

The Science of Organics: Nourishing the Land, Animals and People



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“Organic agriculture is an ecological production management system that promotes and enhances biodiversity, biological cycles and soil biological activity. It is based on minimal use of off- farm inputs”.

- USDA-NOSB, April 1995

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USDA Regulations and Labeling

- 100% Organic or Organic– requires all organic ingredients and processing aids, excluding water and salt
- Excludes use of GMO, sewage sludge and ionizing radiation

<http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELDEV3004446&acct=nopgeninfo>

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Senate Resolution 440, June 2008

Recognition of Soils as an Essential Natural Resource

...Whereas soil, plant, animal and human health are intricately linked and the sustainable use of soil affects climate, water and air quality, human health, biodiversity, food safety and agricultural production.

....despite soil's importance to human health, the environment, nutrition and food, feed, fiber, and fuel production, there is little public awareness of the importance of soil protection

...Whereas the degradation of soil can be rapid, while the formation and regeneration processes can be very slow;

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Soil Functionality

Regulates water flow
Sustains plant and animal life
Filters potential pollutants
Cycles nutrients
Supports structures



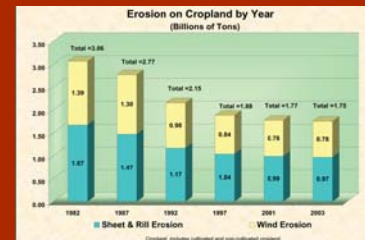
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Threats to Functionality Loss of Soil Fertility

Erosion

Soil compaction

Loss of soil organisms



2003 Natural Resources Inventory – Soil Erosion

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Role of Organic Agriculture and Soil



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Pesticides leach into ground water supplies

- 50% of US residents depend on groundwater for drinking water
- 95% of rural residents in US depend on groundwater

www.epa.gov/agriculture/ag101/pestrisk.html

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Organic Farming Practices Improves Soil Fertility and Productivity

- Productivity measured on a net return per-ha basis are equal between no till and organic systems. - Miller, et. al., 2008
- crop rotations and weed management during a 3 year transition plus a fourth year comparative study in Iowa resulted in comparable grain yields. - Delate, et. al., 2004

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Consumer attitudes

- Food and Farm 2004 survey
- nationally representative sample, 1000 respondents
 - 79% of women respondents say that pesticides, hormones and antibiotics used to produce foods pose moderate to high risk of harm to human health.
 - 61% of men

» http://organicvalley.coop/pdf/roper_survey.pdf

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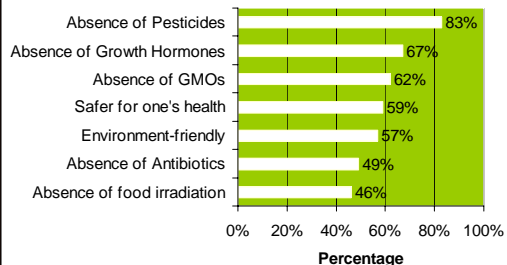
Organic purchasing decisions by consumers

- In 2005 23% of U.S. consumers purchase organic products on a weekly basis, up from 17% in 2000
- 73% of U.S. consumers purchase organic food on an occasional basis

- The Hartman Group, *Organic 2006*

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Implied Properties



- The Hartman Group, *Organic* 2006

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Organophosphorous Pesticides

- Developed from nerve agents used in WWII
- Disrupts the enzyme that regulates neurotransmitters



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Pesticide Exposure in Food

Sources:

- Insecticides applied in the field
- Herbicides applied in the field
- Fungicides applied in storage and transport
- Rodenticides applied in storage and transport

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Vulnerable populations:

- Crop duster pilots and pesticide applicators
- Farmers, farm workers and their families
- Infants and children



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Increased rates of pesticide related cancers in families of farm workers

- Neuroblastoma
- Nervous system tumors
- Hodgkins disease
- Bone and brain cancer
- Childhood leukemia
 - » Buckley et al, 1989, Bunin et al, 1990, Daniels et al, 1997, Kristensen et al, 1996, Curl et al, 2003

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Dietary Pesticide Exposure in Children

Widely used agricultural pesticides are found in the urine of children.

- Common food sources of high pesticide exposure
- Fruits, juices and vegetables

Lu et al, 2006, Curl et al, 2003

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Pesticide Residues on Food

- Highest load
 - Peaches
 - Apples
 - Sweet bell peppers
 - Celery
 - Nectarines
 - Strawberries
 - Cherries
 - Pears
 - Grapes – imported
 - Spinach



- Lowest load
 - Onions
 - Avocado
 - Sweet corn – frozen
 - Pineapples
 - Mango

Source:
Environmental Working Group
www.ewg.org

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Food sales and consumer trends.



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Growth in Organic Food Sales

- From 1997 to 2005 growth in organic food sales fluctuated between 15 and 21 % per year
- Organic penetration in the food market increased from 0.81% in 1997 to 2.48% in 2005

- OTA 2006, Marketing Survey

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Price Sensitivity

- Price is the barrier most often identified
- Over half the respondents would pay up to 30% more for organic products of: Fruit, Fresh vegetables, Meat/poultry, Baby Food

- The Hartman Group, *Organic 2006*

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Demographics

- 17.4% of Organic consumers had household incomes less than \$30,000 per year
- Asian Americans and Latino/Hispanic consumers are as likely to purchase organic food as the general population
 - Latino/Hispanic are more likely to be Core consumers

- Hartman Group, *Organic 2006*

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Professional Guidance and Resources:

ADA Position Paper

ADA Sustainable Food Systems Report and Primer

ADA Hunger and Environmental Nutrition DPG, Organic Talking Points

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Position of the American Dietetic Association:

Food and Nutrition Professionals Can Implement Practices to Conserve Natural Resources and Support Ecological Sustainability

J Am Diet Assoc; 107(6):1033-1043, June, 2007

It is the position of the American Dietetic Association to encourage environmentally responsible practices that conserve natural resources, minimize the quantity of waste generated, and support the ecological sustainability of the food system – the process of food production, transformation, distribution, access and consumption.



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ADA Sustainable Food Supply Taskforce Report and Primer March 2007

- HOD dialogue session October 2005
- Charge of the taskforce:
 - Identify role of ADA members in supporting a sustainable food supply that is healthful and safe
- http://www.eatright.org/cps/rde/xchg/ada/hs.xsl/governance_11642_ENU_HTML.htm



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Resources:

ADA Hunger and
Environmental
Nutrition DPG#15
Organic Talking
Points

www.HENdpg.org



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American Public Health Association Position Statements that support organic agricultural practices:

(www.APHA.org)

- Toward a Healthy Sustainable Food System
- Preserving antibiotic effectiveness
- The environment and children's health
- Protecting human milk from persistent toxic chemical contaminants

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Food and Agricultural Policy

- Education
- Local and State Food Policy Councils
- Federal Food, Nutrition and Agriculture Bills

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Additional Resources:

The Leopold Center for Sustainable Agriculture

www.leopold.iastate.edu

The Organic Center

www.organiccenter.org

The Organic Farming Research Foundation

www.ofrf.org

The Organic Trade Association

www.ota.com

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"The history of every nation is eventually written by the way in which it cares for its soil"

- FDR



Questions?



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References

- American Dietetic Association Food Sustainable Food System Task Force. (2007). "Healthy Land, Healthy People: Building a Better Understanding of Sustainable Food Systems for Food and Nutrition Professionals." www.eatright.org/cps/rde/xchg/ada/hs_xsl/governance_11647_ENU_HTML.htm. Accessed June 23, 2008.
- Curl, CL, Fenske, RA and Elgethun, K. (2003). "Organophosphorous pesticide exposure of urban and suburban preschool children with organic and conventional diets." *Environ Health Perspect.* 111:377-382.
- Delate, K and Cambardella, CA. (2004). "Organic Production: Agroecosystem Performance during Transition to Certified Organic Grain Production." *Agron J*: 96:1288-1298.
- Dimitri, C. and Oberholtzer, L. (2008). "The U.S. Organic Handling Sector in 2004: Baseline Findings of the Nationwide Survey of Organic Manufacturers, Processors and Distributors, EIB-36." U.S. Department of Agriculture, Economic Research Service, April 2008. www.ers.usda.gov/data/organic. Accessed July 10, 2008.
- Dimitri, C. and Venezia, KM. (2007). "Retail and Consumer Aspects of the Organic Milk Market, LDP-M-155-01." (2007). U.S. Department of Agriculture, Economic Research Service, May 2007. www.ers.usda.gov. Accessed July 10, 2008.
- Environmental Protection Agency. *Risk of Pesticide Use*. www.epa.gov/agriculture/ag101/pestrisk.html. Accessed June 10, 2008.
- Harmon, AH and Gerald, BL. (2007). "Position of the American Dietetic Association: Food and Nutrition Professionals Can Implement Practices to Conserve Natural Resources and Support Ecological Sustainability." *J Am Diet Assoc.* 2007; 107:1033-1043.
- Hartman Group. (2006). "Organic 2006: Consumer Attitudes and Behavior, Five Years Later and Into the Future." A National Study Conducted by the Hartman Group, Inc., Spring 2006.

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References cont'd.

- Hunger and Environmental Nutrition DPG#15. (2007). "Organic Food Production Talking Points." www.hendpg.org. Accessed June 23, 2008.
- Lu, C, Barr, DB, et al. (2008). "Dietary intake and its contribution to longitudinal organophosphorous pesticide exposure in urban/suburban children." *Environ Health Perspect.* 116:537-542.
- Lu, C, Toepf, K, et al. (2006). "Organic diets significantly lower children's exposure to organophosphorous pesticides." *Environ Health Perspect.* 114:260-263.
- McCullum, C., DeJardins, E., Kraak, VI, Ladipo, P. and Costello, H. (2005). "Evidence-Based Strategies to Build Community Food Security." *J Am Diet Assoc.* 105:278-283.
- Miller, PR, Buschena, DE, Jones, CA and Holmes, JA. (2008). "Transition from Intensive Tillage to No-Tillage and Organic Diversified Annual Cropping Systems." *Agron J*; 100:591-599.
- Natural Resources Inventory, 2003. www.nrcs.usda.gov/technical/NRI/2003/nri03eros-mrb.html. Accessed June 10, 2008.
- Organic Valley Family of Farms. (2004). "Food and Farm Survey, 2004." http://organicvalley.coop/pdf/roper_survey.pdf. Personal communication February 2007.

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References cont'd.

- S. Res. 440, 100th Congress, 2nd Session, January 31, 2008. "*Recognizing soil as an essential natural resource, and soils professionals as playing a critical role in managing our nation's soils resource.*" www.soils.org/sciencepolicy/files/soils-resolution.pdf
- Stevens-Garmon, J., Chung LH and Lin, BH. (2007). "Organic Demand: A Profile of Consumers in the Fresh Produce Market." *Choices*. 2nd Quarter 2007; 22(2). www.choicesmagazine.org. Accessed May 20, 2008.
 - United States Department of Agriculture, National Organic Standards Board.
www.usda.gov/wps/portal/nutpl/s.7_0_A/7_0_1OB?navid=ORGANIC_CERTIFICATION&parentnav=AGRICULTURE&navtype=RT
 - Versteegan, M and Neubauer, S. (2008). "Organic Foods: Are They a Safer, Healthier Alternative?" *Nutrition in Complementary Care DPG Newsletter*. Fall 2008; 11 (2).

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