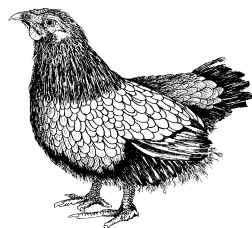
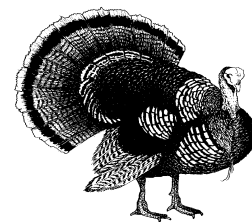


BC Sustainable Poultry Farming Group



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Newsletter

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BC SPFG Initiates NEW Workplan for the Next Three Years

As of April 2006, the BC Sustainable Poultry Farming Group (SPFG) has obtained core funding from the Agriculture Environmental Initiative (AEI) for its research and development activities. This grant allows continuation of some of the work begun in previous years, while providing an opportunity to begin delving into new areas. A significant difference with the new funding is that will not provide a grant for the Groundwater Protection Program, as in previous years.

As previously mentioned, under the new workplan, some of the previous initiatives remain, while several areas are new. The four main areas for project funding are:

1. Further research and development on the vegetative filter concept to control fugitive poultry farm dust
-past studies have shown encouraging results. The SPFG will continue to evaluate the use of vegetative filters to control dust from barn exhaust fans. As well, other methods or procedures will be evaluated as opportunity arises.

Current BC SPFG Program Partners

Agriculture Environment Initiative	B.C. Turkey Assn.
B.C. Chicken Growers' Assn.	Agriculture and Agri-Food Canada
F.V. Egg Producers' Assn.	B.C. Ministry of Agriculture and Lands
B.C. Broiler Hatching Egg Producers' Assn.	Environment Canada
Greater Vancouver Regional District	Abbotsford Soil Conservation Association

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New BC SPFG Work Plan Continued ...

2. Promoting the use of poultry manure as a fertilizer for distant and alternate markets
 ⇒marketing efforts to the BC interior and other areas have been successful, but further efforts are needed to deal with the amount of manure generated in the Fraser Valley. As well, two potential manure processing options may be possible in the valley in the near future. The SPFG intends to work with the proponents in the interest of valley poultry producers to ensure the implementation of such manure processing options, if at all feasible.
3. Food Safety—developing Best Management Practices for the use of poultry manure in horticultural crop production
 - increasingly, manure use in horticultural production is coming under scrutiny due to food safety concerns related to the potential transmission of disease from crop to consuming population. Food safety concerns have the potential to cause severe limitations to the way manure can be applied to horticultural crops. At the present time, we are already seeing reduced use of manure on such crops. The SPFG is interested in evaluating low-cost, but effective methods to reduce the risk of spread of infectious disease. Once found, these risk reduction methods can be developed into protocols that would provide the basis for establishing Best Management Practices.
4. Developing a manure supply mechanism for the guarantee of the delivery of manure to a processing plant in the Fraser Valley
 - a good way to deal with the manure surplus situation in the Fraser Valley is to establish manure utilization options. For such options to work, they must be of sufficient size to allow production at a large enough scale for operational efficiencies to exist. This concept is fine in principle, but is not possible if there is not a guaranteed supply of manure to keep the plant operating at capacity. At the present time, no mechanism exists within the industry to ensure that manure amounts and timing of delivery could match the needs of a processing plant. This project will work towards a means of

Vegetative Filters—a NEW Perspective for Barn Fan Dust Control on Poultry Farms?

achieving a secure supply of manure for an poultry industry approved manure utilization option.

Dust emissions from poultry farms increasingly result in nuisance complaints. As poultry farm density increases, overall levels of odour, particulate and ammonia emissions will likewise increase. The Greater Vancouver Regional District considers farm dust and odour a serious issue for residents.

Another major concern is the close proximity of poultry barns to cropped fields. In a lot of these fields, food crops are grown for direct human consumption (i.e. berries, vegetables). Food safety regulations are beginning to require that no manure (or manure dust particles) be present on harvested crops or the crop may be rejected for sale. If a crop is rejected, the poultry producer may be liable for manure dust leaving his/her property and landing on their neighbour's crop.

This project was conducted in 2 phases. Phase 1 examined the nature and travel of dust emissions, while Phase 2 was designed to evaluate the potential of strategically placed trees to control the release and travel of dust to the surrounding environment.

Phase 1 Recommendations

Vegetative Filters Continued ...

From phase 1, it was decided that trees would be placed at the end of 30 foot wind tunnels to identify their value as a filter to collect exhaust fan dust. Two rows of 18 – 20 foot trees would be placed at about 8 feet apart both within and between rows. Monitoring operations would be designed to assess the amount of dust retained within the tree windbreak. Soil samples would also be collected to evaluate



Vegetative Filter Test Site on Broiler Farm

changes in nutrient composition in soils under the drip line of the trees. To get comprehensive data, it was decided that at least 3 cycles would be monitored.

Phase 2 Particulars

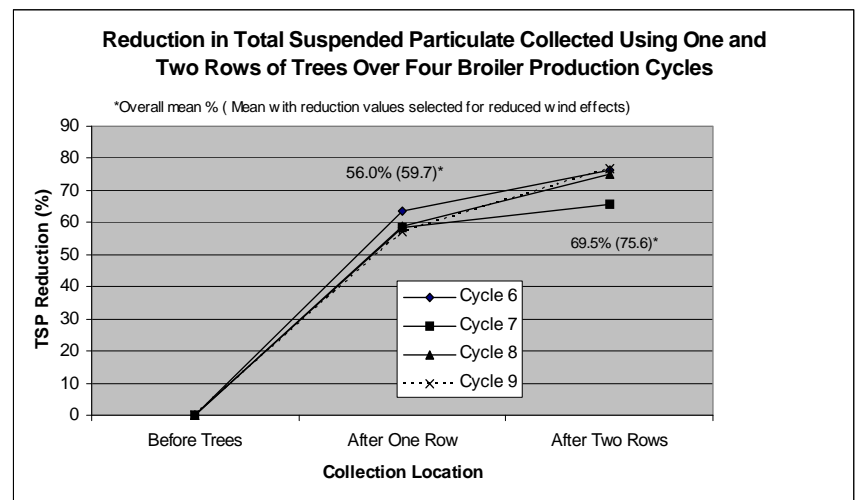
Study Details

As in phase 1, the project has been set up with 2 dust monitoring tunnels (wind tunnels), one at each end of a broiler barn with a 24” and 36” fans (with hoods) exhausting air down each. However, for phase 2, the tunnel has been shortened by 20 feet to a new length of 30 feet. Trees were placed in an arc configuration in two rows eight feet apart with an eight foot spacing in the row. The center of the arc was about 12 feet from the end of the tunnel. Dust measurements were taken at the end of the tunnel (30 feet), before the first row of trees (about 42 feet), between the two rows of trees (about 57 feet), and after the trees (about .

The study was conducted on a Fraser Valley broiler farm for four production cycles during April through November 2005. For the study, bird population ranged from 19,200 to 22,100 per cycle in a 40’ x 400’ barn. To measure particulate emissions, two wind tunnels were constructed at each end of the 400’ barn so that barn exhaust fans would blow down the length of the tunnels. These exhaust fans were set up in the computer system to be the primary fans for barn ventilation.

Results Highlights

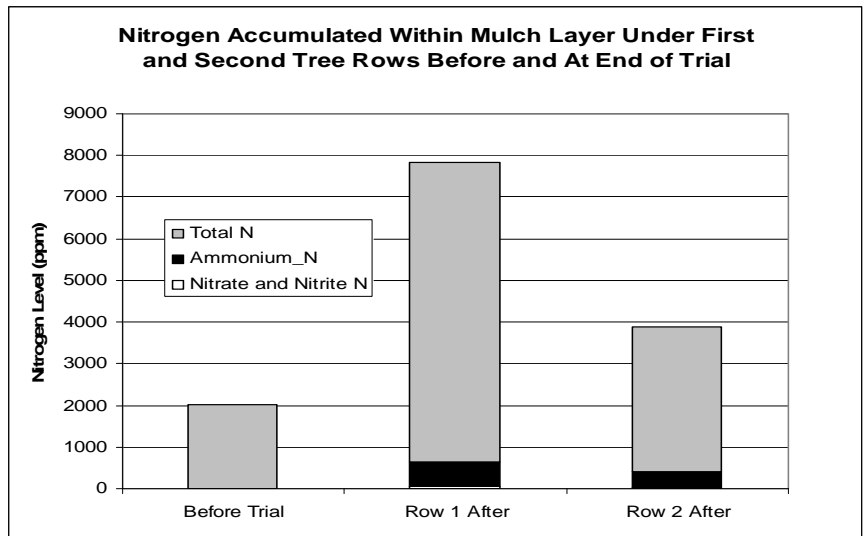
Figure 1



Evaluation of Options Report Cont'd ...

This study indicated that the particular tunnel and tree configuration provided a significant barrier to the release of dust from exhaust fans on a broiler barn. Dust levels were examined through the collection of TSP before and after one, and two rows of trees. TSP reductions (see Table 1) were found to be 56% and 70% for the first and second rows of trees, respectively. Overall TSP reductions for the tunnel and tree arc configuration concept (including the diffusion of dust before the first row of trees) reached an average of 96%. However, further evaluation is needed to examine unidentified losses of dust that were not accounted for in this test.

Figure 2



Soil nutrient changes were most prominent for ammonium and nitrate. Greatest increases were found for the sampling area before the first row of trees. Soil nitrogen mineralization processes followed typical patterns with a corresponding drop in pH where the highest level of ammonium was found.

Over a period of about seven months, the tree mulch showed an accumulation of organic nitrogen as defined by an increase in the total nitrogen over that of the ammonium and nitrate. Differences for soil ammonium and nitrate levels due to mulch treatments were not evident; it is likely that a large portion of the transported nitrogen is in the organic form and is not readily moving from the mulch to the soil under the mulch.

Recommendations

In particular, there were several important objectives:

- ⇒ Re-evaluation of the arc angle to identify the optimal shape for maximum effect;
- ⇒ Staged removal of the non-permeable and semi-permeable sidewall barriers to identify the effect on air flow and dust capture
- ⇒ Evaluation of other tree species for survivability, efficiency of dust capture, and perhaps more rapid growth
- ⇒ Necessity of the tunnel for the directing of exhaust air into the trees
- ⇒ Monitoring of other types of poultry situations and housing.
- ⇒ Evaluate optimal distance of each tree row from the end of the tunnel and from each other.

It is envisioned that after sufficient research and development, the vegetative filter concept can be utilized as a Best Management Practice on Fraser Valley poultry farms.

- ⇒ Agriculture Environmental Partnership Initiative ⇒ Environment Canada
- ⇒ BC Ministry of Water, Land, and Air Protection ⇒ Fraser Valley poultry producers
- ⇒ Greater Vancouver Regional District (in-kind through loan of equipment)

Further Research into Vegetative Filters—next three years

The BC SPFG wishes to acknowledge the following financial partners in this project:

Building on research conducted by the BC SPFG over previous years, renewed funding has been accessed through Agricultural Environment Initiative and Pacific Agri-Food Research Centre. Dr. Shabtai Bittman has been instrumental in allocating research equipment and some of the funding for this project. He is keen to be involved in this project as it truly is unique in nature and scope.

Objectives:

- ⇒ To build on results from a previous study identifying practical on-farm solutions to dust control.
- ⇒ To enhance understanding of the manner in which poultry farm dust is distributed to ensure a complete understanding of the problem.
- ⇒ To further understand processes that govern release of dust from barn fans with a view to increasing the effectiveness of applications to reduce emissions from these sources.



Potted Red Maple and Cedar Tree Species To Be Tested

Further results will be communicated through the SPFG Newsletter in the future. Full reports are available via

Poultry Manure Processing Options—Fraser Valley Update

Presently, the SPFG is working with two poultry manure utilization options. One option is the International Bio-Recovery Corp., liquid composting plant, and the other is a ‘dry’ composting proposal promoted through KC Technologies Inc. While both options are aimed at the fertilizer industries, each is very different both operationally, and in scope.

International Bio-Recovery Corp. (IBR)

The IBR process was reported in the Fall 2005 edition of the SPFG Newsletter. Suffice it to say that the IBR process is a liquid one (8% dry matter) that occurs in large vats and appears to work well. Field tests for the fertilizer product show significant benefits to plant growth to warrant a premium value in the market-

place; additional crop growth and quality benefits suggest that the IBR product can command a considerably increased price in the marketplace. The SPFG has been working with IBR for over a year now. The manure sources of most interest are commercial and breeder layer manures. As well, IBR will work with the commercial egg industry to process spent hens. The process will also accommodate some broiler manure, but the less shavings processed, the better.

KC Technologies Inc. (KCT)

The KCT process is a more traditional approach to composting in that it will work with manure much in the same state as it was delivered—in the ‘dry’ state (40—50 % dry matter). Manure can be composted in

Waste Treatment Options Cont'd ...

windrows and turned, or it can be processed in fixed vessels. Either way, the technology is well known and verified. KCT would use poultry manures with a higher shavings content, such as broiler and turkey manures, which would effectively promote composting in the traditional manner. It is understood that KCT has an extensive fertilizer marketing operation in China and plans to market this product through their China operations, however some limited sales may also occur in North America.

Both Manure Processing Technologies

Both technologies offer a product that has been specially composted with the addition of patented micro-organisms to create a final product with an apparent substantially higher value than traditional compost.

Pathogen risk from manure can be substantially reduced, or eliminated through either composting process. At this time, the SPFG sees value to both proposals as they have the potential to complement each other in handling the various poultry manure types available in the Fraser Valley.

With this in mind, the SPFG plans to assist each proponent to the benefit of Fraser Valley poultry producers.

Both technologies offer a product that has been specially composted with the addition of patented micro-organisms to create a final product with an apparent substantially higher value than traditional compost.

Poultry Associations Sign Three Year MOU with SPFG

During October 2006, each of the four supply managed Fraser Valley poultry associations signed a three year operating and funding Memorandum of Understanding with the BC Sustainable Poultry Farming Group. Previously, a similar agreement had been signed for five years, but expired over a year ago. This new agreement provides context and structure to the nature of the relationship between the SPFG and each poultry association. The new MOU is virtually the same in content as the previous one, except for length.

Revised GPP Conveyor Use and Hauling Rates

The GPP continues to offer poultry manure hauling services to 'distant markets' for 'dry' manure, and as the occasion presents, 'wet solid' manure. Two factors allow the SPFG to deliver to distant markets: use of large volume trucks and the ability to load these trucks through the use of producer-owned conveyors. To make this service convenient, the GPP offers two conveyor usage and service fee options. Rates (as of August 24, 2006) and service level can be seen below:

Two Options for Fraser Valley Poultry Producers

☛ **Option #1 Full Rate** is designed for producers who use full SPFG manure marketing and hauling services. Payment of fee in this scenario is on a straight user fee basis with a **cost of \$280 per tri-axle trailer load**. A **discount of \$50 per load** is possible for producers with a roofed manure storage facility. This discount is available to provide an incentive to producers with a covered manure storage facility large enough to store manure over a substantial period. The discount may be available during the winter or summer rate period at the discretion of the SPFG depending on market demand. However, since it is not likely that there will be a significant demand for manure during the late fall and winter period, manure will likely be scheduled for pick up during Summer.

☛ **Option #2** is conveyor rental only. The charge for conveyor rental is \$1.00 per cubic yard conveyed + conveyor delivery fee. The poultry producer is responsible for all arrangements involving manure transportation and marketing.