

## **CALS Impact Statement**

"Waste Management"

Author: Bonhotal, Jean

2006 - Present

**Project Type:** Extension/Outreach, Research

Is this basic or applied research, both, or neither? Applied Research

**Academic Priority(ies):** Environmental Sciences, Life Sciences

### **Affected States and New York Counties**

Affected State(s): All U.S. states

Affected New York county(ies): All NY Counties

**USDA Topic Area(s):** Enhance Protection and Safety of Agriculture and Food Supply, Protect and Enhance Natural Resource Base and Environment, Support Increased Economic Opportunities and Improved Quality of Life in Rural America

**Impact Summary:** Effectively managing and reducing waste can turn unwanted waste products into resources while avoiding disposal costs. Waste management is part of every industry but a waste product produced by one business can be a resource to another. Mining the majority of these residuals is a good option for manure, meat residuals, mortality, food & yard waste and industrial and household waste, as they have the potential to be valuable amendments for use in agriculture and horticulture production, as erosion control and nutrient and carbon sources, and in energy production and other industrial processes. One of the important roles Cornell Waste Management Institute (CWMI) plays is convening people interested in waste related topics. Over this three-year period we have reached over 2,000,000 people through the CWMI web site, 27,605 downloads from e-commons, 6,675 stakeholders through 114 workshops & conferences, and 8,640 requests through phone and e-mail. We have collaborated with 18 universities (with particularly close collaborations with Penn State, Univ. of Maine, Univ. of Vermont, and Iowa State Univ.), many Cornell departments and staff from more than 20 agencies, and organizations. We have worked with Extension educators from more than 42 counties in NYS including city and urban counties, realizing great mutual benefit.

**Issue:** Managing wastes from homes, farms, businesses and industry is a critical component of society. We all create waste and need to reduce, reuse, recycle, compost, incinerate or landfill. With the advent of CAFO rules and concerns about nutrient management, ever increasing generation of solid waste in all industry, decline in rendering services and demand for livestock bedding, there is increased demand for research and outreach in organic and solid waste residual management. Improper management can pose environmental risks, threaten bio-security, affect human health & annoy neighbors. Cornell has a major role to play, particularly regarding generation & use of wastes in agriculture and communities. CWMI gathers information and delivers research-based knowledge around the world. Through our program, alternative uses for these residuals are researched and connections are made with those who can benefit from their value. Ag lands are targeted for application of wastes that can provide benefits or can pose risks. Work has been done to understand and communicate the risks and benefits to soil and human health of residual use. Understanding waste management risks and choices is critical for educators, citizens and agencies.

**Response:** CWMI provides a bridge between campus experts, educators, practitioners, communities & government officials to develop knowledge & put it to use. Programming has allowed for policy development in mortality disposal and education for CCE in municipal, farm and mortality composting.

CWMI continues to engage diverse stakeholders including: government agency personnel who are responsible for managing waste residuals, regulating wastes and nutrients, assisting the agricultural community and funding waste-related research and outreach; livestock farmers; compost producers; government agencies; other universities and colleges; NGOs; private consultants and waste management companies; Cornell Cooperative

Extension educators and Cornell faculty and departments Through the Managing Wastes PWT, monitoring requests, and web requests that gauge interest in waste related topics, we gear our research and programming to stakeholder needs. We also participate in other related PWT's to see if there are other collaborations and waste related needs with which we can assist.

**Impact:** Cornell Waste Management Institute provided assistance to 6,675 people in 114 events that included NY farms, agriculture advisers, businesses and municipalities that compost manure, mortality and yard and food waste, overall improving water quality and economics. Extension educators, vets, agency staff and composters were reached with research-based information, which helps to set direction for research, policy and outreach. Programs include research to help farmers answer questions related to use of dairy manure solids as a bedding, work with USDA APHIS, USEPA, NYSDEC and NYS Ag & Markets on composting of mass animal casualty in disasters, NYSDEC food scrap workshops, policy around sewage sludge, NYS Dept of Health and NYSDEC soil clean-up standards, and work with contamination in garden soils. CWMI helps with policy development and assists with interpretation of rules in three main areas: mortality disposal, solid waste disposal and organic residual use to generate energy.

Three 2-day workshops trained 62 people who then educated 1,121 people in 15 states. To better reach those with limited travel capabilities and to communicate with trainers, 5 webinars on special topics were convened reaching 800 people. Topics included risk communication, environmental effects of burial and composting, poultry management, butcher waste, unwanted horses and policy related to disposal. CWMI presented information at 5 CAFO meetings that addressed over 480 farm managers and agriculture advisors. Educational materials were developed in collaboration with NYSDEC and NYSDAM on a compost response to an Avian Influenza outbreak. As a result of these trainings and many years of teaching and demonstration most farms, many butchers in NY, VT and PA, and over 200 DOT sites in and out of NYS compost carcasses and residuals.

CWMI works with NYSDEC, NYSDAM, CCE, NRCS and SWCS on emergency response for mass casualty events. 450 emergency personnel were educated to respond to mass mortality events. Cornell University, University of Maine, Penn State University, Iowa State University, USEPA, USDA APHIS, NYSDEC and others worked together to coordinate a third National Carcass Disposal Symposium to disseminate and gather information addressing mass casualty from natural and people induced disasters. One result of this effort is training people, but a second aspect is that federal, state and local policy is being developed to provide simple, safe, economically and environmentally sustainable disposal options. CWMI has a compilation of states policies on animal disposal that all agencies can review and compare.

In ten roundtables and workshops, 440 people received information to better divert and manage food scrap. Participants included regulators, industry, food banks, universities and composters. This input is used to set policy, recover value from waste, and set future programming direction. Along with food waste diversion, industrial waste (including Milk Bone dog biscuit dust, fish, onion trimmings, Breyers and Stony Field yogurt residuals, Cool Whip, Ben & Jerry's residuals and tobacco cuttings) is being diverted for use in agriculture, to produce energy in industrial and farm digesters, compost to provide a value added product and to meet plant nutrient needs while balancing nutrient management plans. CWMI is providing assistance to NYSDEC in revising NYS Solid Waste Management Plan to better manage waste.

The research results of use of dried manure solids as dairy barn bedding reached 290 farmers and industry leaders in workshops and demonstrations. Research included how to best manage dairy manure solids and composting bedded packs. With the current competition for carbon sources, farmers have information from QMPS, Cornell College of Veterinary Medicine and the farms studied to make informed decisions about bedding needs in a sustainable manner.

A new program at CWMI will help gardeners make informed decisions to manage contamination in soils. Three fact sheets have been developed to help gardeners understand contamination in gardens and residential soils, with suggestions for measures to protect human health. A National Institutes of Health grant was secured to assess and address contaminants in urban community gardens through a community-research partnership. Soil test results and interpretation will inform garden management and education programs to minimize impacts to human and soil health.

Over this three-year period we have reached over 2,000,000 people through the CWMI web site, 27,605 down loads from e-commons, 6,675 stakeholders through 114 workshop and conferences and 8,640 requests through phone and e-mail. We have collaborated with 18 universities, many Cornell departments and staff from more than 20 agencies, and organizations. We have worked with Extension educators from 42 counties in NYS including city and urban counties, realizing great mutual benefit.

### **Funding Sources**

Federal Formula Funds – Research: Hatch

Federal Formula Funds - Extension: Smith Lever 3(b) & (c)

Academic Programs Instructional Support:

Other USDA:

Other Federal non-USDA: Department of Agriculture, National Institutes of Health

State or Municipal: New York State Department of Environmental Conservation, New York State Energy Research and Development Authority (NYSERDA)

Private/Other: New York Farm Viability Institute

**Collaborating Entities:** Cornell College of Vet Medicine (NY), NRCS (US), NYS DEC (NY), NYS Dept of Ag and Markets (NY), National Institutes of Health (NY), Penn State University (PA), Pro-Dairy (NY), QMPS (NY), USDA APHIS (US), University of Maine (ME)

**Project Personnel/Investigators:** Bonhotal, J. F.

**CALS Impact Statement**  
"Safety and health issues of composting"  
Author: Bonhotal, Jean F.  
August 2001 - Present

**Project Type:** Extension/Outreach, Research, Teaching

Is this basic or applied research, both, or neither? Applied Research

**Academic Priority(ies):** Environmental Sciences, occupational safety and health

**Affected States and New York Counties**

Affected State(s): All U.S. states

Affected New York county(ies): All NY Counties

**USDA Topic Area(s):**

**Impact Summary:** Research and materials preparation to protect workers engaged in general composting, composting of roadkill, and composting as an emergency response method in the event of an outbreak of highly-pathogenic avian influenza.

**Issue:** I was presented with these projects as a result of joining the Cornell-wide project work team on composting and land application of sewage sludge.

**Response:** I researched and/or derived hazard reduction methods for workers engaged in these types of composting. The results include web-based materials (factsheets, training video), as well as conducting training at conferences for national and international audiences. A book chapter will be published in a few months. I have been contacted by people from other states and countries on using my work to train their employees or keep someone working with a reasonable accommodation.

**Impact:** Roadkilled deer carry many diseases, including chronic wasting disease; so adequate disposal of the carcasses in a manner which removes them from the food chain in a safe and low-tech way reduces risk, as well as producing a usable by-product. In the event of an outbreak of HPAI, on-farm composting both disposes of diseased carcasses on-site, but also minimizes the spread of disease off-site. Protecting workers engaged in this task prevents dual infection with both human and animal influenza, thus reducing the risk of developing a viral form capable of human-to-human transmission and a pandemic. Overall, engaging in hazard reduction practices for composting improves the likelihood that more communities, industries, and individuals will engage in composting as an alternative for disposal and reuse of organic residuals -- a highly desirable alternative for the environment.

**Funding Sources**

Federal Formula Funds – Research:  
Federal Formula Funds - Extension:  
Academic Programs Instructional Support:  
Other USDA:  
Other Federal non-USDA:  
State or Municipal:  
Private/Other:

**Collaborating Entities:** Cornell Waste Management Institute (Ithaca, NY)

**Project Personnel/Investigators:** Brown, N. J., Harrison, E. Z., Bonhotal, J. F., Schwartz, M., Rynk, R.