Response to BC Ministry of Environment Agricultural Waste Control Regulation 2nd Policy Intentions Paper **August 31, 2015**

John Paul, PhD PAg

Summary

The BC Ministry of Environment is currently reviewing and updating the Agricultural Waste Control Regulation, and has invited feedback on its 2nd Policy Intentions Paper.[1] While the suggested improvements to the Agricultural Waste Control Regulation are positive, it does not reflect the current needs of our farmers, nor our public. My response is based primarily on areas with where most of the farm gate receipts in British Columbia are generated, and where:

> *"the development of certain intensive farming practices has over time created serious agricultural pollution issues that are not encountered on the same scale elsewhere in the province."* [2]

Two guiding statements used in this review include:

1. managing our environmental and public health as a prerequisite to increase our economic viability:

   "*Increasing importance is being placed on producing local healthy food and reducing our environmental and carbon footprint, thereby promoting the economic viability of the B.C. agriculture and food sector.*[3]*"*

2. our agricultural producers need to be included in shaping our regulation and industry in light of global and local environmental and health concerns and initiatives:

   "in order for producers to properly fulfill their roles as stewards and managers of agricultural lands, their awareness of environmental stewardship issues needs to be increased. Producers are a vital link in the solution making progress chain and need to be informed about alternative approaches and other interests.[2]

Our farmers can provide solutions that are economically viable and protect environmental and human health. We have experienced this with the Avian Flu response in British Columbia, where our farmers have worked with government agencies in developing an excellent management strategy that minimizes risk for environment and public health, and meets international requirements.

Strategies and regulation for agricultural waste management must be integrated with local and global environmental and public health concerns. These include the increasing public health concerns regarding potential pathogens and antimicrobial resistance, as well as the environmental concern regarding greenhouse gas emissions.

As farming continues to intensify to meet British Columbia's economic goals, more food is produced on a smaller land base, resulting in more agricultural waste. The importance of sustainable management of excess agricultural waste, already identified in 1996[2], is now more critical because the volumes have increased, and there are additional environmental and health concerns.

The Ministry of Environment Policy Intentions paper short-changes the farmers in that our provincial agencies have encouraged agricultural production but have provided few options for managing excess agricultural waste. The lack of options encourages illegally zoned waste management sites which include sites on agricultural land that do not meet environmental or land use regulations. The intentions paper also does not adequately address international food safety requirements or the increasing public health concern regarding pathogens and antimicrobial resistance.

British Columbia has much to be proud of. Let us engage our farmers in a meaningful way in developing an Agricultural Waste Management Regulation that works for all British Columbians.

BC AgriFood Strategy

British Columbia's bold vision for economic growth in the agrifood sector means that we also expect significantly more agricultural waste. We need to manage this appropriately.

The vision for British Columbia's Agrifood Strategy is:

> *"an innovative, adaptive, globally competitive agrifoods sector valued by all British Columbians. The target is $ 14 billion a year in B.C. agrifoods revenue by 2017. To achieve this, the strategy commits the Province to seven goals supporting the following three priorities:*
>
> *High quality, high value products*
>
> *Ensure a safe, secure food supply*
>
> *Advance the development of innovative products and processes*
>
> *Domestic and international markets*
>
> *Strengthen domestic markets*
>
> *Expand international markets*
>
> *Competitiveness*
>
> *Grow B.C's agrifood advantage*
>
> *Secure a strong future for farming*
>
> *Provide a sustainable land base for production"*[4]

This strategy does not address the increased amount of waste or byproducts resulting from increasing our agricultural production. It also does not address environmental or public health impacts of our agricultural waste management.

The importance of environmental and public health needs to be reflected in any changes or improvements to the Agricultural Waste Control Regulation.

Managing Excess Agricultural Wastes – A Concern Already 20 Years Ago

Most farms in British Columbia can be separated into three categories from a waste management perspective:

A. Farms that produce agricultural waste, but can use or process it on the farm.

   Examples include most dairy farms and hobby farms.

B. Farms that produce excess agricultural waste that cannot be used on the farm.

   Examples include most commercial greenhouses, mushroom farms and poultry farms. Many of these farms do not have enough land to utilize the agricultural waste, or they are not able to store or further process the waste because of potential disease or biosecurity concerns.

C. Farms that can potentially use agricultural waste, imported from another farm in a raw or processed form.

   Examples include most vegetable and fruit producers, as well as some of the large forage or turf farms. Many of the vegetable or fruit producers lack the space or the expertise to import and further process agricultural waste to meet Canadian Good Agricultural Practice standards.

The degree of animal intensification was the primary factor causing the increased potential for nitrogen loss to the environment between 1981 and 1991[5]. This report also noted that the amount of land able to utilize manure decreased during the same period because of increased horticultural production (Category C farms not able to use waste from Category B farms). This trend was also noted in another report in 1996 which stated:

> *"trends in the Lower Fraser Valley agriculture indicate that problems will intensify if an increased and ongoing effort to improve nutrient management and to find and implement solutions is not maintained…if there is to be continued progress in attaining sustainability in agriculture and ensuring a clean environment over the next 5 to 10 years, an increased commitment from the industry and other stakeholders is required"* [2]

The potential problems noted in 1996 can be expected to further intensify in order for British Columbia's agrifood sector to meet the 2017 economic goals for the BC Agrifood industry.

A followup report in 2001 indicated that*:*

> *"in some areas of the Fraser Valley, there is a greater supply of nutrients than can be used in local agricultural production. This change has been driven by factors such as a shift to*

confined livestock management, increases in intensity of production requiring feed and fertilizer imports and a switch to lower nitrogen uptake crops…there is a consensus among agricultural producers and government agencies that nutrient management concerns do exist."[6]

The Ministry of Agriculture and the Ministry of Environment Play a Key Role in Education

The importance of a strong Ministry of Agriculture and Ministry of Environment was noted in the 1996 report in relation to sustainable waste management:

"in order for producers to properly fulfill their roles as stewards and managers of agricultural lands, their awareness of environmental stewardship issues needs to be increased. Producers are a vital link in the solution making progress chain and need to be informed about alternative approaches and other interests.[2]*"*

British Columbia has done excellent work in educating for environmental sustainability with its Environmental Farm Plan Program. In 2008, more than 2000 farms had completed the program[3]. Today, British Columbians are part of a total of more than 71,000 Canadian farmers who enjoy peace of mind knowing whether their farm is on-side with environmental regulations[7].

The Environmental Farm Plan Program builds on the understanding that most of our farmers are stewards of the land, and will voluntarily improve their management to be environmentally sustainable. There are three important characteristics of this program to note:

1. It is voluntary – there may be some producers who won't participate
2. It is confidential – there is no duty to report regulatory violations
3. It does not address whether the agricultural wastes are sustainably managed when they leave the farm (export from Category B farms)

The Environmental Farm Plan Program has fulfilled the educational opportunity suggested in the 1996 report which stated:

"Increasing education and awareness to foster changes in attitude and ensure enforcement of regulations when voluntary action is not sufficient…as agricultural producers increase their understanding of the environmental problems and address them, there should be less need for stricter regulations and enforcement. Not unlike other industries, there will always be the need for some amount of regulation and enforcement to ensure that producers do not use inappropriate management practices". [2]

The education process also should include matters of global environmental and public health so that all of us in British Columbia can participate with and be proud of our agrifood industry.

Unfortunately, education itself does not provide solutions to the challenge of excess agricultural waste production in some regions and some agribusiness sectors, nor does it address deliberate non-compliance by some businesses.

How does the Proposed Agricultural Waste Management Regulation propose to deal with excess agricultural waste?

The stated goal for the revised regulation as outlined in the Policy Intentions paper is:

> *"Manure, agricultural wastes, agricultural products and byproducts, wood waste, mortalities, and other materials produced and used on an agricultural operation are managed in a manner that protects the environment and human health"*[1]

The stated key policy concepts include:

> *"encourage beneficial use of agricultural products and byproducts and appropriate agricultural management practices",* and *"focussing on a higher level of protection to higher risk situations"*[1]

There are excellent developments and improvements in this policy intentions paper, particularly the attention to higher risk areas, such as areas with high annual or seasonal rainfall, vulnerable aquifers, and regionally sensitive receiving areas. Another positive development is that the Ministry is considering phasing in a nutrient management plan over three years, which may allow Ministry staff to request or require records of how nutrients are managed in high risk areas.

The Agricultural Waste Control Regulation does little to address the agricultural waste issues of farms that cannot utilize the waste on their own farm. Although the intentions paper states:

> *"The ministry does not intend to restrict movement between farms of manure or other compostable materials in support of good nutrient management"*,[1]

the following statement in the intentions paper summarizes the increasing frustration with the lack of options for our excess agricultural waste:

> *"There will be no change to the requirement that manure and byproducts may only be composted on a farm if they are produced on that same farm, or if they are produced on other farms, but brought on to be composted for use on that same farm."* [1]

Where is all the excess agricultural waste going to go? The environmental concern and the lost economic opportunities associated with the lack of legal options for the excess agricultural waste was presented to the Minister of the Environment in early 2014:

> *"In summary, there are no viable or legal options for the value-added processing of spent mushroom compost. As a result, much of this waste is being exported to unauthorized sites.*

This concern is not only for the mushroom industry, it also exists for the poultry and greenhouse industries as well." [8]

It appears that little has changed with managing our excess agricultural waste in the last 20 years. And who is going to regulate this? How will this be done?

Antimicrobial Resistance

The Agricultural Waste Control Regulation should adequately address the issue of antimicrobial resistance which is an ongoing and increasing health concern around the world.

"Antimicrobial resistance is a global public health challenge. It affects human and animal health, agriculture, the environment, and the economy. Organisms resistant to antimicrobial drugs can emerge in humans, animals, or the environment." [9]

Although the policy intentions paper mentions the potential impacts including excess nutrients and pathogens leading to human health concerns, it falls short of meaningful discussion and policy direction to limit the spread of antimicrobial resistance from manure and mortality management.

Concern with antimicrobial resistance relating to animal manures has been a concern in Canada for some time. The role of veterinary antibiotics and the increased concern regarding antimicrobial resistance was voiced in Canada in 1998:

"It is time to recognize the true costs of antibiotic use in agricultural practice in terms of antibiotic resistance and its consequences on the sustainability of susceptible bacterial flora in the environment and to act accordingly." [10]

We are doing a disservice to our farmers, and to our public, when we don't mention the worldwide concern including the role of manure in the potential for the spread of antimicrobial resistance:

"Manures typically carry antibiotic-resistant bacteria, and numerous genes associated with antibiotic resistance determinants have been detected in molecular inventories of manure microbial populations and in the environment in proximity to land fertilized with manure." [11]

Antimicrobial resistance is present in British Columbia. A recent study found antibiotic resistant organisms on organic and conventionally grown vegetables in a Vancouver market.[12] Another report indicated that antibiotics were commonly used in poultry feed, resulting in antibiotic residues and antibiotic resistant organisms in the manure.[13]

We need to engage in dialogue with our public, with health authorities, and with federal agencies that are working hard to try to meet international goals.

"Currently, the stewardship of antibiotics in Canadian agriculture and veterinary medicine fails to meet international standards….Now is the golden moment to target outcomes that bring antibiotic use in animals in Canada up to international standards." [14]

In some geographical areas in British Columbia, there is a concentration of intensive animal agriculture and horticulture. The worldwide concern regarding antimicrobial resistance should be shaping the Agricultural Waste Control Regulation in how manure and other agricultural wastes should be managed to protect our public and our environment.

With our knowledge and our resources, we can become leaders and models for the world in managing antimicrobial resistance. Our agricultural community needs to be included in the discussions and the concerns.

Good Agricultural Practice

Potentially pathogenic bacteria on fresh vegetables represent a health concern for our public. Seventy two percent of the vegetables sold at markets in Vancouver were contaminated with coliform bacteria[12], and 97% of the E.coli isolated were resistant to at least one antibiotic.[15] Further analysis concluded that irrigation water, compost and soil were the primary sources of contamination, and that the E.coli appeared to be of animal origin. This was confirmed in a European report that concluded animal manures may be a source of potential pathogens and antimicrobial resistance in vegetables.[16] In Ontario, researchers concluded that up to 18 months may be required between the time of manure application and harvest for vegetable production.[11] They concluded that:

"our results reinforce the advisability of manure pretreatment prior to application where possible and otherwise provide new end- points for recommending suitable offset times between the application of raw manure and crop harvest and animal grazing" [11]

In response to concerns about the safety of our fruits and vegetables, food producers and retailers around the world initiated Good Agricultural Practice (GAP) guidelines. It is an internationally accepted program that began in Europe in about 1997:

"EuropeGAP was an initiative by retailers belonging to the Euro-Retailer Produce Working Group. British retailers working together with supermarkets in continental Europe became aware of consumers' growing concerns regarding product safety, environmental impact and the health, safety and welfare of workers and animals." [17]

GAP guidelines include food production safety requirements where raw manure cannot be used on food crops within a certain period before harvest. It provides strict requirements for the use of composted materials, including verification of temperatures achieved during composting and the fecal coliform levels in the compost. It requires a chain of custody that includes the source and data for all inputs used for the crop.

CanadaGAP started in 2000 with the Canadian Horticultural Council, who began developing food safety guidelines in response to its members requiring a due diligence process.[18]

> *"The person responsible purchases compost/compost tea from a supplier and is aware of origin [i.e., produced under conditions that are not a source of biological (e.g., pathogens), chemical (e.g., heavy metals) or physical (glass) contamination] and requests a letter of assurance."* [19]

> *"The person responsible spreads manure only when the interval between application and harvest is greater than 120 days."* [19]

In British Columbia, the only requirement for our fruit and vegetable producers is that manure be covered between October and April, and that it be applied to the soil between February and April. [20]

In British Columbia, the following recommendation was made following the findings of E.coli on vegetables in Vancouver markets:

> *"Producers are encouraged to purchase compost from reliable companies. Producers are recommended to inquire about a Certificate of Analysis (COA) to ensure that the compost has been properly treated and free of pathogens. The COA should include information regarding the source and composition of the compost, the duration for which it was treated, and the absence of pathogens that are relevant to produce."* [12]

Irrigation water was also noted as a source of potential pathogens for vegetable and fruit production. Water in Matsqui and Sumas, BC, used for irrigation was found to contain fecal coliform densities that exceeded the provincial criteria for irrigation water for produce already in 1994.[21] E. coli levels exceeding provincial standards was found in irrigation water used for vegetable production in Cloverdale in 2003-2004.[22] A further study indicated that the primary source of non-compliance with the Agricultural Waste Control Regulation was with hobby farms:

> *"This compliance assessment found results similar to those of previous studies in that hobby farms tend to have greater levels of non-compliance relative to commercial farms. For the three main AWCR categories (storage requirements, pollution prevention and composting) that were evaluated, commercial and hobby farms had a 95% and 66% compliance rate, respectively."* [23]

This report notes the excellent stewardship of many of our agricultural producers, and also noted the potential for E.coli from sources other than the commercial or hobby farms. We measured E.coli in the water entering public ditches from some of the non-farm agricultural properties receiving either agricultural waste or urban organic waste. E.coli densities of up to

2.5 million E.coli per 100 mL were measured, in contrast with the provincial standard of < 77 E.coli per 100 mL.

This emphasizes that although most of our agricultural producers are excellent stewards of our land and resources, the excess agricultural waste goes somewhere, usually to agricultural properties that are not consistent with local and provincial zoning requirements, nor provincial environmental requirements. These activities reflect poorly on our agricultural producers.

How does the Proposed Agricultural Waste Control Regulation reflect the concerns regarding potential pathogens and antimicrobial resistance?

The proposed amendments to the Agricultural Waste Control Regulation does not reflect current local and global concerns regarding pathogens and antimicrobial resistance in three ways:

1. It does not address the excess nutrient and agricultural waste concerns that have been expressed for the last 20 years.
2. There is no accountability for the agricultural waste when it leaves the farm.
3. Processing of agricultural waste as potential sources of nutrients and organic matter for fruit and vegetable production requires management of potential pathogens and antimicrobial resistant microorganisms.

The policy intentions paper notes that the Ministry does not intend to restrict movement of manure or compostable materials between farms, which means that potential pathogens and antibiotic resistant organisms may move freely within our province. This means that raw manure containing potential pathogens and antibiotic resistant organisms can be freely distributed to any other farm or any resident in British Columbia without restriction.

The policy intentions paper states that the updated policy and revised regulation will include:

> *"additional provisions and guidance, including protective measures to address health concerns regarding manure applications on raw food crops",* [1]

which is excellent, however the specifics of these provision has not been identified.

Although there are no restrictions for movement of raw manure or agricultural waste, restrictions do apply if the manure is composted and sold from the farm:

> *"The Organic Matter Recycling Regulation (OMRR) will continue to apply if the composted material contains non-agricultural materials, or if the composted material is intended for commercial sale or non-farm use"* [1]

This statement is positive in that composting requirements are to be followed for agricultural waste to be used to meet Good Agricultural Practice requirements for fruit and vegetable

producers, however, there is little likelihood that farmers or companies wishing to produce compost to meet the requirements of the fruit and vegetable industry would bother. The additional capital and operational cost of complying with the Organic Matter Recycling Regulation is cost prohibitive, compared to continued export of agricultural waste to properties that do not meet local and provincial zoning or environmental regulation. This only serves to make our agricultural producers look bad, when most of our producers are excellent stewards of our land and water.

Given the chain of custody requirements for fruit and vegetable producers to meet international GAP requirements, most fruit and vegetable producers will likely avoid using agricultural waste. This is counterintuitive because the soil needs the organic matter, and needs the micronutrients and healthy microorganisms provided in the agricultural waste if it is processed properly.

Reducing Greenhouse Gas Emissions from Agriculture

Greenhouse gas emission from agriculture is a significant contributor to climate change. The greenhouse gas of greatest significance is nitrous oxide. The greenhouse gas that has the greatest potential for management in agriculture is nitrous oxide. Our regulations should reflect this.

Agriculture accounts for 10-12% of the total global emissions of greenhouse gases, and 60% of the world's nitrous oxide emissions.[24] Agricultural nitrous oxide emissions were projected to increase by 35-60% to 2030 due to increased nitrogen fertilizer use and increased animal production.[25]

In Canada, agriculture accounted for 65% of the national nitrous oxide emissions.[26] Local recommendations in 1999 included setting manure application limits based on phosphorus to improve nitrogen use efficiency and reduce nitrous oxide emission.[27] A European report in 1997 predicted that nitrous oxide emission from agriculture could be reduced by up to 50% by managing manure to optimize nitrogen use.[28]

The additional benefit of managing agricultural wastes to optimize nutrient use is that the impact to ground and surface waters is reduced,[2] as well as the reduction of potential pathogens and antimicrobial resistant organisms in our waterways.

How does the Proposed Agricultural Waste Control Regulation encourage reduction of greenhouse gases?

The updates to the Agricultural Waste Control Regulation do not address reduction of greenhouse gases from agriculture. One of the goals of the regulation is to:

"facilitate appropriate and beneficial use of manure, agricultural byproducts and other nutrient sources." [1]

The intentions paper notes that:

"nutrient management, including land application rates based on crop nutrient requirements and soil residual nutrient levels would be phased in over 3 years" and that *"in high risk areas, nutrients would not be allowed to be applied at rates of application that exceed crop growth requirements, or result in excessive nutrient accumulation"* [1]

The intentions paper appears to be focussed on reducing the potential impact of manure on water quality, and not on reducing greenhouse gas emission. It should be noted that improving the regulations to reduce the impact of manure on water quality may reduce the nitrous oxide emissions in some areas.

Enforcing Our Regulations

For at least 15 years, our provincial agencies have overlooked the reality of agricultural and wood waste processing facilities on agricultural land that are clearly in contravention of the Agricultural Waste Control Regulation. This needs to change if we as British Columbians are going to be proud of our agrifood sector.

The importance of enforcing regulations along with education to have a healthy agrifood sector were identified and recommended 20 years ago:

"Increasing education and awareness to foster changes in attitude and ensure enforcement of regulations when voluntary action is not sufficient. [2]

Enforcement of the Code of Agricultural Practice (part of the Agricultural Waste Control Regulation), evaluation of the success of the Agricultural Waste Control Regulation, and expanding the ALC mandate to include environmental issues were recommended in this report.

The importance of regulation in meeting the desired public health and environmental health outcomes was identified in 2001:

"Failure to comply with the Agricultural Waste Control Regulation may lead to the issuance of pollution abatement orders, pollution prevention orders, or formal prosecution. The Agricultural Waste Control Regulation is enforced by the Ministry of Environment. Operations that cause pollution may be subject to fines up to $ 1,000,000 and/or 6 months in jail." [6]

The experience that our industry currently has with the BC Ministry of Environment is that very little regulatory enforcement is occurring, and the Ministry of Environment has condoned non-compliant businesses in two ways:

1. By ignoring the regulations for some businesses known to be non-compliant with the Agricultural Waste Control Regulation, and
2. Stating that one of these businesses was actually in compliance with MOE regulation, when clear interpretation of the Agricultural Waste Control Regulation was that it was not. [29]

The regulation is clear as indicated in the policy intentions paper for both manure and wood waste:

> *"There will be no change to the requirement that manure and byproducts may only be composted on a farm if they are produced on that same farm, or if they are produced on other farms, but brought on to be composted for use on that same farm."* [1]

and:

> *"allowable uses of wood waste include: plant mulch, soil conditioner or ground cover, on farm access ways, livestock bedding…as a component for composting with manure and other agricultural byproducts and wastes…high risk uses of wood waste would not be allowed – such as for berm construction, as fill….."* [1]

Having our own government ignore its own regulations does not give British Columbians confidence in our Ministry of Environment. Furthermore, it reflects poorly on the farming community, most of whom are good environmental stewards.

There are three options for responding to these businesses that have been out of compliance with the Agricultural Waste Control Regulation for many years:

1. Change the regulation to allow agricultural waste and wood waste processing on the farm
2. Identify a plan to bring non-compliant businesses into compliance, or
3. Publically acknowledge that non-compliant businesses have permission to be out of compliance with provincial environmental regulation.

Conclusions

The BC Ministry of Environment has included many of the key agricultural industry sectors in a total of nine meetings with the working group in this review process. In my experience growing up in the agricultural sector in BC, and working with BC agricultural producers, our farmers are stewards of the land and environment at heart. In my experience with Avian Flu response, when our farmers are provided with the relevant local and global information regarding potential issues, they rise to the occasion and provide well thought out and effective solutions.

Overall, the intentions paper did not adequately address four key issues:

1. Many of our agricultural operations produce excess organic waste that needs to be further processed to encourage beneficial use, but cannot be managed on the farm because of space limitations or biosecurity concerns.
2. There is growing international and local concern regarding antimicrobial resistance and the role of our manure and soil management
3. Many of our fruit and vegetable growers are not able to use agricultural waste because more fruit and vegetable buyers are requesting proof of Good Agricultural Practice guidelines surrounding food safety, particularly in relation to potential pathogens.
4. The importance of a good and enforceable regulation, outlined in 1996, in the context of the Ministry of Environment's admitted lack of resources and low stated priority for agricultural waste management, as well as inconsistent regulatory enforcement.

In my opinion, the working group should be encouraged to provide local regulatory and policy direction in relation to these concerns as these issues potentially reflect poorly on our agricultural industry, and on our farmers.

How can we invite British Columbians into a healthy dialogue for a regulatory process that benefits our farmers, our environment and our health, and allows our agricultural industry to be world leaders in modelling economic, social and environmental sustainability?

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