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Summer 5-1-2008

## Understanding Your Soil Test Report

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Rich Koenig

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### Recommended Citation

Cardon, Grant E.; Kotuby-Amacher, Jan; Hole, Pam; and Koenig, Rich, "Understanding Your Soil Test Report" (2008). *Gardening*. Paper 14.

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# Agriculture

Utah State  
UNIVERSITY

COOPERATIVE  
extension

May 2008

AG/Soils/2008-01pr

## Understanding Your Soil Test Report

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*Pam Hole*, Supervisor USU Analytical Labs

*Rich Koenig*, Washington State University

Regular soil testing helps to develop and maintain more productive soils for farming, gardening, and landscaping. The purpose of this guide is to help you understand and interpret the results from a Utah State University soil test report. Additional Utah State University Extension bulletins are available, which address solutions to specific soil problems and offer guidance on fertilizer selection and use. See “Where to obtain additional information” at the end of this guide.

### General Information

A soil test report (Figure 1) lists the date the sample was received and when analyses were completed, as well as the lab number assigned to your sample. Use this number when contacting the lab with questions about your report. The sample identification is the name you assigned to your sample. The crop to be grown (or garden or lawn) is also listed, as well as any comments you provided on the information form submitted with your sample. The bulk of the report is composed of the results of tests you specified, test interpretations, and recommendations.

The utility of a soil test report depends largely on understanding the results in the context of the need for improvements or remedial measures in the soil physical (texture, structure, etc.) and chemical (pH, salinity, plant nutrient content, etc.) characteristics. To better understand the need for manipulation of these important soil conditions, this report offers two resources. First, each section of the soil test report is described along with a brief overview of



the role of that soil condition on the soil's function and productivity. Secondly, a set of detailed tables of soil test interpretations and associated recommendations for amending soil is provided for the various settings or land uses under consideration for any given soil. As research continues, soil test interpretations can change as new information or technologies emerge. Therefore, the interpretations are subject to modification from time to time, and will be periodically updated within this publication.

A routine soil analysis includes an estimate of soil texture, and lab analysis of pH, soil salinity (ECe), and the levels of plant available phosphorus and potassium in the sample. This core of tests provides the minimum information needed to manage a soil for optimum physical conditioning and plant growth and performance. Additional tests are available to determine soil nitrogen levels, micronutrient levels (such as sulfur, iron, zinc, etc.), organic matter content, salt ion balances, and specific elemental analysis.

**Figure 1. Example Soil Test Report**

**Soil Test Report  
and  
Fertilizer Recommendations**

**USU Analytical Labs**

Utah State University  
Logan, Utah 84322-4830  
(435) 797-2217  
(435) 797-2117 (FAX)  
www.usual.usu.edu

Date Received: 4/20/2005

Date Completed: 4/27/2005

Name:

Address:

Phone:

County:

Lab Number: 501

Grower's Comments:

Acres in Field:

Identification: GROSSL'S GARDEN

Crop to be Grown: Shrubs/Trees

Soil Test Results		Interpretations	Recommendations
Texture	Clay Loam		
pH	7.5	Normal	
Salinity - ECe	dS/m 1.0	Normal	
Phosphorus - P	mg/kg 3	Very Low	2 lbs P2O5/1000 sq ft
Potassium - K	mg/kg 358	Adequate	0 lbs K2O/1000 sq ft
Nitrate-Nitrogen - N	mg/kg 7		2-4 lbs N/1000sq ft*
Zinc - Zn	mg/kg 1.8	Adequate	0 oz Zinc/1000 sq ft
Iron - Fe	mg/kg 1	Low	
Copper - Cu	mg/kg 1.4	Adequate	
Manganese - Mn	mg/kg 5.9	Adequate	
Sulfate-Sulfur - S	mg/kg 21.5	Adequate	0 lbs Sulfur/1000 sq ft
Organic Matter	% 2.1		
SAR			

**Notes**

\*SEE GARDEN GUIDE.

For further assistance, please see your County Agent --

For further information and publications of interest, see the

[USU Analytical Lab webpage](#) or [Utah State University Extension](#)

A regular program of soil testing and evaluation of the results (particularly of routine analyses), coupled with the guidance provided by this document and Extension personnel at the county and state levels, will ensure that soil quality and productivity can be optimized and maintained at desirable levels.

In addition to this publication, please refer to the companion documents: “Selecting and Using Inorganic Fertilizers” and “Selecting and Using Organic Fertilizers” (HG509 and HG510, respectively). These publications provide detailed guidance on fertilizer sources, nutrient content determination, and calculation of application rates. These documents are available online at no charge at <http://extension.usu.edu>.

## Texture

Texture refers to the texture class of the soil. Sandy soils (sand, loamy sand, sandy loam) have lower water and nutrient holding capacities, whereas high clay soils (clay, silty clay, clay loam, silty clay loam) tend to be poorly drained and are subject to compaction. Additions of organic matter will increase the ability of sandy soils to hold water and nutrients, and the ability of high clay soils to drain water and resist compaction.

Click here for a table of soil test interpretations and recommendations.

## pH

pH indicates the acidity or alkalinity of soil. A pH of 7 is neutral. Values less than 7 are acidic and values greater than 7 are alkaline. Utah soils tend to be moderately alkaline (pH range 7.5 to 8.5). Most plants grow well in soils with pH values between 6.0 and 8.0. Trace element (e.g., iron) deficiencies can occur in soils with pH values greater than 8.0, and with some sensitive plants (e.g., berries, grapes, silver maple, pin oak) in soils with pH values greater than 7.5.

## Salinity-ECe

Salinity indicates the amount of soluble salt in soil. High salinity levels inhibit seed germination and plant growth. Different plants have different salt tolerance levels. Generally, if  $EC_e = 0$  to 2, salinity effects are mostly negligible; if  $EC_e = 2$  to 4, salinity may affect sensitive plants; if  $EC_e = 4$  to 8, yields of many plants are restricted; if  $EC_e = 8$  to 16, only tolerant plants will grow; if  $EC_e$  is above 16, only a few, very tolerant plants will grow.

A soil pH greater than 8.2 together with moderate to high salinity ( $EC_e > 2$  to 4) may indicate a problem with excess sodium. This can be verified by determining the sodium adsorption ratio (SAR) of soil (described below).

For more information on managing saline soils, please refer to: “Salinity and Plant Tolerance” (AG-SO-03) online at <http://extension.usu.edu>.

## Phosphorus-P

The phosphorus soil test result is in units of parts per million (or ppm), which is equivalent to pounds of available phosphorus per million pounds of soil. The soil test value is a measure of the amount of phosphorus available to plants during the growing season. A very low or low phosphorus test value indicates that additional phosphorus must be applied to prevent a deficiency. An adequate to high soil test value indicates that sufficient phosphorus is available to grow the plants you identified. Very high amounts of phosphorus indicate excessive fertilizer or manure application, and may lead to nutrient imbalances in plants, or negative environmental impacts to nearby water sources..

Click here for a table of soil test interpretations and recommendations.

## Potassium-K

The potassium soil test value is a measure of the amount of potassium available to plants during the growing season. A very low or low potassium test value indicates that additional potassium must be applied to prevent a deficiency. An adequate or

higher soil test value indicates that sufficient potassium will be available for growing the plants you identified. There are no known negative impacts to plants for potassium levels testing high or very high.

### **Nitrate-Nitrogen-N**

Nitrogen (N) is the most important, and generally the most limiting plant nutrient in the soil system. It is required for optimal growth and function for all living things, and hence is in very high demand in terrestrial systems. Annual additions of nitrogen are generally required for optimum growth and performance of any plant and so recommendations are based on annual plant needs rather than soil test levels. For this reason, nitrogen analysis is not included in the routine soil analysis package available through the lab. However, in many instances, especially where large, repeated applications of compost or manure are added to soils, nitrogen dynamics and management can be complex and knowledge of the soil test level is imperative to prevent over application, or loss of nitrogen from the system.

If requested, the amount of plant-available nitrogen is indicated by the nitrate-nitrogen value in the upper 2 or more feet of soil, normally the sum of 0 to 12 inch and 12 to 24 inch sample depths. The upper 2 feet of soil are used because nitrate-N is mobile and will move through soil with irrigation water or rainfall. Nitrogen recommendations depend on the nitrate-nitrogen soil test value, the crop to be grown or landscape setting (e.g., lawn or garden), yield, and site history (last crop grown, residue removal, and previous applications of nitrogen and/or manure). If a nitrate-nitrogen test was not requested, nitrogen recommendations will be based on the annual need of the crop to be grown, yield, and site history.

### **Zinc-Zn**

Zinc is occasionally deficient in Utah soils, especially where topsoil has been removed during construction and land leveling activities. Plants such as corn, potatoes, onions, and beans are most susceptible to zinc deficiency. A low or marginal soil test zinc value indicates a need for zinc fertilization at rates indicated on your report.

### **Iron-Fe**

Iron deficiency is a common problem with landscape plants in Utah. Iron sensitive trees, shrubs, and fruits growing in soils testing below 5 ppm iron may benefit from iron fertilization. Soil pH is an important factor in the optimum management of iron availability in soils, so consultation with extension personnel is helpful in understanding the dynamics and nuances of iron fertilization.

### **Copper-Cu and Manganese-Mn**

Copper and manganese deficiencies are rarely observed in Utah. When indicated, copper and manganese applications should initially be made on a trial basis to determine if there is a response before treating large areas.

### **Sulfate-Sulfur-S**

Sulfur deficiency is most likely to occur in higher elevation areas where irrigation waters are relatively pure or in urban settings where municipal water sources (which have been treated to have low levels of dissolved salts) are used for irrigation. A low or marginal sulfur test indicates a need for sulfur fertilization at rates recommended on the report.

[Click here for a table of soil test interpretations and recommendations.](#)

### **Sodium Adsorption Ratio-SAR**

The SAR is the ratio of sodium (Na) to calcium (Ca) plus magnesium (Mg) in the soil solution. A high SAR can cause the deterioration of soil aggregates and often results in surface crusting and poor water infiltration and plant growth. Soils with a SAR greater than 10 to 15 are classified as sodic and will likely require the addition of gypsum (calcium sulfate) or other amendments (such as elemental sulfur and/or organic matter) at high rates to aid in the displacement of sodium, reformation and stabilization of soil aggregates, and improvement of infiltration. Contact your local county Extension agent for assistance in treating soils with a high SAR.

For more information on high sodium soils, refer to: “Managing Sodic Soils in Utah” (AG275) online at <http://extension.usu.edu>.

### **Organic Matter-O.M.**

Organic matter provides nutrients such as nitrogen and sulfur for plant growth while improving soil tilth (physical condition). Generally, higher levels of organic matter are desirable. Soil organic matter content also influences the effectiveness and application rate of certain herbicides. Follow the instructions on your herbicide label or contact your local county Extension agent for assistance.

### **Recommendations**

Nutrient recommendations are expressed in pounds per acre for agricultural soil samples, or pounds per

1000 square feet for turf, landscape, and garden soil samples. These recommendations are used as the basis for calculating the application rates of fertilizers you select to meet the nutrient needs.

### **Where to Obtain Additional Information**

The Utah State University Analytical Laboratory has information on soil, plant, feed, and water analysis. Other Utah State University Extension bulletins are also available on a wide range of topics. For information and assistance in obtaining these guides, contact your local county Extension agent, the Utah State University Analytical Laboratory (Utah State University, Logan, Utah 84322-4830; 435-797-2217), or the Utah State University Extension Web site: <http://extension.usu.edu>.

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This publication is issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Noelle E. Cockett, Vice President for Extension and Agriculture, Utah State University.

# Soil Test Interpretations and Recommendations Tables

## Agricultural Crops:

Alfalfa  
Barley  
Corn (grain)  
Corn (silage)  
Dryland Alfalfa  
Dryland Small Grains  
Dryland Pasture  
Grass Hay  
Legume/Grass Mix Pasture  
Oats  
Potato  
Wheat

## Urban Landscape Settings:

Garden  
Lawn  
Sports/Recreational Turf  
Trees & Shrubs  
Fruit Trees  
Site Reclamation

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**ALFALFA INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations							Recommendations			
	Very Low	Low A	Low B	Marginal	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low A	If Interpretation = Low B	If Interpretation = Marginal
pH		< 6.1	---	---	6.1 to 8.4	> 8.4 to ≤ 8.6	> 8.6	---	---	---	---
EC (salts, dS/m)	< 0.05	≥ 0.05 to < 0.15	---	---	≥ 0.15 to < 3	≥ 3 to < 8	≥ 8	---	---	---	---
Phosphorus (mg/kg)	< 4 mg/kg	≥ 4 to < 8	≥ 8 to < 11	≥ 11 to ≤ 15	> 15 to < 30	≥ 30 to < 60	≥ 60	200-250 lbs P2O5/A	150-200 lbs P2O5/A	100-150 lbs P2O5/A	50-100 lbs P2O5/A
Potassium (mg/kg)	≤ 50	> 50 to ≤ 70	> 70 to ≤ 100	100 - 150	> 150 to < 250	≥ 250 to < 400	≥ 400	180-220 lbs K2O/A	140-180 lbs K2O/A	100-140 lbs K2O/A	60-100 lbs K2O/A
Nitrogen (mg/kg)*	---	---	---	---	---	---	---	---	---	---	---
Zinc (mg/kg)	< 0.5	≥ 0.5 to < 0.8	---	≥ 0.8 to ≤ 1	> 1 to < 50	≥ 50	---	10 lbs Zn/A	5 lbs Zn/A	---	0-5 lbs Zn/A
Iron (mg/kg)*	< 3.1	≥ 3.1 to ≤ 5	---	---	> 5 to < 50	≥ 50	---	---	---	---	---
Copper (mg/kg)*	---	≤ 0.2	---	---	> 0.2 to < 50	≥ 50	---	---	---	---	---
Manganese (mg/kg)*	---	≤ 1	---	---	> 1 to < 50	≥ 50	---	---	---	---	---
Sulfur (mg/kg)	---	≤ 8	---	---	> 8	---	---	---	10-20 lbs S/A	---	---
Organic Matter (%)	---	---	---	---	---	---	---	---	---	---	---
SAR	---	---	---	---	< 15	≥ 15	---	---	---	---	---

**\*Notes:**

Nitrogen application is not recommended on Alfalfa  
 Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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**BARLEY INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations							Recommendations			
	Very Low	Low A	Low B	Marginal	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low A	If Interpretation = Low B	If Interpretation = Marginal
pH		< 6.1	---	---	6.1 to 8.4	> 8.4 to ≤ 8.6	>8.6	---	---	---	---
EC (salts, dS/m)	< 0.05	≥ 0.05 to <0.15	---	---	≥ 0.15 to < 8	≥ 8 to < 12	≥ 12	---	---	---	---
Phosphorus (mg/kg)	< 4 mg/kg	≥ 4 to < 8	≥ 8 to < 11	≥ 11 to ≤ 15	> 15 to < 30	≥ 30 to < 60	≥ 60	150-170 lbs P2O5/A	70-90 lbs P2O5/A	40-60 lbs P2O5/A	0-50 lbs P2O5/A
Potassium (mg/kg)	≤ 50	> 50 to ≤ 70	>70 to ≤ 100	100 - 150	> 150 to < 250	≥ 250 to < 400	≥ 400	180-220 lbs K2O/A	140-180 lbs K2O/A	80-120 lbs K2O/A	40-60 lbs K2O/A
Nitrogen (mg/kg)	---	---	---	---	---	---	---	See Below	See Below	See Below	See Below
Zinc (mg/kg)	≤ 0.5	> 0.5 to < 0.8	---	≥ 0.8 to ≤ 1	> 1 to < 50	≥ 50	---	10 lbs Zn/A	5 lbs Zn/A	0-5 lbs Zn/A	---
Iron (mg/kg)*	< 3.1	≥ 3.1 to ≤ 5	---	---	> 5 to < 50	≥ 50	---	---	---	---	---
Copper (mg/kg)*	---	≤ 0.2	---	---	> 0.2 to < 50	≥ 50	---	---	---	---	---
Manganese (mg/kg)*	---	≤ 1	---	---	> 1 to < 50	≥ 50	---	---	---	---	---
Sulfur (mg/kg)	---	≤ 8	---	---	> 8	---	---	---	10-20 lbs S/A	---	---
Organic Matter (%)	---	---	---	---	---	---	---	---	---	---	---
SAR	---	---	---	---	< 15	≥ 15	---	---	---	---	---

Nitrogen Recommendations	
For Yield Goal = 110 bushels/acre	130 lbs N/acre
For Yield Goal = 100 bushels/acre	110 lbs N/acre
For Yield Goal = 85 bushels/acre	85 lbs N/acre
Adjustment for different yield goals	add or subtract 1.6 lbs N/bu/acre
Adjustment if NO3-N is determined	50 + (Yield goal(bu/ac)) - 4(Soil Test Nitrate)

**\*Notes:**

Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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**CORN (GRAIN) INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations							Recommendations			
	Very Low	Low A	Low B	Marginal	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low A	If Interpretation = Low B	If Interpretation = Marginal
pH		< 6.1	---	---	6.1 to 8.4	> 8.4 to ≤ 8.6	>8.6	---	---	---	---
EC (salts, dS/m)	< 0.05	≥ 0.05 to <0.15	---	---	≥ 0.15 to < 3	≥ 3 to < 8	≥ 8	---	---	---	---
Phosphorus (mg/kg)	< 4 mg/kg	≥ 4 to < 8	≥ 8 to < 11	≥ 11 to ≤ 15	> 15 to < 30	≥ 30 to < 60	≥ 60	150-170 lbs P2O5/A	70-90 lbs P2O5/A	40-60 lbs P2O5/A	0-50 lbs P2O5/A
Potassium (mg/kg)	≤ 50	> 50 to ≤ 70	>70 to ≤ 100	100 - 150	> 150 to < 250	≥ 250 to < 400	≥ 400	180-220 lbs K2O/A	140-180 lbs K2O/A	80-120 lbs K2O/A	40-60 lbs K2O/A
Nitrogen (mg/kg)	---	---	---	---	---	---	---	See Below	See Below	See Below	See Below
Zinc (mg/kg)	≤ 0.5	> 0.5 to < 0.8	---	≥ 0.8 to ≤ 1	> 1 to < 50	≥ 50	---	10 lbs Zn/A	5 lbs Zn/A	---	0-5 lbs Zn/A
Iron (mg/kg)*	< 3.1	≥ 3.1 to ≤ 5	---	---	> 5 to < 50	≥ 50	---	---	---	---	---
Copper (mg/kg)*	---	≤ 0.2	---	---	> 0.2 to < 50	≥ 50	---	---	---	---	---
Manganese (mg/kg)*	---	≤ 1	---	---	> 1 to < 50	≥ 50	---	---	10-20 lbs S/A	---	---
Sulfur (mg/kg)	---	≤ 8	---	---	> 8	---	---	---	---	---	---
Organic Matter (%)	---	---	---	---	---	---	---	---	---	---	---
SAR	---	---	---	---	< 15	≥ 15	---	---	---	---	---

Nitrogen Recommendations	
For Yield Goal = 160 bushels/acre	200 lbs N/acre
For Yield Goal = 140 bushels/acre	170 lbs N/acre
Adjustment for different yield goals	1.6 lbs N/bu/acre
Adjustment if NO3-N is determined	220 - 5(Soil Test Nitrate)

**\*Notes:**  
Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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**CORN (SILAGE) INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations							Recommendations			
	Very Low	Low A	Low B	Marginal	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low A	If Interpretation = Low B	If Interpretation = Marginal
pH	---	< 6.1	---	---	6.1 to 8.4	> 8.4 to ≤ 8.6	> 8.6	---	---	---	---
EC (salts, dS/m)	< 0.05	≥ 0.05 to < 0.15	---	---	≥ 0.15 to < 3	≥ 3 to < 8	≥ 8	---	---	---	---
Phosphorus (mg/kg)	< 4 mg/kg	≥ 4 to < 8	≥ 8 to < 11	≥ 11 to ≤ 15	> 15 to < 30	≥ 30 to < 60	≥ 60	150-170 lbs P2O5/A	70-90 lbs P2O5/A	40-60 lbs P2O5/A	0-50 lbs P2O5/A
Potassium (mg/kg)	≤ 50	> 50 to ≤ 70	> 70 to ≤ 100	100 - 150	> 150 to < 250	≥ 250 to < 400	≥ 400	180-220 lbs K2O/A	140-180 lbs K2O/A	80-120 lbs K2O/A	40-60 lbs K2O/A
Nitrogen (mg/kg)	---	---	---	---	---	---	---	See Below	See Below	See Below	See Below
Zinc (mg/kg)	< 0.5	≥ 0.5 to < 0.8	---	≥ 0.8 to ≤ 1	> 1 to < 50	≥ 50	---	10 lbs Zn/A	5 lbs Zn/A	---	0-5 lbs Zn/A
Iron (mg/kg)*	< 3.1	≥ 3.1 to ≤ 5	---	---	> 5 to < 50	≥ 50	---	---	---	---	---
Copper (mg/kg)*	---	≤ 0.2	---	---	> 0.2 to < 50	≥ 50	---	---	---	---	---
Manganese (mg/kg)*	---	≤ 1	---	---	> 1 to < 50	≥ 50	---	---	---	---	---
Sulfur (mg/kg)	---	≤ 8	---	---	> 8	---	---	---	10-20 lbs S/A	---	---
Organic Matter (%)	---	---	---	---	---	---	---	---	---	---	---
SAR	---	---	---	---	< 15	≥ 15	---	---	---	---	---

Nitrogen Recommendations		
For Yield Goal = 28 tons/acre		200 lbs N/acre
For Yield Goal = 22 tons/acre		150 lbs N/acre
Adjustment for different yield goals		4 lbs N/ton/acre
Adjustment if NO3-N is determined		100 + 5(yield goal) - 5(Soil Test Nitrate)

**\*Notes:**  
Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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**DRYLAND ALFALFA INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations							Recommendations			
	Very Low	Low A	Low B	Marginal	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low A	If Interpretation = Low B	If Interpretation = Marginal
pH	---	< 6.1	---	---	6.1 to 8.4	> 8.4 to ≤ 8.6	> 8.6	---	---	---	---
EC (salts, dS/m)	< 0.05	≥ 0.05 to < 0.15	---	---	≥ 0.15 to < 3	≥ 3 to < 8	≥ 8	---	---	---	---
Phosphorus (mg/kg)	< 4 mg/kg	≥ 4 to < 8	≥ 8 to < 10	≥ 10 to ≤ 12	> 12 to < 30	≥ 30 to < 60	≥ 60	50-70 lbs P2O5/A	35-55 lbs P2O5/A	20-40 lbs P2O5/A	0-30 lbs P2O5/A
Potassium (mg/kg)	≤ 50	> 50 to ≤ 70	> 70 to ≤ 100	---	> 100 to < 250	≥ 250 to < 400	≥ 400	180-220 lbs K2O/A	140-180 lbs K2O/A	80-120 lbs K2O/A	---
Nitrogen (mg/kg)*	---	---	---	---	---	---	---	---	---	---	---
Zinc (mg/kg)	< 0.5	≥ 0.5 to < 0.8	---	≥ 0.8 to ≤ 1	> 1 to < 50	≥ 50	---	10 lbs Zn/A	5 lbs Zn/A	---	0-5 lbs Zn/A
Iron (mg/kg)*	< 3.1	≥ 3.1 to ≤ 5	---	---	> 5 to < 50	≥ 50	---	---	---	---	---
Copper (mg/kg)*	---	≤ 0.2	---	---	> 0.2 to < 50	≥ 50	---	---	---	---	---
Manganese (mg/kg)*	---	≤ 1	---	---	> 1 to < 50	≥ 50	---	---	---	---	---
Sulfur (mg/kg)	---	≤ 8	---	---	> 8	---	---	---	10-20 lbs S/A	---	---
Organic Matter (%)	---	---	---	---	---	---	---	---	---	---	---
SAR	---	---	---	---	< 15	≥ 15	---	---	---	---	---

**\*Notes:**

Application of Nitrogen is not recommended on Alfalfa  
 Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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**DRYLAND GRAINS INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations							Recommendations			
	Very Low	Low A	Low B	Marginal	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low A	If Interpretation = Low B	If Interpretation = Marginal
pH	---	< 6.1	---	---	6.1 to 8.4	> 8.4 to ≤ 8.6	>8.6	---	---	---	---
EC (salts, dS/m)	< 0.05	≥ 0.05 to <0.15	---	---	≥ 0.15 to < 3	≥ 3 to < 8	≥ 8	---	---	---	---
Phosphorus (mg/kg)	< 4 mg/kg	≥ 4 to < 8	≥ 8 to < 10	≥ 10 to ≤ 12	> 12 to < 30	≥ 30 to < 60	≥ 60	50-70 lbs P2O5/A	35-55 lbs P2O5/A	20-40 lbs P2O5/A	0-30 lbs P2O5/A
Potassium (mg/kg)	≤ 50	> 50 to ≤ 70	>70 to ≤ 100	---	> 100 to < 250	≥ 250 to < 400	≥ 400	180-220 lbs K2O/A	140-180 lbs K2O/A	80-120 lbs K2O/A	---
Nitrogen (mg/kg)	---	---	---	---	---	---	---	See Below	See Below	See Below	See Below
Zinc (mg/kg)	< 0.5	≥ 0.5 to < 0.8	---	≥ 0.8 to ≤ 1	> 1 to < 50	≥ 50	---	10 lbs Zn/A	5 lbs Zn/A	---	0-5 lbs Zn/A
Iron (mg/kg)*	< 3.1	≥ 3.1 to ≤ 5	---	---	> 5 to < 50	≥ 50	---	---	---	---	---
Copper (mg/kg)*	---	≤ 0.2	---	---	> 0.2 to < 50	≥ 50	---	---	---	---	---
Manganese (mg/kg)*	---	≤ 1	---	---	> 1 to < 50	≥ 50	---	---	---	---	---
Sulfur (mg/kg)	---	≤ 8	---	---	> 8	---	---	---	10-20 lbs S/A	---	---
Organic Matter (%)	---	---	---	---	---	---	---	---	---	---	---
SAR	---	---	---	---	< 15	≥ 15	---	---	---	---	---

Nitrogen Recommendations	
If NO3-N is not determined	40-70 lbs N/acre
If NO3-N is determined	(40-70 lbs N/acre) - 4(Soil Test Nitrate)

\*Notes:  
Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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**DRYLAND PASTURE INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations							Recommendations			
	Very Low	Low A	Low B	Marginal	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low A	If Interpretation = Low B	If Interpretation = Marginal
pH	---	< 6.1	---	---	6.1 to 8.4	> 8.4 to ≤ 8.6	> 8.6	---	---	---	---
EC (salts, dS/m)	< 0.05	≥ 0.05 to < 0.15	---	---	≥ 0.15 to < 5	≥ 5 to < 10	≥ 10	---	---	---	---
Phosphorus (mg/kg)	< 4 mg/kg	≥ 4 to < 8	≥ 8 to < 10	≥ 10 to ≤ 12	> 12 to < 30	≥ 30 to < 60	≥ 60	50-70 lbs P2O5/A	35-55 lbs P2O5/A	20-40 lbs P2O5/A	0-30 lbs P2O5/A
Potassium (mg/kg)	≤ 50	> 50 to ≤ 70	> 70 to ≤ 100	---	> 100 to < 250	≥ 250 to < 400	≥ 400	180-220 lbs K2O/A	140-180 lbs K2O/A	80-120 lbs K2O/A	---
Nitrogen (mg/kg)	---	---	---	---	---	---	---	See Below	See Below	See Below	See Below
Zinc (mg/kg)	< 0.5	≥ 0.5 to < 0.8	---	≥ 0.8 to ≤ 1	> 1 to < 50	≥ 50	---	10 lbs Zn/A	5 lbs Zn/A	---	0-5 lbs Zn/A
Iron (mg/kg)*	< 3.1	≥ 3.1 to ≤ 5	---	---	> 5 to < 50	≥ 50	---	---	---	---	---
Copper (mg/kg)*	---	≤ 0.2	---	---	> 0.2 to < 50	≥ 50	---	---	---	---	---
Manganese (mg/kg)*	---	≤ 1	---	---	> 1 to < 50	≥ 50	---	---	---	---	---
Sulfur (mg/kg)	---	≤ 8	---	---	> 8	---	---	---	10-20 lbs S/A	---	---
Organic Matter (%)	---	---	---	---	---	---	---	---	---	---	---
SAR	---	---	---	---	< 15	≥ 15	---	---	---	---	---

Nitrogen Recommendations	
If NO3-N is not determined	50 lbs N/acre
If NO3-N is determined	50 lbs N/acre - 4(Soil Test Nitrate)

\*Notes:  
Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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**FRUIT TREES INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations					Recommendations	
	Very Low	Low	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low
pH	----	< 6.1	6.1 - 8.4	> 8.4 - 8.6	> 8.6	----	----
EC (salts)	< 0.05	0.05 - 0.15	0.15 - 1.5	1.5 - 3.0	> 3.0	----	----
Phosphorus	< 5	5 - < 10	10 - < 30	30 - < 50	> 50	2 - 3 lbs P2O5/1000 sq ft	1 lbs P2O5/1000 sq ft
Potassium	< 35	35 - < 75	75 - < 400	>= 400	----	2 - 3 lbs K2O/1000sq ft	2 lbs K2O/1000 sq ft
Nitrogen	----	----	----	----	----	2-4 lbs N/1000 sq ft/season	2-4 lbs N/1000 sq ft/season
Zinc	< 0.5	0.5 to 1.0	1.0 to 50	>=50	----	3 oz/1000 sq ft	2 oz/1000 sq ft
Iron	<3.1	3.1 - 5	>5	>=50	----	<i>None given</i>	<i>None given</i>
Copper	----	<=0.2	0.2-50	>=50	----	<i>Never a problem</i>	<i>Never a problem</i>
Manganese	----	<=1	1 - 50	>=50	----	<i>Never a problem</i>	<i>Never a problem</i>
Sulfur	----	< 8	>= 8	----	----	-----	0.5 lbs S/1000 sq ft
Organic Matter	----	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>
SAR	----	----	< 15	>=15	----	<i>None given</i>	<i>None given</i>

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**GARDEN INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations					Recommendations	
	Very Low	Low	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low
pH	----	< 6.1	6.1 - 8.4	> 8.4 to 8.6	> 8.6	----	----
EC (salts)	< 0.05	0.05 - 0.15	0.15 - 1.5	1.5 - 3.0	> 3.0	----	----
Phosphorus	< 10	10 - < 19	19 - < 30	30 - < 60	> 60	3 lbs P2O5/1000 sq ft	1-2 lbs P2O5/1000 sq ft
Potassium	----	< 125	125 - 400	> 400	----	-----	2 lbs K2O/1000 sq ft
Nitrogen	<10	10-25	> 25	----	----	2-4 lbs N/1000 sq ft	1-2 lbs N/1000 sq ft
Zinc	< 0.5	0.5 to 1.0	1.0 to 50	>=50	----	3 oz/1000 sq ft	2 oz/1000 sq ft
Iron	<3.1	3.1 - 5	>5	>=50	----	<i>None given</i>	<i>None given</i>
Copper	----	<=0.2	0.2-50	>=50	----	<i>Never a problem</i>	<i>Never a problem</i>
Manganese	----	<=1	1 - 50	>=50	----	<i>Never a problem</i>	<i>Never a problem</i>
Sulfur	----	< 8	>= 8	----	----	-----	0.5 lbs S/1000 sq ft
Organic Matter	----	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>
SAR	----	----	< 15	>=15	----	<i>None given</i>	<i>None given</i>

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**GRASS HAY INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations							Recommendations			
	Very Low	Low A	Low B	Marginal	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low A	If Interpretation = Low B	If Interpretation = Marginal
pH	---	< 6.1	---	---	6.1 to 8.4	> 8.4 to ≤ 8.6	>8.6	---	---	---	---
EC (salts, dS/m)	< 0.05	≥ 0.05 to <0.15	---	---	≥ 0.15 to < 5	≥ 5 to < 10	≥ 10	---	---	---	---
Phosphorus (mg/kg)	< 4 mg/kg	≥ 4 to < 8	≥ 8 to < 11	≥ 11 to ≤ 15	> 15 to < 30	≥ 30 to < 60	≥ 60	100-125 lbs P2O5/A	75-100 lbs P2O5/A	50-75 lbs P2O5/A	0-50 lbs P2O5/A
Potassium (mg/kg)	≤ 50	> 50 to ≤ 70	>70 to ≤ 100	100 - 150	> 150 to < 250	≥ 250 to < 400	≥ 400	180-220 lbs K2O/A	140-180 lbs K2O/A	80-120 lbs K2O/A	40-60 lbs K2O/A
Nitrogen (mg/kg)	---	---	---	---	---	---	---	See Below	See Below	See Below	See Below
Zinc (mg/kg)	< 0.5	≥ 0.5 to < 0.8	---	≥ 0.8 to ≤ 1	> 1 to < 50	≥ 50	---	10 lbs Zn/A	5 lbs Zn/A	---	0-5 lbs Zn/A
Iron (mg/kg)*	< 3.1	≥ 3.1 to ≤ 5	---	---	> 5 to < 50	≥ 50	---	---	---	---	---
Copper (mg/kg)*	---	≤ 0.2	---	---	> 0.2 to < 50	≥ 50	---	---	---	---	---
Manganese (mg/kg)*	---	≤ 1	---	---	> 1 to < 50	≥ 50	---	---	---	---	---
Sulfur (mg/kg)	---	≤ 8	---	---	> 8	---	---	---	10-20 lbs S/A	---	---
Organic Matter (%)	---	---	---	---	---	---	---	---	---	---	---
SAR	---	---	---	---	< 15	≥ 15	---	---	---	---	---

Nitrogen Recommendations	
For Yield Goal = 1-2 tons/acre	50 lbs N/acre
For Yield Goal = 2-4 tons/acre	75 lbs N/acre
For Yield Goal = 4-6 tons/acre	100-150 lbs N/acre
For Yield Goal = 6-8 tons/acre	150-200 lbs N/acre
If NO3-N is determined	(Goal Recommendation) - 4(Soil Test Nitrate)

**\*Notes:**  
Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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## LAWN INTERPRETATIONS + RECOMMENDATIONS

	Interpretations					Recommendations	
	Very Low	Low	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low
pH	----	< 6.1	6.1 - 8.4	> 8.4 to 8.6	> 8.6	----	----
EC (salts)	< 0.05	0.05 - 0.15	0.15 - 1.5	1.5 - 3.0	> 3.0	----	----
Phosphorus	< 5	5-15	>15 - 30	> 30 - 50	> 50	2 - 3 lbs P2O5/1000 sq ft	1 lbs P2O5/1000 sq ft
Potassium	<= 75	75 -125	> 125-400	> 400	----	2 - 3 lbs K2O/1000sq ft	2 lbs K2O/1000 sq ft
Nitrogen	----	----	----	----	----	2-4 lbs N/1000 sq ft/season	2-4 lbs N/1000 sq ft/season
Zinc	< 0.5	0.5 to 1.0	1.0 to 50	>=50	----	3 oz/1000 sq ft	2 oz/1000 sq ft
Iron	<3.1	3.1 - 5	>5	>=50	----	<i>None given</i>	<i>None given</i>
Copper	----	<=0.2	0.2-50	>=50	----	<i>Never a problem</i>	<i>Never a problem</i>
Manganese	----	<=1	1 - 50	>=50	----	<i>Never a problem</i>	<i>Never a problem</i>
Sulfur	----	< 8	>= 8	----	----	-----	0.5 lbs S/1000 sq ft
Organic Matter	----	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>
SAR	----	----	< 15	>=15	----	<i>None given</i>	<i>None given</i>

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**LEGUME/GRASS MIX INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations							Recommendations			
	Very Low	Low A	Low B	Marginal	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low A	If Interpretation = Low B	If Interpretation = Marginal
pH	---	< 6.1	---	---	6.1 to 8.4	> 8.4 to ≤ 8.6	>8.6	---	---	---	---
EC (salts, dS/m)	< 0.05	≥ 0.05 to <0.15	---	---	≥ 0.15 to < 3	≥ 3 to < 8	≥ 8	---	---	---	---
Phosphorus (mg/kg)	< 4 mg/kg	≥ 4 to < 8	≥ 8 to < 11	≥ 11 to ≤ 15	> 15 to < 30	≥ 30 to < 60	≥ 60	100-125 lbs P2O5/A	75-100 lbs P2O5/A	50-75 lbs P2O5/A	0-50 lbs P2O5/A
Potassium (mg/kg)	≤ 50	> 50 to ≤ 70	>70 to ≤ 100	100 - 150	> 150 to < 250	≥ 250 to < 400	≥ 400	180-220 lbs K2O/A	140-180 lbs K2O/A	80-120 lbs K2O/A	40-60 lbs K2O/A
Nitrogen (mg/kg)	---	---	---	---	---	---	---	See Below	See Below	See Below	See Below
Zinc (mg/kg)	< 0.5	≥ 0.5 to < 0.8	---	≥ 0.8 to ≤ 1	> 1 to < 50	≥ 50	---	10 lbs Zn/A	5 lbs Zn/A	---	0-5 lbs Zn/A
Iron (mg/kg)*	< 3.1	≥ 3.1 to ≤ 5	---	---	> 5 to < 50	≥ 50	---	---	---	---	---
Copper (mg/kg)*	---	≤ 0.2	---	---	> 0.2 to < 50	≥ 50	---	---	---	---	---
Manganese (mg/kg)*	---	≤ 1	---	---	> 1 to < 50	≥ 50	---	---	---	---	---
Sulfur (mg/kg)	---	≤ 8	---	---	> 8	---	---	---	10-20 lbs S/A	---	---
Organic Matter (%)	---	---	---	---	---	---	---	---	---	---	---
SAR	---	---	---	---	< 15	≥ 15	---	---	---	---	---

Nitrogen Recommendations	
For 75% grass, 25% legume and Yield Goal = 1-2 tons/acre	25 lbs N/A
For 75% grass, 25% legume and Yield Goal = 2-4 tons/acre	50 lbs N/A
For 75% grass, 25% legume and Yield Goal = 4-6 tons/acre	75-100 lbs N/A
For 75% grass, 25% legume and Yield Goal = 6-8 tons/acre	100-150 lbs N/A
For 50% grass, 50% legume and Yield Goal = 1-2 tons/acre	0 lbs N/A
For 50% grass, 50% legume and Yield Goal = 2-4 tons/acre	25 lbs N/A
For 50% grass, 50% legume and Yield Goal = 4-6 tons/acre	50 lbs N/A
For 50% grass, 50% legume and Yield Goal = 6-8 tons/acre	75 lbs N/A
For 25% grass, 75% legume and Yield Goal = 1-2 tons/acre	0 lbs N/A
For 25% grass, 75% legume and Yield Goal = 2-4 tons/acre	0 lbs N/A
For 25% grass, 75% legume and Yield Goal = 4-6 tons/acre	25 lbs N/A
For 25% grass, 75% legume and Yield Goal = 6-8 tons/acre	50 lbs N/A
Adjustment if NO3-N is determined (note recommendation never less than 0 lbs N/acre)	(Goal Recommendation) - 4(Soil Test Nitrate)

**\*Notes:**

Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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**OATS INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations							Recommendations			
	Very Low	Low A	Low B	Marginal	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low A	If Interpretation = Low B	If Interpretation = Marginal
pH		< 6.1	---	---	6.1 to 8.4	> 8.4 to ≤ 8.6	>8.6	---	---	---	---
EC (salts, dS/m)	< 0.05	≥ 0.05 to <0.15	---	---	≥ 0.15 to < 8	≥ 8 to < 12	≥ 12	---	---	---	---
Phosphorus (mg/kg)	< 4 mg/kg	≥ 4 to < 8	≥ 8 to < 11	≥ 11 to ≤ 15	> 15 to < 30	≥ 30 to < 60	≥ 60	150-170 lbs P2O5/A	70-90 lbs P2O5/A	40-60 lbs P2O5/A	0-50 lbs P2O5/A
Potassium (mg/kg)	≤ 50	> 50 to ≤ 70	>70 to ≤ 100	100 - 150	> 150 to < 250	≥ 250 to < 400	≥ 400	180-220 lbs K2O/A	140-180 lbs K2O/A	80-120 lbs K2O/A	40-60 lbs K2O/A
Nitrogen (mg/kg)	---	---	---	---	---	---	---	See Below	See Below	See Below	See Below
Zinc (mg/kg)	< 0.5	≥ 0.5 to < 0.8	---	≥ 0.8 to ≤ 1	> 1 to < 50	≥ 50	---	10 lbs Zn/A	5 lbs Zn/A	---	0-5 lbs Zn/A
Iron (mg/kg)*	< 3.1	≥ 3.1 to ≤ 5	---	---	> 5 to < 50	≥ 50	---	---	---	---	---
Copper (mg/kg)*	---	≤ 0.2	---	---	> 0.2 to < 50	≥ 50	---	---	---	---	---
Manganese (mg/kg)*	---	≤ 1	---	---	> 1 to < 50	≥ 50	---	---	---	---	---
Sulfur (mg/kg)	---	≤ 8	---	---	> 8	---	---	---	10-20 lbs S/A	---	---
Organic Matter (%)	---	---	---	---	---	---	---	---	---	---	---
SAR	---	---	---	---	< 15	≥ 15	---	---	---	---	---

Nitrogen Recommendations	
For Yield Goal = 110 bushels/acre	130 lbs N/acre
For Yield Goal = 100 bushels/acre	110 lbs N/acre
For Yield Goal = 85 bushels/acre	85 lbs N/acre
Adjustment for different yield goals	1.6 lbs N/bushel/acre
Adjustment if NO3-N is determined	50 + (Yield goal) - 4(Soil Test Nitrate)

**\*Notes:**

Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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**POTATO INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations							Recommendations			
	Very Low	Very Low	Low	Marginal	Adequate	High	Very High	If Interpretation = Very Low	If Interpretation = Low	If Interpretation = Low	If Interpretation = Marginal
pH	---	< 6.1	---	---	6.1 to 8.4	> 8.4 to ≤ 8.6	> 8.6	---	---	---	---
EC (salts, dS/m)	< 0.05	---	≥ 0.05 to < 0.15	---	≥ 0.15 to < 2.5	≥ 2.5 to < 5	≥ 5	---	---	---	---
Phosphorus (mg/kg)	< 7 mg/kg	≥ 7 to < 16	≥ 16 to < 21	≥ 21 to < 30	≥ 30 to < 40	≥ 40 to < 60	≥ 60	200-240 lbs P2O5/A	150-170 lbs P2O5/A	90-110 lbs P2O5/A	0-50 lbs P2O5/A
Potassium (mg/kg)	≤ 40	> 40 to ≤ 70	> 70 to ≤ 100	> 100 to ≤ 140	> 140 to < 350	≥ 350 to < 400	≥ 400	230-270 lbs K2O/A	190-230 lbs K2O/A	120-160 lbs K2O/A	80-120 lbs K2O/A
Nitrogen (mg/kg)	---	---	---	---	---	---	---	See Below	See Below	See Below	See Below
Zinc (mg/kg)	< 0.5	---	≥ 0.5 to < 0.8	≥ 0.8 to ≤ 1	> 1 to < 50	≥ 50	---	10 lbs Zn/A	5 lbs Zn/A	---	0-5 lbs Zn/A
Iron (mg/kg)*	< 3.1	≥ 3.1 to ≤ 5	---	---	> 5 to < 50	≥ 50	---	---	---	---	---
Copper (mg/kg)*	---	---	≤ 0.2	---	> 0.2 to < 50	≥ 50	---	---	---	---	---
Manganese (mg/kg)*	---	---	≤ 1	---	> 1 to < 50	≥ 50	---	---	---	---	---
Sulfur (mg/kg)	---	---	≤ 8	---	> 8	---	---	---	10-20 lbs S/A	---	---
Organic Matter (%)	---	---	---	---	---	---	---	---	---	---	---
SAR	---	---	---	---	< 15	≥ 15	---	---	---	---	---

Nitrogen Recommendation	
For Yield Goal = 300 cwt/acre	130 lbs N/acre
For Yield Goal = 250 cwt/acre	100 lbs N/acre
Adjustment for different yield goals	0.5 lbs N/cwt/acre
Adjustment if NO3-N is determined	180 + 0.6(yield goal - 100) - 6(Soil Test Nitrate)

**\*Notes:**  
Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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**RECLAMATION INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations							Recommendations			
	Very Low	Low A	Low B	Marginal	Adequate	High	Very High	If Interpretation = Very Low	If Interpretation = Low A	If Interpretation = Low B	If Interpretation = Marginal
pH	---	< 6.1	---	---	6.1 to 8.4	> 8.4 to ≤ 8.6	> 8.6				
EC (salts, dS/m)	< 0.05	≥ 0.05 to < 0.15	---	---	≥ 0.15 to < 3	≥ 3 to < 8	≥ 8				
Phosphorus (mg/kg)	< 4 mg/kg	≥ 4 to < 8	≥ 8 to < 10	≥ 10 to ≤ 12	> 12 to < 30	≥ 30 to < 60	≥ 60	50-70 lbs P2O5/A	35-55 lbs P2O5/A	20-40 lbs P2O5/A	0-30 lbs P2O5/A
Potassium (mg/kg)	≤ 50	> 50 to ≤ 70	> 70 to ≤ 100	---	> 100 to < 250	≥ 250 to < 400	≥ 400	180-220 lbs K2O/A	140-180 lbs K2O/A	80-120 lbs K2O/A	---
Nitrogen (mg/kg)	---	---	---	---	---	---	---	See Below	See Below	See Below	See Below
Zinc (mg/kg)	< 0.5	≥ 0.5 to < 0.8	---	≥ 0.8 to ≤ 1	> 1 to < 50	≥ 50	---	10 lbs Zn/A	5 lbs Zn/A		0-5 lbs Zn/A
Iron (mg/kg)*	< 3.1	≥ 3.1 to ≤ 5	---	---	> 5 to < 50	≥ 50	---				
Copper (mg/kg)*	---	≤ 0.2	---	---	> 0.2 to < 50	≥ 50	---				
Manganese (mg/kg)*	---	≤ 1	---	---	> 1 to < 50	≥ 50	---				
Sulfur (mg/kg)	---	≤ 8	---	---	> 8	---	---		10-20 lbs S/A		
Organic Matter (%)	---	---	---	---	---	---	---				
SAR	---	---	---	---	< 15	≥ 15	---				

Nitrogen Recommendations	
If NO3-N is not determined	40-60 lbs N/A
If NO3-N is determined	(Recommendation) - 4(Soil Test Nitrate)

**\*Notes:**  
Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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## SPORTS TURF INTERPRETATIONS + RECOMMENDATIONS

	Interpretations					Recommendations	
	Very Low	Low	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low
pH	----	< 6.1	6.1 - 8.4	> 8.4 to 8.6	> 8.6	----	----
EC (salts, dS/m)	< 0.05	0.05 - 0.15	0.15 - 1.5	1.5 - 3.0	> 3.0	----	----
Phosphorus (mg/kg)	< 5	5-15	>15 - 30	> 30 - 50	> 50	2 - 3 lbs P2O5/1000 sq ft	1 lbs P2O5/1000 sq ft
Potassium (mg/kg)	<= 75	75 -125	> 125-400	> 400	----	2 - 3 lbs K2O/1000sq ft	2 lbs K2O/1000 sq ft
Nitrogen (mg/kg)	----	----	----	----	----	2-4 lbs N/1000 sq ft/season	2-4 lbs N/1000 sq ft/season
Zinc (mg/kg)	< 0.5	0.5 to 1.0	1.0 to 50	>=50	----	3 oz/1000 sq ft	2 oz/1000 sq ft
Iron (mg/kg)*	<3.1	3.1 - 5	>5	>=50	----	<i>None given</i>	<i>None given</i>
Copper (mg/kg)*	----	<=0.2	0.2-50	>=50	----	<i>Never a problem</i>	<i>Never a problem</i>
Manganese (mg/kg)*	----	<=1	1 - 50	>=50	----	<i>Never a problem</i>	<i>Never a problem</i>
Sulfur (mg/kg)	----	< 8	>= 8	----	----	-----	0.5 lbs S/1000 sq ft
Organic Matter (%)	----	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>
SAR	----	----	< 15	>=15	----	<i>None given</i>	<i>None given</i>

**\*Notes:**

Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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## TREES AND SHRUBS INTERPRETATIONS + RECOMMENDATIONS

	Interpretations					Recommendations	
	Very Low	Low	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low
pH	----	< 6.1	6.1 - 8.4	> 8.4 to 8.6	> 8.6	----	----
EC (salts, dS/m)	< 0.05	0.05 - 0.15	0.15 - 1.5	1.5 - 3.0	> 3.0	----	----
Phosphorus (mg/kg)	< 5	5 - < 10	10 - < 30	30 - < 50	> 50	2 - 3 lbs P2O5/1000 sq ft	1 lbs P2O5/1000 sq ft
Potassium (mg/kg)	< 75	75 - 125	126 - 400	> 400	----	2 - 3 lbs K2O/1000sq ft	2 lbs K2O/1000 sq ft
Nitrogen (mg/kg)	----	----	----	----	----	2-4 lbs N/1000 sq ft/season	2-4 lbs N/1000 sq ft/season
Zinc (mg/kg)	< 0.5	0.5 to 1.0	1.0 to 50	>=50	----	3 oz/1000 sq ft	2 oz/1000 sq ft
Iron (mg/kg)*	<3.1	3.1 - 5	>5	>=50	----	<i>None given</i>	<i>None given</i>
Copper (mg/kg)*	----	<=0.2	0.2-50	>=50	----	<i>Never a problem</i>	<i>Never a problem</i>
Manganese (mg/kg)*	----	<=1	1 - 50	>=50	----	<i>Never a problem</i>	<i>Never a problem</i>
Sulfur (mg/kg)	----	< 8	> 8	----	----	-----	0.5 lbs S/1000 sq ft
Organic Matter (%)	----	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>	<i>None given</i>
SAR	----	----	< 15	>=15	----	<i>None given</i>	<i>None given</i>

### \*Notes:

Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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**WHEAT INTERPRETATIONS + RECOMMENDATIONS**

	Interpretations							Recommendations			
	Very Low	Low A	Low B	Marginal	Adequate/Normal	High	Very High	If Interpretation = Very Low	If Interpretation = Low A	If Interpretation = Low B	If Interpretation = Marginal
pH		< 6.1	---	---	6.1 to 8.4	> 8.4 to ≤ 8.6	>8.6	---	---	---	---
EC (salts, dS/m)	< 0.05	≥ 0.05 to <0.15	---	---	≥ 0.15 to < 3	≥ 3 to < 8	≥ 8	---	---	---	---
Phosphorus (mg/kg)	< 4 mg/kg	≥ 4 to < 8	≥ 8 to < 11	≥ 11 to ≤ 15	> 15 to < 30	≥ 30 to < 60	≥ 60	150-170 lbs P2O5/A	70-90 lbs P2O5/A	40-60 lbs P2O5/A	0-50 lbs P2O5/A
Potassium (mg/kg)	≤ 50	> 50 to ≤ 70	>70 to ≤ 100	100 - 150	> 150 to < 250	≥ 250 to < 400	≥ 400	180-220 lbs K2O/A	140-180 lbs K2O/A	80-120 lbs K2O/A	40-60 lbs K2O/A
Nitrogen (mg/kg)	---	---	---	---	---	---	---	See Below	See Below	See Below	See Below
Zinc (mg/kg)	< 0.5	≥ 0.5 to < 0.8	---	≥ 0.8 to ≤ 1	> 1 to < 50	≥ 50	---	10 lbs Zn/A	5 lbs Zn/A	---	0-5 lbs Zn/A
Iron (mg/kg)*	< 3.1	≥ 3.1 to ≤ 5	---	---	> 5 to < 50	≥ 50	---	---	---	---	---
Copper (mg/kg)*	---	≤ 0.2	---	---	> 0.2 to < 50	≥ 50	---	---	---	---	---
Manganese (mg/kg)*	---	≤ 1	---	---	> 1 to < 50	≥ 50	---	---	---	---	---
Sulfur (mg/kg)	---	≤ 8	---	---	> 8	---	---	---	10-20 lbs S/A	---	---
Organic Matter (%)	---	---	---	---	---	---	---	---	---	---	---
SAR	---	---	---	---	< 15	≥ 15	---	---	---	---	---

Nitrogen Recommendations	
For Yield Goal = 140 bushels/acre	170 lbs N/acre
For Yield Goal = 100 bushels/acre	120 lbs N/acre
Adjustment for different yield goals	2 lbs N/bushel/acre
Adjustment if NO3-N is determined	50 + (yield goal) - 4(Soil Test Nitrate)

**\*Notes:**  
Iron, Copper, and Manganese deficiencies not generally diagnosed in Utah

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