



Tree Nutrition & Fertilization

Objectives

- ✓ Understand the reasons for fertilizing urban trees
- ✓ Explain why determining nutritional requirements and availability is the first step prior to fertilization recommendations.
- ✓ Recognize the problems that can be associated with excessive fertilization.
- ✓ Become familiar with the essential elements

Three Things to Take

- ✓ We cannot “feed” trees – or any plant for that matter.
- ✓ Fertilizer is NOT the correct automatic answer.
- ✓ We are professionals because of our diagnostic work.

The Differences

- ✓ **Nutrition** is, the provision to cells and organisms of the materials necessary (aka essential elements), in the *form of food*, to support life.
- ✓ The plant provides.
- ✓ **Fertilization** is, the application of various forms of nitrogen (N), phosphorous (P) and potassium (K) to cells and organisms.
- ✓ People can provide.



- ✓ Is fertilizer present here?
- ✓ Is nutrition available here?
- ✓ How do we know?



Why fertilize?

- ✓ To overcome a visible nutrient deficiency
- ✓ To increase vegetative growth, flower or fruit set
- ✓ To increase plant vitality
- ✓ To eliminate a deficiency detected through laboratory analysis

Why not to fertilize

- ✓ When sufficient levels of all essential elements are present
- ✓ When the potential for certain pest problems may be increased
- ✓ When herbicide damage is present in or on the plant

Diagnosing need

- ✓ Soil analysis
- ✓ Foliar analysis



Soil Analysis

- Less expensive than foliar analysis
- Provides data on soil pH, organic matter and cation exchange capacity
- Good snapshot or base
- Necessary first step



Foliar Analysis

- Provides a clear picture of the plants' nutrient status
- Precise knowledge of adequate and deficient elements
- Expensive

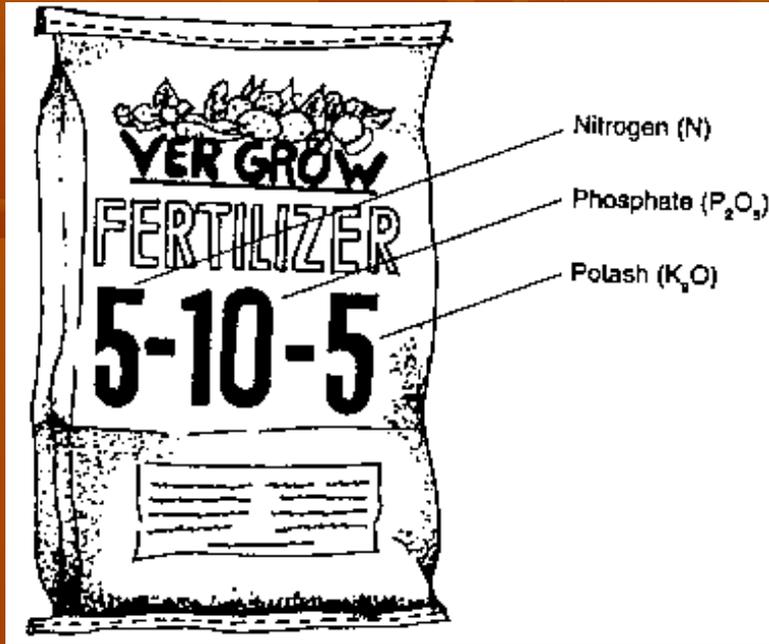
We have need, now what?

- Injection
- Slow-release
- Foliar
- Surface
- Subsurface
- Ahhh-h-h-h-h-h-h-h-!!!!!!!!!!

Macro-nutrients

- Nitrogen (N)
- Phosphorous (P)
- Potassium (K)
- Sulfur (S)
- Magnesium* (Mg)
- Calcium* (Ca)

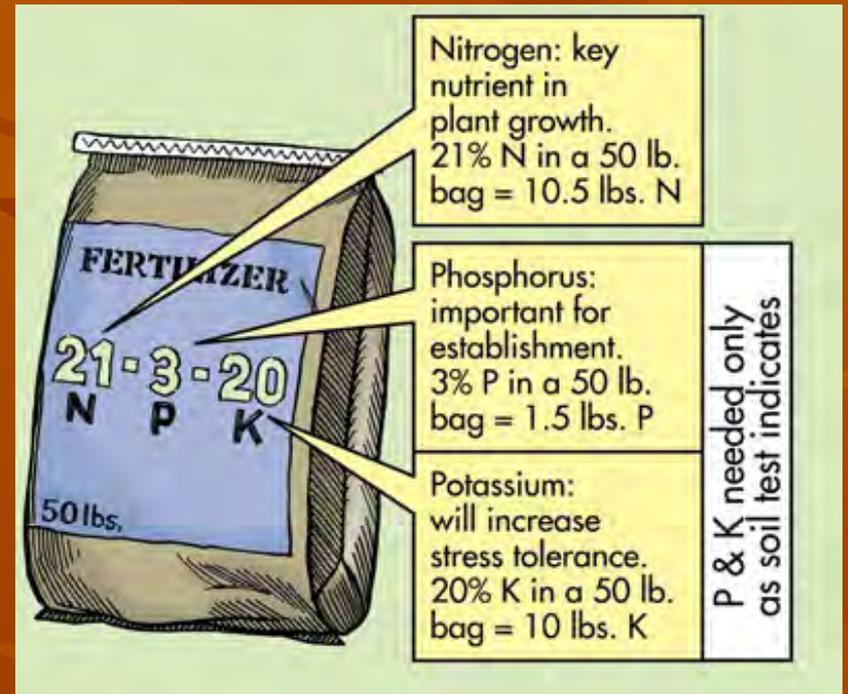
Real life application



- How much N is in the bag at left- assuming it's a 50 lb. bag?
- If fertilizer is applied @ 2 lbs/ 1,000 sq ft and there are 3,000 sq ft to fertilize, how many bags of fertilizer are needed?

Another fertilizer

- How much N is “N” the bag?
- At 2 lbs N/1,000 sq ft, how much fertilizer is required for 5,000 sq ft?
- What is the fertilizer analysis?
- Assume it’s a 50lb bag.
- Is this a complete fertilizer?



One more...



- How much potassium is in milorganite®?
- At 2 lbs N/1,000 sq ft, how much milorganite® do we need for 3,000 sq ft?
- Is this a complete fertilizer?
- Is this an organic fertilizer?

Prescription without diagnosis is malpractice!

Example of Soil Test Report from MU Soil Testing Labs for Lawns and Garden Fertility Test:

University Extension
University of Missouri
Columbia

Soil Test Report For Lawns and Gardens

-----MU Laboratories-----
23 Mumford Hall
Columbia, MO 65211
(573) 882-0623
or
P.O. Box 160
Portageville, MO
(573) 379-5431

Serial No. H46109H-1	County Boone	Region
Submitted 3/27/2010	Processed 3/29/2010	
http://www.soiltest.psu.missouri.edu/		

Sample ID: Home garden 1

This report is for:
Lawn Garden
1000 Univ. Ave
Columbia, MO 65201

Lab No: CO103997

Last Limed: unknown

SOIL TEST RESULTS		RATING				
		Very low	Low	Medium	High	Very high
pHs	5.5	*****				
Phosphorus (P)	7 lbs/a	***				
Potassium (K)	191 lbs/a	*****				
Calcium (Ca)	5253 lbs/a	*****				
Magnesium (Mg)	495 lbs/a	*****				
Organic Matter:	2.6 %	Neutr. Acidity: 2.0 meq/100 g		CEC: 16.0 meq/100g		

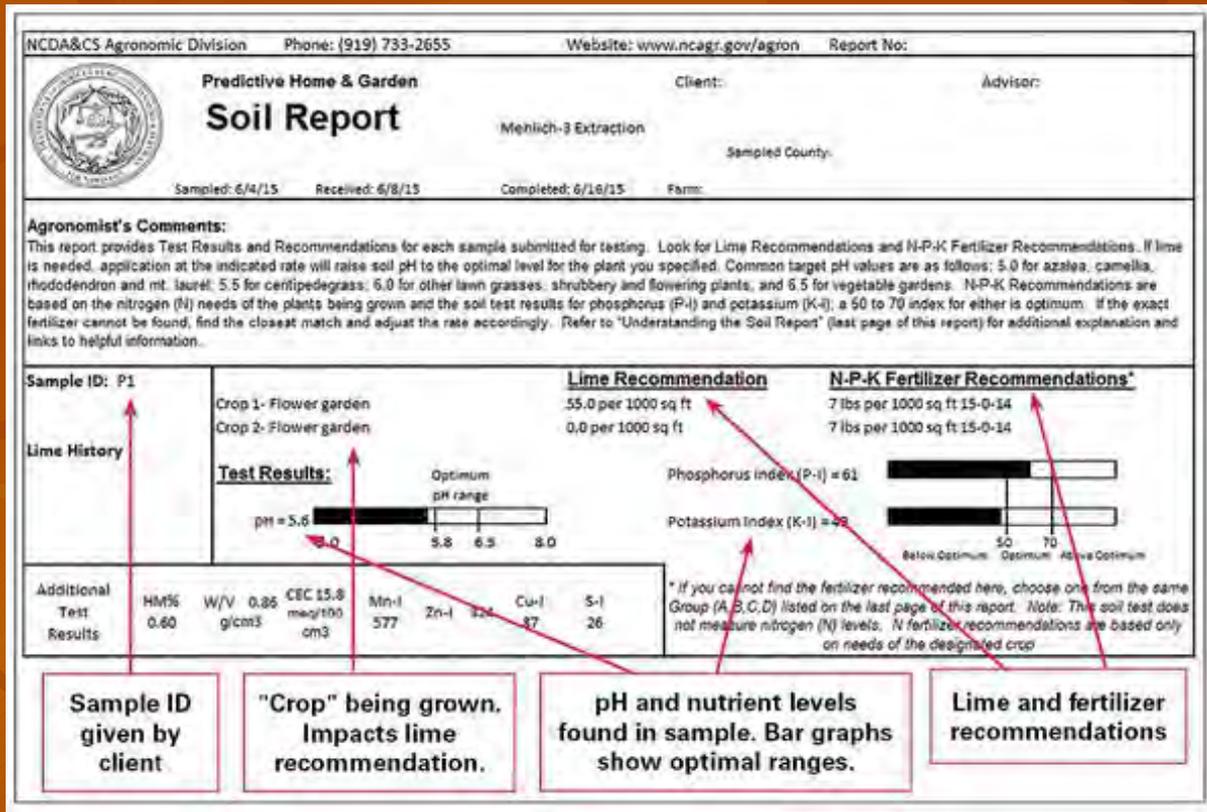
Fertilizer & Limestone Recommendations (lbs/1000 sq ft)

Crop	Nitrogen(N)	Phosphorus(P ₂ O ₅)	Potash (K ₂ O)	Zinc(Zn)	Sulfur(S)	LIME
1 vegetables	0.5	4.0	0.5			100
2 blueberries	1.0	4.0	1.0		50	0

Comments:

- ***Fertilizer rates are given in pounds of actual nutrient per 1000 sq. ft to be applied
- ***The soil needs additional organic matter for gardens and crops other than lawns. See MU Publication G6950, "Steps in Fertilizing Garden Soil" and G6956, "Making and Using Compost".
- ***Lime takes two to three months to react with the soil. Apply lime three to six months before planting.
- *** For blueberries soil needs to be treated with 50 lbs of elemental S per 1000 sq. ft to acidify the soil. It takes 3 months for S to react with the soil and acidify the soil.
- The soil should be tested every 2 to 3 years to determine the effects of your fertilization practices and to develop a new set of fertilizer and limestone guidelines.

Apply only nutrients that have been found to be deficient!



Some workbook questions

- If fertilizer “burn” or leaching are potential problems, it may be desirable to use a _____ - _____ fertilizer.
- The most important factor for good uptake of fertilizer elements is adequate _____.
- Foliar application of fertilizer is sometimes used to correct _____ deficiencies.