioned while we were eating lunch that a study was conducted, and somewhere around 80-90% of people trusted the Canadian label and only 50-60% of people trusted the US label. Although the regulations between the two countries are slightly different, there was quite a big difference in trust from people in what they considered good organic food. He also mentioned that in a meeting where this was mentioned, they suggested they put the Canadian label on all organics so people want to buy them more if they were to trade internationally.

**15. A.** Forman Farm: That basalt rock may capture up to 90-92% of atmospheric CO2. It was interesting to hear both aspects of determining whether he would use basalt rock to cover his fields. He mentioned that for farmers to want to use this, there needs to be an incentive (particularly financial) since it does not directly benefit the farmer, if it only helps to capture CO2. He then mentioned there was evidence of basalt deterring insects, and therefore the basalt cost to the farmer would be made up by the farmer no longer requiring pesticide use. It was interesting to see the struggle between the farmers personal needs and ethical needs, in this case he was balancing helping reduce atmospheric CO2 but with a benefit directly to himself, because it comes back to selfishness or greed. It's hard to do something beneficial if you don't get to directly gain from it and it costs you. Salt of the Earth: Systemic herbicides are taken up by the vascular system of the plant. Consuming plants treated with systemic herbicides means the herbicides remains in the plant no matter if it was washed or not. Charles mentioned there could be a possible effect of systemic herbicide use on human microbiome. It is interesting to think about this possibility as a major concern for how herbicides could alter our microbiome environment. We have all consumed produce that had systemic herbicide use, but we do not have evidence yet of impacts of this on our health.

**B.** Donaldson Farm: The feed for dairy cows is primarily corn silage. They treat corn silage with a bacteria that makes it digestible and the nutrients accessible to the cows. Corn silage is a high energy source that is low in fibre (digestible for cows). They use corn silage to increase energy consumption, so that the cows produce more milk. This is interesting because it brings up the question still of whether cows should be fed grass or corn. They stated that corn is technically a grass, but I found that corn is considered a cereal grain. Regardless of this fact, to produce corn silage, bacteria needs to be added. This still brings up questions like: does this affect the cows ruminant system? How does it compare to feeding only grass? It's an interesting debate of whether using corn silage to drastically promote growth and milk production is more beneficial than feeding grass which is evolutionarily what they are meant to eat. Ironwood Organics: That organic matter has a noticeable effect on the nectar production in flowers and this directly correlates with an increase in honey production from bees. This was interesting because it highlighted the importance of maintaining and increasing organic matter in the soil for upscale effects in the ecosystem.  We understand that organic matter is important for nutrient availability, water-holding ability and biological activity but it was cool to see the effect of good soil on the rest of the ecosystem (soil increases flowers nectar production in turn increasing bees honey production by providing more nectar).

**16. A.** The first most interesting fact I learned today was that the farmers we visited had a generally positive outlook on livestock farming, especially concerning cattle. This was interesting to me because of the negative light that is normally painted around the cattle industry, it was a little surprising to hear from both of the farmers today that they both believe that the raising of cattle, when done in a responsible manner, is the most effective and desirable form of farming.The next most important takeaway from today was that the farming industry, despite being in constant demand, is not necessarily a very profitable business even when growing ‘profit-crops’ such as soybean and corn. This was rather interesting because from an outside perspective we often assume that many farmers, especially those with large fields of desirable crops, are making large profits due to their high output of high-demand products however due to the rapidly developing technologies and practices around the industry, they are constantly pouring their potential profits into new equipment and upgrades for the farms.

**17. A.** The most interesting idea that I learned at Charlie Forman's farm was his use of bees in the tomato greenhouse! He explained that he used the bee's natural predation against flies to keep their populations under control. This was very interesting to me as it shows Charlie's knowledge of interspecies relationships which has allowed him to simulate a natural ecosystem and reduce the need for pesticides. Another interesting idea that was spoken about by both farmers was that cattle seems to be the most sustainable form of agriculture. Both farmers agreed about this concept and explained that having cows allows for reduced inputs into the farm and therefore keeps it sustainable. I found this interesting because the war against cattle is very popular in the media, when in reality it is the large-scale farms that cause the most harm.

**18. A.** To me the most interesting part of the Foreman and Salt of the Earth farms was the apparent lack of interest in farming. Specifically, both farmers described difficulties hiring local workers to help in the field and resorted to outsourcing their work to workers outside of Canada. Charles stated that he believes this is a societal issue, causing people to not take interest in repetitive, labor-intensive work which I also think is a fair point and potentially a result of our growing industries outside of agriculture.  Additionally, the topic of farm succession was also discussed by both parties and seems to be another issue for farmers these days. As generational transfer of farms becomes less common thanks to other avenues and the innate hard work required for minimal returns. At least before retirement, echoing the quote "Farmers live poor and die rich.".

**B.** Today what interested me at the Donaldson farm was the reoccurring topic of tiling fields. As both the Salt of the Earth farm and the Donaldson farm used this practice to reduce water damage in their fields. Specifically, I found this interesting because I had never heard of it before despite working in agriculture, and because it seemed to be effective despite its presumably invasive nature. Moreover, at the Ironwood farm the low fungal disease pressures impressed me. As someone who works directly with cereal crop disease like the fusarium, rust, and ergot it was interesting to think that this lack of disease might be due to nature simply taking its course. Brief,  maintaining low infection by not spraying any fungicides thus having other fungi compete with these typically destructive organisms.