# Comparing Soil Nutrients and pH Across Different Areas

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1. **Defining the Research Question**
2. Explaining the Relevance
3. Forming a Hypothesis
4. Methods
5. Experiment Results
6. Drawing a Conclusion

# How do soil nutrients (nitrogen, phosphorus, potassium) and pH levels differ between rural, suburban, and urban areas, and how do these differences affect plant growth and environmental health?

- Designed to be answered through soil measurements across different land types.
- Links variables (nutrients and pH) to real-world impacts on ecosystems and agriculture.

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# Explaining the Relevance

- Understanding soil health can inform land use, improve crop yield, reduce pollution, and mitigate climate change.
- Supports sustainability efforts through understanding the human impact on soil quality.

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The soil samples in the rural areas will have higher nitrogen, phosphorus, and potassium levels as a higher pH level than urban and suburban areas.

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Site Selection: We picked 3 different areas within IL to test soil for this experiment

Soil Selection: We took 3 soil samples from each location to get a range of data, we found soil that seemed to have minimal disturbance

Testing: We tested the soil using the test kits provided to have the most accurate results between the 3

Data Analysis: We created tables and graphs for our findings and compared the data from each the of 3 locations

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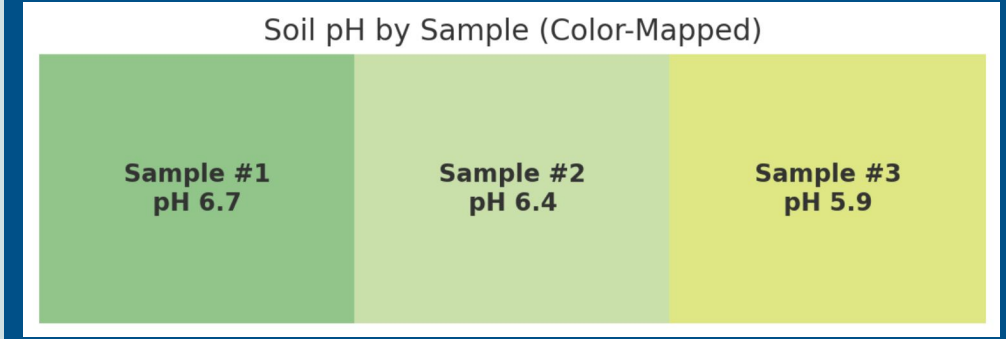
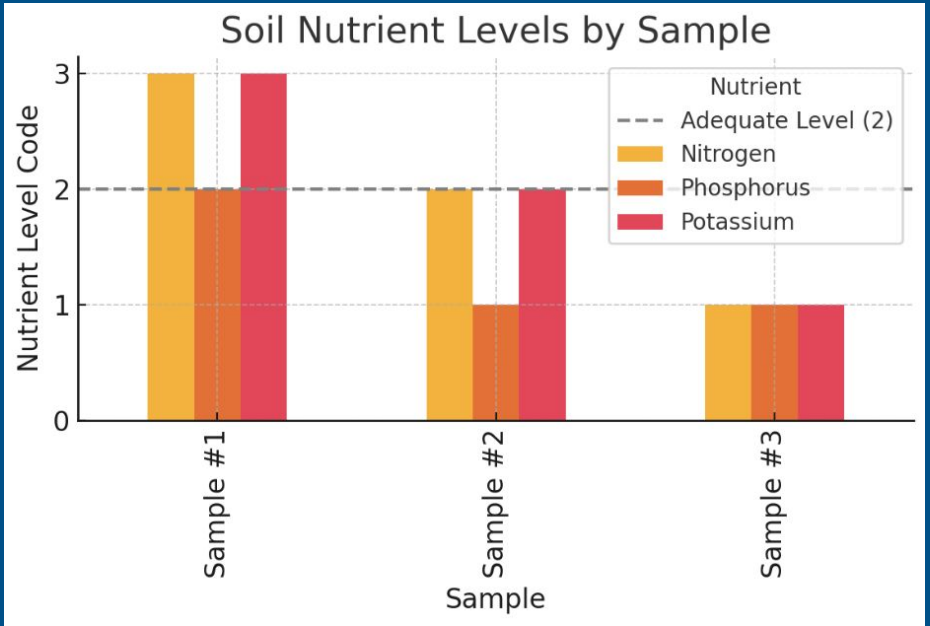
# Rural Soil Samples

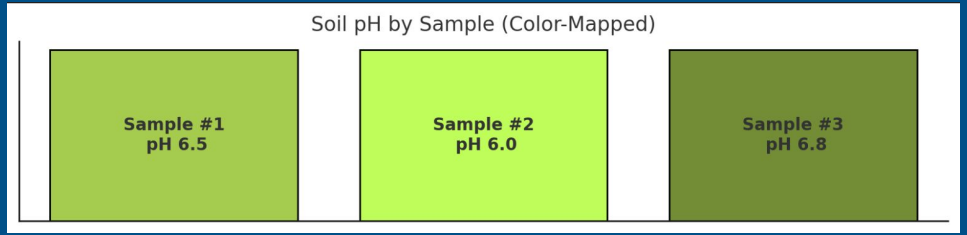
| | pH (color) | pH Value | Nitrogen Level | Phosphorus Level | Potassium Level |
|---|---|---|---|---|---|
| Sample #1 | Green | 6.7 | N3 | P2 | K3 |
| Sample #2 | Light Green | 6.4 | N2 | P1 | K2 |
| Sample #3 | Yellow Green | 5.9 | N1 | P1 | K1 |

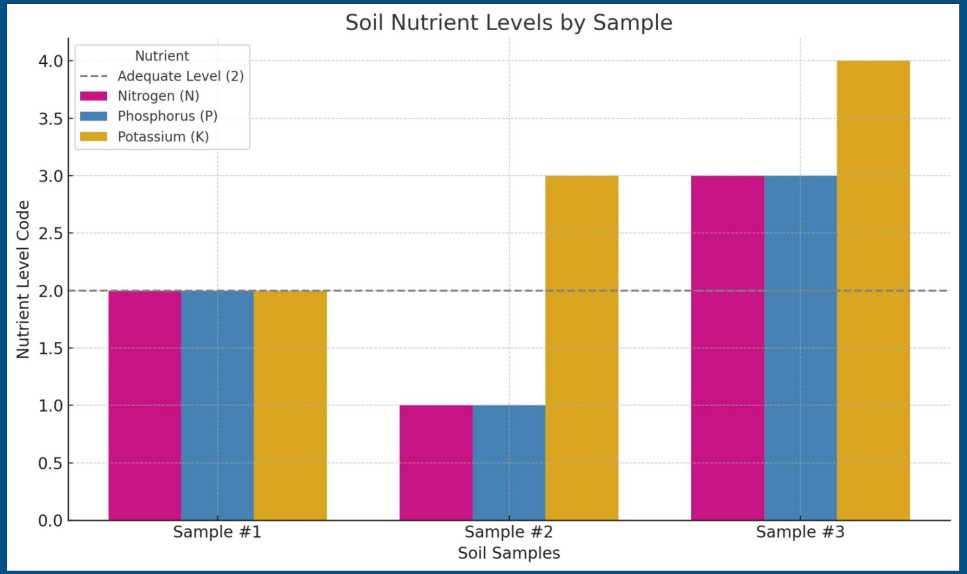


# Suburban Soil Samples

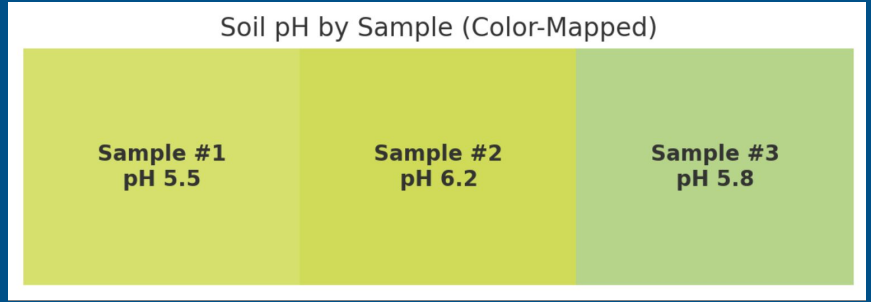
| | pH (color) | pH Value | Nitrogen Level | Phosphorus Level | Potassium Level |
|---|---|---|---|---|---|
| Sample #1 | Light Green | 6.5 | N2 | P2 | K2 |
| Sample #2 | Yellow Green | 6.0 | N1 | P1 | K3 |
| Sample #3 | Green | 6.8 | N3 | P3 | K4 |

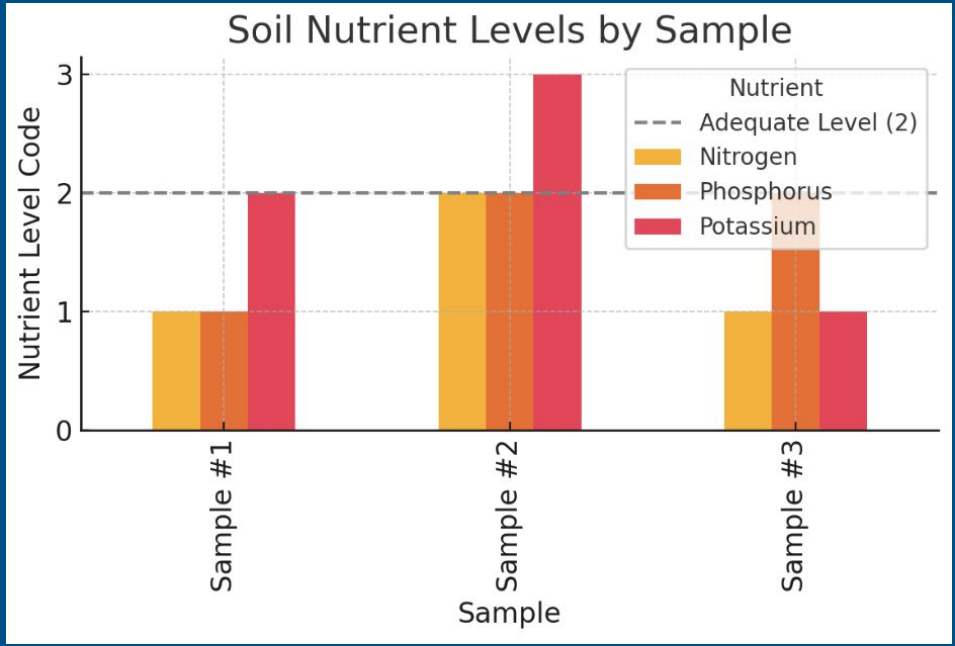


# City Soil Samples

| | pH (color) | pH Value | Nitrogen Level | Phosphorus Level | Potassium Level |
|---|---|---|---|---|---|
| Sample #1 | Yellow | 5.5 | N1 | P1 | K2 |
| Sample #2 | Greenish Yellow | 6.2 | N2 | P2 | K3 |
| Sample #3 | Light Green | 5.8 | N1 | P2 | K1 |



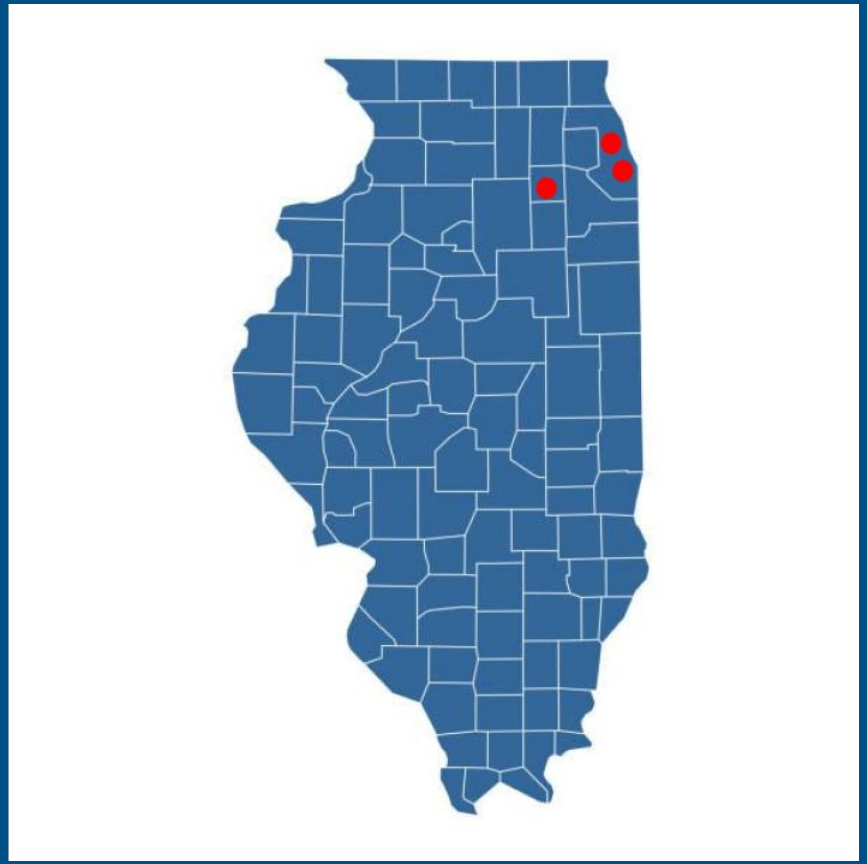



# Locations of Soil Samples:

City sample - Chicago, IL

Suburban sample - Glenview, IL

Rural sample - Yorkville, IL



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# Drawing a Conclusion

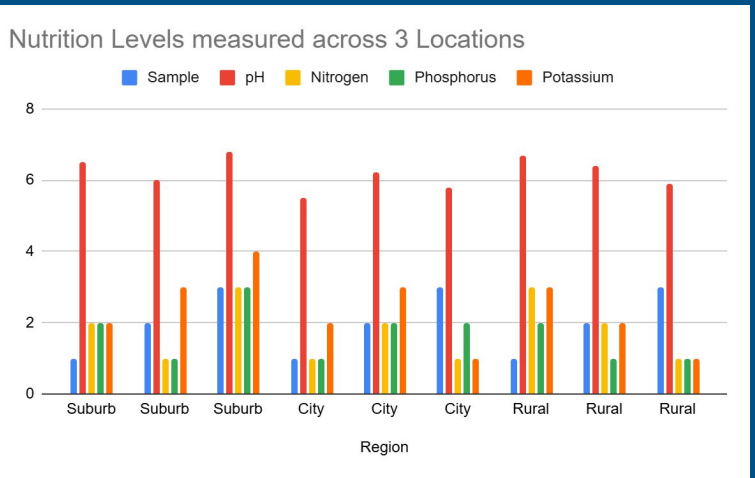
Key:

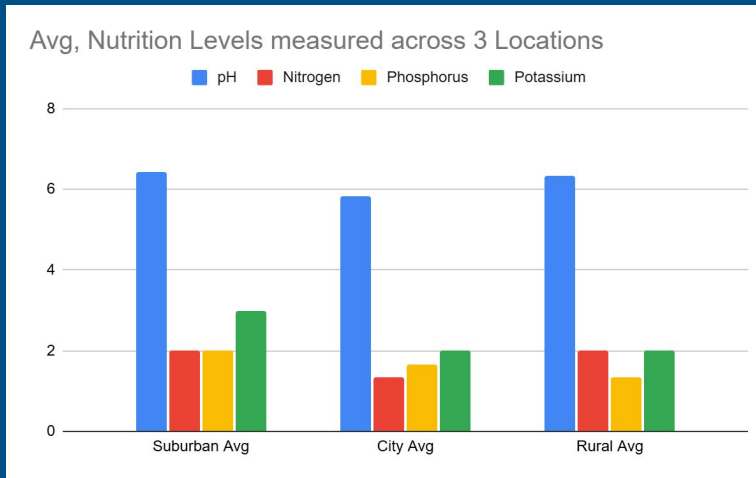
| | |
|---|---|
| Nitrogen = 3 | N1 = 1, N2 = 2, N3 |
| Phosphorus 3 | P1 = 1, P2 = 2, P3 = |
| Potassium 3, K4 = 4 | K1 = 1, K2 = 2, K3 = |

Our hypothesis states that rural soil will have  higher nitrogen and potassium levels and a higher pH than suburban and urban areas.

As shown below,  the data partially supported this hypothesis:

- pH: Suburban areas had the highest avg. pH of 6.43 with rural having 6.33 and city having 5.83
- Nitrogen: Rural and suburban having an avg lvl of N2 where the city tested closer to N1
- Phosphorus: Suburban areas tested the highest levels of Potassium at P2 where as the rural and city areas were closer to P1
- Potassium: Suburban had the highest levels at K3 where as Rural and City levels were the same at K2



# Conclusion

While rural soil showed strengths in the levels tested, the data proved no conclusive evidence that one area out of the three stood out regarding nutrients and pH showing how complex soil health is.