Healthy Soils, Healthy Communities: A Research and Education Partnership with Urban Gardeners

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Assessing and Addressing Exposures to Soil Contaminants Related to Urban Gardening

BACKGROUND AND PUBLIC HEALTH SIGNIFICANCE

Urban gardening is becoming an increasingly popular activity. In New York City alone, it is estimated that there are over 1000 community gardens. Urban community gardens can provide affordable, locally grown, healthy foods and many other benefits associated with urban green space, opportunities for recreation and community building activities, and reduced environmental impacts of food transport and large-scale production. However,

- Garden soils (and urban soils in particular) can contain contaminants (e.g., lead, other metals, PAHs) that may pose risks to human health. Gardening activities provide opportunities for exposure though incidental soil ingestion and inhalation, vegetable consumption and other pathways.
- The nature and extent of contamination and associated potential exposures and risks in many urban areas remain poorly defined.
- Gardeners and other community stakeholders have requested support in considering soil contamination risks and implementing strategies to reduce exposure.

COMMUNITY OUTREACH EFFORTS PRIOR TO PROJECT START

- A September 2008 forum organized by Cornell University provided insights into the main concerns related to soil contamination and community health and identified strategies and resources for addressing those concerns (Figures 1, 2).
- Workshops, garden visits, and other interactions with gardeners and others helped to further outline areas in need of future research and education and public health action strategies (Figures 3-6).
- The NYS Environmental Justice Interagency Task Force held stakeholder meetings that identified concerns related to food, community gardening and soil contaminant testing.
- Soil and plant tissue data from pilot sampling projects in New York City and Ithaca are being used to plan future soil sample collection and research.

BUILDING A COMMUNITY-RESEARCH PARTNERSHIP

The need to consider the benefits of urban gardening while addressing potential health risks associated with soil contamination requires input from multiple perspectives and areas of expertise. To help fulfill these needs, a new community-research partnership was formed upon the foundation of pilot efforts to include team members from Cornell University, Cornell University Cooperative Extension-NYC, NYS Department of Health, community gardening organization GreenThumb, and other community stakeholders.

Our partnership brings together educators, gardeners, gardening program managers, soil scientists, and health risk assessors. Our outreach to gardeners and others (e.g., through gardening events in NYC and Ithaca, urban farming workshops in Buffalo) furthers our knowledge of key issues and sets the framework for more formal community involvement through an advisory committee being established in Spring 2010.

HIGHLIGHTS FROM CORNELL PILOT OUTREACH EFFORTS

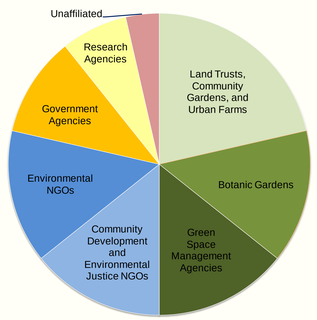

Figure 1. Forty participants at a 2008 forum in New York City represented 28 diverse organizations and agencies.

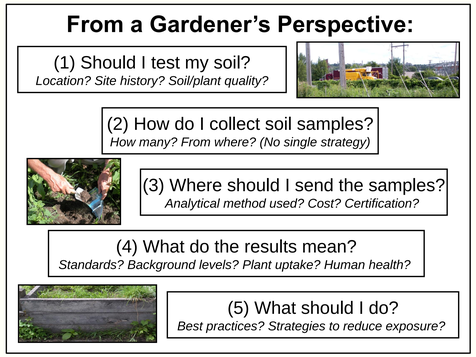

Figure 2. Key questions representing soil testing concerns from a gardener's perspective.

Figure 3: A community garden in Brooklyn that had been a vacant lot with illegal dumping. Top soil was brought in to cover the contaminated site.

Figure 4: Garden managers and educators learn about soil sampling and testing protocols.

Figure 5: Cornell researchers visit the compost operation at a Brooklyn community garden.

Figure 6: Urban gardeners and teachers learn about soil and strategies for mitigating exposure to contaminants.

Other Identified Concerns and Information Needs

- Training and information on site assessment, and soil sampling and testing protocols
- Information about and access to reliable, affordable, certified soil testing labs
- Simple guidelines for interpretation of soil test results
- Contaminants in municipal compost and available soil/fill
- Possible liability issues or closure or avoidance of gardens if soil tests reveal contamination

PROJECT GOALS

Our project aims for a better understanding of:

- The nature and extent of soil contamination in urban community gardens;
- Associated exposures and health risks; and
- Effective exposure reduction strategies.

Overall, we hope to help empower gardeners and others to make informed decisions to foster healthy soils and healthy communities.

KEY ACTIVITIES

- Assess soil and vegetable contaminant levels and human exposures through gardening activities in urban community gardens.
- Evaluate the effectiveness of management strategies to reduce exposure to soil contaminants.
- Translate research findings into education and public health action strategies to reduce exposures to soil contaminants and potential risks.
- Evaluate the success of education and outreach programs in addressing community concerns and reducing exposures to soil contaminants related to urban gardening activities.
- Identify future research needs related to potential exposures and risks for urban gardeners.

PRELIMINARY CONSIDERATIONS AND CHALLENGES

- Data sharing sensitivities and strategies for direct communication with gardeners
- Statewide variability of soil contamination perceptions and mitigation strategies
- Need for contaminant data management systems for gardening organizations
- Certified laboratory analysis vs. screening procedures
- Best sampling protocols in light of site heterogeneity and contaminant variability

NEXT STEPS

- Establish advisory committee to review progress and provide advice, input, and feedback on decisions and convene first meeting.
- Expand pilot efforts to determine contaminant levels in soils and vegetables from community gardens in New York City, Ithaca, and Buffalo.
- Implement field experiments to quantify the effects of management strategies (organic matter additions, mulching, etc.) on contaminant levels in different crop types with implications for human exposures and risks.
- Through interviews and questionnaires, characterize gardening practices, risk perceptions and vegetable consumption characteristics of community gardeners.

For more information, fact sheets, and other resources, please visit: **http://cwmi.css.cornell.edu/soilquality.htm**

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