Parks and Communities without Toxics Pesticides

Lane County Parks,
Willamalane Park and
Recreation District,
Eugene Parks and
Open Space Divison

Springfield, Oregon

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Beyond Pesticides
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The Federal Pesticide Policy Context

Rachel Carson

56th Anniversary of *Silent Spring*

Rachel Carson's landmark book, *Silent Spring*, published in 1962 –56 years ago, has provided us with guiding principles, an affirmation of core values, routed in scientific understanding of biological systems that are central to the sustainability of our environment and our very existence.

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Pesticide-Free Park and Turf Management

- **Topics:**
  Soil testing
  Soil conditioning
  Aeration
  Water-retention

What's In A Pesticide?

Active Ingredients are by nature biologically and chemically active against the target pest, be it an flying insect, microbe, or fungus. By definition, these materials kill living things.

Inert Ingredients are often as toxic as the active ingredient, although the law defines these materials as "secret business information." Inerts, often petrochemicals, like benzene, toluene or xylene, generally make up the largest percentage of a pesticide formulation. Inerts are the solution, dust, or granule into which the active ingredient is mixed. Inerts generally make up the majority of the pesticide product formulation.

Contaminants and impurities are often a part of the pesticide product and are responsible for the product hazards. Dioxins are contaminants in pentachlorophenol, created as a function of the production process.

Metabolites, often more hazardous than the active ingredients, are breakdown products which form when the pesticide mixes with air, water, soil or living organisms.

30 Commonly Used Lawn Pesticides Health Effects

- 16 are likely, probable or possible carcinogens
- 17 are known or suspected endocrine disruptors
- 12 are linked to birth defects
- 21 are reproductive toxicants
- 25 cause kidney or liver damage
- 26 are sensitizers/irritants

30 Commonly Used Lawn Pesticides

- 19 are groundwater contaminants
- 22 are toxic to birds
- 30 are toxic to fish and other aquatic life
- 29 are toxic to bees

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Chronic poisoning

- Frog deformities have been linked to a number of pesticides, including atrazine, glyphosate, and other herbicides.

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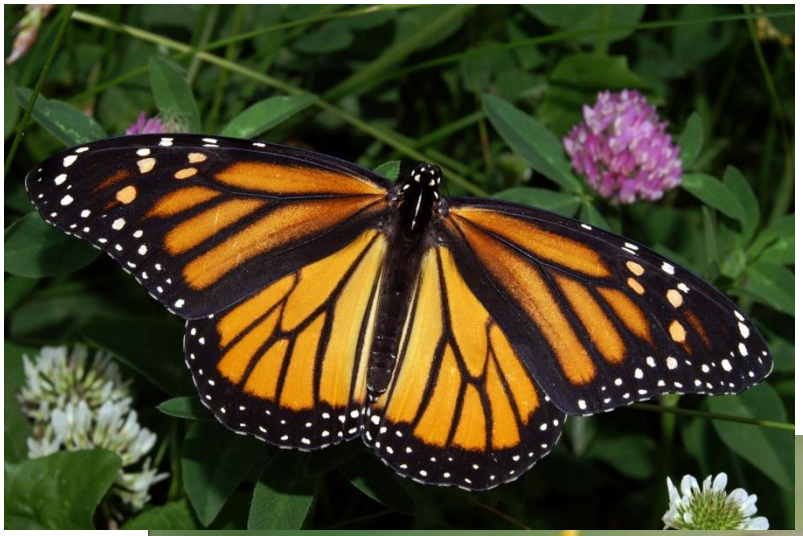
Indirect effects of pesticides

- Herbicides can cause a reduction in habitat or food, such as milkweeds used by monarch butterflies.
- Systemic insecticides can harm pollinators, including honey bees and wild bees.



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Key Studies

Children's Vulnerability

American Academy of Pediatrics

2012

"Children encounter pesticides daily and have unique susceptibilities to their potential toxicity. Acute poisoning risks are clear, and understanding of chronic health implications from both acute and chronic exposure are emerging. **Epidemiologic evidence demonstrates associations between early life exposure to pesticides and pediatric cancers, decreased cognitive function, and behavioral problems**."

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Organic Practices & Policy

- "Systems Approach"
- National List of Allowed and Prohibited Substances

  See **"Fertilizers Compatible with Organic Landscape Management,"** list

- Certification and Inspection
- National Organic Standards Board

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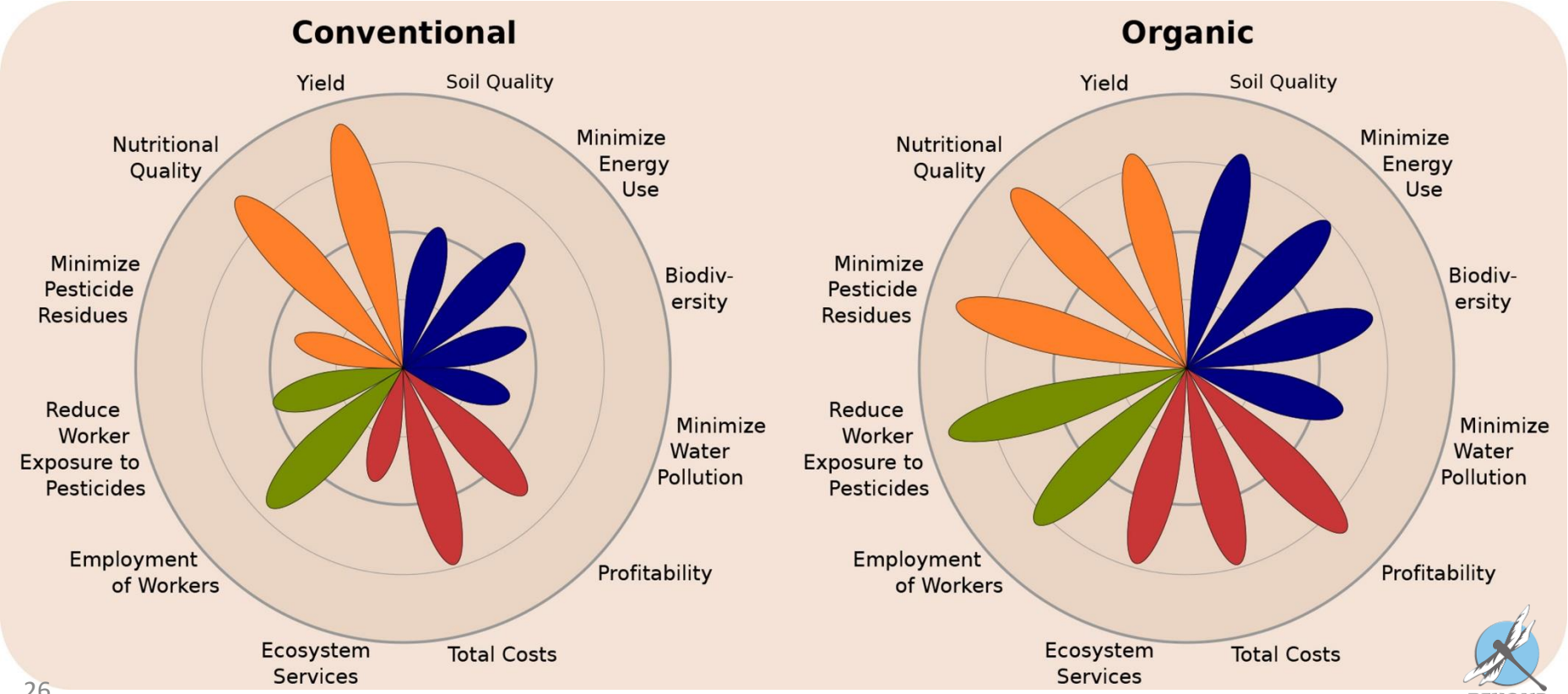
Washington State University 2016 Study: Numerous benefits from organic production

An organic turfgrass system also:

■ Improves soil quality ■ Minimizes energy use ■ Increases biodiversity ■ Minimizes water pollution ■ Minimizes pesticide residues ■ Reduces worker/applicator exposure to pesticide residues ■ Improves ecosystem services ■ Equal or less cost in long term while landscape quality is maintained



Reaganold, John and Jonathan Wachter. 2016. Organic agriculture in the 21st Century. *Nature Plants*. 2. 15221. http://www.nature.com/articles/nplants2015221

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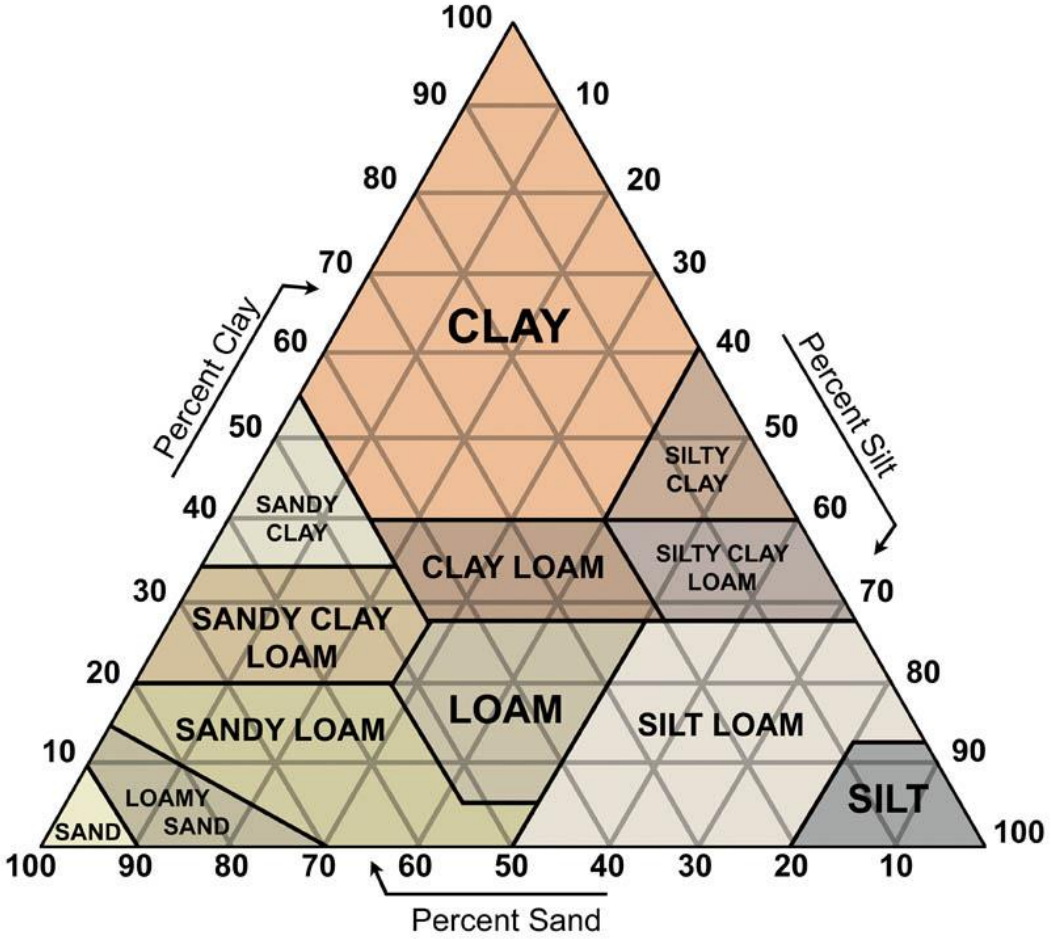
Soil Textural Triangle



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Soil Chemistry Basics

- pH (Acidity or Alkalinity)
- Nutrient Management
- Organic Matter (OM) and Cation Exchange Capacity (CEC)

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Soil Biomass and Microorganisms

- Soil biomass is the foundation upon which our nutrient program is based.
- In taking a “feed the soil” approach, soil microbes are at the heart of our management strategy.
- Natural, organic fertilizer is broken down by the microbial life to nutrients for the plant.
- *Synthetic fertilizers by their nature, and with high salt content, compromise the activity and resiliency of the life in the soil.

Managing the Biomass

- **Compost Tea**

  Large number of microbes to soil

- **Humates**

  Builds healthy soil; Increased organic matter which helps to reduce N loss through leaching; Contains carbon as an energy source for microbes; Improves soil structure, aggregation, water filtration, aeration, and water-holding capacity

  Increases nutrient availability to the grass plant; Facilitates mineral breakdown; Increases microbial activity overall; And, helps with root growth and expansion, and chlorophyll density

- **Compost**

  Increases soil organic matter; When combined with over-seeding, enhances germination and establishment; By virtue of its neutral pH and healthy microbial population, helps counteract naturally acidic soils without lime; During decomposition, continues to release nutrients over time.

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Transition Period

- When moving from a conventional program to a natural “systems approach”, the length of transition is directly related to the intensity of current and past management practices and the overall turf quality.
- After years of synthetic, water-soluble fertilizers with high salt levels, the soil microbiology may likely be bypassed and somewhat compromised.
- Don’t expect a collapse or failure.

Fertility and Turfgrass Nutrition

- Nitrogen (N), Potassium (K) and Phosphorus (P).
- Nitrogen not just from liquid fertilizer, also from compost topdressing, compost tea and humic substances, microbial inoculants, and grass clippings.
- Synthetic fertilizers provide “quick green-up,” but pollute and require many applications.

  1) Synthetics treat *symptoms*

  2) Synthetics do not nourish whole systems and overall root health
- Organic fertilizers work with soil microbial life.

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Cultural Practices

- **Irrigation**
  - Deep watering
- **Cultivation**
  - Need non-compacted, aerobic soils
- **Over-seeding**
  - Maximum density of grass suppresses weeds
- **Mowing** (to aid photosynthesis)
  - 3 inches

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A Precautionary Approach

Overall, 155 local ordinances that regulate the use of toxic chemicals in parks and playgrounds. 58 local ordinances ban the use of glyphosate.

"We have determined that prophylactic use, such as a seed treatment, of the neonicotinoid pesticides that can distribute systemically in a plant and can potentially affect a broad spectrum of non-target species is not consistent with Service policy. We make this decision based on a precautionary approach to our wildlife management practices and not on agricultural practices." (Fish and Wildlife Service, 2016)

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