



Mrs. Howell, Advanced Placement Environmental Science Program, University City High School

# THE EFFECT OF MUNG BEANS ON SOIL NUTRIENT AVAILABILITY

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## ABSTRACT:

Soil taken from the Riparian Zone and the South Facing Slope bank of Rose Canyon were used to plant Mung Beans. A soil testing kit will test for Nitrogen, Phosphorus, pH, and potassium levels to show the nutrient availability after the plants grow in the soil. From observations and the quantitative nutrient results, it will relay the type of soil that is most appropriate to use when growing plants.

## INTRODUCTION:

Good quality soil is essential for plant growth. Plants require certain nutrients and minerals as well as proper hydration and sunlight in order to grow. According to an article in The Scientist Magazine from 2011, there is mounting evidence to suggest that the transfer of carbon through the roots of plants to the soil plays a primary role in regulating ecosystem responses to climate change and its mitigation. It shows how plants can affect the soil from a chemical level. Specifically, for riparian areas, they tend to be focus points for groundwater recharge and discharge. This allows for the distribution of mineral nutrients to be carried to riparian soils as well. Thus determining the type of soil to use is important to growing natural and fertile vegetation.

## METHOD:

1. Retrieve soil from Rose Canyon and obtain a control soil.
2. Use the Mineral Nutrient and pH Testing Kit to test the three types of soil
3. Test the soil for three weeks, consisting of every other week. The experiment should run for a total of five weeks.
4. Record the information on a data sheet by comparing the tested results with standard markers found in the soil testing kit.



## RESULTS:

### SOUTH SLOPE SOIL

### RIPARIAN ZONE SOIL

THE EFFECTS OF MUNG BEANS (PLANTS) ON SOIL				
WEEK ONE				
TESTS	CONTROL	RIPARIAN SOIL	SOUTH FACING SLOPE SOIL	OBSERVATIONS
pH	7.0	7.0	6.0	Planted 10 seeds
Phosphorus (P)	Trace	Trace	Trace	
Potassium (K)	N/A	Very High	High	
Nitrogen (N)	N/A	Trace	Trace	



TESTS	TWO WEEKS LATER (1)			OBSERVATIONS
	CONTROL	RIPARIAN SOIL	SOUTH FACING SLOPE SOIL	
pH	7.0	8.0	7.0	Only 6 beans germinated in the control. Only 8 beans germinated in the riparian zone. All 10 beans germinated in the South Bank Slope soil. There may have been an increase in certain nutrients due to the decomposition of some of the beans. All of the plants growing in the different types of soil
Phosphorus (P)	Trace	Low	Trace	
Potassium (K)	N/A	Very High	Very High	
Nitrogen (N)	Trace	Trace	Trace	



TESTS	TWO WEEKS LATER (2)			OBSERVATIONS
	CONTROL	RIPARIAN SOIL	SOUTH FACING SLOPE SOIL	
pH	7.0	8.0	7.5	The nitrogen level is fairly low in the riparian zone. All of the plants appear to be healthy. They are all green. More of the seeds began to germinate in the control.
Phosphorus (P)	Trace	Low	Trace	
Potassium (K)	N/A	Very High	Very High	
Nitrogen (N)	Trace	Trace	Slightly Low	

## PHOTOGRAPHS:



Control



South Facing Slope



Riparian Zone



Control



South Facing Slope



Riparian Zone

## DISCUSSION:

The data tables showed an increase in the potassium level in the South Slope Facing Soil after a few weeks, thus, making its level the same as the Riparian Soil. After the first two weeks there was a slight increase in the amount of phosphorus in the Riparian Soil and there was a slight increase in the amount of nitrogen in the South Slope Facing Soil. The results do not necessarily prove that there is a higher nutrient content in the Riparian Soil compared with the other soils because some of the other soils had similar or higher results. But, there were similar increases in the amount of soil nutrient content.