# Thirty Years of Pest Control in Museums: Policy & Practice

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**ABSTRACT**

The Smithsonian's Museum Conservation Institute (MCI) has contributed to a targeted approach to Integrated Pest Management. This paper will review changes in museum practices that have taken place during the past thirty years: from the closure of ethylene oxide (EtO)facilities in major libraries and museums, the introduction of museum specific approaches and courses, the advent of preventive cultural changes, the tightening of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and the Occupational Safety and Health Administration (OSHA) workplace rules, the withdrawals of numerous pesticides and mothproofing agents, the advent of public outreach and inquiry, the development of intramural groups, the adoption of climate sensitive patterns and practice, to the formal licensing of conservators and collection management staff, and in-house museum based research on the effects of pesticides, the creation of standards for testing, and the mitigation of museum pesticides. The paper will focus on the effect of FIFRA on the development of museum working standards and research initiatives as safety issues, on the gradual recognition of the need for a scientific understanding of the biology, the materials, and the regulations to control and prevent insect infestations in museums. In doing so, the distance from economic entomology and general urban entomology will be underscored.

**Keywords:** FIFRA, fumigation, laws, IPM, pesticides, safety, object safety, toxicity

## INTRODUCTION

During the last thirty years, the recognition of biodeterioration in the preservation of museum objects and the potential effects of pesticides on museum staff has gained prominence. At the same time, laws and regulations have also altered the landscape of pest control activities inside museums. The Smithsonian Institution with its 19 museums and 147+ million artifacts and works of art, is a federal trust facility open to the public, largely based in Washington, D.C. As such, it has weathered changes in policies and practices, even as the various museums and departments maintain individual procedures and protocols.

The Museum Conservation Institute, previously known as the Conservation Analytical Laboratory and then the Smithsonian Center for Materials Research & Education, is the central laboratory for research on art work and artifacts. It has been buffeted by the changes in federal and state laws and has also participated in advancing some of the alterations in museum policy, programs, and practices [1-7, 18, 20, 24, 29, 38, 39, 44, 46].

Although the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) had been enacted in 1947, its primary purposes were to provide farmers with sufficient information (“labeling”) about the pesticide products to use them safely and to establish performance standards—efficacy--for the pest(s) the pesticide was meant to kill. With the establishment of the Environmental Protection Agency (EPA) in 1970, this agency took over the administration of FIFRA from the Department of Agriculture. An update of the law in 1972 specifically mandated that the EPA consider the environmental impact as well as the regulation, sale, and use of pesticides. Under the authorization of the EPA, individual States enact regulations and enforce compliance of FIFRA, including the licensing and regulation of pest control operators (PCO’s), inspections of their operations, storage, and record keeping. Both in 1972 and again in amendments in 1978, 1988, and 1996 Congress has amended FIFRA to strengthen the registration and re-registration of pesticides. The 1996 Food Quality Protection Act, in particular, is important to museum and archives because it established special dosage and exposure for infants and children, when it established a ‘single health based standard for all foods’ and required a rolling periodic review and registration of all pesticides [4,5,12-13,15-16,19, 30-35, 37-39, 46-47].

This “registration” process differentiates the pesticide manufacturers from the requirements of the chemical industry needed to sell a small quantity of solvent. A generalized table lists several of the categorical differences. A fiduciary role is mandated by law for the manufacturer of a ‘restricted use’ pesticide; the manufacturer is required to specify the limits or boundaries of usage, is required to generate data and literature [12, 30, 31, 34, 37]. The pesticide applicator is required to hold, use, store, document, and dispose of residual pesticide in a specific manner (see Table 1). Thus, the period between 1980 and 1990 brought the greatest changes to fumigation practices and to pesticide use in museums as these regulations filtered down to museums and archives.

Table 1. A comparison of a restricted use Pesticide label with a MSDS (Material Safety Data Sheet) for a solvent used in Conservation [12, 21, 30, 31, 37, 41, 47].

| Requirements | Restricted Use Pesticide | Small quantity chemical (ex. acetone) |
|---|---|---|
| Ingredients, Purity, Quality, CAS # | √, √, √,√ | √, √, √,√ |
| MSDS/SDS: handling, exposure, Personal protective equipment | √, √, √ | √, √, √ |
| Health Hazard: Toxicity class, $LD_{50}$ | √ | possibly |
| Storage Regulation:<br>Security<br>Container | <br>√<br>√ | |
| Uses Permitted:<br>Substrates Allowable<br>Target Insect(s)<br>When (timing before harvest)<br>Conditions for use ($^oC$, RH)<br>Concentration permitted<br>Duration | **√**<br>**√**<br>√<br>√<br>√<br>√<br>√ | |

| | | |
|---|---|---|
| Environmental Guidelines | √ | |
| Placarding, Notification<br>Dept. of Transportation rules | √<br>√ | possibly |
| Mishandling:<br>Civil liability<br>Loss of Access, Loss of Livelihood<br>Criminal liability | <br>√<br>√<br>√ | possibly |
| Record keeping of use, quantity required | √ | |
| Academic studies<br>Bionics, dosage, efficacy, safety | √-all | √-safety |
| Manufacturer's research<br>Dosage, Logistics, Efficacy, safety | √-all | √-safety |

**DECADE OF THE 1980'S**

Treatment strategies from broad-based biostats in storage units to single dose fumigation had paralleled the growth of climate controlled museum environments. Pest management inside museums was largely practiced by in-house technicians on a routine basis. The use of the fumigant ethylene oxide (EtO) became widespread. Ethylene oxide kills all stages of an insect and sterilizes mold as well. Policies were casual, and procedures, somewhat haphazard, as seen in Table 2 taken from a 1980 pesticide survey of zoos and science museums [7, 6]. While ethylene oxide was used by only 5% of responding institutions, another survey of 75 large (university) libraries and archives showed 36% (27) were using ethylene oxide and 16% (12) more had fumigation chambers not yet in use [2, 5, 8, 19, 32 ].

Table 2. From a 1980 museum survey: The Percentage of Responding Institutions taking precautions when dealing with pesticides [5, 8]

| *Safety precautions taken* | | *No precautions taken* | (%) |
|---|---|---|---|
| Minimize exposure periods | 49 | No perceived hazard | 25 |
| Gloves worn | 21 | Too time-consuming | 10 |
| Gas mask worn | 12 | Not specified | 4 |
| Other | 13 | | |
| *Ventilation* | | *Air quality monitoring* | |
| Considered adequate | 63 | Human senses | 84 |
| Considered inadequate | 37 | Gas detection | 5 |
| | | None | 11 |

The required re-registration of pesticides in 1980 ended the production of some products and led to the reclassification of others. Manufacturers had products they could not or would not support; museums were caught with equipment they could not legally operate. [19, 32, 34, 38] By 1983, fumigation was suspended in the majority of US libraries and museums: their fumigation chambers were not compliant with the new standards and would cost too much to retrofit [5, 15, 19]. Fumigants like ethylene oxide, methyl bromide, and sulfuryl fluoride were severely restricted; others like Dowfume 75 (ethylene dichloride in carbon tetrachloride) were no longer manufactured. In the face of the new federal mandates, many pesticides and mothproofing agents were also dropped from production [2, 16, 35, 48]. This was the beginning of the end for a great deal of "off-label" and casual use in museums, libraries, archives, and zoos [4, 8, 30, 32, 38-40].

While the Smithsonian Institution had already purchased and installed a fumigation chamber and smaller vacuum fumigation unit in a purpose limited space at the Museum Support Center (MSC) for the Conservation Analytical Laboratory (CAL) to operate, it also contracted Keith Story from Harvard to write a book geared to insect control in museums, incorporating Integrated Pest Management (IPM) strategies. The book, *Approaches to Pest Management in Museums,* was published in 1984. CAL began to offer one-day courses on pest management, given by Keith Story, in 1985. Professionally, three CAL staff members, including the deputy director, qualified as licensed pest control operators (PCO's) [4, 11, 38, 39, 46].

**DECADE OF THE 1990'S**

IPM stressed the use of non-chemical means as a primary defense against insect damage. With broad spectrum insecticides like organophosphates, carbamates, and cyclodienes being canceled, scientists and collection managers had to consider new strategies [1, 10]. During the 1990's these strategies included the introduction of alternative inert gas disinfestation like nitrogen ($N_2$), carbon dioxide ($CO_2$), and Argon (Ar) and the approval of sulfuryl fluoride (Vikane) for chamber fumigation. Bionics—the study of an insect life cycle and preferences—produced new product and protocol avenues: baits, insect pheromones, growth regulators, and microbial predators [1, 10, 22, 23, 26-28, 42, 43].

Inside the Smithsonian, a group of conservators and collection managers responsible for pest control in their units founded a forum to exchange methods and ideas (Pizzazz group). Different museums and different collection units had divergent strategies in order to meet their collections' requirements: freezing for botany and anthropology, carbon dioxide fumigation for vertebrate zoology, argon anoxic disinfestation for fine art, and microbial predators for the live botanical studies. The past history of pesticide use at the National Museum of Natural History's (NMNH) anthropology department was published, as a monitoring study of the odd beetle there [17, 18, 22, 36, 45]. Later, the National Museum of the American Indian contracted to have a similar past history of pesticide use in the Heye Foundation collection completed for internal reference. Talks on insect bionomics (study of organisms and their relationships to the environment were given to NMNH "MOVE" technicians who transferred collections from NMNH to MSC so that they were made aware of protocols for the health of the collection as well as for their own health. At MCI, the association of climate zones to species of museum pests was reviewed, citing temperate vs. tropical zones [28].

**IN THE 2000'S**

In the first decade of the second millennium, the role of biodeterioration in damage to fine art was established [25]. The ramifications of older practices were made clearer with new technologies [24, 29, 44]. At MCI, the portable XRF was re-characterized to identify the presence of heavy metal poisons—principally arsenic (As) and mercury chloride (Hg) [44]. The means to mitigate such residual pesticides was pursued at MCI in conjunction with the NMAI [29]. Down the hallway at the Laboratories of Analytical Biology, the cellulolytic bacteria inside the gut of termites were characterized [9]. Such biological studies may help propel pest management forward in future decades. Other studies at MCI continue the review of Prussian Blue, an inorganic pigment and dye that loses color with anoxia (and high light levels). MCI also successfully carried out an anoxic treatment with argon on a major costume collection for the upcoming National Museum of African American History and Culture in two 11.5 x 11.5 x 8 foot (1058 cubic feet) plastic chambers [6]. As a result of subsequent work on this collection, which retains its susceptibility to insect attack, MCI promulgated a pest management policy and monitoring program within its footprint at MSC. It also has supported a specific textile protocol for the textile conservation laboratory. These efforts have increased awareness by all MCI staff and interns to conditions that can reduce insect activity within our collections. It has also benefited the office of facilities management by identifying the locations of anomalous pests (gnats, wasps) that may indicate building envelope issues that may need repair.

## 2010 TO PRESENT

Another problem encountered with Smithsonian collections has been organic residual fumes of paradichlorobenzene (PDB) and of naphthalene; some staff have proven to be more sensitive to these fumes than the threshold limiting value (TLV) or the perceptible odor minimum would indicate [20]. MCI continues to support the dissemination of the latest pest management information for museums. *Pesticide Mitigation in Museum Collections* is sold out but available free, on line [24]. MCI has trained several conservators in anoxic protocols and encouraged them to get PCO licenses. At the present time, one staff conservator is licensed as are two research associates.

## SUMMARY

- Over the last thirty years, the Smithsonian Institution had supported a variety of pest management methods for a variety of reasons, within the guidelines of federal regulations. Across the museums a variety of suitable treatments have been developed.
- MCI supports BCIN, the Bibliographic Conservation Information Network database, where 1162 references on fumigation studies, 695 on pesticides, 1,077 on insecticides, and 3,119 on insects can be found [43]. Several hundred articles were collected over the years by MCI (and predecessor namesakes CAL and SCMRE) staff, who have also contributed their own research articles to those numbers.
- Smithsonian policies encourage collaboration across museums to understand bionomics and the specific requirements of federal agencies and preservation needs of particular collections.

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The administration of FIFRA, including licensing & courses:

In Maryland: http://www.md.state.md.us
In Virginia: http://www.vdacs.virginia.gov/pesticides/categories.html
In Washington, D.C.: http://ddoe.dc.gov/service/pesticides

**REFERENCES**


1. Baker, M.T., H.D.Burgess, N.E. Binnie, M.R. Derrick, and J.R.Druzik. 1990. "Laboratory investigation of the fumigant Vikane®" *ICOM Committee for Conservation, 9th Triennial Meeting, Dresden, German Democratic Republic, 26-31 August 1990: Preprints* Ed. K. Grimstad, Kirsten. Paris: ICOM Committee for Conservation. Pp.804-811.
2. Ballard, M.W. 1984. "Mothproofing Museum Textiles," *ICOM Committee for Conservation, 7th triennial meeting, Copenhagen, 10-14 September, 1994 Preprints.* Paris: international Council of Museums. Pp. 84.9.1-84.9.6.
3. Ballard, M.W. 1987. "Checklist for Pest Control..." *AIC News* **22**:3:2-3, [reprinted *Collections Caretaker* **1**:3:4-5]
4. Ballard, M.W. and N.S. Baer. 1987. "Conservation Notes: Is Fumigation Possible?" *The International Journal of Museum Management and Curatorship* **6**:1: 83-86.
5. Ballard, M.W. and N.S. Baer. 1986. "Ethylene Oxide Fumigation: Results and Risk Assessment," *Restaurator* **7**:4: 143-168.
6. Ballard, M.W., D. Koestler, J. Hau, and J.Tanner 2007. "Argon Treatment Using Anoxia Chambers," MCI #6134 internal report.
7. Ballard, M.W. and T. Parker, 1987 "Laws and Licensing" *AIC News* **22**:3:5 [reprinted *Collections Caretaker* **1**:3 (Spring, 1998):2-3]
8. Bell, B.M.and E.Stanley, 1981. "Appendix G: Tabular Results of the Survey of Museum Pest Control Procedures," in *Pest Control in Museums: A Status Report (1980),* Edwards, S.R., B.M. Bell, and M.E. King, eds. Lawrence, Kansas: Association of Systematics Collections.
9. Brauman, A., Doré, J., Eggleton, P., Bignell, D., Breznak, J. A. and Kane, M. D. 2001. Molecular phylogenetic profiling of prokaryotic communities in guts of termites with different feeding habits. FEMS Microbiology Ecology, 35: 27–36. doi: 10.1111/j.1574-6941.2001.tb00785.x
10. Burgess, H. D. and N.E. Binnie, 1990. "The effect of Vikane on the stability of cellulosic and ligneous materials - Measurement of deterioration by chemical and physical methods." *Materials issues in art and archaeology II: Symposium held April 17- 21, 1990, San Francisco, California, USA***.,** eds P.B. Vandiver, J.Druzik, and G.S.Wheeler. *Materials research society symposium proceedings*. Vol. 185. Pittsburgh: Materials Research Society, 1991 Pp.791-798.
11. Erdhardt, D. 1982. Fumigation Chamber Residues.CAL Report #4183 (internal report).
12. *Farm Chemicals Handbook '92*. 1992. Willoughby, Ohio: Meister Publishing Company.
13. *FIFRA Law Overview* http://www.epa.gov/agriculture/lfra.html#Summary%20of%20the%20Federal%20Insecticide,%20Fungicide,%20and%20Rodenticide%20Act
14. Goldberg, L. 1996. "A History of Pest Control Measures in the Anthropology Collections, National Museum of Natural History, Smithsonian Institution," *Journal of the American Institute for Conservation* 35:1:23-43.
15. Goldgraben, R. 1980. *Preliminary benefits analysis of ethylene oxide as a fumigant in libraries.* MacLean (Virginia): The MITRE Corporation. Metrek Division.

16. Hammick, Sharon. 1989. "Warning! Dichlorvos Resin Pest Strip," *Supplement to Textile Conservation Newsletter Issue #16 (Spring, 1989)*.
17. Hawks, C. A. and D. Bell. 1999. "Removal of stains caused by mercuric chloride treatments from herbarium sheet labels." *ICOM Committee for Conservation 12th triennial meeting,Lyon, France, August 29-September 3.* Pg. 723-727.
18. Hawks, C. A. and D.W. von Endt. 1990. "Mercury and mercury compounds in Natural History Collections: an annotated bibliography," *Natural History Conservation* **5**:4-19.
19. *Health Assessment Document for Ethylene Oxide: Final Report*. 1985. Environmental Protection Agency. EPA/600/8-84/009F June, 1985.
20. Hodgkins, R., S. Heald and O. Madden, 2012. "Detecting, Quantifying, and Removing Mothball Vapors from Textiles in the National Museum of the American Indian Collection," presentation at the *Annual Meeting of the Society for the Preservation of natural History Collections (SPNHC 2012).*
21. *Insect Control Guide* Vol. 8. 1995. Willoughby, Ohio: Meister Publishing Company.
22. Jacobs, J. F. 1995. "Pest monitoring case study" *Storage of natural history collections. Volume 1, A preventive conservation approach,* C.L.Rose, C.A.Hawks and H.H. Genoways, eds. Society for the Preservation of Natural History Collections, Pp.221-231.
23. Koestler, R. J. 1993. "Insect eradication using controlled atmospheres and FTIR measurement for insect activity" *ICOM Committee for Conservation 10th triennial meeting, Washington, DC, 22-27 August 1993: Preprints,* eds. J.Bridgland. Paris: International Council of Museums Committee for Conservation. `Pp.882-886.
24. Koestler, R. J. and A.E. Charola, eds. 2010. *Pesticide Mitigation in Museum Collections: Science in Conservation: Proceedings from the MCI Workshop Series.* Washington, DC: Smithsonian Institution Scholarly Press. http://si-pddr.si.edu/dspace/handle/10088/8829
25. Koestler, R.J, V.R. Koestler, A.E. Charola and F.E. Nieto-Fernandez, eds. 2003. *Art, Biology, and Conservation: Biodeterioration of Works of Art*. The Metropolitan Museum of Art, New York. Yale University Press, New Haven. 576pp.
26. Koestler, R. J. and T.F. Mathews. 1994. "Application of anoxic treatment for insect control in manuscripts of the Library of Megisti Laura, Mount Athos, Greece" *Environnement et conservation de l'écrit, de l'image et du son: actes des Deuxièmes Journées Internationales d'Etudes de l'ARSAG, 16 au 20 mai 1994 (Environment and conservation of writing, images, and sound: proceedings of ARSAG's second international study days, 16-20 May 1994)*; Paris: Association pour la recherche scientifique sur les arts graphiques [ARSAG], Pp.59-62.
27. Koestler, R.J., E. Parreira, E.D. Santoro, and P. Noble, P. 1993. "Visual effects of selected biocides on easel painting materials" *Studies in conservation* **38**:4:265-273.
28. Lim, C.Q., M. Razak and M. Ballard. 1990. "Pest Control for Temperate vs. Tropical Museums: North America vs. Southeast Asia," *ICOM Committee for Conservation,* 9th *Triennial Meeting, Dresden German Democratic Republic, 26-31 August 1990: Preprints.* Ed. K. Grimstad. Paris: ICOM Committee for Conservation. Los Angeles: Getty Conservation Institute, Vol. 2, Pp. 817-820.
29. Madden, O., Johnson, J. and J. Anderson. 2010. Pesticide Remediation in Context: Toward Standardization of Detection and Risk Assessment. In: Koestler, Robert J. and Charola, Asuncion E., *Pesticide Mitigation in Museum Collections: Science in Conservation: Proceedings from the MCI Workshop Series.* Washington, DC: Smithsoian Institution Scholarly Press, pp.1-6.
30. Maillis, A. 1982. *Handbook of Pest Control*, 6th edition, ed K.O. Story. Cleveland, Ohio: Franzak & Foster Company.

31.________. 2011. *Handbook of Pest Control*, 10th edition, ed. D. Morland .Richfield?, Ohio: Maillis Handbook Company.

32. McGriffin, R. F. 1985 "A Current Status Report on Fumigation in Museums and Historical Agencies," *Technical Leaflet #4*. Nashville: American Association for State and Local History, 1985. http://resource.aaslh.org/view/a-current-status-report-on-fumigation-in-museums-and-historical-agencies/

33. Mid-West Section, ITPC. 1983. "Effect of Selected Insecticides on the Colorfastness of Acid and Disperse Dyes on Nylon and Polyester." *Book of Papers: 1983 National Technical Conference.* Research Triangle Park: American Association of American Textile Chemists and Colorists. Pg. 14-30.

34. "Occupational Exposure to Ethylene Oxide," Final Standard Occupational Safety & Health Administration (OSHA). 1984. *Federal Register.* June 22, 1984, 25734-25809.

35. O'Melia, F.C. Dow Chemical Company, Midland, Michigan May 4, 1983. personal communication to Mary W. Ballard.

36. Pool, M. A. 1997. "Preliminary analysis of the effects of cold storage on fur garments and mammal skins." *Collection Forum*.**13**:1:25-39.

37. Pool, M., N. Odegaard, and M.J. Huber. 2005 "Identifying the Pesticides: Pesticide Names, Classification, and History of Use," *Old Poisons, New Problems: A Museum resource for Managing Contaminated Cultural Materials* ed by N. Odegaard, A. Sadongei, & associates. Lanham, MD : AltaMira Press.

38. Postlethwaite.A.W. n.d. "Achieving Integrated Pest Eradication with heightened Sensitivities to Collections Safety and Human Toxicity."

39. Postlethwaite.A.W. 1987. "Fumigation, choice of fumigant and design of facility," *ICOM Committee for Conservation,* 8th *Triennial Meeting, Sydney, Australia 6-11 September, Preprints.* Marina del Rey: Getty Conservation Institute, 1990. Pp. 1189-1195.

40. Rice, J.W. 1962."Principles of Textile Conservation Science n. 2. Practical Control of Fungi and Bacteria in Fabric Specimens" *Textile Museum Journal* **1**:1:52-55.

41. Rossol, M. 2011. "Appendix B: Evaluating the Material Safety Data Sheet," *Pick Your Poison*. Hoboken: John Wiley & Sons, Inc.

42. Rust, M.K. and J.M. Kennedy. 1993. *The Feasibility of using Modified Atmospheres to Control Insect Pests in Museums: Final Report Contract No. GF/RUST/89 July1, 1989-December 12, 1991.* Marina del Rey: The Getty Conservation Institute.

43. Sarel-Whitfield, F.G., Cole, J.H. and G.F.H. Whitney. 1958."The Bionomics of *Tineola Bisselliella*, Humm. Under Laboratory Culture and Its Behaviour in Biological Assay. Parts I, II, III, & IV" reprint from *Laboratory Practice* Vol.7 No.4, 5, 6, 7 (April 1958) Pp.210-217, 1 plate; 275-284; 339-343; 408-411; 2 p. BCIN/MCI #34715.

44. Sirois, P. J., J.S. Johnson, A. Shugar, J. Poulin and O. Madden. 2009. "Pesticide Contamination: Working Together to Find a Common Solution." In: *Preserving Aborigional Heritage: Technical and Traditional Approaches: Proceedings of Symposium 2007.* Ottawa: Canadian Heritage, Canadian Conservation Institute, pp.175-186.

45. Strang, T.J.K. 1992. "A Review of Published Temperatures for the Control of Pest Insects in Museums," *Collections Forum* . **8**:2: 41-67.

46. Story, K.O. 1985. *Approaches to Pest Management in Museums*. Washington, D.C.: Smithsonian Institution. http://www.si.edu/mci/english/learn_more/publications/articles.html

47. Ware, G.W. and D.M. Whitacre. 2004. *The Pesticide Book*. Willoughby, Ohio: MeisterPro Information Resources.
48. Williams, S.L. and C.A. Hawks. 1986. "Considerations in the Use of DDVP Resin Strips for Insect Pest Control in Biological Research Collections," *Biodeterioration 6: papers presented the 6th International Biodeterioration Symposium, Washington, D.C., August 1984* eds. Barry, S., D.R. Houghton, G.C. Llewellyn, and C.E. O'Rear. C.E Washington, D.C.: CAB International, Pp. 344-350.

3 Executive Summary Choices in pest control are very important for the health and safety of students and staff. Pests can carry disease, contaminate food supplies, and trigger allergic reactions. However, the use of pesticides can put the health of students and staff at risk.Â  This report summarizes the findings of this survey and represents the most comprehensive assessment of pest control practices in Oregon schools to date. Recommendations for reducing pesticide use in Oregon schools are included at the end of the report. By adopting a cautious approach, schools can reduce or even eliminate the risks associated with pesticides altogether using simple, low-cost methods such as Integrated Pest Management. Old Bill's Pest Control â€“ Limetree Walk, HP7 9HY Amersham, Buckinghamshire â€“ rated 5 based on 16 reviews "Excellent service. Immediate response by...Â  Old Billâ€™s Pest Control was formed by Dave after thirty years as a police officer dealing with a dif See more. CommunitySee all. 257 people like this. 268 people follow this. AboutSee all. Limetree Walk (2,525.92 km) HP7 9HY Amersham, Buckinghamshire. The advantage of biological control in contrast to other methods is that it provides a relatively low-cost, perpetual control system with a minimum of detrimental side-effects. When handled by experts, bio-control is safe, non-polluting and self-dispersing.Â  CIBC also serves as a clearing-house for the export and import of biological agents for pest control worldwide. CIBC successfully used a seed-feeding weevil, native to Mexico, to control the obnoxious parthenium weed, known to exert devious influence on agriculture and human health in both India and Australia.