The Bird Flu Effects and The Poultry Manure Dilemma

The Green Industry is in the throes of a Dynamic Paradigm Shift.

A rapidly growing number of professional landscape companies have switched over to using organic-based fertilizers for a multitude of reasons.

Beginning with the economic meltdown of 2008 which saw conventional fertilizer materials hit an all-time high in costs, professional landscapers have been seeking alternatives to help insulate themselves from the volatility of the fertilizer markets. In the 16 years since, professional landscape and turf management service companies realized advantages to differentiating from the behemoth lawn care companies by building their brand on sustainable, Eco-friendly, science-based solutions that increased nutrient efficiency, delivered a higher quality lawn and landscape, and reduced the requirements for chemical weed and pest controls, high NPK inputs, and grass seed.

The organic inputs that are replacing inert fillers (with zero agronomic value) are affordable and provide added value that is becoming increasingly difficult to calculate vs. 100% conventional fertilizer materials.

One such material, composted poultry manure has become a staple and key ingredient when formulating enhanced efficiency fertilizers. The Bird Flu now threatens that supply. Over 90 million poultry stock birds have been euthanized in the U.S. just in the last 3 years. As a result, everybody is talking about the cost of eggs. It has become its own political platform. With the trade tariffs looming, the entire Green Industry is bracing for perhaps another 2008 when NPK materials costs exceeded $1,000 a ton. Once this happens, lawn and landscape service companies that have built their fertilization programs on conventional practices, will quickly become believers in Old World agronomic practices. The demand for organic-based materials will skyrocket.

The war on The Bird Flu has been a roller coaster of progress vs. backsliding. Currently, the case numbers have dropped in recent weeks, promising some much needed light at the end of a long tunnel.

Evidence points to the drop in demand for the inflated costing eggs and

poultry as a major factor in the reduction of wholesale egg costs, along with chicken farming operation bird populations. Fewer birds could be helping the spread of the virus. Meanwhile, the decreased demand for eggs has forced farms to back off of egg production, causing a national egg shortage that the new administration is working to resolve buy buying eggs from other countries. These eggs are not subject to the new trade tariffs, but you can bet it negatively impacts the U.S. Economy.

Chicken farms have not been in any rush to replace the 90 million birds that had to be culled as part of the control measures for managing The Bird Flu. This is directly related to the diminished demand for expensive eggs and roasting hens. But there is another element to the poultry industry that must be considered that ties into organic farming, professional landscaping, golf course management, land reclamation, cannabis production and waste disposal.

Chickens are a multi-billion-dollar industry. There is an egg laying chicken for every man, woman, and child in the United States. That's over 330 million birds. On average, Americans go through 1.43 egg laying chickens per year. Extrapolate that out per 330 million people and you get 472 million egg laying chickens per year. The average American, meat-eating person will consume about 26 chickens (roasting/fryer hens) per year. That's 7.8 billion roasting/fryer chickens per year This equates to a mountain of manure the size of Mt Everest (not true but you get the point). It presents a very big problem.

Throw in the turkeys, pigs, sheep, and cows and now you have a manure disposal problem that is spiraling out of control. If you extrapolate that meat consumption on a global scale, the numbers are astronomical. If you consider the greenhouse gasses generated from livestock (14.5% globally) the environmental impact is critical.

Countries like China, India, Brazil, and Saudi Arabia have adopted the American meat-eating diet. This pushes the number of livestock into the hundreds of billions which requires more feed grain. That means more fertilizer gets produced and applied to grow food for livestock and humans. Between all the fertilizer produced and applied and all the livestock manure

that is generated from meat consumption, the pressure on water quality is overwhelming.

Additionally, the effects of climate change on the polar ice caps has elevated sea levels to historic highs that now threaten to wash into our fresh water reservoirs.

I truly believe that the next world war will have a lot to do with clean water. Man has been fighting and dying for clean water since the very beginning of mankind. If you plot the population growth trajectory as it relates to meat consumption it is nearly impossible to project the impact on clean water supplies. I honestly believe that we have surpassed sustainability of human life on this planet. It is just a matter of time. The apocalypse will not be heralded in by the four horsemen. It will come by way of our own disregard and neglect of our precious, natural resources. This will dwarf any threat of a global pandemic or a zombie apocalypse. This is the reality we face.

Poultry manure when composted is an incredible fertilizer. Just like other livestock manures, it must go through a composting process before you apply it to landscape plants or turf grass or else it will cause burning. This is because the raw manure is loaded with free nitrogen, a form that is not combined with other molecules. When manure is composted, the micro-organisms convert the free nitrogen into ammonia, nitrites and nitrates that can be taken up and used by plants. This is called fixing (fixed nitrogen) which is gentle and non-burning to plants. We talked about old-world practices where farmers manured the fields every few years. The manure was applied in large volumes and left for a few months to allow the natural composting process to fix the nitrogen. Some farmers would till the raw manure into the top layer of the soil to enhance and expedite the composting process. Once the conversion to fixed nitrogen occurred, it was safe to plant crops without fear of burning.

Like biosolids, poultry manure has received its fair share of criticism. There is not as much of the ICK factor going on but there is an unmerited fear of avian flu. The real problem is in the manure collection and processing methods. They are outdated and pose a serious threat to water quality.

Poultry facilities now must incorporate and execute stringent sanitation practices to control the threat of spreading avian flu and other diseases.

Antibiotics are a big part of disease control in poultry which results in pharmaceutical contamination in the poultry manure, eggs, and the roaster/fryer chickens that we consume. This can be problematic in that it can lead to bacterial mutations that are immune to antibiotics. Not only does this affect the chicken population but it also has a long-term impact on humans.

Poultry producers like Perdue and Tyson took a step in the direction of antibiotic free birds, but you have to look closer at how they get around this. What are they feeding the birds to take the place of antibiotics.

Food additives for antibiotic free chickens are a complex and diverse platter of chemical and biological substances that while EPA approved as safe in the low rates used, the long-term effects on health are unknown.

Common chemical food additives for poultry production include Ethoxyquin, Butylhydroxytoluene, and butylhydroxyanisole which cause eye and skin irritation, reproductive effects, liver, kidney, and thyroid effects, and have carcinogenic potential. Butylhydroxytoluene disrupts the proper function of the immune system, with toxic effects on the liver, kidneys, lungs, blood system, and reproductive systems.

Butylhydroxyanisole can cause cancer in animals, disrupt hormones and inducing dysfunction, lowering testosterone levels and inducing allergic reactions in the skin.

To make matters worse, poultry producers use an array of cleansing substances that can cause side effects that include severe vomiting, liver failure, and death. Chlorine dioxide, acidified sodium chloride, trisodium phosphate, and peroxy acids, can irritate the eyes, nose and throat, in some cases causing nosebleeds. Trisodium phosphate may cause severe gastrointestinal tract irritation with nausea, vomiting, and possible burns. Peroxy acids are oxidizers that are corrosive in high concentrations. They can

cause irreversible damage to the eyes and skin and in extreme cases, that can cause hemorrhaging, edema, and consolidation of the lungs.

These common sanitizers can be found in water treatment and food processing but are applied at low rates that are acceptable for human consumption according to EPA regulations. This applies to acute toxicity and side effects, but what about daily, long-term exposure, and how much chemical ends up in the manure?

Organic poultry production incorporates microbial solutions in the form of probiotics and prebiotics, along with herbal, and vitamin food additives to boost the immune systems of the chickens, but what about the substances used in the cleansing procedures? Is the higher cost for organic poultry really worth it if producers are relying on harmful chemicals to process the birds for human consumption? Is it all just a big marketing ploy to increase profits for large corporations? The examples are in plain sight. It is up to the consumer to connect the dots by doing the research and deciding for ourselves what we put in our bodies.

A prime example of marketing deception is found in the many choices of chicken eggs. What is the difference between cage free and free range? When you see this, do you picture the chickens running loose on wide open ranges, free to seek sustenance from nature as they were intended? I can assure you, that is not the case, yet we as consumers pay a lot more for eggs that are marketed as such. Cage free, and free-range chickens spend most, or all of their life indoors. It is a surreal sight to see thousands of highly vocal chickens inside a huge warehouse, huddled together in a mass that I liken to an indoor sports stadium with thousands of screaming fans after their team scores the winning points at the end of a game.

What about pasture raised? There is more truth in this promise in that the chickens have more room, but they are still contained, otherwise the population could not be managed properly. The most significant element to the nutritional health of the chickens as it pertains to human consumption, is the diet of the chickens. Pasture raised chickens have access to a natural diet as nature intended, but the diet needs to be supplemented to ensure the full

potential of profit. The additional space equates to better living by lowering stress, improving physical fitness, and providing cleaner air to breathe. These better living conditions are secondary to diet, but a close second. The added costs for pasture raised chicken eggs are related to the larger land requirements, more intensive management practices and the manure collection process. Yes. You still have manure disposal to manage.

The only way to improve upon pasture raised chickens is to raise your own chickens.

In 2023, the latest iteration of the Bird Flu was spreading at an alarming rate. Tyson Foods went back on its commitment to eliminating antibiotics, when they announced in July 2023 that they would resume using some antibiotic drugs in poultry production. This could open the door for other poultry producers to follow their lead.

This unresolved conflict could signal a trend explosion for organic poultry producers, which could lead to advancing microbial technologies to help close the huge gap in cost to the consumer. Even so, it still leaves the manure disposal issue unresolved.

The outdated manure collection and processing practices are slowly but surely being regulated, leading to the updating of infrastructure and processing practices that eliminate e coli, salmonella and other pathogens that pose real health threats to humans and livestock. When processed properly, poultry manure is safe to use on organic crops and is designated as Certified Organic by The Organic Materials Review Institute (OMRI) or OMRI Listed. This designation is the benchmark for fertilizer materials that meet certain guidelines required by organic farmers in the United States. This makes processed poultry manure the most commonly used fertilizer in organic crop production in the country.

What I love the most about processed/composted poultry manure is the nutrient release curve. Roughly 50% of the nitrogen is quickly available and the other 50% is slowly available nitrogen. Most of the slowly available nitrogen is cold water insoluble N that releases in cooler soil temperatures.

The remaining water insoluble N will carry over for several months which makes for a systematic metering out of the released nitrogen to be plant available as the plant roots have the ability to take up the nitrogen. This makes composted poultry manure the most efficient organic fertilizer that is commonly used today.

Just like biosolids, processed poultry manure contains nearly all of the sixteen essential elements for plant health. With egg layer poultry manure, there's a much higher concentration of calcium. This is because of their diet. Egg layers are fed ample amounts of lime which is high in calcium. This strengthens the egg shells to make them durable in order to withstand the stress of processing and handling. Calcium is valued in crop soil management for its ability to help balance pH and serves as a catalyst for other trace nutrients that would otherwise be locked up in the soil.

Egg layer poultry manure sources are usually free of fillers that are commonly found in roasting/fryer poultry manure. The egg layer chickens are housed in automated houses that remove the manure via conveyor belt systems that do not require bedding materials such as straw, rice hulls, saw dust, etc. Whereas, roaster/fryer chickens are housed in systems that are not always automated and require the bedding materials that make cleaning the flooring of the chicken houses much easier.

There are many sources of poultry manure that are granulated or pelleted into finished products that are low odor, low dust, easy to handle and can be easily applied. They can also be blended with biosolids and other conventional fertilizer materials to create more efficient fertilizers. Because most processed poultry manure is OMRI listed and more widely acceptable for crop production in the United States, the disposal problem is not as critical as that of biosolids but given the rapidly growing trend of poultry consumption and the trajectory of the global population growth, (10 billion people by 2050) the modernization and disposal of poultry waste should be a priority for regulators. If we fail act now, we will end up with much more serious problems in the future.

One of the biggest problems with our broken waste disposal system is

regulation infractions are often treated with a slap on the wrist. This eye-opening account of the failure of regulators to provide oversight and enforce the environmental laws, is one of the many disgraceful examples of the unchecked threats to our environment.

Report: Majority of Poultry Farms in Md. Failed Inspections But Faced Few Penalties

By: **Elizabeth Shwe** - October 28, 2021

A new report from the Environmental Integrity Project on Maryland's poultry industry found widespread issues with waste management and reporting compliance, but regulators have rarely imposed fines. USDA photo by Lance Cheung/Flickr.

Eighty-four percent of poultry farms in Maryland failed their first state inspection over the last several years, most due to inadequate waste management and failure to keep records — but the state rarely penalized poultry farms for their violations, according to a recent report by an environmental watchdog organization.

Out of 182 poultry farms that were inspected, 153 failed their initial inspection and 78 failed follow-up inspections from 2017 to 2020. Two thirds of the inspected poultry farms failed due to waste management problems and 95% failed to file annual reports to the state or maintain records about their operations, the report by the Environmental Integrity Project on Maryland's poultry industry found.

Despite the failed inspections, the report found that the Maryland Department of the Environment, which is responsible for issuing water pollution control permits for animal feeding operations and for enforcing the federal Clean Water Act, imposed fines on only eight of the 78 facilities with repeated violations, and collected fines from only four poultry farms.

Jay Apperson, a spokesman for MDE, said he could not comment on the

report's findings because MDE has not seen it. But, he said, "The Maryland Department of the Environment, in coordination with the Maryland Department of Agriculture, maintains a strong program to enforce environmental regulations pertaining to poultry operations. A high percentage of violations that are found are associated with record-keeping requirements, as opposed to water quality issues. Where we do find environmental concerns we focus on returning facilities to compliance with regulations, but we will go after polluters and impose financial penalties when needed."

The Environmental Integrity Project report is based on public records obtained from MDE and MDA from Maryland's Public Information Act law. For the last nine months, EIP reviewed more than 5,000 pages of poultry operation inspection reports and other state records to evaluate how much oversight there is of the state's poultry operations.

The state has restrictions on how much manure farmers can apply to fields that already have high soil phosphorus levels. Adding manure to fields can help provide nutrients for crops, especially when soils are low in phosphorus. However, excessive phosphorus on fields can get into waterways after storms, which risks algal blooms and sucks up the oxygen needed by fish.

According to the Chesapeake Bay Foundation, agriculture runoff is the number one source of nitrogen and phosphorus pollution entering The Chesapeake Bay, contributing to 40% of the nitrogen and 50% of phosphorus in the Bay.

Twenty-nine of 57 poultry farms that EIP reviewed reported to the state that they had been applying illegal amounts of animal manure on their crop fields in 2019. Most farms are required to have runoff prevention plans that incorporate buffer zones and other measures when fertilizing crops and managing animal manure in order to prevent excess nutrients going into waterways, and the Maryland Department of Agriculture is responsible for enforcing these plans.

But MDA has not issued any fines on poultry farms for spreading excess poultry manure, according to Jason Schellhardt, the spokesman for the

agency.

Currently, there are 553 permitted poultry concentrated animal feeding operations (CAFOs) and Maryland animal feeding operations (MAFOs) in Maryland, according to Apperson. In 2019, Caroline County had 108 poultry farms that produced almost 50 million birds, the highest number in any county, according to the report. Dorchester County had 45 poultry farms in 2019, which yielded 28 million birds.

The report also found that 174 poultry operations on the Eastern Shore are within 400 feet of a house, which increases residents' exposure to ammonia, dust and manure particles. Only 64 of these poultry farms had vegetated buffers such as a row of trees between the poultry house and residents' homes, which is a way to divert emissions, the report said.

In 2016, Wicomico County residents formed a protest group to oppose construction of what was going to be the largest poultry operation in the state near Salisbury, citing health concerns from air pollution and manure that could pollute drinking water sources.

During the 2020 legislative session, Del. Vaughn Stewart (D-Montgomery) introduced a bill that would have blocked the expansion of industrial poultry operations in the state by precluding MDE from issuing storm water permits for any animal feeding operations producing more than 300,000 chickens annually. However, the bill never made it out of committee.

MDE has just three employees who perform in-person inspections at poultry farms and MDA has nine employees who oversee nutrient management plans of over 5,000 farms across the state. The report found that the number of poultry farms inspected by MDE fell by 40% since 2013.

To improve poultry farms' compliance with the federal Clean Water Act and state laws, EIP recommends that MDE and MDA impose more penalties against poultry farms in violation with their nutrient management plans and water permits. The report also recommends that the state hire more inspectors, increase water and air monitoring near poultry farms and enforce

the state's new manure application rules for farms.

"MDA is failing to provide any reality-based ground-truthing or accountability for the largest single source of pollution in the Bay, the agricultural industry," the report states. EIP also described state oversight over poultry operations as "an empty paperwork exercise that falls well short of what is needed to control agricultural runoff pollution or protect the Chesapeake Bay."

Turkey manure is similar to poultry manure in the physical and chemical characteristics but the manure collection and processing is limited to that of roaster/fryer chickens which requires filler/bedding materials such as straw, rice hulls, saw dust and so forth. These sources of turkey and poultry manure that contain fillers used in bedding are classified as litter. The nutrients are diluted down and they are more difficult and costly to process into granulated/pelleted forms that can be easily handled and applied.

Cow manure and hog manure are much more challenging to process into easy to handle and apply fertilizer materials. Most cow and hog manure are packaged, marketed, and sold as organic soil amendments. These are fantastic materials that have a lot of value, but they are not practical in modern lawn care practices.

Other manures, such as bat guano and cricket crap, were very popular in the United States back in the early twentieth century. They are still available and they are still used in many other countries but they are expensive and hard to apply, thus not practical in modern lawn care practices. Additionally, there is no market for mass production of bats and crickets for human consumption, so the threat to the environment is a low priority.

Another problem with poultry waste is the ammonia gas that the waste emits into the air. Many processing facilities have incorporated technology that captures most of the gases and converts the gases to energy and liquid fertilizers. The infrastructure is expensive and the corrosion of equipment from the ammonia gas creates an even bigger challenge to scalability.

Technology for converting solid waste to bio fuel is another solution yet to be implemented on a large scale. The infrastructure costs, coupled with the competition of lower cost fossil fuels can be a stumbling block for investors and entrepreneurs looking to get a return on investment, and acceptable profits.

One way to circumvent this is by implementing systems to use the bio fuel to power the poultry processing plant and manure composting facilities. By locating the waste to bio fuel plant close to the source, you limit logistics and transportation costs. Additionally, you negate the need for marketing and support since the waste source and the bio fuel processing are under one roof, owned by the same entity. The excess energy created can feed into the local power grid to provide lower cost, cleaner energy to surrounding communities. This would create jobs for smaller communities where opportunities are being phased out by the pressure to convert to from fossil fuels to cleaner energy. The economic growth that would follow can provide revenue needed to fund incentives and tax breaks that can accelerate expansion.

It doesn't take financial wizardry to connect the dots and see the economic future. Once mankind can figure out how to turn our waste into significant profits, solutions will appear. It's already happening.

Perhaps there's a glimmer of hope on the horizon.