

# Brix Bounty Farm

*Building Agricultural Skills for the Southcoast*

## Restoring Health to Compromised Soils, aka Soil Remediation 101



### Why Worry?

Whether our gardens are situated in urban, suburban, or rural areas; we must consider the possibility of soil contamination and potential health risks of garden activities on contaminated properties. Soil contamination can be related to a variety of past activities impacting the soil. For example; lead based soil contamination may be a result of leaded gasoline, lead based paints, and/or the use of lead arsenate for herbicide use. This isn't solely an urban problem; rural development of agriculture lands may pose risks associated with prior agricultural chemical use.

### Exposure Pathways

Exposure to soil contaminants is not limited to ingestion related to consumption of vegetables. Often, greater risk is associated with exposure to dust and soil particulates, both through unwashed produce and exposure while working in the garden; through direct contact with the soil & tracking of dust into indoor environments.

**Site Assessment: Is Remediation Possible? Is this site appropriate for home or community gardens?**

### Soil Testing

At a minimum basic soil tests (including heavy metals), available through UMass Amherst (\$15 including Organic Matter) - <http://www.umass.edu/soiltest/>. More extensive testing may be recommended (\$\$\$).

### Raised Beds

For many soils with contamination concerns; "capping" the soil and building raised beds and mulched pathways is a less expensive option to for the establishment of garden space.

### Remediation

Depending on the level and type of contamination; soil remediation may be a viable option; see page 2...

### Contaminants of Concern (the most common contaminants)

- **Lead (Arsenic, Cadmium, and Heavy Metals)**
  - Phytoremediation isn't the answer (no hyper-accumulators for lead exist).
  - Soil pH impacts heavy metal availability.
  - Phosphate may bind and "sequester" lead to reduce availability.
- **PAH's – Polycyclic Aromatic Hydrocarbons**
- **VOC's (Volatile Organic Chemicals)**

**Brix Bounty Farm – Fresh Vegetables & Community Education**

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# *Restoring Health to Compromised Soils: Soil Remediation 101 Tip Sheet*

## Resources (links current as of March 2011)

- \*Brix Bounty Farm & Garden Resource Page - <http://www.brixbounty.com/farmgarden-resources/>
- \*Urban Ag - <http://www.brixbounty.com/farmgarden-resources/school-and-community-gardens/>
- \*City Farmer - <http://www.cityfarmer.info/>
- \*Cornell - **Soil Contaminants and Best Practices for Healthy Gardens** - [http://cwmi.css.cornell.edu/Soil\\_Contaminants.pdf](http://cwmi.css.cornell.edu/Soil_Contaminants.pdf)
- \*EPA Brownfields **Urban Ag. Webpage** - <http://www.epa.gov/brownfields/urbanag/>
- EPA CLU-IN Website – **Contaminated Site Clean Up Information** - <http://www.clu-in.org/>
- \*EPA CLU-IN **Eco Tools Webpage** - <http://www.clu-in.org/ecotools/>
- EPA – **The Use of Soil Amendments for Remediation, Revitalization, and Reuse** - <http://www.clu-in.org/download/remed/epa-542-r-07-013.pdf>
- EPA Webinar #1 (Sept. 2010) – **Brownfields and Urban Agriculture Reuse: The State of Scientific Knowledge and Research Needs** - <http://www.epa.gov/brownfields/urbanag/webinar1.htm>
- Mass Department of Environmental Protection - **Mass DEP** - <http://www.mass.gov/dep/index.htm>
- **Mycoremediation** - <http://www.fungi.com/mycotech/mycova.html> and a TED Talk by Paul Stamets - <http://www.youtube.com/watch?v=XI5frPV58tY>
- \***Urban Agriculture and Soil Contamination: An Introduction to Urban Gardening** (Practice Guide #25, 2005) University of Louisville - [http://cepm.louisville.edu/Pubs\\_WPapers/practiceguides/PG25.pdf](http://cepm.louisville.edu/Pubs_WPapers/practiceguides/PG25.pdf)
- California – Department of Toxic Substances Control – **Interim Guidance for Sampling Agricultural Properties** - <http://www.dtsc.ca.gov/Schools/upload/Ag-Guidance-Rev-3-August-7-2008-2.pdf>
- New Jersey - **Finding and Recommendations for the Remediation of Historic Pesticide Contamination** (1999) - <http://www.state.nj.us/dep/special/hpctf/final/hpctf99.pdf>
- \***Guidance for Evaluating Residual Pesticides on Lands Formerly Used for Agricultural Production** Oregon - <http://www.deq.state.or.us/lq/pubs/docs/cu/GuidanceEvalResidualPesticides.pdf>
- **Social Networking Site for Environmental Consultants** - <http://commonground.edrnet.com>
- **Soil Solutions** – Mid-Atlantic Company Offering Large Scale Soil Remediation (for reference) <http://www.soil-blending.com/about-soil-blending-solutions.html>