



The use of industrial fertilizers and their effects on the soil



Ebenezer Mphuru, Christopher Peter and Winniel Munis

Introduction:

This project is prepared by the students of Fountain Of Hope Christian School in Kilimanjaro. It deals with application of chemical fertilizer and their effects on soil. When Chemical fertilizers are applied excessively or used continuously for a number of years, they affect the natural properties of soil. Soil is the composition of organic and inorganic matter, rock sediments from mineral and a habitat in which micro organisms live and plants feed from. The natural soil properties can be determined by their composition. The most common soil properties we deal with in this project is the soil **PH, soil texture, aeration process, water percolation process and the rate of micro organism growth. Chemical fertilizers** are fertilizers which boost up soil fertility (the ability to produce) and contains a fixed proportion of elements.

Chemical fertilizers can be applied either correctly or incorrectly (excessively). Besides, when chemical fertilizers are used continuously they bring effects on the soil properties. In the project we have two main experiments
i) To determine if the excessive use of chemical fertilizers has got effects on soil properties
ii) To determine if the continuous application of chemical fertilizers has got effects on soil properties.



EXPERIMENTAL METHOD.

In this project we did two main experiments which contain a branch of several other experiments. The first experiment is to determine **if the excessive use of chemical fertilizers has an effects on soil properties such as ;**

- soil pH
- soil texture aeration process
- the ability of the soil to retain water (percolation)
- growth of microorganism

this experiment was linked with the hypothesis "excessive application of chemical fertilizers has effects on the above soil properties.

The second experiment was aimed at determining **if the continuous application of chemical fertilizers has effects on soil properties such as:**

- soil pH
- soil texture
- growth of microbes
- aeration process
- water percolation process.

EXPERIMENT 1.

This experiment is set out to show if the excessive use of fertilizer has effects on soil properties. When chemical fertilizers are applied incorrectly they bring negative effects on soil.

Aim: To determine if excessive application of chemical fertilizer has effects on soil pH.

APPARATUS.

- sample of pure soil from virgin forest which do not contain chemical fertilizer at all,
- a sample of soil which has been applied chemical fertilizers excessively
- barium sulphate
- white tile
- spatula
- an indicator

PROCEDURE

- Place a spatula full of soil on white tiles
- add indicator until the sample can be steered into the thick paste
- sprinkle barium sulphate powder over the paste
- wait for some time



OBSERVATION.

Observe the color change.

CONCLUSION

Therefore; chemical fertilizers causes a change in soil pH depending on the fertilizer used and pH condition of soil.



Conclusions: From various experiments cited in this project report book, it is very clear that the application of chemical fertilizers destroys soil structure leading to the destruction of natural properties of the soil. The soils applied chemical fertilizer showed changes on their chemical and physical properties.

In soils on which chemical fertilizers were applied either excessively or continuously, we found that their natural structure was destroyed hence causing changes in soil texture, aeration process in soil, soil PH and growth of micro-organism. This caused the decrease in the ability of soil to produce, since very fertile soil is the one with improved structure that allows biochemical processes to take place effectively in the soil.

Our commitment and limitless efforts on carefully doing this project enabled us to get some accurate data from our study. The strong methods that enabled us to acquire the information on this project include determination of soil PH using a PH scale, surveys and live interviews with farmers and valuable information from literature review.

References:

- B.S. Beckett GCSE edition: water percolation, Oxford university press (1986)
- D.T. Msabila: soil properties, comprehensive approach to physical geography. Oxford University press (2011): soil PH, cation exchange, chemical fertilizers, Chemistry

Acknowledgements: This project represents countless efforts of many committed and dedicated people. We extend our special regards to the Head Mistress (FOH) Mrs. Martha Hizza, Mr. Josephat Turyamureba our school academic master, Mr. Joseph Hizza, Mr. Hans Kemei, the school organization and our fellow students (FOHSEC) for their prayers and constant encouragement.

Our heartfelt gratitude goes to Mrs. Joyce Kessy the agricultural officer at (KDC), Mr. Matei from (KNCU).

We acknowledge the zeal and dignity of our dearest parents for their financial support and constant encouragement. Special thanks should go to ; Rev. Dr. Michael Muniss, Rev. Peninah Muniss, Miss Everstar Michael Muniss, Rev. Dr. Godfrey Mphuru, Rev. Mrs. Sarah Mphuru, Miss Vaileth Mphuru, Hon. Mr. Peter Mushi, Rev. Tr. Eugenia Mushi, Prof. Michael Mushi.

Special thanks should go to Caroline Mushi, Faith Masika, Glory Limpert, Noella Mwanri, Yadah Praise, Glory Matunda, Jupiter Shoo and Praygod Jackson Jr.

Further information:

Download at: www.youngscientists.co.tz/posters