
SLAUGHTER WASTE COMPOSTING DEMONSTRATION PROJECT SEMINAR AND FIELD DAY

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Slaughter Waste Composting Demonstration Project, Seminar and Field Day – June 2006

Project Summary

As part of the process of finding solutions for the on site disposal of solid slaughter wastes, the Investment Agriculture Foundation funded Sylvis Environmental to demonstrate a methodology for composting slaughter wastes based on the static pile system developed by the Cornell Waste Management Institute in Ithaca, New York. The project consisted of a slaughter waste static pile composting demonstration trial and a two day seminar and field day with speakers covering various aspects of the composting of slaughter wastes.

Slaughter Waste Static Pile Composting Demonstration Project

Pile building

The composting demonstration project was undertaken under an Approval from the B.C. Ministry of Environment. The slaughter waste compost pile was built on May 27, 2006 at the Kuiper Ranch in Lower Nicola B.C. Slaughter waste was sourced from Kam Lake View Meats in Kamloops and consisted of mixed slaughter waste from beef animals under 30 months of age with SRM waste removed. The waste, made up of heads, feet, rumen tissue and contents, fat, trimmings, small bones and some liquid was frozen at the slaughter plant until the day of pile building when it was hauled to the site in 45 gallon drums. Wood waste was sourced from Aspen Planers in Merritt. It consisted of wood chips and bark of variable particle size with some particles being at least 5 cm in length to provide the required bulking for the compost pile. Aged feedlot bedding was also used in the trial and was obtained from Kuiper Ranch. It consisted of wood shaving bedding from livestock pens that was soiled with urine and feces. It had aged for approximately one year.

The compost pile was built on a base layer of 60 cm of wood waste on top of two layers of heavy plastic. The base of the pile measured 11 m long by 3.6 m wide. The site was graded so that any leachate from the pile would flow into the plastic-lined leachate collection ditch built alongside the pile. The first layer of slaughter waste was placed on top of the wood waste base in a layer approximately 45 cm deep and 1.5 m wide. The waste was then covered with a 30 cm layer of either wood waste (Pile A) or feedlot bedding (Pile B) and a second layer of slaughter waste put on top of this. The pile was then capped with 45 to 60 cm of either wood waste or feedlot bedding. Three temperature probes were installed into each side of the pile and the probes were linked to a Hobo data logger. A total of 18-45 gallon drums of slaughter waste were used in the making of the pile and approximately 30 cubic metres of wood waste. Less than 10 cubic metres of feedlot bedding were used in the pile.

The assistance of the following persons in completing this phase of the project is gratefully acknowledged:

Mino Kuiper, Kuiper Ranch – site, equipment and operator for pile construction and monitoring.

Graham Strachan, B.C. Ministry of Agriculture, Kamloops – waste sourcing, assistance in pile construction, installation and maintenance of temperature sensors and compilation of temperature data.

Barb John, B.C. Ministry of Environment – timely preparation of Approval for the project.

Monitoring of the compost pile

Note: the western half of the pile (capped with wood waste) is identified as Pile A while the eastern half (capped with aged feedlot bedding) is identified as Pile B although the halves are contiguous.

The Hobo data logger collected temperature data from each half of the pile every 4 hours throughout the day. In addition, as a back up, for the first month manual temperature measurements were made with a composting thermometer. A rain gauge was installed beside the pile to monitor area rainfall during the first months of composting. Visual monitoring was made periodically to observe any bird or animal impact on the pile's integrity. Odour and leachate monitoring were also done periodically. Monitoring of the pile ceased in mid-September 2006 when the temperature probes were removed.

Pile size: the pile shrank approximately 30 cm in height during the first month and a further 30 cm in the following three months.

Odour and pests: there was a very faint odour from Pile A after the pile was built and throughout the first month of composting but no discernible odour from Pile B. It seemed that the odour from Pile A was rising with convective air from inside the pile and exiting through pathways created by the plastic tubes that surrounded the temperature probes that were inserted into the top of the pile. There was some bird activity on Pile A during the first two weeks of composting, possibly due to the odour, but the birds were not able to penetrate the capping layer. There was no bird activity around Pile B. No other pest problems have been observed since the pile was built. An electric fence with a solar battery was installed on the site and has worked very well. There has been no evidence of wildlife or livestock trampling the pile.

Pile internal temperature: One week after the pile was constructed, its internal temperature had reached 52 – 68 C. Throughout the second week of composting (approx. June 4-10) the temperature in the interior of both halves of the pile hovered around 70 C (160 F), with the feedlot bedding covered pile averaging 72 C and the wood waste pile averaging 67 C. During the three months of temperature monitoring, significant variation was observed in temperatures at different locations in the pile, with probes inserted to 1.3 m (4 feet) generally registering much higher temperatures than those inserted to 1 m (3 feet) only.

Pile A (wood waste capped pile): Temperature in this pile reached a maximum of 68 C on day 9 of composting. At the end of the second week, the temperature gradually began to decline and had declined to 50 C by June 21, mid-way through the 4th week of composting. By the end of July after 8 weeks of composting, the temperatures in this pile had dropped below 50 C. On September 11 when the temperature probes were removed, the internal temperature ranged from 29 to 37 C.

Pile B (feedlot bedding capped pile): Maximum temperature in this pile of 72 C was reached on day 10 of composting. The temperatures in this pile remained high through 12 weeks of composting, declining only slightly to between 50 C and 60 C from the maximum temperatures observed during weeks two and three. Temperatures in this pile began to drop below 50 C after 14 weeks of composting. On September 11 when the probes were removed, the temperatures within this pile ranged from 36 C to 55 C. In

terms of promoting the breakdown of the slaughter wastes through biological activity, this feedstock was much more successful, probably due to the manure present in the bedding which provided an ongoing source of nutrients and readily available carbon to the microbes in the pile.

Leachate: no leachate from the pile was observed at any time during the 3 months that the pile was monitored. There were several heavy rainfall events during the summer and although there was rainwater in the leachate collection ditch, there was no evidence that liquid had leached through the pile during rain events.

Degradation of slaughter waste: on September 22, the pile was pulled apart to see how well material had broken down. All soft tissue had disappeared. A small amount of hair remained on bones which otherwise were bare. The composted material was dark brown in colour and looked like a mix of wood waste and well rotted organic matter. The inside of the pile was dry and it appeared that composting had slowed significantly. There was a very faint, not unpleasant musty odour inside the pile.

Fate of slaughter waste compost

Mino Kuiper intends to allow the compost to age until fall 2007 when he will screen it and apply it to farm land. As there was no SRM in the slaughter waste used for the project, this end use is acceptable. B.C. Ministry of Environment has requested that the compost be tested for pathogens and nutrients before land application and a modified land application plan prepared.

Slaughter Waste Composting Seminar and Field Day

On June 26 and 27, a seminar and field day were held in Merritt, B.C. for interested slaughter plant personnel, regulators and other agency staff. There were approximately 60 attendees on Day 1 and 20 on Day 2. Attendance on Day 1 was equally split between slaughter plant personnel and agency staff while Day 2 attendees were almost exclusively federal and provincial agency staff. Day 1 of the seminar consisted of a morning seminar with presentations on various aspects of composting of slaughter wastes followed by a field tour and demonstration at the Kuiper Ranch in the afternoon. Day 2 was a morning only session for regulators and other agency staff.

Day 1 speakers included: Dr. Natalie Bragg, CFIA Edmonton, on the Proposed CFIA standards for composting of slaughter wastes; Mr. Jack Bryden, B.C. MoE, Victoria, on the OMRR and slaughter waste composting in B.C.; Ms. Ruth McDougall, Sylvis, on Basic principles of composting; Ms. Jean Bonhotal, Cornell Waste Management Institute, Ithaca N.Y. on the Composting of slaughter and butcher wastes and Mr. Rick Van Kleeck, Investment Agriculture, Abbotsford, on the Economics of composting slaughter wastes. The afternoon session was at the Kuiper Ranch where Jean Bonhotal critiqued the compost pile and demonstrated the building of a static compost pile using wood waste and 4 barrels of mixed slaughter waste. Following the on-site session, Mr. Kuiper provided tours of his fish habitat restoration work and meat processing plant.

Day 2 of the seminar was aimed at agency staff and consultants. It was a morning session only which included presentations by: Dr. Kim Stanford, Alberta Agriculture, on Current research on prions and composting, Ms. Jean Bonhotal on Regulatory aspects of the composting of slaughter wastes in New York State and the U.S. and Mr. Jack Bryden on the Permitting of slaughter waste composting projects in B.C. The morning concluded with a round table discussion.