The (Potential) Risks of Urban Farming

Nicole Penichet, PhD

Geosyntec Consultants

Geosyntec consultants

Urban Agriculture

- Community gardens
- Backyards and balconies
- School gardens
- Educational farms
- Recreational farms
- Peri-urban

Geosyntec consultants

Sources of Contamination

- Previous industrial use
- Paint particles
- Storm water runoff
- Atmospheric deposition
- Wood preservatives (CCA treated lumber)
- Contaminated fill/composts
- Waste disposal
- Bonfires
- Pet feces
- Sewage sludge
- Asbestos

Geosyntec consultants

Contaminated Media

- Heavy metals
  - Lead
  - Arsenic
  - Zinc
  - Mercury
  - Copper
  - Cadmium

- Organic compounds
  - PAHs, PCBs, pesticides
- Pathogens
- Asbestos fibers

Geosyntec consultants

Pathways of Exposure

- Incidental ingestion of soil from surface of produce or from hand-mouth activities
- Dermal contact
- Irrigation water is likely very minor

Wash your fruits/veggies!

Geosyntec consultants

Pathways of Exposure

- Consumption of soil by animals used for food (milk, eggs)
- Consumption of contaminated grass or vegetation by livestock
- Contaminated feed

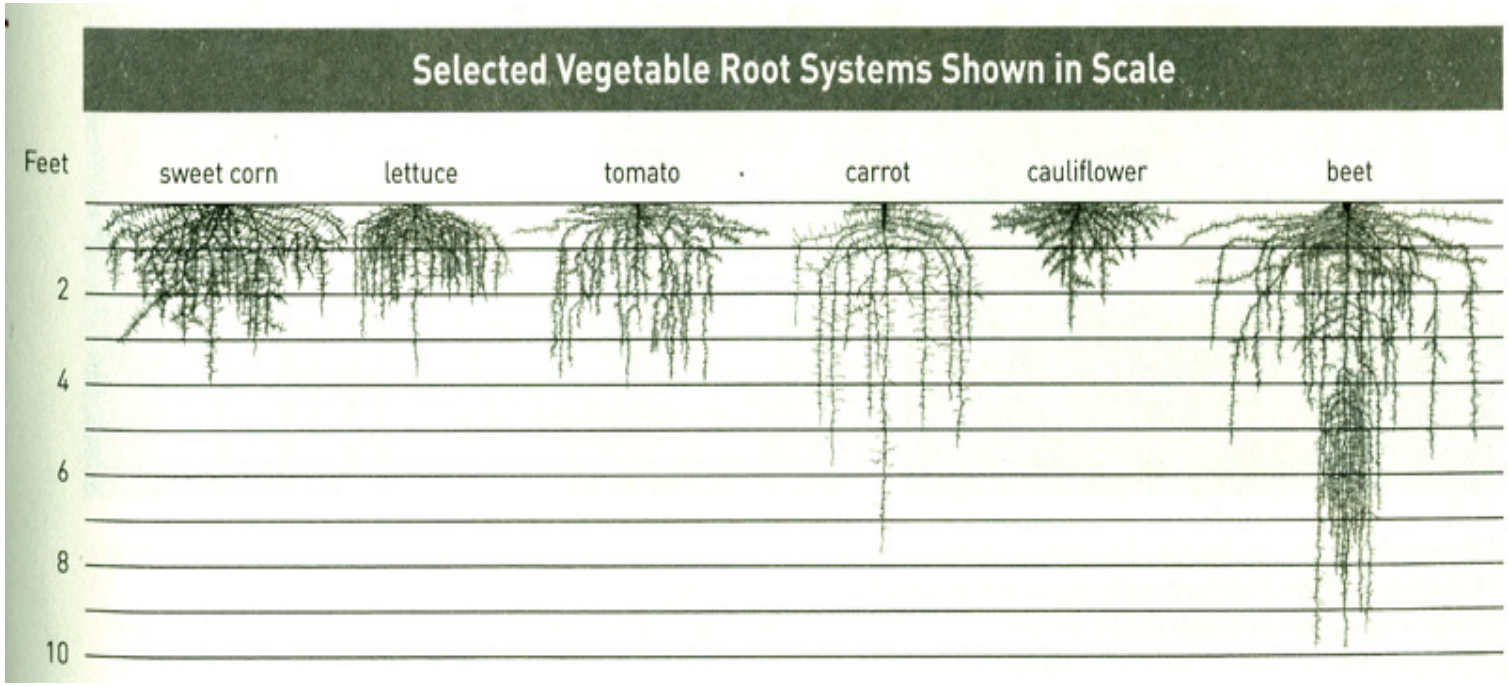
DINING & WINE

High Lead Found in City-Sourced Eggs

By JULIE SCELFO OCT. 8, 2012

Uptake by plants

- Bioavailability of chemicals depends on soil properties
  - (soil pH, organic matter, clay content, plant species-specific)
- Uptake through roots, but some root veggies do not (e.g., carrots)
  - Even if the roots take up lead, translocation to fruit is very low



Geosyntec consultants

Peri-Urban Ag/Plant City, Florida

Geosyntec consultants

BMPs / Urban Gardening

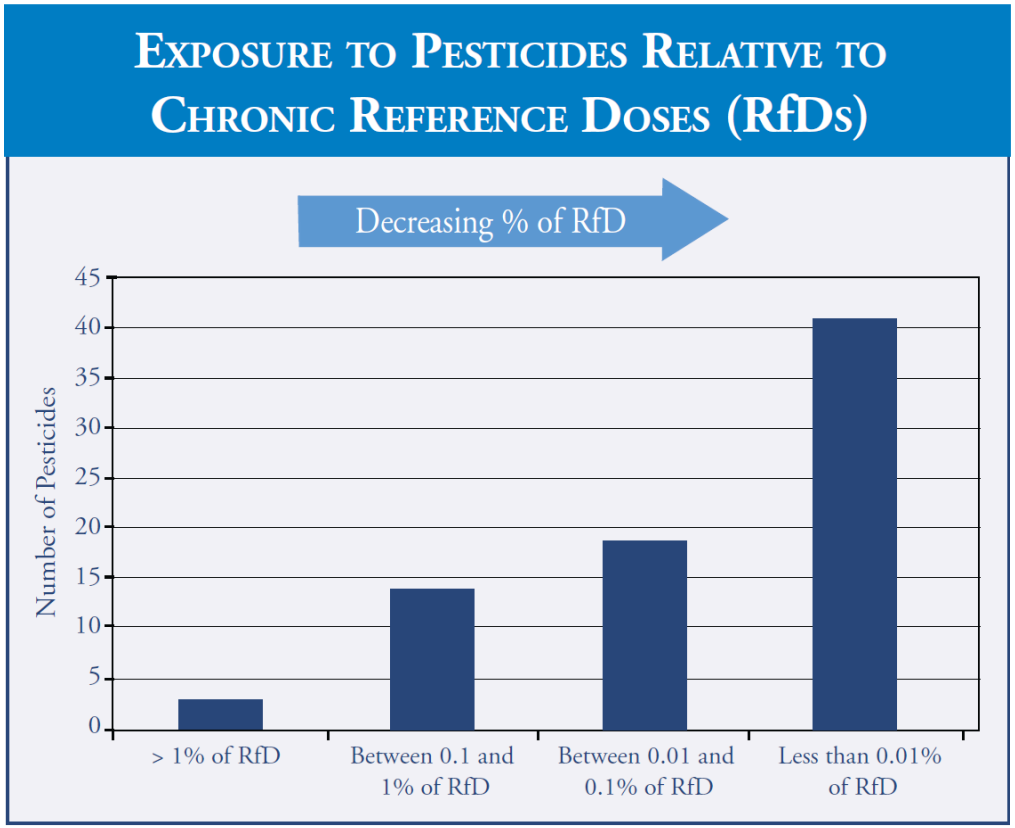
- Test soil and GW if possible
- Excavation & soil replacement (best, expensive)
- Install barrier fabric
- Raised beds
- Amend soil with compost from known source
- Plant “resistant” crops
- Follow labels for pests/fertilizers
- Gloves, protective clothing
- Wash hands
- Wash produce


Photo Credit: https://www.flickr.com/photos/joellemiller

Geosyntec consultants

So…what are the risks??

- **The risks, if any, primarily come from the actual farming, not the ingestion of produce**
- Poor plant uptake of Most chemicals/metals
- Chemical residues are generally very low
- City water used for Irrigation purposes
- Limited exposure



Michael Peterson, M.E.M., DABT

Geosyntec consultants

Thank You!
Questions/Comments

Nicole Penichet

npenichet@geosyntec.com