Common Sense Solutions

Elizabeth McVeety, CPRP
Garden Center Coordinator
Zilker Botanical Garden
IPM Defined

- Common sense practices
- Most economical
- Protects people, property and environment
Zilker Botanical joins EPA’s PESP May 8, 2012
We’re all in this together

- Widespread agricultural pollution of land and seas
- Accelerated soil loss
- Damage to fish and aquatic life
- Pesticide Buildup in our bodies
- Decline in nutritional value of our food
Bees Pollinate approximately 75% of the fruits, nuts and vegetables grown in this country

$14 billion annually

Disappearance of bees may the biggest general threat to our food supply

Neonicotinoids (imidacloprid) linked to colony collapse
Parkinsons linked to pesticide use

- Maneb, Ziram, Paraquat, Benomyl, Permethrin
- No only farmworkers
Pesticide Risks to Human Health & the Environment

- Organophosphates (Orthene, Cygon, Aztec)
- N-methyl carbamates (Temik, Ficam)
- Triazines (Atrazine, Weed and Feed)
- Chloroacetanilides, (alachlor-Lasso)
- Pyrethrins/pyrethroids (Ambush, Permethrin).
Reasons to Go Organic*

- Improved Health
- Cost-Effectiveness
- Time Savings
- Healthier Plants
- Plants are more stress tolerant
- Crops have improved food quality and taste
- Improved environment

*from Organic Management for the Professional, Howard Garrett, John Ferguson, Mike Amaranthus
Best Practices

- Healthy plants lessen the need for treatment
- Proper Design - Right Plant in the Right Place
- Improve Soil Health
- Proper Installation
- Proper Maintenance
Design Elements

- Mature height and width
- Consider plant hardiness, nutrient, light and water needs
- Choose well adapted, disease resistant varieties
- Order, balance, proportion
- Harmony, unity
- Flow, rhythm, transition
It all starts with the soil

- Soil test
- Drainage
- Compost
- Soil amendments
Soil Sampling

- Soil, Water and Forage Testing Laboratory
  2474 TAMU
  College Station, TX  77843

- Texas Plant & Soil Lab
  5115 West Monte Cristo Rd.
  Edinburg, TX  78541
SOIL COMPOSITION

<table>
<thead>
<tr>
<th>ORGANIC MATTER</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Misc</th>
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</thead>
<tbody>
<tr>
<td>TEXTURE</td>
<td>Sandy</td>
<td>Loam</td>
<td>Clay</td>
<td>Mis</td>
</tr>
<tr>
<td>pH</td>
<td>Acid</td>
<td>Neutral</td>
<td>Alkaline</td>
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</tr>
</tbody>
</table>

AVAILABLE SOIL NUTRIENTS:

- Amounts of soluble soil nutrients that are immediately available to plants.

<table>
<thead>
<tr>
<th>NITRATES (NO₃)</th>
<th>Poor</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHOSPHORUS (P)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POTASSIUM (K)</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CALCIUM (Ca)</td>
<td></td>
<td></td>
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</tbody>
</table>

MICRONUTRIENTS:

- Calculated Availability

<table>
<thead>
<tr>
<th>IRON (Fe)</th>
<th>Poor</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANGANESE (Mn)</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZINC (Zn)</td>
<td>X</td>
<td></td>
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</tbody>
</table>

RECOMMENDATIONS:

- **ORGANIC MATTER**: The available humus fraction (slow release nitrogen) is the foundation of any soil fertility or plant nutrition program. Our tests measure only the humic (well decomposed - available) portion. To build O.M., it is a long-term process. Use manure, composts, humates and other humic products for fast results in the soil-building program. Supplemental products such as Organic Formulas, humic/lignin products, soil inoculants, compost teas, fish products, vegetable meals, etc. should also be beneficial.

- **NITROGEN**: Tests adequate - keep to a minimum.

- **PHOSPHATE**: Use ½ lb/1000 sq ft. of P₂O₅ or PHOSPHATE: (Natural Organic) Work into soil or broadcast at least 2-6 lb/1000 sq ft of a finely ground rock. Phosphate, mix 20% as much fine sulfur for natural acidification to help release P and other nutrients. Should last for several years when enough is used. Apply in band on alkaline soils. A good livestock compost, chicken litter or Guano can also supply P.

- **POTASH**: Use 1 lb/1000 sq ft of K₂O or POTASH: build reserves with rock minerals: greensand, lava, granite dust, etc. Also, commercial red 0-0-60 can be a mined natural mineral an economical source to correct major deficiencies.

- **SULFUR**: Use up to 80 lb/ac (2 lb/1000 sq ft of area) it is best when used 2 or 3 times a year. (S effect lasts only 45-90 days in most cases.) Sulfur improves the physical condition (tilth) of the soil for better water and root penetration and increase nutrient availability. Sulfur activates Sulfur helps the available water (H₂O) soluble form. Soluble Ca helps sodium to leach. S can also release P & Ca & Mg by solubilizing them to the available water (H₂O) soluble form. Mulching, when plants are established, with a good grade of compost can also be beneficial each season. Course material on top for shading is beneficial.
Organic Soil Amendments

- Compost
- Cover crops
- Nitrogen: Greensand, Fish Emulsion, Cottonseed, Blood Meal, Worm Castings
- Phosphorus: Rock Phosphate
- Potassium: Alfalfa Meal
- Expanded Shale
- Use slow release 8-2-4 fertilizer
Set plant at same soil depth in which it grew in its container.
Girdling Roots need to be dealt with before planting
Reasons for pruning

- Train the plant
- Maintain plant health
- Improve quality of flowers, fruit, foliage or stems
- Restrict or redirect growth
- Never top a tree!
Pruning Basics

- Keep your tools clean and sharp
- Sterilize your tools between trees, shrubs or after cutting diseased wood
- Make clean, directional cuts
- Prune for a good reason!
Proper Pruning Angles
TAMU Earthkind Landscaping Doug Welsh

Figure 5. Pruning back to an intersecting lateral branch
When to Prune

- Early Spring (late February) generally best
- Prune Spring flowering shrubs after bloom.
- Avoid pruning Live Oaks February-June
Stop Crape Murder!
Photos by Greg Grant
Cultural Practices

- Irrigation schedule
- Air circulation
- Mulch
- Practice good sanitation
- Avoid plant stress
- Build soil microbes
Learn to recognize common beneficial insects
Common Pest & Disease Problems
Common Sense Solutions
Determine Cause of Damage
Nematodes

- Microscopic organisms in the soil
- More likely in light sandy soil, low in organic matter
- Symptoms include:
  - Wilting
  - Stunted plants
  - Chlorotic or pale leaves
  - Infected roots swell and form knots or galls
Organic controls for Nematodes

- Rotate plantings
- Use trap crops such as marigolds or annual rye grass
- Grow nematode-resistant varieties
- Destroy infected roots at harvest
- Add organic matter
- Solarize soil and leave fallow
- Stimulate soil biology with compost
- Citrus peelings tilled into soil
- Cedar flakes can be used as a repellant
Chewing Insects

- Spray with Neem as repellant
- Hand Pick
- Nolo (Nosema locustae) for grasshopper control
- Spray with Spinosad
- Bt for caterpillar control
Aphids & Spider Mites
Thrip Damage
Organic Solutions for Sucking Insects

- Encourage beneficial insect predators
- Strong spray of water (repeat every 3 days until aphids, mites are controlled)
- Neem Oil spray
- Horticultural Oil spray
- Insecticidal Soap spray
- Soil nematodes
Sooty Mold on Crape Myrtle
Fungal Disease Control

- Cultural Practices
- Compost tea
- Neem Oil spray
- Serenade Fungicide *Bacillus subtilis*
- “Cornell Formula”, 50/50 water/milk
Weed Control

- Cultural Practices
- Mechanical removal
- Vinegar/soap solution, Green Go
- Corn Gluten
Fire Ants

- Spinosad (Green Light, Fertilome)
- Spot treatments
Tool kit

- **Insecticidal soap**: aphids, whitefly, and spider mites
- **Horticultural oil**: scale, spider mites, aphids, and whitefly
- **B.t. (Bacillus thuringiensis)**: caterpillars
- **Neem Oil**: aphids, mites, thrips, whitefly, fungal diseases
- **Spinosad**: caterpillars, Colorado potato beetle, fire ants
- **Bacillus subtilis** (Serenade) – controls leaf diseases
- **Potassium bicarbonate** – fungicide, ball moss control
“No one can do everything, but everyone can do something”

- Helen Keller