

Macronutrients

Essential nutrients for plants required in relatively large amounts compared to other constituents of whole plant tissue.



Pecan

Carya illinoensis

Nutrient	Sufficiency Range Suggested application*	Purpose in Plant
Nitrogen (N)	1.7 - 3.0 % ~150 lbs N/acre	Largest requirement behind water. Proteins, amino acids, chlorophyll.
Phosphorus (P)	0.12 - 0.30 % ~80 lbs P ₂ O ₅ /acre	Cell formation, protein synthesis, fat and carbohydrate metabolism
Potassium (K)	1.0 - 1.5 % ~100 lbs K ₂ O/acre	Water regulation, enzyme activity, cold hardiness, resistance to insect pests
Calcium (Ca)	1.0 - 1.5 %	Root permeability, enzyme activity, cell elongation and stability
Magnesium (Mg)	0.35 - 0.75 %	Chlorophyll, fat formation and metabolism
Sulfur (S)	0.18 - 0.30 %	Protein, amino acid, vitamin and oil formation

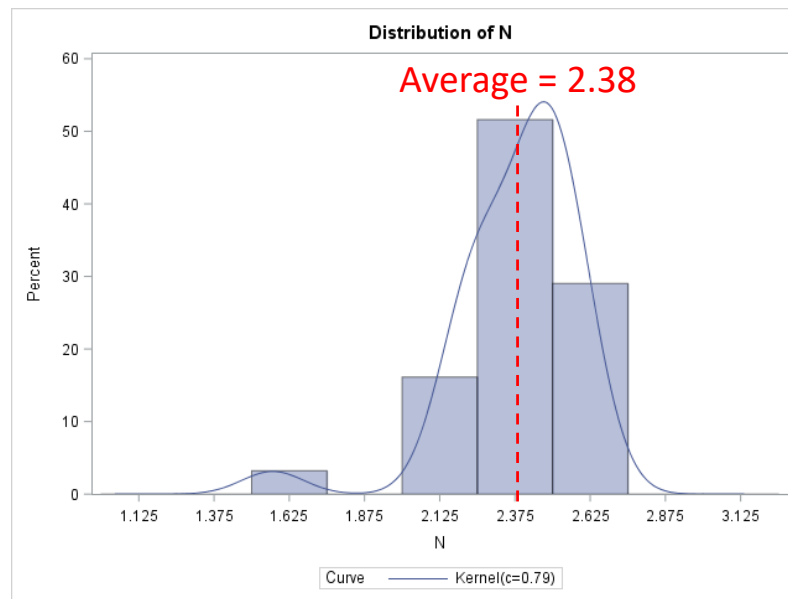
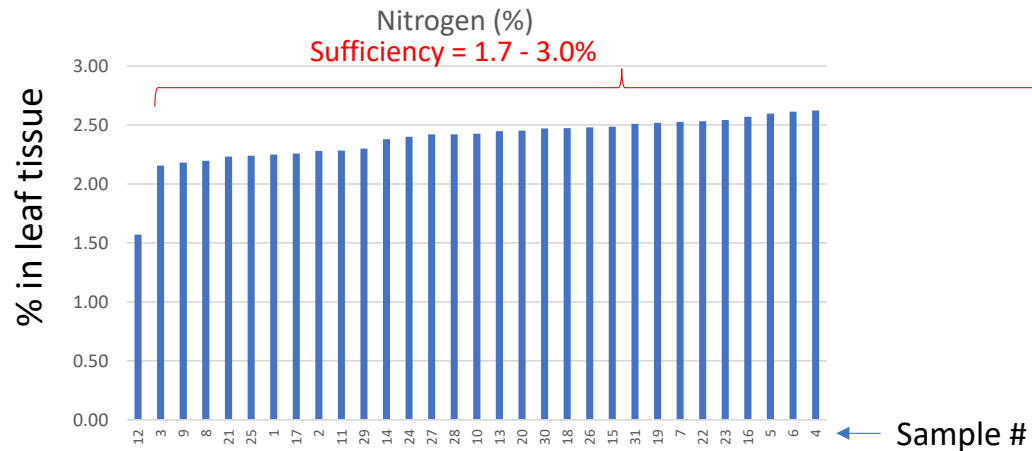
*always base on pre-season soil test

<https://soiltesting.tamu.edu/webpages/recommendations.html>

Plant analysis handbook III, Bryson et al., 2014

Smith et al., *HortTechnology* 22:594-599 2012

Min	1.57
Max	2.62
Range	1.05
Mean	2.38
Median	2.43
Standard Deviation	0.20
Relative Standard Deviation	8.52



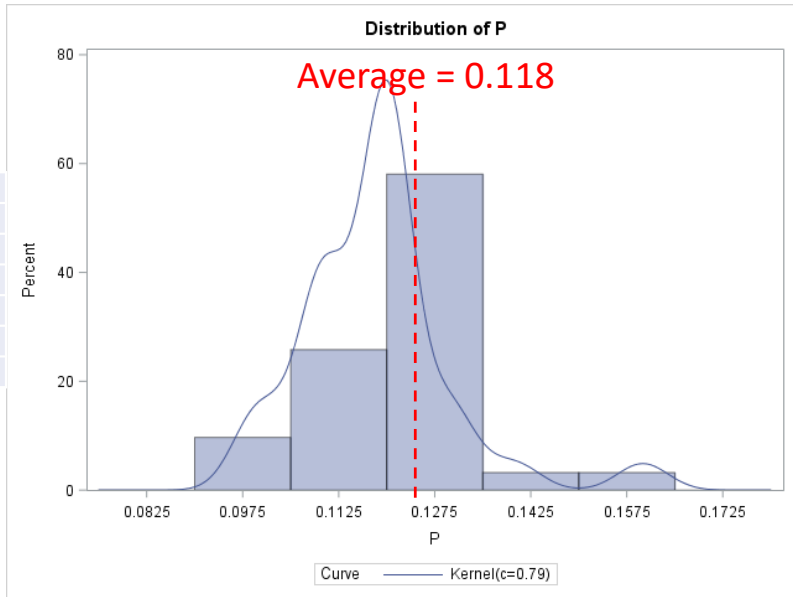
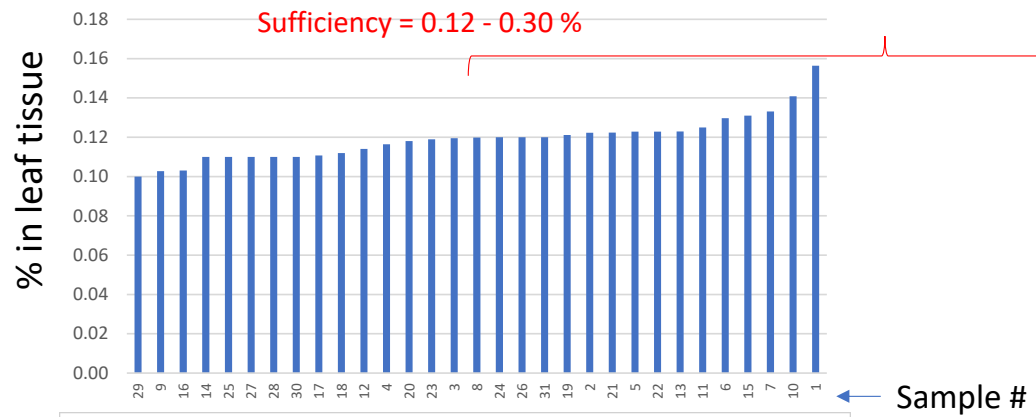
How to read these charts

The top chart shows all results for 31 samples arranged from lowest to highest (l-r) with individual sample #s on the x (bottom) axis and result (% or ppm) on y axis. Sufficiency ranges for each nutrient are superimposed above the results.

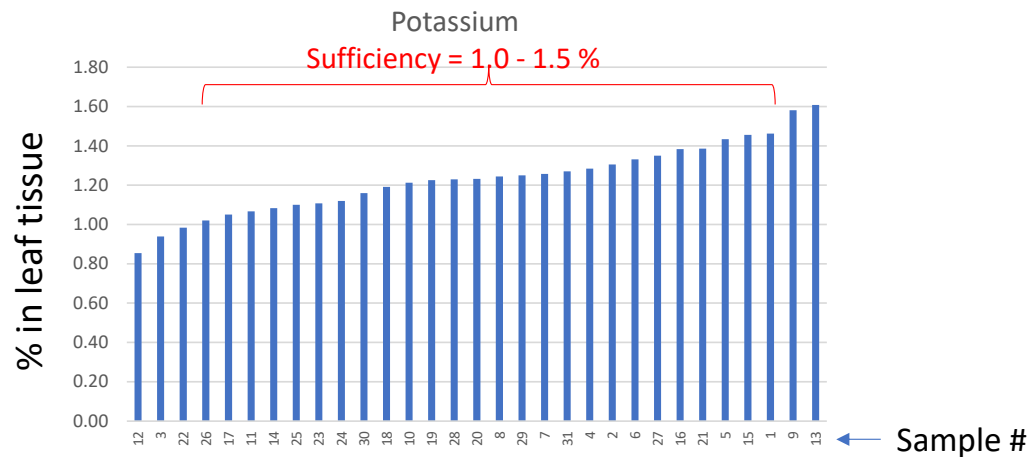
The bottom chart is a kernel density distribution which can tell you where the mean (average) is, and where the rest of the data is distributed around that mean. The blue line gives you an indication of whether the data is normally distributed (nice bell shape) or not.

Simple summary stats for each nutrient are in the tables to the left. Relative standard deviation gives you an idea of how much spread there is in the data compared to the mean value.

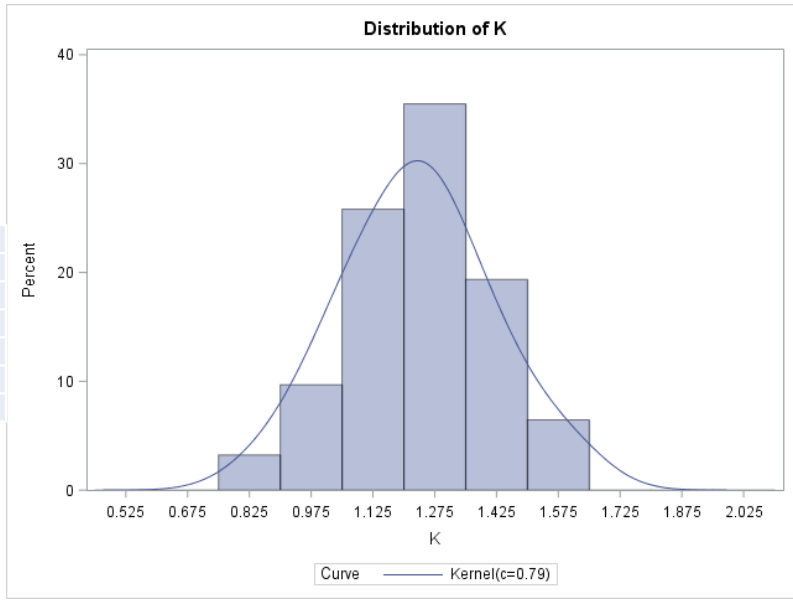
Phosphorus



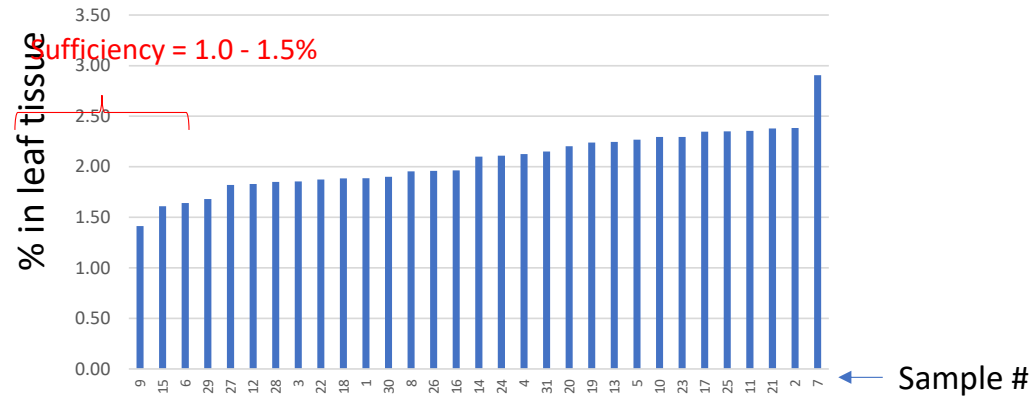
Min	0.10
Max	0.16
Range	0.06
Mean	0.12
Median	0.12
Standard Deviation	0.01
Relative Standard Deviation	9.53



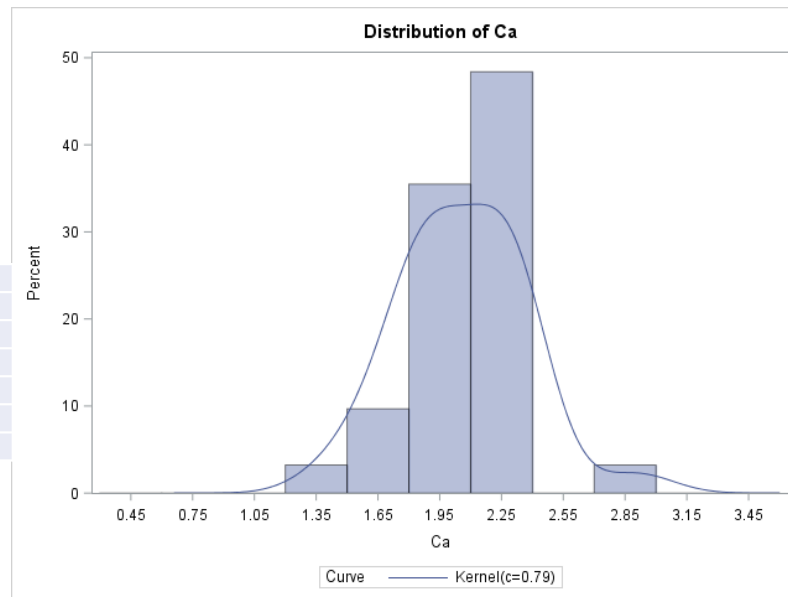
Min	0.85
Max	1.61
Range	0.75
Mean	1.23
Median	1.23
Standard Deviation	0.18
Relative Standard Deviation	14.51



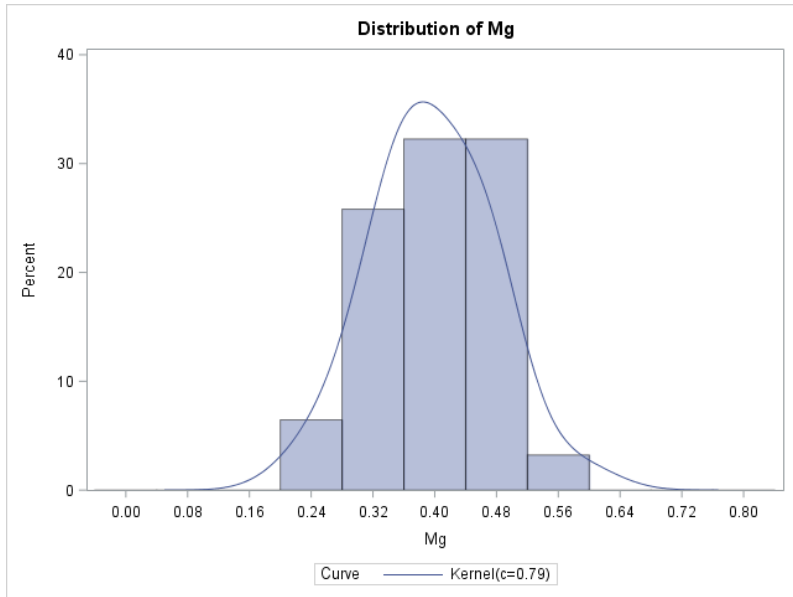
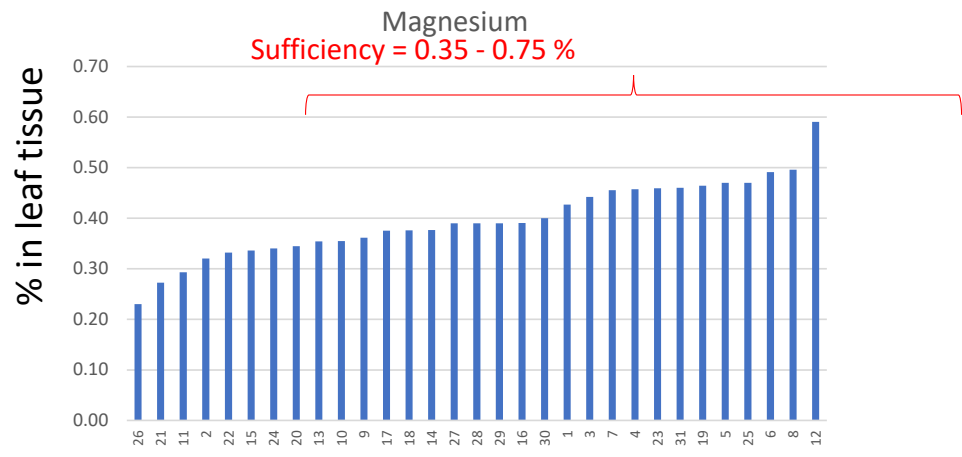
Calcium

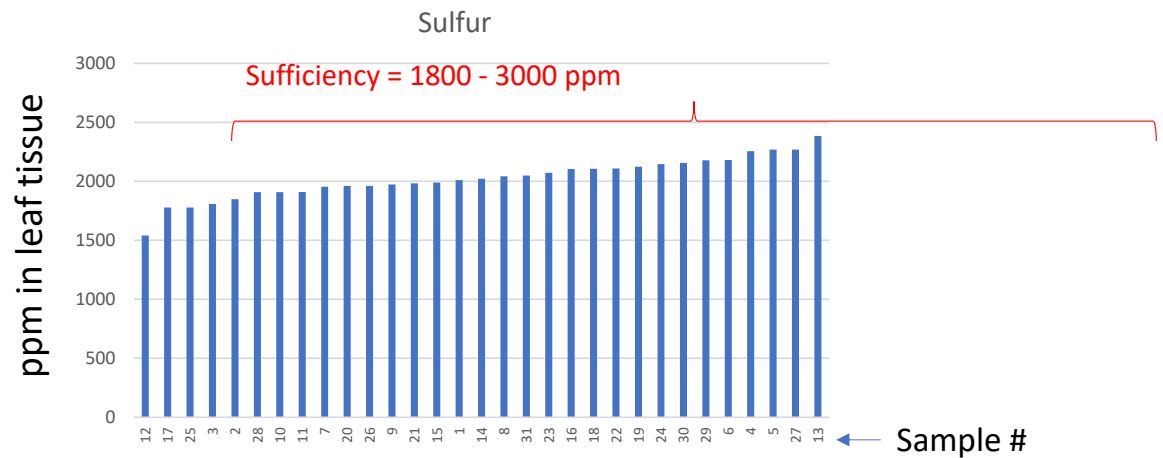


Min	1.41
Max	2.91
Range	1.49
Mean	2.06
Median	2.10
Standard Deviation	0.30
Relative Standard Deviation	14.62

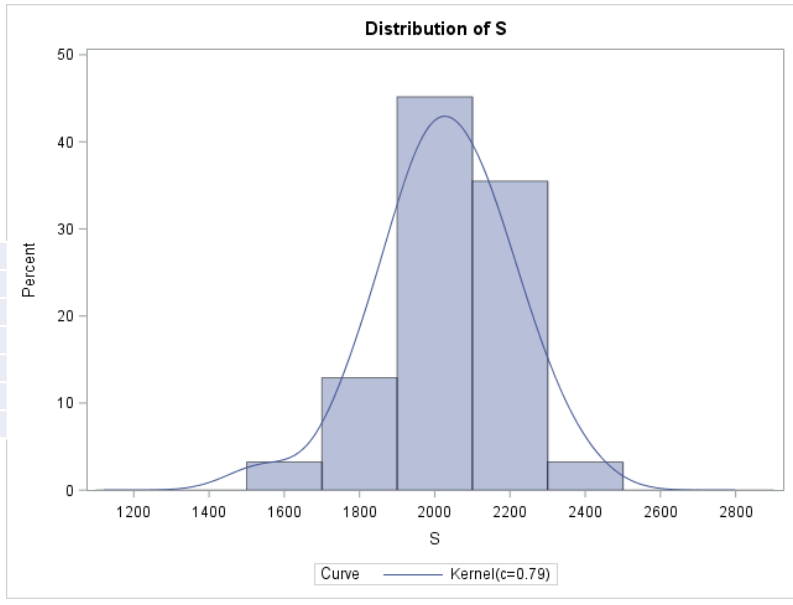


Min	0.23
Max	0.59
Range	0.36
Mean	0.40
Median	0.39
Standard Deviation	0.08
Relative Standard Deviation	18.94

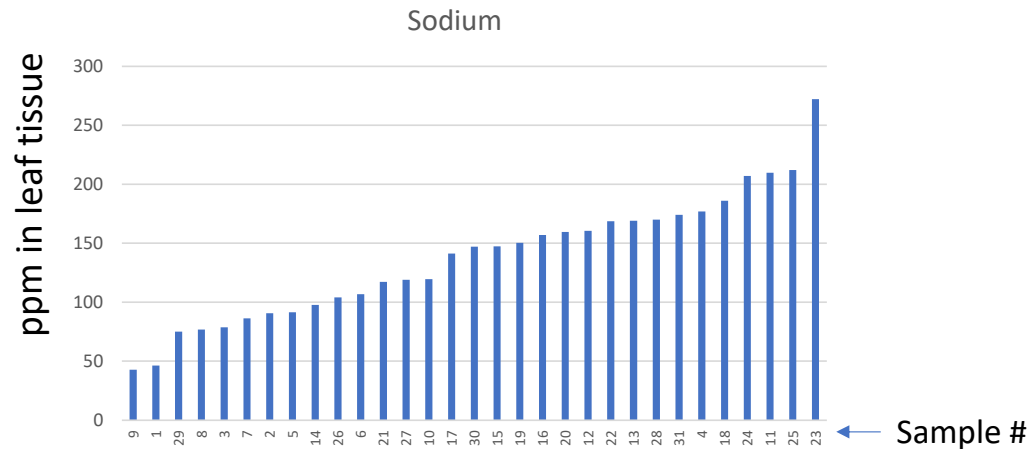




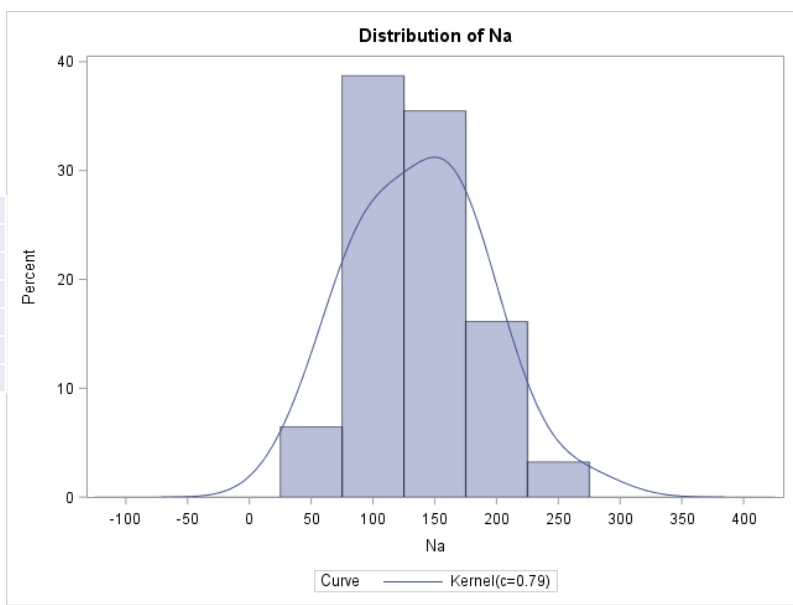
Min	1540.79
Max	2384.15
Range	843.36
Mean	2025.04
Median	2021.65
Standard Deviation	173.98
Relative Standard Deviation	8.59



← Sample #



Min	42.81
Max	272.17
Range	229.37
Mean	137.44
Median	147.00
Standard Deviation	52.84
Relative Standard Deviation	38.45



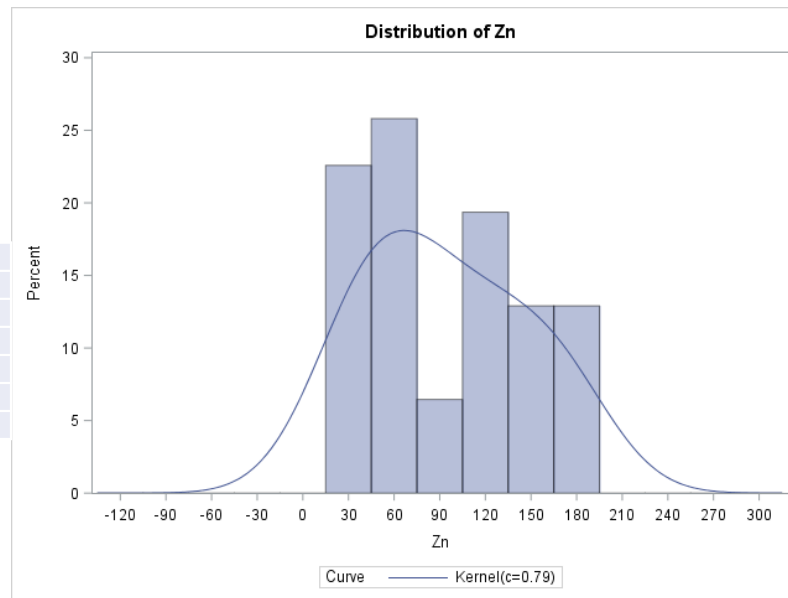
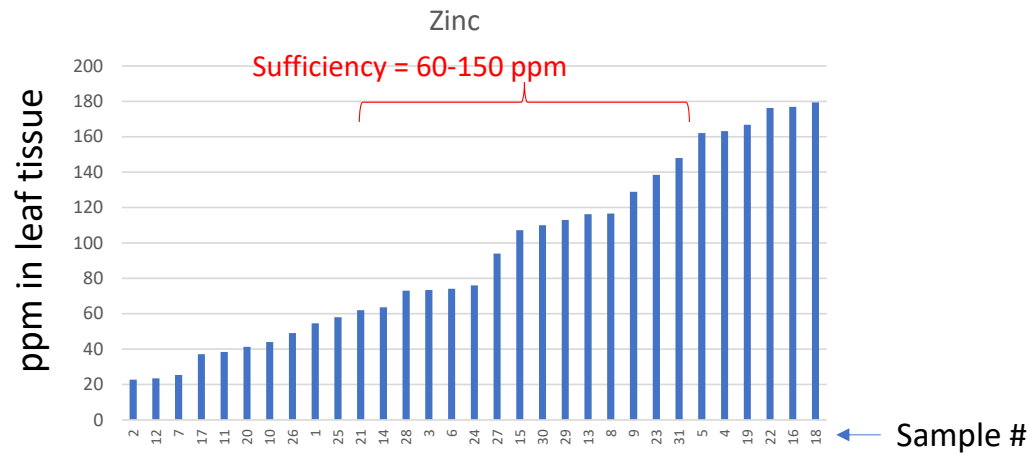
Micronutrients

Essential nutrients for plants required in relatively tiny amounts compared to other constituents of whole plant tissue.



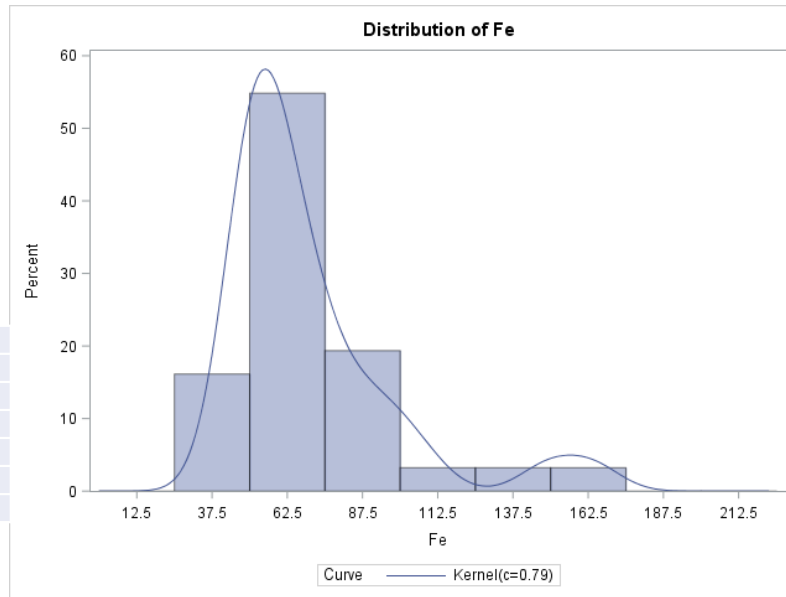
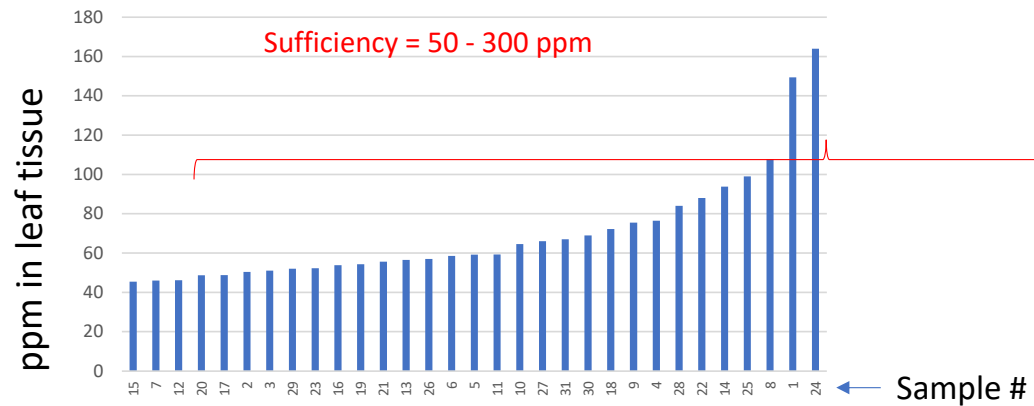
Pecan
Carya illinoensis

Nutrient	Sufficiency Range	Relation to quality
Boron (B)	15-50 ppm	Associated with fruit retention and quality
Copper (Cu)	6-30 ppm	Can mitigate toxicities from excess nitrogen
Iron (Fe)	50-300 ppm	Plays a role in kernel color
Manganese (Mn)	100-2000 ppm	Increases photosynthesis of immature pecan trees when applied as amino acid chelate
Zinc (Zn)	60-150 ppm	Responsible for development of oil content and fatty acid - <i>too much decreases both.</i>

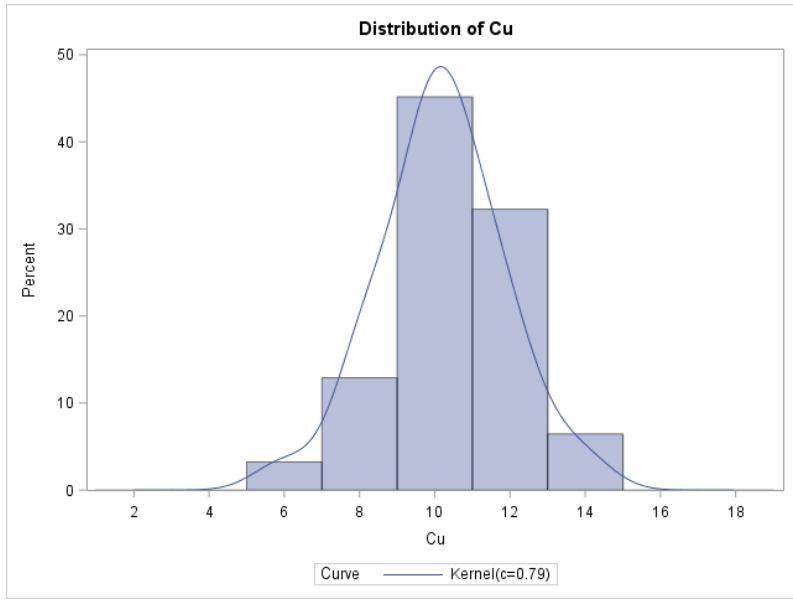
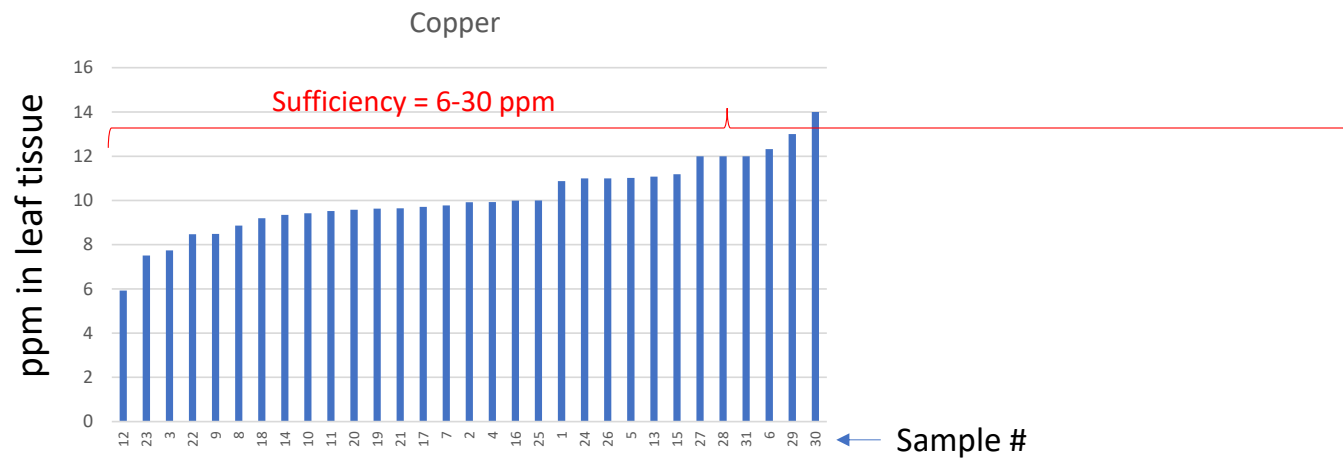


Min	22.75
Max	179.50
Range	156.75
Mean	93.98
Median	76.00
Standard Deviation	51.11
Relative Standard Deviation	54.39

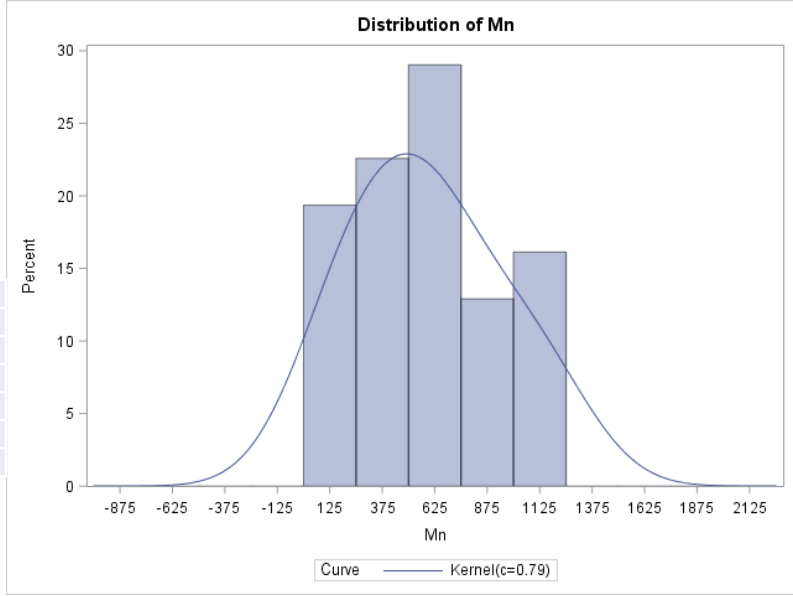
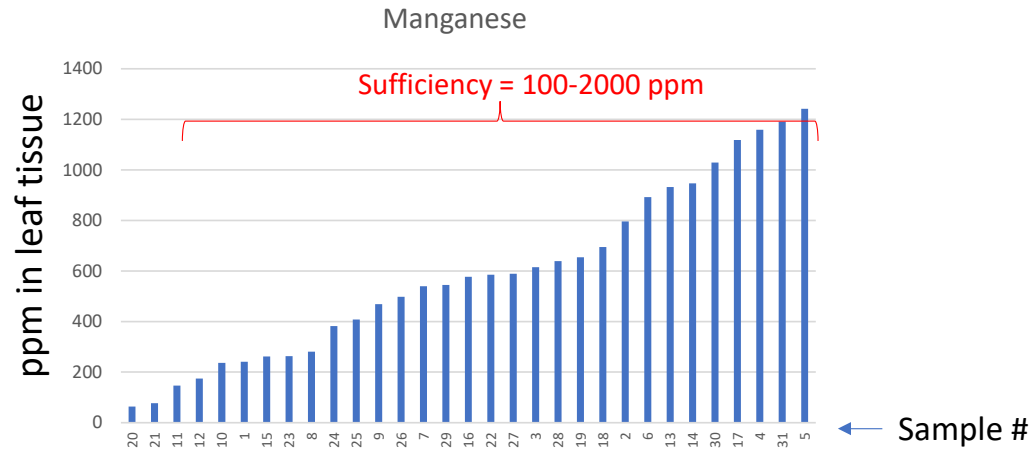
Min	45.43
Max	164.00
Range	118.58
Mean	70.06
Median	59.19
Standard Deviation	28.35
Relative Standard Deviation	40.46



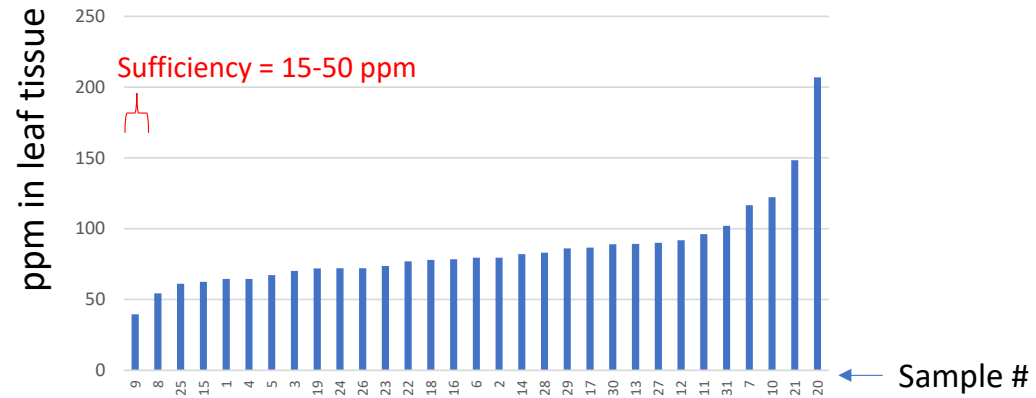
Min	5.93
Max	14.00
Range	8.08
Mean	10.13
Median	9.92
Standard Deviation	1.68
Relative Standard Deviation	16.54



Min	64.03
Max	1242.07
Range	1178.04
Mean	588.63
Median	577.02
Standard Deviation	343.97
Relative Standard Deviation	58.44



Boron



Min	39.42
Max	206.95
Range	167.53
Mean	85.63
Median	79.49
Standard Deviation	30.63
Relative Standard Deviation	35.77

