

What's Your pH? Lab Answer Key

Test Results

Farmer	Soil pH <i>using pH meter</i>	Soil pH <i>using pH test strip</i>	Soil pH <i>using soil pH test</i>	Average
Alice				5.0
Benny				6.5
Carlotta				8.0

- Based on a comparison to the nutrient availability chart:
 - What nutrients might be limited in farmer Alice's field?
Nitrogen, phosphorus, potassium, sulfur, calcium, magnesium, molybdenum
 - What nutrients might be limited in farmer Benny's field?
Maybe calcium and magnesium, but others nutrients should be available based on the pH.
 - What nutrients might be limited in farmer Carlotta's field?
Phosphorus, iron, manganese, boron, copper, zinc
- If needed, what method for amending soil pH would you advise for each farmer? When answering this question, consider the following factors: *(Internet research recommended)*
 - ▶ Cost of altering pH through addition of lime or elemental sulfur vs. Cost of adding various nutrient amendments
 - ▶ Cost of transportation and application of the amendment
 - ▶ Options for growing crops best suited for existing soil pH
 - ▶ Length of time needed for a measurable change in soil pH to occur
 - ▶ Soil texture
 - ▶ Form of the amendment: liquid, powder, or granular.

Farmer Alice

Add: *Lime to raise the soil pH*

This recommendation is based upon the following facts:

Adding lime would likely be more economical than adding all of the nutrients that may be lacking. This will raise the soil pH and make nutrients more available to crops.

Answers may vary. If you have the class time, students could spend another class period researching costs and doing calculations that correspond to the 25 acre fields of each farmer.

What other information might you need to know about the soil in farmer Alice's 25 acre field to provide instructions on the type and amount of soil amendment needed to change the pH? List at least two questions.

- ▶ *Meet with farmer Alice to walk her property and discuss the history of her farmland and management for clues on why her soil is acidic.*
- ▶ *Order a complete soil analysis to determine nutrient levels, texture, organic content, microbial activity, soluble salts.*
- ▶ *Test farmer Alice's irrigation water.*

What's Your pH? Lab Answer Key *(continued)*

Farmer Benny

Add: *First, do a soil test to determine if calcium and magnesium are lacking. If they are, research fertilizer choices that would supplement these nutrients.*

This recommendation is based upon the following facts:
The soil pH of 6.5 is near neutral and is suitable for many crops.

What other information might you need to know about the soil in farmer Benny's 25 acre field to provide instructions on the type and amount of soil amendment needed to change the pH? List at least two questions.

- ▶ *What crops does farmer Benny plan to grow?*
- ▶ *What supplements if any are being used on the farm now?*

Farmer Carlotta

Add: *Before adding anything, do a soil test to determine if the nutrients in question are in fact lacking. If they are lacking, analyze the cost between adding a fertilizer compound to supply those nutrients and adding elemental sulfur to lower the pH (adding elemental sulfur is often costly and may be more economical for horticultural production than agronomic crops).*

This recommendation is based upon the following facts:
Answers may vary. If you have the class time, students could spend another class period researching costs and doing calculations that correspond to the 25 acre fields of each farmer.

What other information might you need to know about the soil in Farmer Carlotta's 25 acre field to provide instructions on the type and amount of soil amendment needed to change the pH?

- ▶ *What crops does Carlotta plan to grow?*
- ▶ *Test the irrigation water at Carlotta's farm to see if this is a possible reason for the high soil pH.*
- ▶ *What types of fertilizer have been used in the past and present?*

List at least five crops that do well in slightly acidic soil:
Tomatoes, carrots, potatoes, sweet potatoes, blueberries, strawberries, soybeans, corn, squash, oats, cotton, or peanuts.

List at least five crops that do well in slightly alkaline soil:
Alfalfa, sugarbeets, cauliflower, spinach, celery, cabbage, turnips, Brussels sprouts, or mustard greens.