How to remedy/explain the various reported values

Soil Texture:

Soil with a high sand content drains well but nutrients can flush out easily. Add organic material (compost, humus, etc.) regularly to increase soil water-retention and nutrient-retention capacity (see comments on soil humus content). Keep the soil mulched and well-watered in hot summer months. Use a moisture meter to determine if the soil is adequately moist 3-5" below the surface (for garden plantings). Make sure small trees get 1-2" of water per week when there is insufficient rain.

Silty soils have good water-holding capacity but may not drain well. Add organic material (compost, humus, manure, etc.) to improve the soil structure and keep the soil well-mulched in the summer (see comments on soil humus content). Consider raised garden beds if the soil stays wet too long in the spring. Avoid soil compaction and excessive machine tilling.

Clay soil retains moisture and nutrients well and can be quite fertile (though hard to work when very wet or very dry). Clay-rich soils are especially helped by the addition of large amounts of organic matter to promote drainage; work compost or humus into the upper 12" of soil each year along with supplemental nitrogen to promote decomposition (see comments on soil humus content). Keep the soil surface well mulched in the summer. Avoid machine tilling and soil compaction. Use raised garden beds if possible.

Loams have a good balance of sand, silt, and clay components and are considered the best soils for gardens. Maintain good levels of organic matter with additions of compost, humus, manure, etc. and mulch during hot summer months (see comments on soil humus content).

Humus:

If humus content is very low it can affect the ability of the soil to maintain and release nutrients. Add a 3 inch layer of compost to the garden each spring and fall. Plant a green manure cover crop (such as buckwheat or mammoth red clover) in late summer and dig it into the soil in the spring about 1 month before planting.

If humus content is low it can affect the ability of the soil to maintain and release nutrients. Add a 3 inch layer of compost to the garden each year. Plant a green manure cover crop (such as buckwheat or mammoth red clover) in late summer and dig it into the soil in the spring about 1 month before planting.

If humus content is moderate it could be improved, especially for high-clay or high-sand soils. Add a 2 inch layer of compost to the garden each year. For plants that prefer an organic-rich soil (like strawberries), plant a green manure cover crop (such as buckwheat or mammoth red clover) in late summer and dig it into the soil in the spring about 1 month before planting.

If humus content is above average it could be increased for high-sand or high-clay soil. Add a 1-2 inch layer of compost to the garden each year to maintain the existing levels.

If humus content is high it should be maintained at these levels, particularly if you have high-sand or high-clay soil. Add a 1-2 inch layer of compost to the garden every other year to maintain the existing levels.

pH:

If the soil is too acidic (pH 5) for most vegetable gardens, though it is fine for acid-loving plants such as blueberries, azaleas, and rhododendrons (never lime areas in which these plants are growing). To get pH into the 6.0-7.0 range for vegetable crops, apply 250 lbs of lime per 1000 sq. ft. every year for 3 to 4 years. If an SMP buffer test is available for your soil, follow those test recommendations (lower lime levels may be required in some cases).

If the soil is too acidic (pH 6) for most vegetable gardens, though it is fine for acid-loving plants such as blueberries, azaleas, and rhododendrons (never lime areas in which these plants are growing). To get pH into the 6.0-7.0 range for vegetable crops, apply 250 lbs of lime per 1000 sq. ft. every year for 2 to 3 years. If an SMP buffer test is available for your soil, follow those test recommendations (lower lime levels may be required in some cases).

This is an appropriate pH level (pH 7) for most vegetable crops in Western Oregon, though somewhat high for acid-loving plants such as blueberries, azaleas, and rhododendrons (never lime areas in which these plants are growing). Apply 25-50 lbs of lime per 1000 sq. ft. every 2 to 3 years to keep the soil pH in the 6.0-7.0 range (for clay-rich soils). Loamy soil will need about 15 lbs of lime, and sandy soil will need about 5 lbs of lime for soil pH maintenance.

If the soil is too alkaline (pH 8) for most vegetable crops. Where plants are established, add up to 5 lbs of elemental sulfur per 1000 sq. ft. every 6 months for one year to lower the pH back to the normal range of 6.0-7.0. When the soil is not planted you may add up to 10 lbs of elemental sulfur in the fall before spring planting.

If the soil is too alkaline (pH 8+) for most vegetable crops. Where plants are established, add up to 5 lbs of elemental sulfur per 1000 sq. ft. every 6 months for 2 years to lower the pH back to the normal range of 6.0-7.0. When the soil is not planted you may add up to 10 lbs of elemental sulfur in the fall before planting the following spring. Add another 5 lbs at planting time and in the following fall. Avoid establishing plants that require neutral or acid soil until the pH is reduced.

Nitrogen:

If soil N is low (40) you must apply N fertilizer to meet plant growth needs. 4 lb. N / 1000 sq. ft. is appropriate for most vegetable crops and for fruit trees (if they are making less than 12" annual growth). Note that a fertilizer with an N:P:K rating of 12-4-4 will contain only 12% N. To get 4 lb of N into the soil, you must therefore apply 4 / 0.12 or 33.3 lbs of fertilizer. Do this calculation whether you are using chemical or organic fertilizer.

If soil N is moderate (100) fertilizer must be added periodically to meet plant growth needs. 2 lb. N / 1000 sq. ft. is appropriate for most vegetable crops and for fruit trees (if they are making 12"-18" annual growth). Note that a fertilizer with an N:P:K rating of 12-4-4 will contain only 12% N. To get 2 lbs of N into the soil, you must therefore apply 2 / 0.12 or 16.7 lbs of fertilizer. Do this calculation whether you are using chemical or organic fertilizer.

If soil N is Above-average (150) levels can cause weak, spindly plant growth and can create pollution in groundwater and streams. Do not add additional N fertilizer to gardens, or to fruit trees (if growth is over 18" per year). However, if you have sandy soil with low-to average humus content, N levels may drop to average or below-average values by the next season. Re-test the soil at that time.

Excessive soil N levels cause excessive vegetative plant growth and can create pollution in groundwater and streams. Do not add additional N-containing fertilizer to gardens, or to fruit trees (i.e., avoid fertilizer in which there is anything other than zero in the N position of the N:P:K analysis) . However, if you have sandy soil with low-to average humus content, N levels may drop to average values by the next season. Re-test the soil at that time.

Phosphorus:

Phosphorus is relative immobile in soil (20) and must be dug into the surface layer for plant roots to get at it. Add 3 lb phosphate / 1000 sq. ft. to bring garden phosphorus levels up to normal. Note that a fertilizer such as triple superphosphate has an N:P:K rating of 0-46-0 (P is expressed as phosphate). To get 3 lb of phosphate into the soil, you must therefore add 3 / 0.46 or 6.5 lbs of this fertilizer.

Phosphorus is relative immobile in soil (40) and must be dug into the surface layer for plant roots to get at it. Add 2 lb phosphate / 1000 sq. ft. to bring garden phosphorus levels up. Note that a fertilizer such as triple superphosphate has an N:P:K rating of 0-46-0 (P is expressed as phosphate). To get 2 lb of phosphate into the soil, you must therefore add 2 / 0.46 or 4.3 lbs of this fertilizer.

If Phosphorus is somewhat above average (100) a small addition of fertilizer is needed to keep the levels high. Cultivate in up to 1 lb phosphate / 1000 sq. ft. to maintain garden phosphorus levels. Note that a fertilizer such as triple superphosphate has an N:P:K rating of 0-46-0 (P is expressed as phosphate). To get 1 lb of phosphate into the soil, you must therefore add 1 / 0.46 or 2.2 lbs of this fertilizer.

Very high Phosphorus levels can interfere with the absorption of micronutrients and nitrogen. Do not apply any fertilizer that has a P value in the N:P:K analysis that is other than zero. Take soil samples carefully to avoid spots where there might be high P concentrations from fertilizer applications in previous years; P is relatively immobile in soils.

Potassium (K):

Low Potassium levels (150) can leach from soils (especially sandy ones) and must be made up with fertilizer. Add 3.5 lb potash / 1000 sq. ft. to bring levels up to normal. In the N:P:K analysis for fertilizer, potassium (K) is expressed as potash. Thus, to get 3.5 lbs of potash from a fertilizer rated as 5:10:12, with 12% potash, it is necessary to apply 3.5 / 0.12 or 29.2 lbs of fertilizer.

Moderate Potassium levels (250) can leach from soils (especially sandy ones) and some additions must be made periodically. Add 1.5 lb potash / 1000 sq. ft. to maintain normal levels. In the N:P:K analysis for fertilizer, potassium (K) is expressed as potash. Thus, to get 1.5 lbs of potash from a fertilizer rated as 5:10:12, with 12% potash, it is necessary to apply 1.5 / 0.12 or 12.5 lbs of fertilizer.

High potassium levels (800) in relation to N favor reproductive growth (fruit, flowers), but a low potassium level can lead to reduced vegetative growth (stems, leaves). If potassium levels are high, do not add additional K fertilizer (i.e., avoid mixed fertilizers with a significant K value in the N:P:K analysis). Since potassium can leach from soils, re-check the levels next season.

Very high potassium levels in relation to N can lead to reduced vegetative growth and leaf burn. If potassium levels are high, do not add additional K fertilizer (i.e., avoid mixed fertilizers with a K value in the N:P:K analysis that is above zero). Since potassium can leach from soils, re-check the levels in 1-2 years.

Calcium:

Low Calcium values (1000) If pH levels are adjusted to a normal value of 6.0-7.0, there will normally be no problems with Ca availability. Low Ca values generally indicate the need for lime. If an SMP buffer test is available for the soil, follow its recommendations for lime addition. Otherwise, follow the recommendations given in the pH test.

Moderate Calcium values (2000) If pH levels are adjusted to a normal value of 6.0-7.0, there will normally be no problems with Ca availability when Ca is within the normal range. Follow the recommendations for pH adjustment given above.

High Ca values may indicate a soil that is somewhat alkaline. If the pH value is above 7.0, follow the recommendations for the pH test above to lower it into the normal range; this should eliminate any problems with Ca availability.

Magnesium:

If you have a low pH and a Magnesium deficiency (60), use dolomitic lime when you add lime to raise the pH. On low-Mg soils, apply 1 tablespoon Epsom salt around each tomato and pepper plant to improve fruit set. Potassium magnesium sulfate (22% potash, 22% sulfur, 11% Mg) can be used if both Mg and potassium are low. Mg is leachable, so low-Mg soils will need periodic Mg additions.

If Magnesium and pH are both within the normal range (180), generally no addition is necessary. However, Mg can be leached from soils (particularly sandy soils), so occasional additions may be needed to maintain proper levels. Re-test soil every 2-3 years.

High Magnesium levels can inhibit Ca uptake. Toxic levels can be reached on a few SW Oregon serpentine soils. Do not use dolomitic lime if pH must be adjusted, and do not use potassium magnesium sulfate or other Mg-containing compounds to adjust potassium levels. Re-check the soil in 1-2 years to see if leaching has reduced Mg to normal levels.