

Nutrient Management

Landscape Ornamentals

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Virginia Tech Hampton Roads AREC

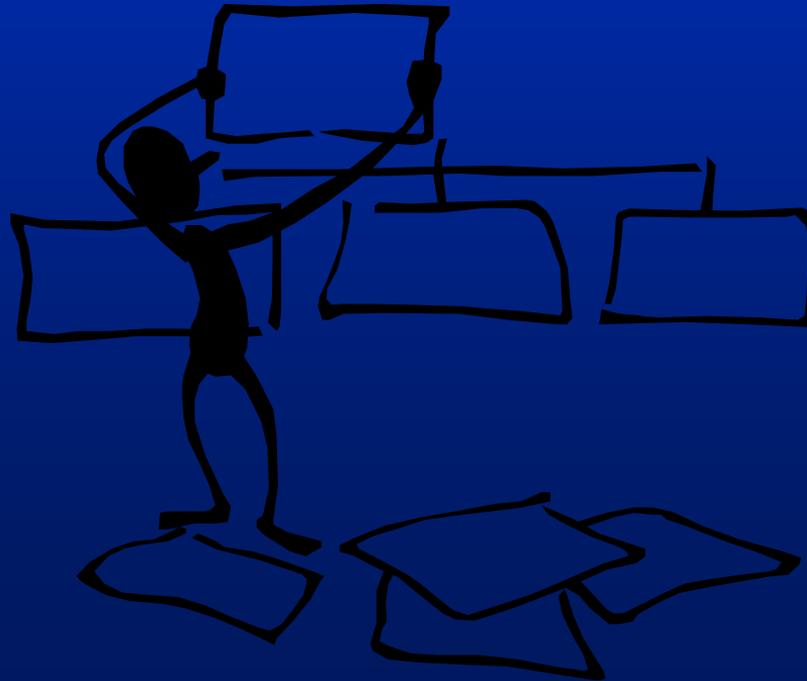


Where do you start?

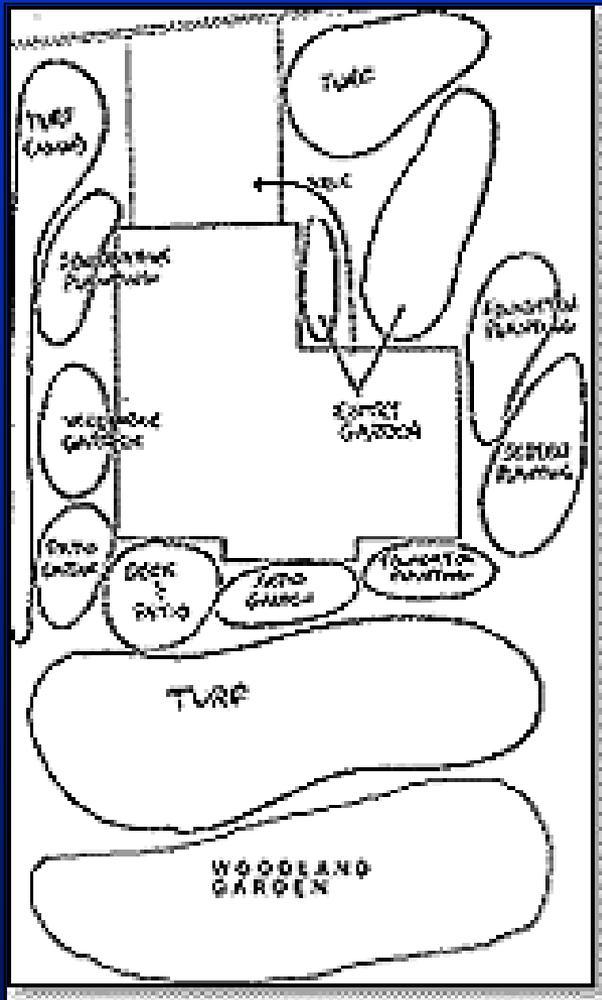


Define

- **Management areas**
- **Management expectations**

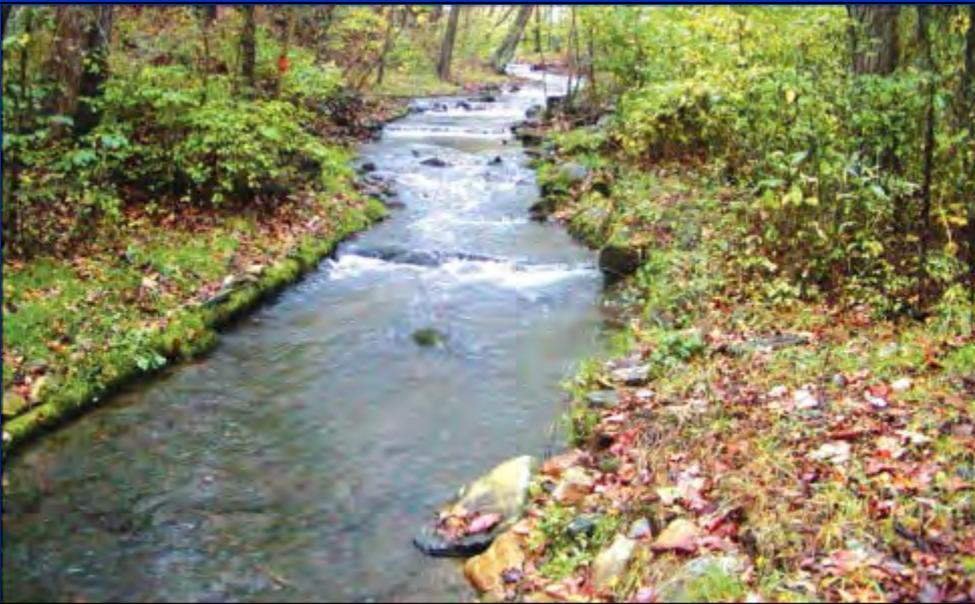


Management Areas



public, private, utility/work

Management Expectations











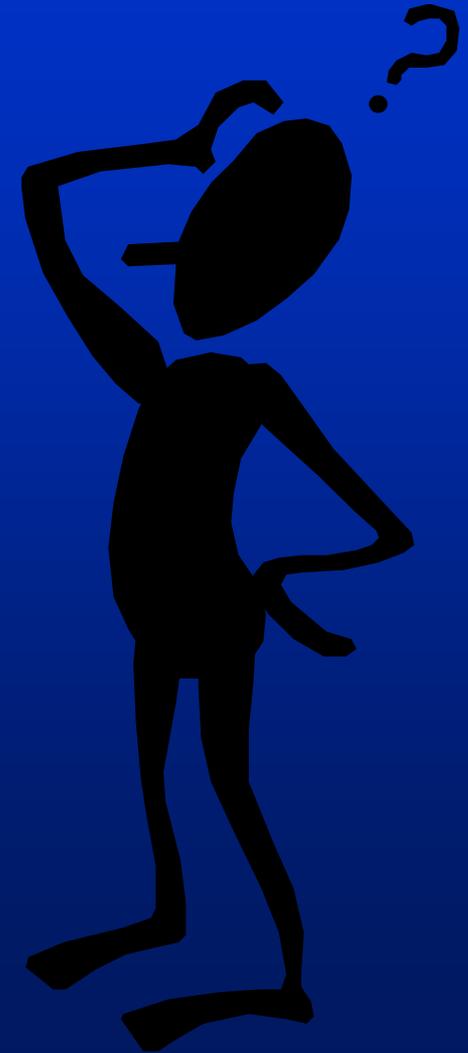
FOUNDATION STONES
SANTA FE RANCHHOUSE
1879-1894

Plant Analysis

Which plants?

Where are they?

What condition?



Which Plants?

Annual – 1 growing season

Bi-annual – 2 seasons

Perennial – more than 2

Herbaceous/Woody Deciduous/Evergreen

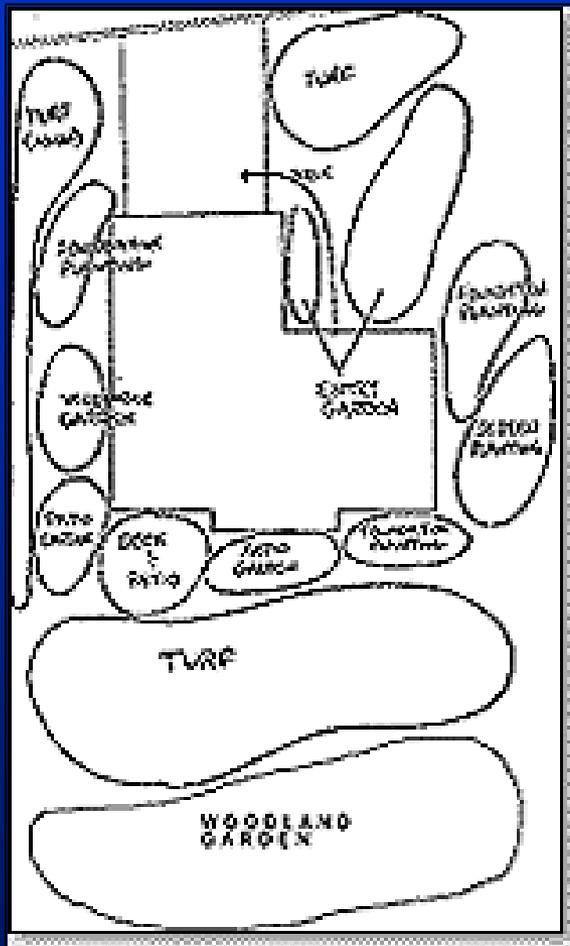


Family Genus Species Cultivar/Variety



UGA3370014

Where are they?



- Public, private, service
- Highly visible
- Container
- Bed
- Turf area
- New or established



What condition?





Soil Tests

Landscape ornamentals require different

- Amounts of nutrients
- Timing of nutrient applications
- Application locations
- Types of nutrients



Virginia Cooperative Extension

Soil Test Report

Spotsylvania County Office
 P.O. Box 95
 Spotsylvania, VA 22553-0095
 540-507-7570

Virginia Tech Soil Testing Laboratory
 145 Smyth Hall (0465)
 Blacksburg, VA 24061
 www.soiltest.vt.edu

SEE ENCLOSED SHEET
 1 17

DATE

GREENGRASS JANE
 100 DECENT DR

DATE

MY LAWN CARE COMPANY
 P O BOX 111

WYDOWN, VA 23648

WATERLAWN, VA 23648

SAMPLE HISTORY

Sample ID	Field ID	LAST CROP		LAST LIME APPLICATION		SOIL INFORMATION				
		Name	Yield	Months Prev.	Ton/acre	SMU-1 %	SMU-1 %	SMU-1 %	Yield Estimate	Productivity Group
020808										

LATEST RESULTS (see Note 1)

Analyte	P (lb/a)	K (lb/a)	Ca (lb/a)	Mg (lb/a)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	B (ppm)	S (ppm)
Result	109	173	1318	238	5.0	12.5	0.4	31.4	0.3	
Rating	M+	M+	M+	VH	SUFF	SUFF	SUFF	SUFF	SUFF	

Analyte	Soil pH	Buffer Index	Est. CEC (meq/100g)	Acidity (%)	Base Sat. (%)	Ca Sat. (%)	Mg Sat. (%)	K Sat. (%)	Organic Matter (%)
Result	5.5	5.97	7.0	36.2	63.8	46.7	13.9	3.1	

FERTILIZER AND LIMESTONE RECOMMENDATIONS

Crop: LAWN MAINTENANCE - BLUEGRASS, FESCUE (102)

512. LIME RECOMMENDATIONS: Apply 140 pounds of agricultural limestone (ground or pulverized) per 1000 square feet in several small applications of up to 50 lbs each, at intervals of 1 to 6 months, until the full amount is applied.

208. FERTILIZER RECOMMENDATIONS: Use any complete "law-type" fertilizer according to the instructions in the enclosed note on lawn fertilization. (A "law-type" fertilizer is typically high in nitrogen, and low in phosphorus and potassium, e.g., 15-3-7.)

Commercial Soil Test Notes

Explanation of soil tests note 1

Field crops note 2

Forage crops note 3

Trace elements note 4

Use of manures note 5

Flue-cured tobacco (PDF | 124KB) note 6

Dark-fired tobacco (PDF | 114KB) note 7

Sun-cured tobacco (PDF | 114KB) note 8

Burley tobacco (PDF | 125KB) note 9

Apple production (PDF | 61KB) note 10

Peach production (PDF | 48KB) note 11

Hardwood & pine tree crops (PDF | 133KB) note 12

Greenhouse & nursery (PDF | 192KB) note 13

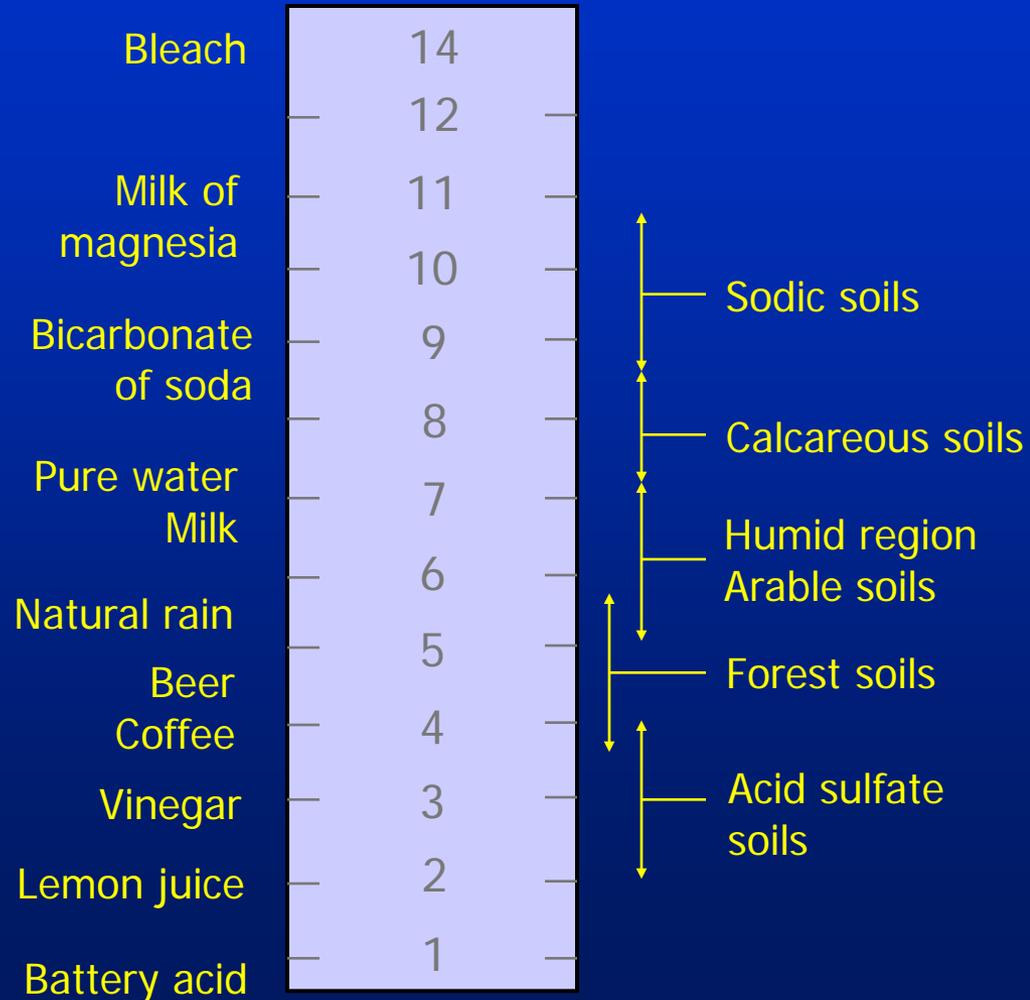
Athletic fields, golf course fairways, sod production, & recreational lawns (PDF | 186KB) note 14

Nutrient management for golf courses note 15

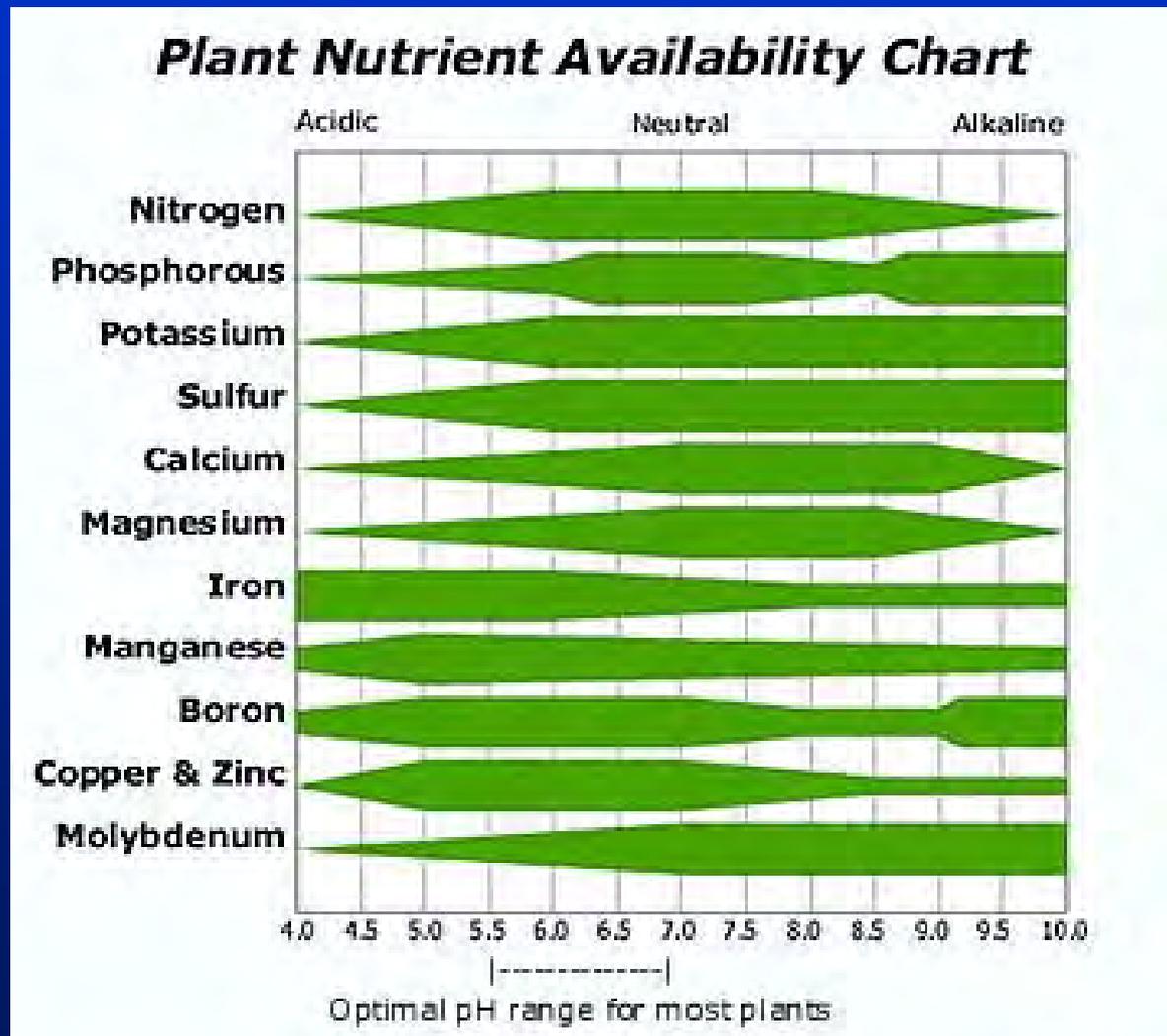
Christmas tree crops note 23

Chemical Properties of Soil

- **pH – the acidity or alkalinity**
 - **Affects nutrient availability**
 - **Determined by parent material, microbial activity**
 - **Not easily manipulated**



pH and Nutrient Availability





**pH 6.5 & higher
aluminum not avail.**



**pH 5.5 & lower
aluminum = blue**

Microbiological testing

<http://www.soilfoodweb.com/>



Soils Stewardship

- **Soil is a dynamic entity.**
- **Understanding the basic physical and chemical properties of soils will help you make better fertilizing decisions.**
- **Good soil = healthy plants & fewer nutrient applications.**



Timing & Placement of Plant Nutrients

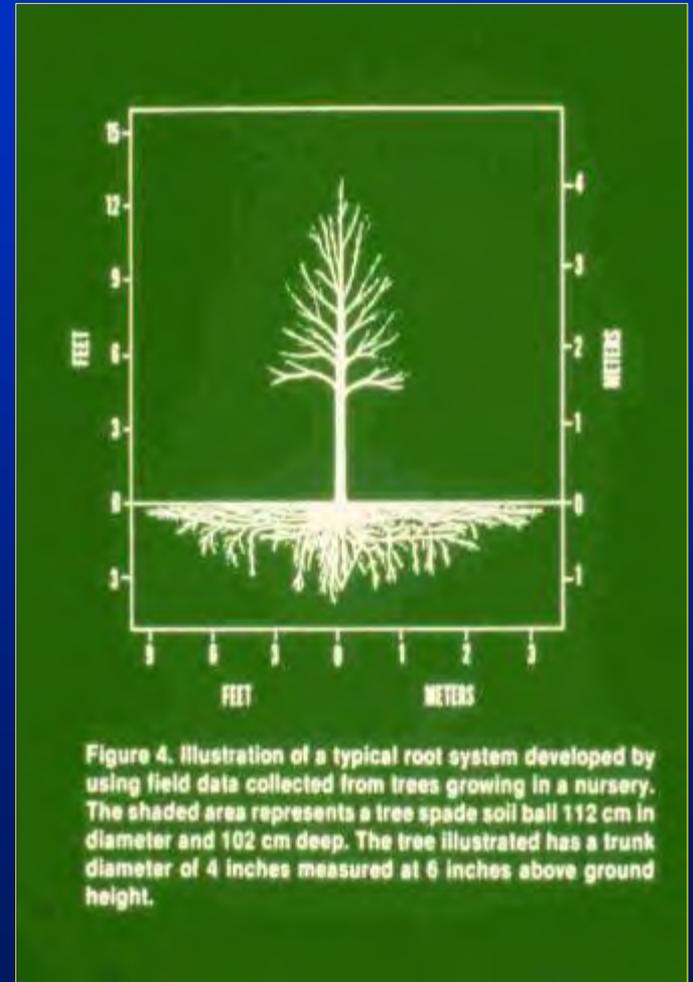


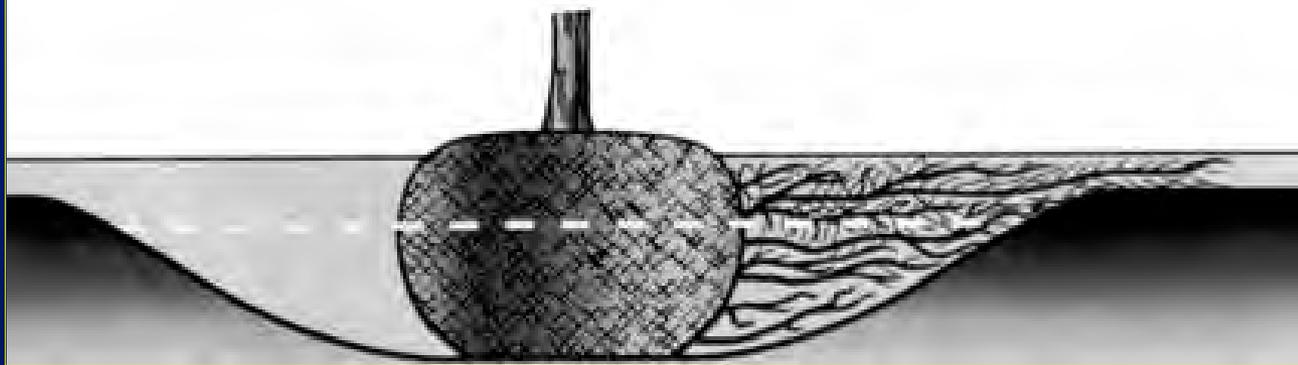
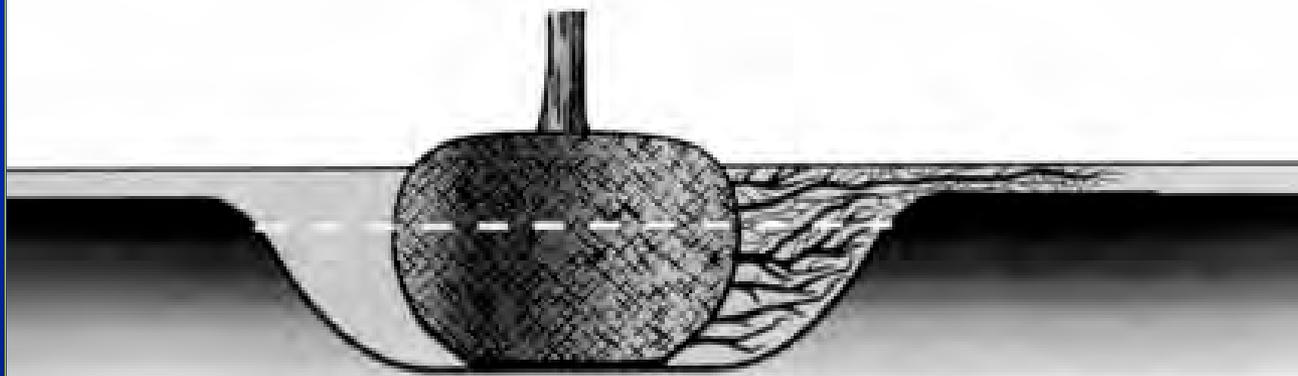
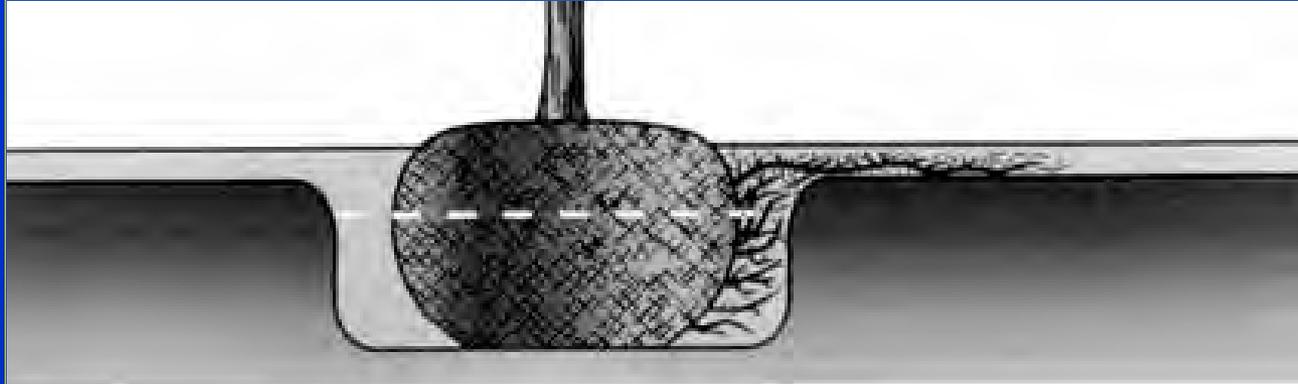
When?

- **WHEN NECESSARY!**
- **Newly planted**
- **Under stress (pruned, construction, pest pressure)**
- **Mixed plantings (i.e. trees & shrubs/herbaceous)**
- **Winter, Spring, Summer, or Fall?**

Where?

- At “feeder” roots
- Surface broadcast
(under mulch)
- Incorporated into
bed/planting hole
- Foliar
- Injected





Grass

Mulch



Recommendations

- **General**

- **Slow release (WIN 50% minimum)**
(IBDU, sulfur-coated urea, resin-coated urea, nitroform, Osmocote)

- **Incorporated**

- **To establish**

- **With moderate N, P?, & low K**

- **1-4 lbs. of N/1000ft²/year** (split application)

- **Shade areas less**

- **Sand more frequent applications**

Specific Recommendations

based on area, soil test, species, mgt. goals

- **Annuals**

- quick release + slow release, high P & K
- incorporated into entire bed



- **Bulbs**

- after bloom, high P & K, bonemeal



- **Perennials**

- higher P & K for roots & flowers
- early spring for nutrients over season
- lightly for perennials planted in fall for root growth
- around established plants, in the hole for new plants



Specific Recommendations

based on area, soil test, species, mgt. goals

- **Trees & shrubs (1-4 lbs N/1000ft²/year)**
 - Newly planted – yearly, 3-4 lbs N
 - Mature/established – 3-4 years. 1-2 lbs N
 - Hollies & junipers – less
 - Red tip, roses, English laurels – more
 - Ericaceous (azalea, rhododendrons, pieris, mountain laurels, camellias, pH 4.5-6.0 – acidic fertilizers (ammonium), very lightly due to shallow roots
 - in early spring for slow steady nutrients over season
 - At dripline of established plants, in hole for new plants

Chemical fertilizers, analysis, speed of reaction and effect on soil pH.

Fertilizer	Analysis	Speed of Reaction and Leaching	Soil Reaction	#'s of each fertilizer to use to get roughly 1#N/1000ft ²
Ammonium nitrate	33-0-0	Rapid	Acidic	3
Ammonium sulfate	20-0-0	rapid	Very acidic	5
Urea	46-0-0	Rapid	Slightly acidic	2
Ureaformaldehyde	38-0-0	Slow	Slightly acidic	2 1/2
Di-ammonium phosphate	18-46-0	Rapid	Acidic	5 1/2
Calcium nitrate	15-0-0	Rapid	Alkaline	6 1/2
Potassium nitrate	13-0-44	Rapid	Neutral	7 1/2
10-10-10	10-10-10	Rapid	Varies with N source	10
Osmocote	18-6-12	Slow	Acidic	5 1/2

Table 1. Average nutrient content of various organic fertilizer sources.

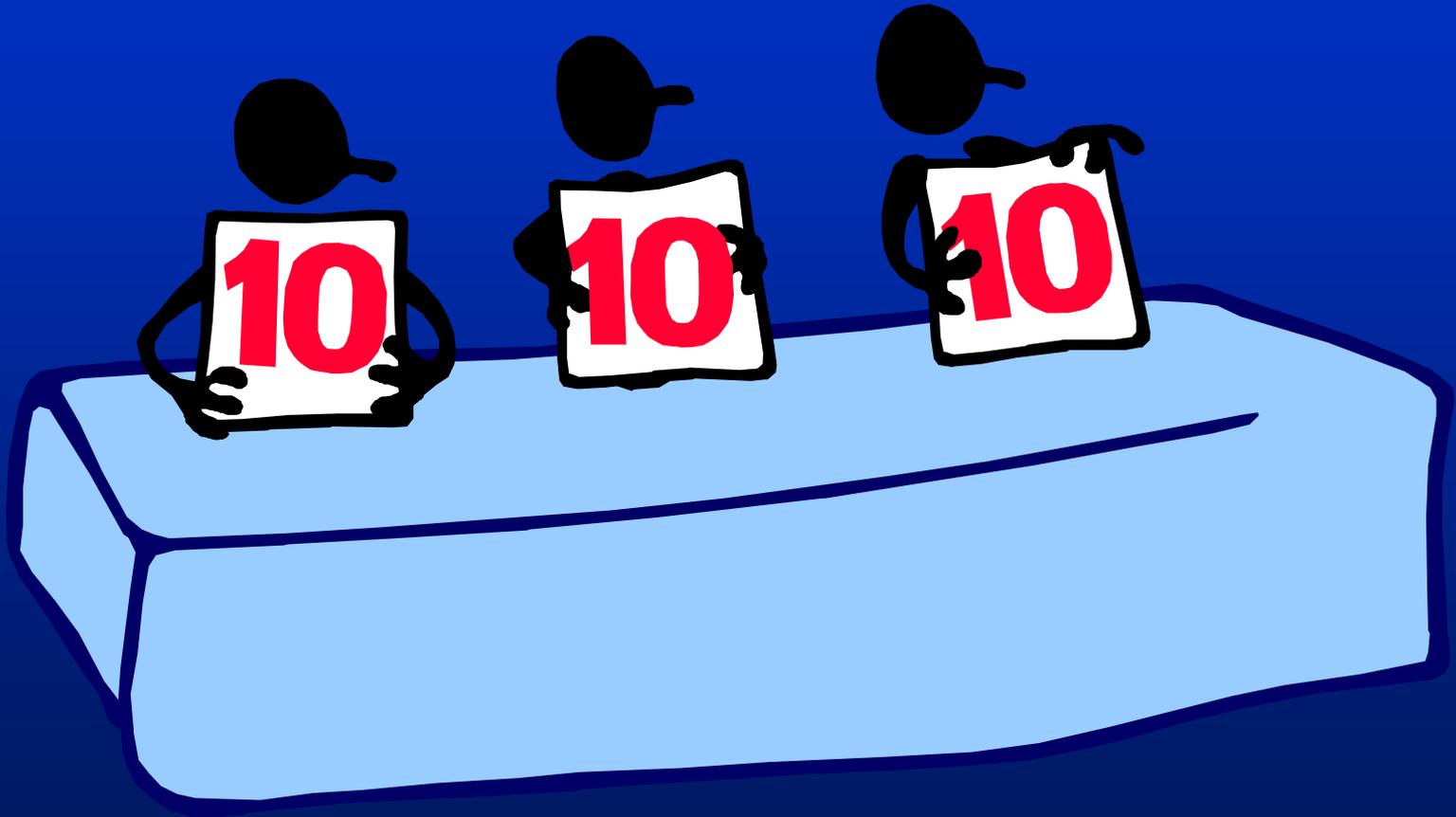
	% Nitrogen (N)	% Phosphorus (P₂O₅)	% Potash (K₂O)
Blood, dried	13.0	—	—
Bone meal (raw)	3.5	22.0	—
Bone meal (steamed)	2.0	28.0	—
Cottonseed meal	6.6	2.5	1.5
Fish scrap (dried)	9.5	6.0	—
Soybean meal	7.0	1.2	1.5
Horse manure	0.7	0.3	0.6
Cow manure	0.6	0.2	0.6
Pig manure	0.5	0.3	0.5
Sheep manure	0.8	0.3	0.9
Chicken manure	1.1	0.8	0.5
Duck manure	0.6	1.4	0.5

Other nutrient sources

- Compost
- Soil conditioner
- Mulch
- Meal
- Manure

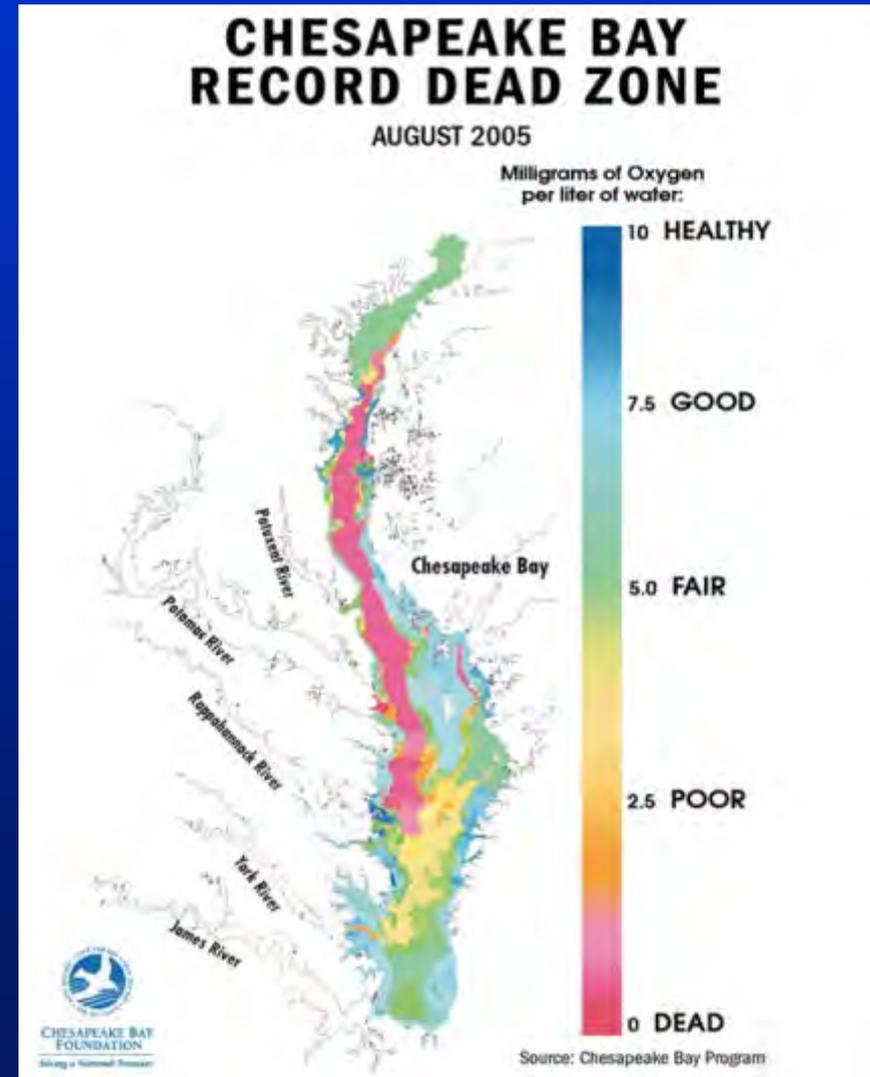


Big picture - additive impact



Over/improper Fertilization

- pH change - deficiencies
- Root damage
- Crown damage, death
- “Burn”
 - marginal leaf necrosis from high salinity
 - similar to injury from drought
- Surface & groundwater contamination



Special Situations

- **Buffer zones**
- **Infiltration trenches**
- **Rain gardens**
- **Bioretention basins**
- **Filtterra units**
- **Wetlands**
- **Green roofs**

Phytoremediation

'phyton' (plant) + 'remediare' (to remedy)
Greek Latin

Correction of
environmental problems
using plants.



Hampton Roads AREC



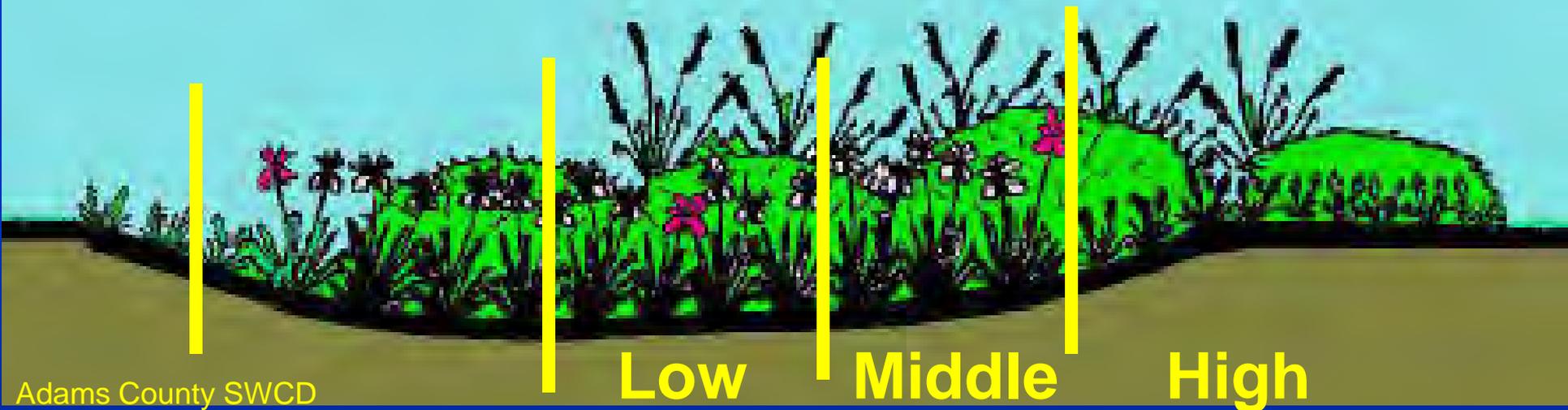


Bayville Golf Club





Rain Gardens



Adams County SWCD
Quincy, IL

- 💧 3 planting zones
- 💧 4 days or less
- 💧 5% of drainage area
- 💧 6" water







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Norfolk, VA



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