Urban Population

Over 80% U.S. population lives in a metropolitan area

- U.S. produce travels an estimated 1,500 miles
  
  *Pirog 2003*

- Estimated 36% of fruit and vegetables loss due to spoilage
  
  *FAO 2011*
Food Security

“Access by all people at all times to enough food for an active healthy life.” USDA

- 49.0 million people lived in food-insecure households
- 8.3 million children lived in food-insecure households
Urban Agriculture: *Not just tomatoes*
Types of Urban Agriculture

- Back yard
- Community Gardens
- Commercial Farms
- Peri-Urban
Urban Agriculture – *Is it significant?*

- 30% of food worldwide is grown in cities
  *UN 2005*

- 29% ↑ in food gardening among U.S. urban households from 7 m to 9 m
  *NGA 2014*

- 39% of U.S. farms located in metro areas

- 40% of the value of U.S ag production
  *ERS 2010*
What does Urban Ag have to offer?

- Food security/fresh food
- Jobs
- Waste to resource
- Reuse of vacant lands
- Physical activity
- Community connections
- Biological habitat
Taking Urban Ag to the Next Level

Benefits of trees & shrubs:
- Fruit and nut products
- Food production services
- Air quality
- Phytoremediation
- Extreme weather adaptation

Research
Fruit and Nut Products

Plant selection & breeding

- Urban conditions
- Smaller size
Food Production Services: *Pollination*

30% of food production relies on insect pollination  
*Klein et al. 2007*

-Green Leaf Studio-

- Pollinator visits decline to 50% at 2,000 ft from habitat  
  *Ricketts et al. 2008*

- Wild bee abundance is dependent upon woody native plants  
  *Morandin & Kremen 2012*
Food Production Services: Biocontrol

18% of crops lost to animal pests
*Oerke 2006*

✿ Biocontrol value: $4.5 billion/yr
*Losey and Vaughan 2006*

*Morandin et al. 2011*
Food Production Services: *Microclimate*

- Windbreaks increase vegetable and fruit yields from 16-56%
  
  *Baldwin 1988*
Air Quality

- One acre of tree cover can remove 80 lbs of air-borne pollutants/year  
  Nowak and Heisler 2010

- Total air pollution removal ($O_3$, PM$_{10}$, NO$_2$, SO$_2$, CO) by urban trees is estimated at 711,000 tons, worth $4.8 billion/year  
  Nowak et al. 2006
Phytoremediation

Over 400,000 brownfield sites may be suitable for agriculture with appropriate redevelopment

US GAO 2012
Phytoremediation

Willow and poplars can be effective for Cd, Zn, and organic pollutants
Isebrands and Richardson 2014

Fruit and nuts from trees and shrubs are very low in trace metals
Pauline and Saumel 2014

Gilman Blvd Edible Landscape, Issaquah, WA
Extreme Weather Adaptation

Image by the Denver Post
Extreme Weather Adaptation

🌱 Deep rooted trees and shrubs offer resilience to droughts and floods. *Garret 2009*
Urban Heat Island Mitigation

- Peak air temperatures in tree groves are 9°F (5°C) cooler. *EPA 2013*

- A 1% increase in urban forest canopy can reduce max temps down 0.07–0.36°F. *Nowak et al. 1996*
An Old Idea Takes Root in Cities

Farming Food Forests

Imagine growing forests full of free food right in the middle of cities. Nutritious, tasty food would be available for the picking. Forest areas would help clean and cool the city air. Wildlife would find a safe habitat. Urban, or city, dwellers could enjoy the beauties of nature.

The Mini Page talked with experts on food forests to learn more about this growing idea.

Layers of food

Many jobs

Food forest designers look for plants that do a variety of jobs. Besides providing food or medicine, the plants might attract helpful insects, return nutrients to the soil or supply mulch. Filling every part of the forest with food-producing plants helps keep down weeds.

Food forests provide more than a variety of foods. Dave Jacke, a food forest researcher, says the ideal food
1. CANOPY (LARGE FRUIT & NUT TREES)
2. SUB-CANOPY LAYER (DWARF FRUIT TREES)
3. SHRUB LAYER (CURRANTS & BERRIES)
4. HERBACEOUS (COMFREY, BEETS, HERBS)
5. RHIZOSPHERE (ROOT VEGETABLES)
6. SOIL SURFACE (GROUND COVER, STRAWBERRY)
7. VERTICAL LAYER (CLIMBERS, VINES)
Hazelwood Food Forest  Pittsburg, PA

Established in 2010

¼ acre

Over 100 edible species

Images from Hazelwood Food Forest
Each public dollar invested in agricultural research and extension generates $20 or more...
