

# Pest Management That Makes \$ense

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## Raising the Horticultural Bar

Presented by

**Linda Novy**

Linda J. Novy & Associates

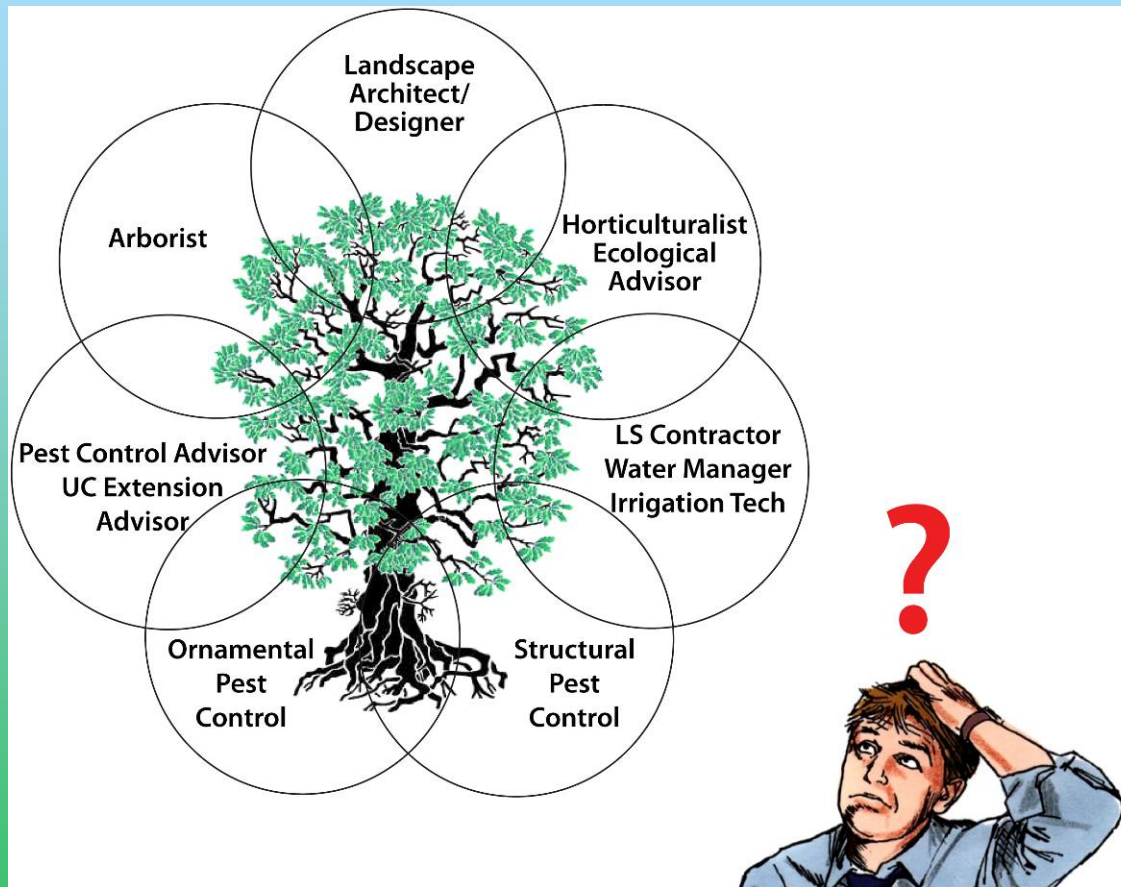
*November 18, 2011*

# Raising the Horticultural Bar

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- Holistic approach to landscape management
- Inter-relationships and synergies between “green” service providers
- How decisions affect natural capital and ecosystem services
- Beginning an ecological dialogue and new business model

# Great Team, But...

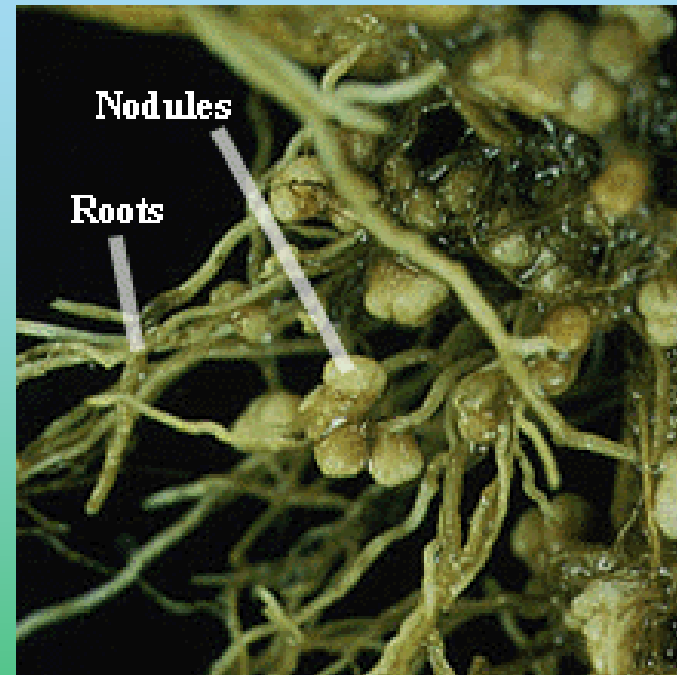


## Who's In Charge?

# Mutually Beneficial Relationships in Nature



*Mycorrhizae*



*Rhizobium*

# Mother Earth Needs Our Help

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# Natural Capital & Ecosystem Services

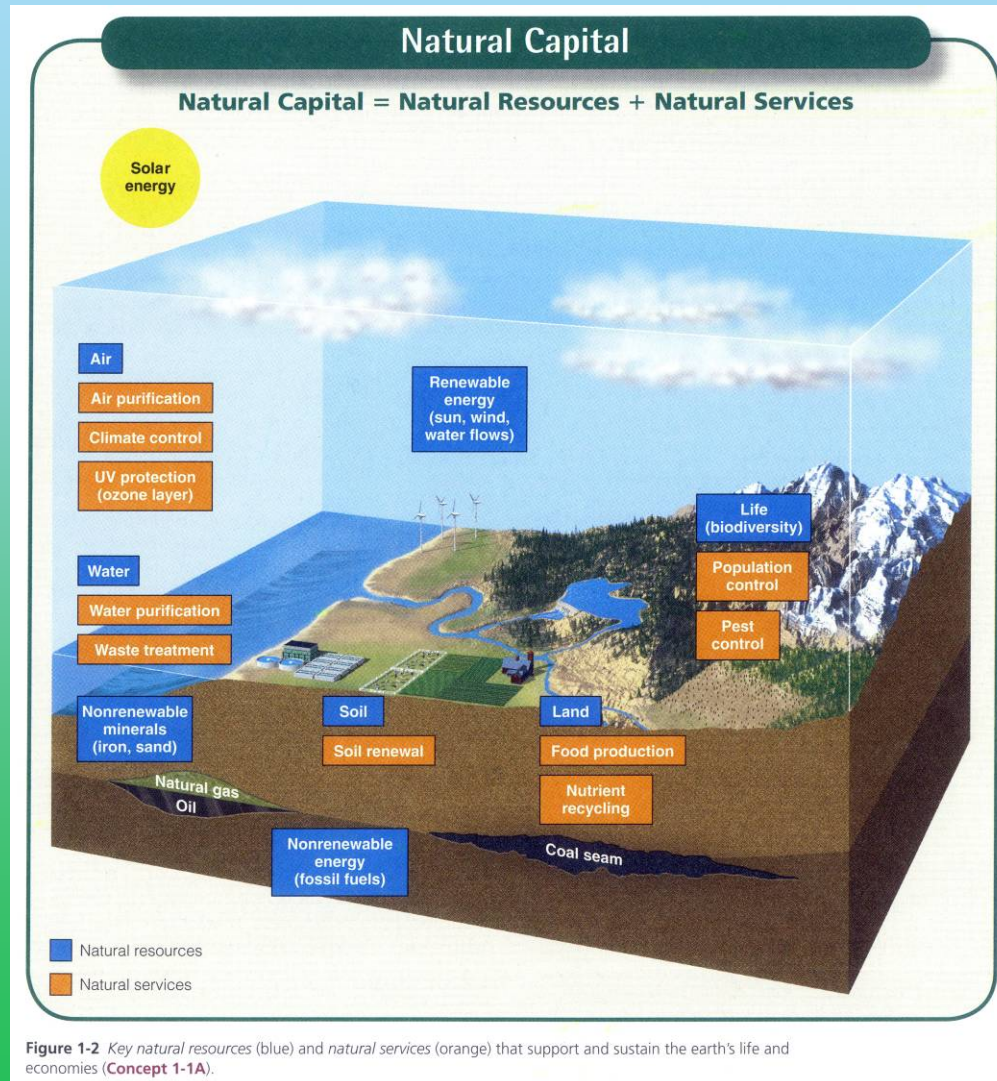
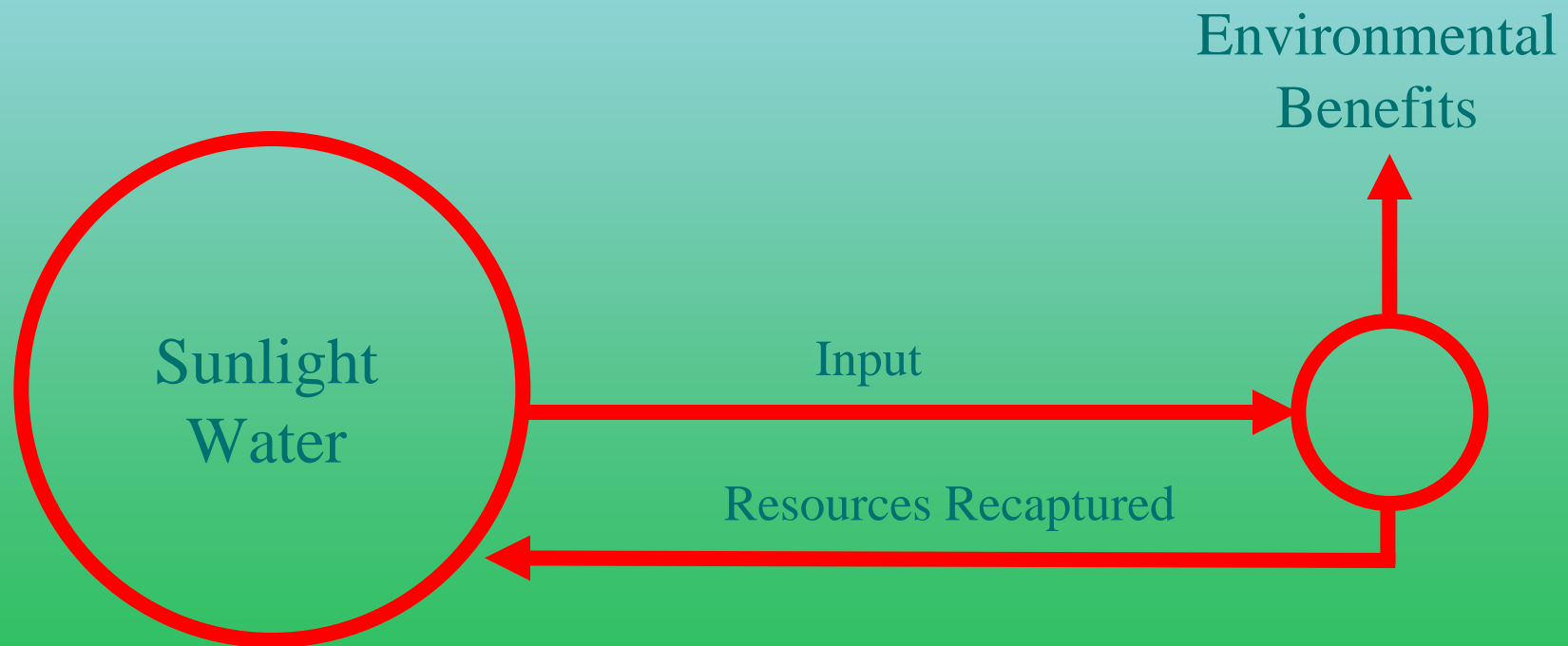


Figure 1-2 Key natural resources (blue) and natural services (orange) that support and sustain the earth's life and economies (Concept 1-1A).



# Closed Loop System

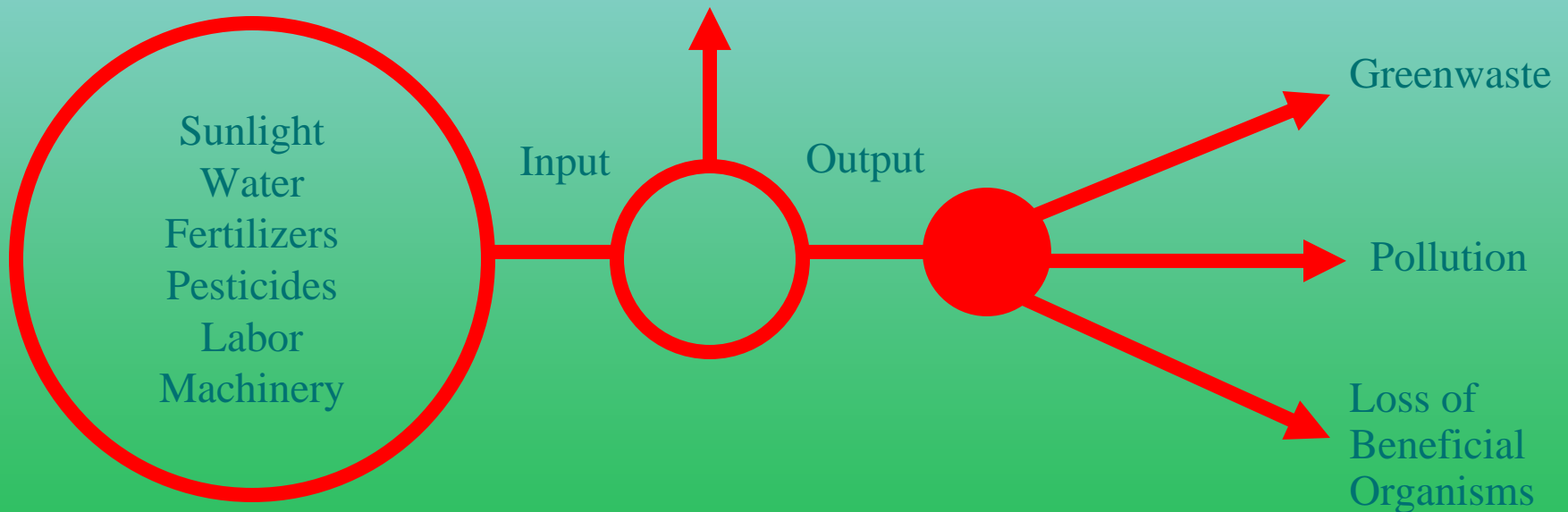
## Sustainable Use of Resources in Nature





# Linear System

## Unsustainable Use of Resources



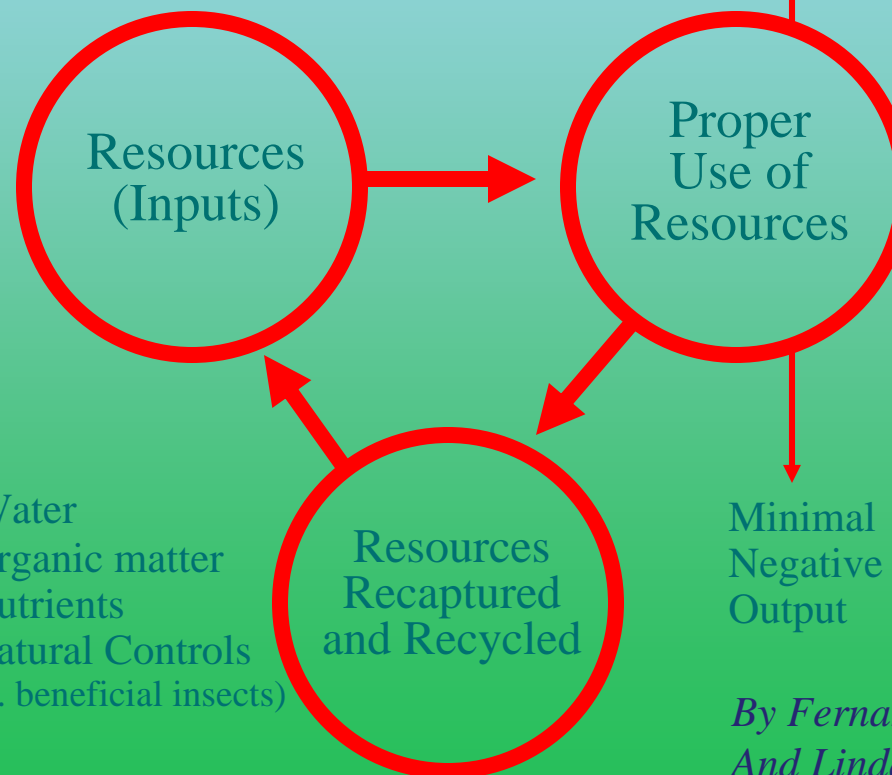


# Sustainable Use of Resources

## Environmental Benefits

- Air & Water Quality - Wildlife Enhancement - Biodiversity
- Temperature Regulation - Reduction of Pollution
- Biosphere Protection

- Solar Energy
- Water
- Soil Nutrients
- Organisms (plants, insects, soil biota)
- Power-Labor and Fossil Fuel
- Eco-Education



- Water
- Organic matter
- Nutrients
- Natural Controls (e.g. beneficial insects)

- Water Management
- Organic matter
- Compost and Site Generated Mulch
- Integrated Pest Management
- Plant Selection
- Soil Management
- Nitrogen-Fixing Plants
- Eco-Literacy

Minimal Negative Output

*By Fernando Agudelo-Silva, Ph.D.  
And Linda J. Novy, September 1999*

# Landscape Footprint

## Resource Inputs



## Outputs



Landscape

Outputs - Inputs = Landscape Status

*By Fernando Agudelo-Silva, Ph.D.  
And Linda J. Novy, November 2011*

# Case Study 1

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## 25-Acre Sonoma County Manufacturing Site

- Site: Lawns, shrubs, oak woodland remnant
- Need: Reduce maintenance costs, improve biodiversity

# Case Study 1

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- Process:
  - Develop intra-company team and a consulting entomologist/ecologist
  - Assessment, material and labor flow, plant communities, infrastructure
  - Address the “low hanging fruit”
  - Enhance ecology
  - Monitor resource use and report



# Results – Case Study 1

Vegetation Comparison Table

Plant cover	1996 sq. ft.	2002 sq. ft.	% Change
Turf	717,570	583,448	-19
Ivy	88,822	17,768	-80
Tall fescue	582,496	379,237	-35
Hypericum	16,192	774	-95
Pepper trees	30,000	0	-100
Eucalyptus trees	236,250	0	-100
Willow trees	10,800	0	-100
Strawberries	2,796	1803	-36
Butterfly garden	0	8,163	100
Boston ivy	10,000	5,000	-50
Rosemary & grasses	0	250,000	100
Pyrus trees	2,000	0	-100
Honey locust	16	0	-100
Undeveloped	4,189,666	4,420,693	-8
Native Plants	TBD	TBD	TBD

Low maintenance areas transitioned naturally to native plants

# Results – Case Study 1

Resource Comparison Table

Site inputs	1997	2001	% Change
Herbicides	6,643 oz.	11,010 oz.	*65% increase
Insecticides	89 oz.	64 oz.	39% decrease
Mulched areas	275,000 sq. ft.	600,000 sq. ft.	118% increase
Fertilizer 21-7-14	1,274 lbs.	500 lbs.	61% decrease
Water (AF)	133	130	2% decrease

# Case Study 2

## San Francisco Commercial Office Building

- Site: Roof Gardens with Urban Forest
- Need: Troubleshoot declining landscape and excessive irrigation expense



# Case Study 2

- Process:
  - Chemical soil testing, horticultural and infrastructure needs
  - Change irrigation
  - New landscape team seasonal meetings
  - Soil restoration, IPM, native plantings
  - Monitor resource use

Soil Analysis Report - Client Copy  
Bartlett Tree Research Laboratories

Bartlett Arborist: Juan Carrasco  
Plant Species: Birch  
Location/ELM ID: Upper bed  
Fertilization Goal: Correct Deficiency

Sample ID: 87838  
Date: 12-Aug-08  
A&L: 08-233-0517

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**Results**

Soil pH 7.5 Too Alkaline  
Ideal pH range for Birch: 5.0 to 6.5

Nitrogen (NO3)	20.0 * Medium	Iron (Fe)	454.0 High
Phosphorous (P)	192.0 Very High	Manganese (Mn)	100.0 * Medium
Potassium (K)	314.0 High	Copper (Cu)	12.2 Very High
Magnesium (Mg)	308.0 * Medium	Zinc (Zn)	53.6 Very High
Calcium (Ca)	4110.0 Very High	Boron (B)	1.4 High
Sodium (Na)	62.0 * Very Low		
Soluble salt	0.4 * Very Low		

Soil Organic Matter (OM) 4.5 Low      Nutrient Retention Capacity 12.1 Very High

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**Recommendations**

Prescription Fertilization	Pounds or Gallons per 1000 sq. ft.	Kg or Liters per 100 sq. m
Nitrogen		
30 - 0 - 0 gallons	1.0	4.1
38 - 0 - 0 gallons	7.0	3.4
Phosphorus		
0 - 30 - 0 gallons	0.0	0.0
Potassium		
0 - 0 - 52 pounds	0.0	0.0
Gypsum	pounds	0.0
Lime	pelletized	0.0
	powdered	0.0
Sulfur	pounds	30.0
Magnesium	pounds	8.0
Iron chelate	gallons	0.0
	pounds	0.0
Manganese	gallons	0.6
	pounds	2.0
Conventional Fertilization		
Boost Natural	50	203.2
Boost	25.0	101.6
Boost Granular	15.0	7.2
Organic Milorganite	40.0	19.2
Mulch or incorporate organic matter:	Yes	

**Comments:**

\* indicates a deficiency    \*\* indicates a potential toxicity  
 \*\*\*Maximum single application limestone 75 lbs pelletized or 50 lbs powdered. Max sulfur 5 lbs on turf or 25 lbs on mulch or bare soil per 1000 sqft.  
 Root Rx: Maximum single application limestone 150 lbs pelletized or 100 lbs powdered. Max sulfur 37.5 lbs on mulch or bare soil per 1000 sqft.  
 F.A. Bartlett Tree Expert Company Copyright 2008. All Rights Reserved

# Case Study 2

- Results:
  - Improved landscape health and function
  - Reduced water and plant costs
  - LEED Credits
  - Established Landscape Management Team



# Case Study 3

- Home Owners Association
- Site: 27 acre site, Daly City
- Need: Master Plan for landscape renovation



# Case Study 3

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- Process:
  - Develop the team
  - Mapping, tree and irrigation surveys
  - Soil, IPM and landscape maintenance assessment
  - Client education, team meetings
  - Pilot projects

# Case Study 3



# Chemical Soil Analysis

## A & L WESTERN AGRICULTURAL LABORATORIES

1311 WOODLAND AVE #1 • MODESTO, CALIFORNIA 95351 • (209) 529-4080 • FAX (209) 529-4736



REPORT NUMBER: 11-034-032

CLIENT NO: 99999

SEND TO: LINDA J NOVY & ASSOC  
PO BOX 969  
FAIRFAX, CA 94978-

GROWER: CROWN COLONY HOA, DALY CITY

SUBMITTED BY: LINDA

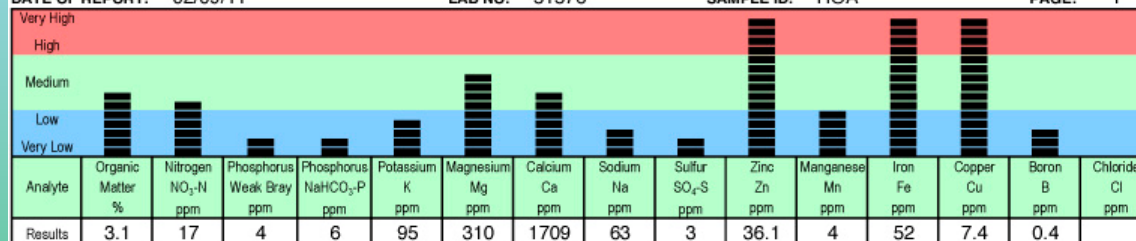
### Graphical Soil Analysis Report

DATE OF REPORT: 02/09/11

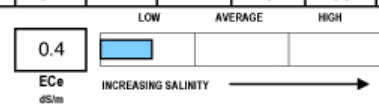
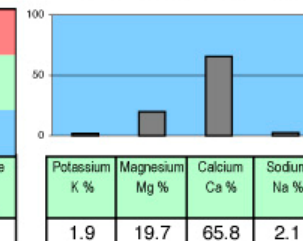
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SAMPLE ID: HOA

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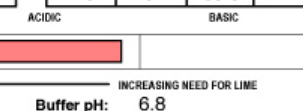
### Percent Cation Saturation (computed)



13.0 CEC meq/100g

L Ex. Lime

6.3 pH



### Soil Fertility Guidelines

CROP: LANDSCAPE

RATE: lb/1000 sq ft

NOTES:

Dolomite (70 score)	Lime (70 score)	Gypsum	Elemental Sulfur	Nitrogen N	Phosphate P <sub>2</sub> O <sub>5</sub>	Potash K <sub>2</sub> O	Magnesium Mg	Sulfur SO <sub>4</sub> -S	Zinc Zn	Manganese Mn	Iron Fe	Copper Cu	Boron B
	50			2.7	2.5	4.5		0.6					

- C** PRIOR TO PLANTING: Spread the above requirements per 1,000 sq ft and mix into the top 6-8 inches of soil. Initially, limit nitrogen to 1.5 lb/1,000 sq ft or 25-30 ppm NO<sub>3</sub>-N to avoid salt damage.
- O** NITROGEN sources include composts and legumes as well as blood meal, cottonseed meal, hoof & horn meal, fish meal, or chicken feather meal. Sodium nitrate is not recommended. Monitor brix levels.
- E** PHOSPHATE: Availability varies with product. However, poultry-based products are a good source.
- N** Otherwise, consider bone meal or soft rock phosphate. Blood & bone meal will also provide nitrogen.
- T** POTASH: Composts may be a significant source of potash. Certain sources of sulfate of potash may also be used, as well as kelp/seaweed products, wood ash, crushed granite and greensand.

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*MB att:iss*

Mike Buttress, CPAg

A & L WESTERN LABORATORIES, INC.

# Soil Food Web Assay



## Foodweb Analysis Soil

### Report prepared for:

Linda J Novy & Assoc.  
Linda Novy  
PO Box 969  
Fairfax, CA 94978 USA

Report Sent: 8/22/2011

Sample#: 01-112247 | Submission: 01-021566

Unique ID: SFW #1

Plant: ornamentals

Invoice Number: 0

Sample Received: 8/4/2011

For interpretation of this report please contact:  
Soil Foodweb Oregon  
[info@oregonfoodweb.com](mailto:info@oregonfoodweb.com)  
(541) 752-5066

*Consulting fees may apply*

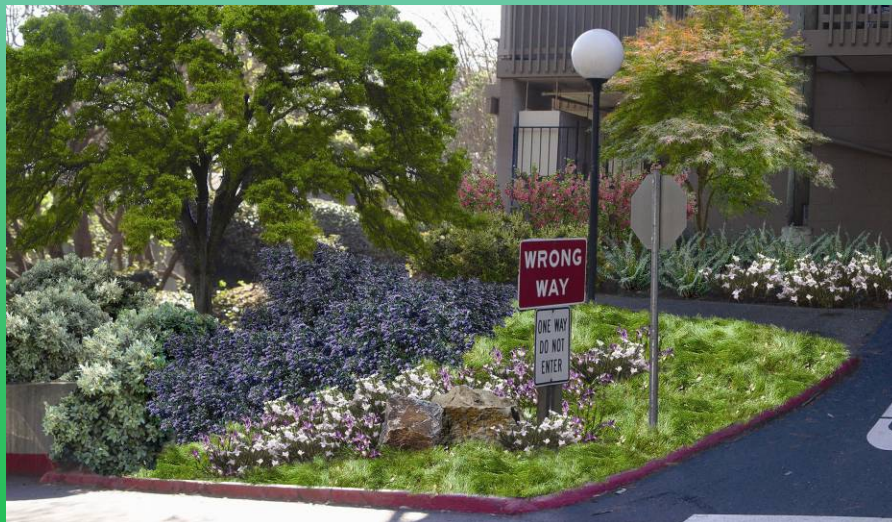
[lindanovy@comcast.net](mailto:lindanovy@comcast.net)

Organism Biomass Data	Dry Weight	Active Bacteria (µg/g)	Total Bacteria (µg/g)	Active Fungi (µg/g)	Total Fungi (µg/g)	Hyphal Diameter (µm)	Nematode detail (# per gram or # per mL) Classified by type and identified to genus. (If section is blank, no nematodes identified.)		
<b>Results</b>	<b>0.890</b>	24.2	671	12.6	372	2.8	Bacterial Feeders	1.74	
<b>Comments</b>	Above Range	Above range	Above range	Below range	In range		Achromadora		0.08
<b>Expected Range</b>	Low: 0.45 High: 0.85	5	20	40	100		Cephalobus		0.68
		15	250	65	500		Monhystrella		0.47
							Plectus		0.04
							Prismatolaimus		0.17
							Prodesmodora		0.13
							Rhabditidae		0.13
							Rhabdolaimus		0.04
							Fungal Feeders	0.59	
							Thonus		0.13
							Tylencholaimus		0.47
							Fungal/Root Feeders	0.81	
							Aphelenchoides	Foliar nematode	0.25
							Aphelenchus		0.04
							Filenchus		0.51
							Predatory	0.04	
							Clarkus		0.04
<b>Results</b>	<b>0.55</b>	<b>0.03</b>	<b>0.04</b>	<b>0.52</b>	100-150	8.05			
<b>Comments</b>	Low	Low	Low	Low					
<b>Expected Range</b>	Low: 2 High: 5	0.1	0.15	0.1	0.75	1.5			
		0.15	0.15	1.5					

635 SW Western Blvd Corvallis, OR 97333 USA  
(541) 752-5066 | [info@oregonfoodweb.com](mailto:info@oregonfoodweb.com)  
[www.oregonfoodweb.com](http://www.oregonfoodweb.com)

01-112247: Page 1 of 2

# Pilot Project



# Case Study 3

- Results:
  - New sustainable landscape specifications
  - Soil management and resource recapture program
  - Shift IPM to Arborist
  - Restoring native plant communities and urban forest
  - Client committed to ecological approach



# Case Study 4

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- Private Home Owner
- Site: 1.5 acre site, San Anselmo
- Need: Restore native plants, coordinate services



# Case Study 4

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- Process:
  - Soil and landscape assessment
  - Meet and coordinate the team
  - Monthly implementation with each service provider
  - Soil restoration and maintenance modification
  - Removal of invasive non native species

# Case Study 4

## A & L WESTERN AGRICULTURAL LABORATORIES

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REPORT NUMBER: 11-180-116

CLIENT NO: 99999

SEND TO: LINDA NOVY & ASSOCIATES  
PO BOX 969  
FAIRFAX, CA 94978-

GROWER:

SUBMITTED BY: LINDA

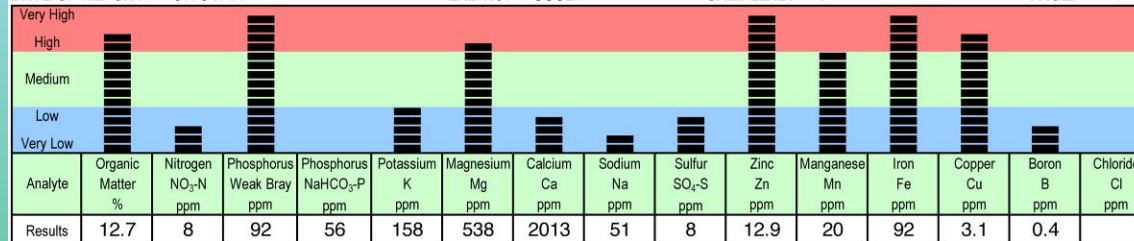
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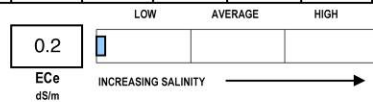
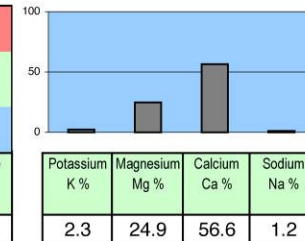
LAB NO: 55621

SAMPLE ID: 1

PAGE: 1



### Percent Cation Saturation (computed)



CEC meq/100g: 17.8

Ex. Lime: L

pH: 6.0



NaHCO<sub>3</sub>-P unreliable at this soil pH

### Soil Fertility Guidelines

CROP: NATIVES

RATE: lb/1000 sq ft

NOTES:

Dolomite (70 score)	Lime (70 score)	Gypsum	Elemental Sulfur	Nitrogen N	Phosphate P <sub>2</sub> O <sub>5</sub>	Potash K <sub>2</sub> O	Magnesium Mg	Sulfur SO <sub>4</sub> -S	Zinc Zn	Manganese Mn	Iron Fe	Copper Cu	Boron B
	70			2.2		3.5		0.6					

- C** MICRONUTRIENTS: Where levels appear to be high, avoid any further applications for the time being. Very high (VH) levels may not necessarily be toxic, but avoid. Maintain correct soil pH.
- M** NITROGEN sources include composts and legumes as well as blood meal, cottonseed meal, hoof & horn meal, fish meal, or chicken feather meal. Sodium nitrate is not recommended. Monitor brix levels.
- E** POTASH: Composts may be a significant source of potash. Certain sources of sulfate of potash may also be used, as well as kelp/seaweed products, wood ash, crushed granite and greensand.
- T** MAINTENANCE: Split the above amount over the year at a time according to local conditions and requirements. Choose a source that best fits this combination.

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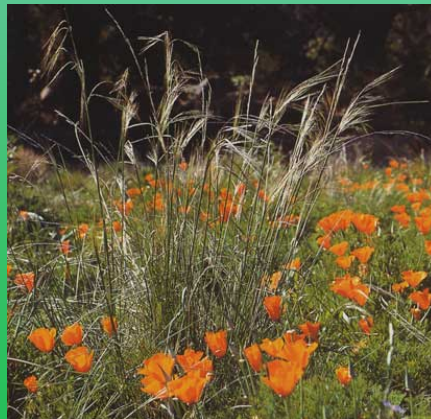
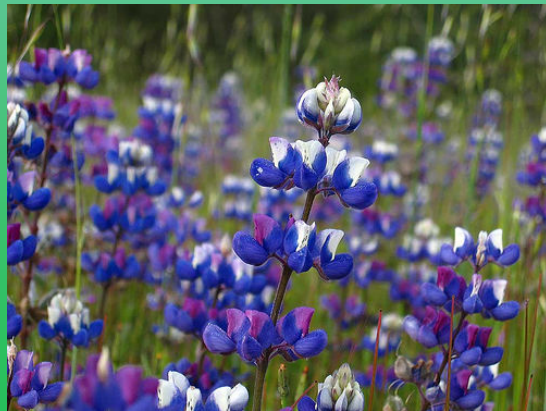
*MB*  
Mike Buttress, CPAg  
A & L WESTERN LABORATORIES, INC

# Case Study 4



# Case Study 4

- Results:
  - Coordinated service delivery
  - Soil management, compost, chips and AACT
  - Reduced IPM treatments
  - Restoring native plant communities
  - Client committed to ecological approach



# 5 Key Points

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- **Perform a site evaluation** for each new project.
- **Create a professional network** with other service providers. Meet seasonally onsite.
- **Educate staff and clients about the ecology** of each property.
- **Commit to Sustainability and Environmental Restoration.**
- **Provide ongoing monitoring.**

# Thank You!

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