DIVISION OF AGRICULTURE
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Agriculture and Natural Resources

FSA2153

The Soil Test Report

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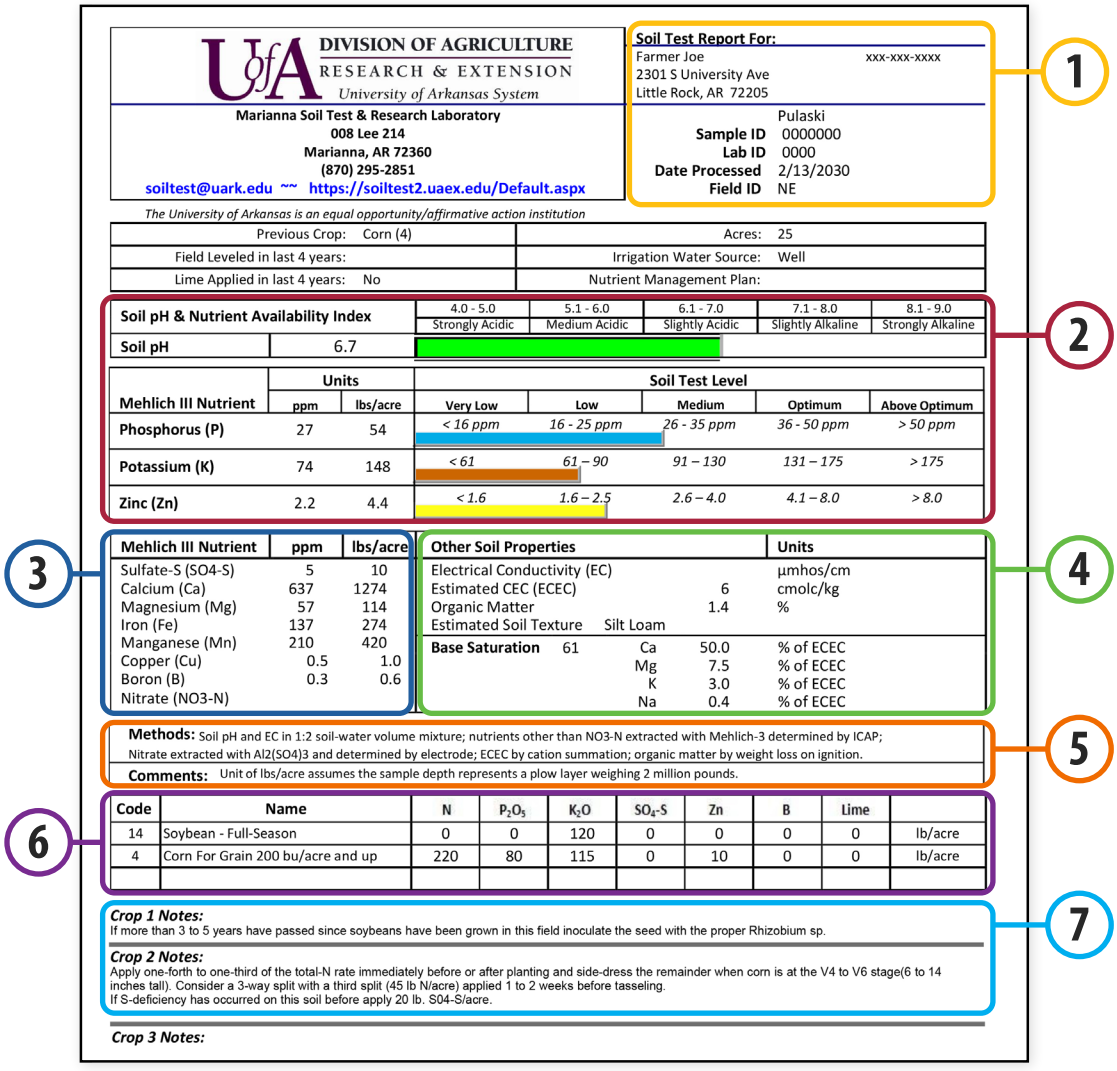
The University of Arkansas soil test report was revised in 2019 when the shift was made to online sample submission and online generated reports. The new report presents additional information to help the user understand the meaning of the numbers in the report. The new soil test report is divided into seven sections (Figure 1):

1. Background information.
2. Soil pH and nutrient availability index.
3. Other nutrient concentration values.
4. Other soil properties.
5. Information on methods used.
6. Fertilizer and amendment recommendations.
7. Crop notes associated with crop codes selected.



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Soil Test Report For:
Farmer Joe xxx-xxx-xxxx
2301 S University Ave
Little Rock, AR 72205

Pulaski
Sample ID 0000000
Lab ID 0000
Date Processed 2/13/2030
Field ID NE

Previous Crop: Corn (4)	Acres: 25
Field Leveled in last 4 years:	Irrigation Water Source: Well
Lime Applied in last 4 years: No	Nutrient Management Plan:

Soil pH & Nutrient Availability Index	4.0 - 5.0 Strongly Acidic	5.1 - 6.0 Medium Acidic	6.1 - 7.0 Slightly Acidic	7.1 - 8.0 Slightly Alkaline	8.1 - 9.0 Strongly Alkaline
Soil pH 6.7					

Mehlich III Nutrient	Units ppm	Units lbs/acre	Soil Test Level: Very Low	Low	Medium	Optimum	Above Optimum
Phosphorus (P)	27	54	< 16 ppm	16 - 25 ppm	26 - 35 ppm	36 - 50 ppm	> 50 ppm
Potassium (K)	74	148	< 61	61 – 90	91 – 130	131 – 175	> 175
Zinc (Zn)	2.2	4.4	< 1.6	1.6 – 2.5	2.6 – 4.0	4.1 – 8.0	> 8.0

Mehlich III Nutrient	ppm	lbs/acre
Sulfate-S (SO4-S)	5	10
Calcium (Ca)	637	1274
Magnesium (Mg)	57	114
Iron (Fe)	137	274
Manganese (Mn)	210	420
Copper (Cu)	0.5	1.0
Boron (B)	0.3	0.6
Nitrate (NO3-N)		

Other Soil Properties				Units
Electrical Conductivity (EC)				µmhos/cm
Estimated CEC (ECEC)			6	cmolc/kg
Organic Matter			1.4	%
Estimated Soil Texture	Silt Loam			
Base Saturation	61	Ca	50.0	% of ECEC
		Mg	7.5	% of ECEC
		K	3.0	% of ECEC
		Na	0.4	% of ECEC

Methods: Soil pH and EC in 1:2 soil-water volume mixture; nutrients other than NO3-N extracted with Mehlich-3 determined by ICAP; Nitrate extracted with Al2(SO4)3 and determined by electrode; ECEC by cation summation; organic matter by weight loss on ignition.
Comments: Unit of lbs/acre assumes the sample depth represents a plow layer weighing 2 million pounds.

Code	Name	N	P_2O_5	K_2O	SO_4-S	Zn	B	Lime	
14	Soybean - Full-Season	0	0	120	0	0	0	0	lb/acre
4	Corn For Grain 200 bu/acre and up	220	80	115	0	10	0	0	lb/acre

Crop 1 Notes:
If more than 3 to 5 years have passed since soybeans have been grown in this field inoculate the seed with the proper Rhizobium sp.

Crop 2 Notes:
Apply one-forth to one-third of the total-N rate immediately before or after planting and side-dress the remainder when corn is at the V4 to V6 stage(6 to 14 inches tall). Consider a 3-way split with a third split (45 lb N/acre) applied 1 to 2 weeks before tasseling.
If S-deficiency has occurred on this soil before apply 20 lb. S04-S/acre.

Crop 3 Notes:

Figure 1. An example soil test report.

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1. Background Information

The background information section is located at the top of the report and includes client information, field size, field ID, county of origin, and selected field history and management information. The sample ID can be used to identify the soil sample in the portal (https://uasoiltest.uada.edu/). Soil analysis reports are available for up to one year.

2. Soil pH and Nutrient Availability Index

The soil pH and nutrient availability index section contains the main soil chemical properties. Soil pH is one of the most important properties since it affects plant growth and the availability of several nutrients. The concentrations of phosphorus (P), potassium (K), and zinc (Zn) are provided in both parts per million (ppm) and pounds per acre (lb/acre). The lb/acre unit assumes that the soil sample represents an acre-furrow-slice weighing approximately 2 million pounds. In addition to reporting nutrient concentrations, the report provides a general interpretation of the nutrient availability index, referred to as the soil test level, for P, K, and Zn. This soil test level is related to the yield expected without fertilization. The soil test level applies only to P, K, and Zn since the levels of other nutrients are not commonly used to make fertilizer recommendations.

3. Other Nutrient Concentration Values

Figure 2 shows how the soil test report presents the concentration of other nutrients, such as sulfate-S (SO_4-S), calcium (Ca), and magnesium (Mg), which is provided as a reference as they may help with the diagnosis of nutrient-related problems.

Nitrogen (only in the nitrate form) is determined only for certain crops, but it can be determined for a fee if requested. Analysis for nitrate-nitrogen is not performed for samples submitted from lawns, pastures, and many other crops due to the variable nature of this nitrogen form.

Mehlich III Nutrient	ppm	lbs/acre
Sulfate-S (SO4-S)	5	10
Calcium (Ca)	637	1274
Magnesium (Mg)	57	114
Iron (Fe)	137	274
Manganese (Mn)	210	420
Copper (Cu)	0.5	1.0
Boron (B)	0.3	0.6
Nitrate (NO3-N)		

Figure 2. How the concentrations of nutrients, other than P, K, and Zn, are presented in the soil test report.

4. Other Soil Properties

Figure 3 shows how qualitative soil properties are presented in the soil test report. Soil electrical conductivity (EC) quantifies the soluble salts present in the soil with units of µmhos/cm. For most samples, EC is performed only by request and for a fee. However, soil EC may be analyzed at no cost when requested by a county agent to help troubleshoot plant growth problems.

Other Soil Properties				Units
Electrical Conductivity (EC)				µmhos/cm
Estimated CEC (ECEC)			6	cmolc/kg
Organic Matter			1.4	%
Estimated Soil Texture	Silt Loam			
Base Saturation	61	Ca	50.0	% of ECEC
		Mg	7.5	% of ECEC
		K	3.0	% of ECEC
		Na	0.4	% of ECEC

Figure 3. How additional soil properties are presented in the soil test report.

The estimated cation exchange capacity (ECEC) indicates the ability of a soil to hold cations, positively charged ions. The units of ECEC are cmol of charge per kg of soil. Other labs may report ECEC as meq per 100 grams of soil. Both units are equivalent (1 meq/100 g = 1 cmolc/kg). Generally, sandy soils have an ECEC < 6 loamy soils have an ECEC of 6 to 20 and clayey soils have an ECEC > 20. Organic matter is a fee-based analysis and is only determined by request. The soil texture is estimated based on a relationship between clay content and soil properties.

The estimated base saturation (e.g., 61 in the example) represents the percentage of soil cation exchange sites occupied by the basic ions: Ca, Mg, sodium (Na), and K. The difference between the base saturation number and 100 is the percentage of the cation exchange sites occupied by the acidic ions: Al and H. The reported cation-specific numbers represent the percentage of CEC sites in the soil occupied by each of the cations, and their sum equals the base saturation. The exchangeable Na percentage (Na % of ECEC) is used to identify soils that may be adversely affected by sodium accumulation. When the %Na in a soil sample exceeds 15%, the soil is considered sodic, but soil properties and plant growth may be adversely affected at Na values less than 15%.

5. Information on Methods Used

This section of the report provides information on the laboratory methods used to analyze the soil samples submitted to the lab. Soil test laboratories may use different methods of soil analysis, which influence the concentration of nutrients extracted. Knowledge of the soil test methods is critical for understanding the extracted soil nutrient concentrations and being able to develop appropriate fertilizer recommendations.

6. Fertilizer and Amendment Recommendations

The recommendations section includes the fertilizer and lime recommendations for the crop(s) of interest. Clients can choose up to three different crops, but the order of the crops selected does not represent a crop rotation. The amount of fertilizer and lime recommended may be given in pounds per acre (lb/acre), pounds per 1,000 square feet (lb/1000 ft^2), or pounds per 100 feet of row (lb/100-row ft), depending on the crop selected. Examples of the three different formats are shown below. The first example represents a recommendation based on lb/1000 ft^2, which is typically associated with homeowner samples (lawns and gardens).

In the first example (Figure 4), the recommendation for roses is to apply 1 lb N (nitrogen), 0 lb P_2O_5 (phosphorus), 2 lb K_2O (potassium), and 0 lb of lime/1000 ft^2. To convert the recommendations to lb/acre, To convert the recommendations to lb/acre, simply multiply by 43.6.

Figure 5 represents a recommendation for blueberries, which is based on pounds per 100 feet of row (lb/100-row ft). In this case, 1 lb N, 0 lb P_2O_5, 0.6 lb K_2O, and 10 lb SO_4-S, and 0 lb of lime were recommended. To convert the recommendations to lb/acre, simply divide 435.6 by the feet between rows, then multiply that value by the *"lb/100 ft/row"* recommendation.

The third example (Figure 6) represents a recommendation for field corn based on pounds per acre (lb/acre). In this case, the recommendation called for 290 lb N, 0 lb P_2O_5, 60 lb K_2O, 0 lb SO_4-S, and 0 lb lime. Also, note that the recommendation is specific for a corn yield of 175 bushels per acre. Different recommendations would be provided for targeted corn yields of 125, 150, or 200 bushels per acre, or corn for silage. The fertilizer recommendations for corn and other crops, such as grain sorghum, and forages for hay are based on intended yield goals, so the user must be careful to select the appropriate yield goal and associated crop code.

7. Crop Notes

The crop notes section includes guidelines on how and when to apply the recommended fertilizer for the first listed crop code. Precautionary notes or recommendations for other nutrients may also appear in this section. Figure 7 shows the notes that would accompany the recommendations for the corn crop. The crop codes can be changed using the online program to generate nutrient recommendations and notes for other crops.

CODE	Name	N	P_2O_5	K_2O	SO_4-S	Zn	B	Lime	
601	Roses	1	0	2.0	0	0	0	0	lb/1000 sq. ft.

Figure 4. Example of a fertilizer and lime recommendation in lb/1000 sq ft.

CODE	Name	N	P_2O_5	K_2O	SO_4-S	Zn	B	Lime	
527	Blueberries (all ages) - Home Garden	1	0	0	10	0	0	0	lb/100 ft/row

Figure 5. Example of a fertilizer and lime recommendation in lb/100 row ft.

CODE	Name	N	P_2O_5	K_2O	SO_4-S	Zn	B	Lime	
3	Corn For Grain 175 b/A	290	0	60	0	0	0	0	lb/acre

Figure 6. Example of a fertilizer and lime recommendation in lb/acre.

Crop 2 Notes:
Apply one-forth to one-third of the total-N rate immediately before or after planting and side-dress the remainder when corn is at the V4 to V6 stage(6 to 14 inches tall). Consider a 3-way split with a third split (45 lb N/acre) applied 1 to 2 weeks before tasseling.

Figure 7. Example of crop notes that accompany the fertilizer and amendment recommendations.

Acknowledgment is given to Dr. Leo Espinoza and Matt Fryer for an earlier version of this factsheet.

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FSA2153R-PD-8-2025