Common Course Outline
HORT 115
Soils and Fertilizers
3 Semester Hours

The Community College of Baltimore County

Description

Soils and Fertilizers
Explores soils and fertilizers from a management point of view; emphasis is placed on intensive horticultural practices, practical application of soil/media testing and analysis, soil structure, porosity, pH and its relationship to good cultural practices, nutrient content, and soil/media management will be explored.
Prerequisite: (ENGL 051 or LVE 1) or (ESOL 051 or LVE 1), (RDNG 051 or LVR 1), (MATH 081 or LVM 1)

Overall Course Objectives

Upon completion of this course the student will be able to:

A. explain soil texture.
B. determine the effect of soil texture on plant root systems.
C. determine the soil texture by mechanical tests.
D. discuss the effect of sandy soils in plant management.
E. discuss the effect of silty soils in plant management.
F. discuss the effect of clay in plant management.
G. determine the effect of soil texture and soil water on infiltration.
H. determine the effect of soil texture and soil water on permeability.
I. discuss the effect of soil texture and water holding capacities.
J. explain the plant/root relationship and root structure.
K. determine the effect of soil texture on water and oxygen requirements of plants.
L. identify the various mineral soils in the area.
M. explain soil structure.
N. discuss mineral and organic colloids.
O. explain the effect of organic colloids on soil structure.
P. clarify the use of fibrous vs. humus materials to alter soil porosity.
Q. justify the use of green manure in plant growth management.
R. examine the effect of manures, peats, wood chips, and sawdust on mineral soils.
S. demonstrate the ability to make a soil test.
T. make accurate recommendations based on soil test results.
U. determine the effect of organic soils on plant root systems.
V. examine the origin of organic soils.
W. explain how to adapt plants indigenous to organic soils to mineral soils.
X. define artificial soil mixes and their importance to horticultural plant management.
Y. determine the effect of artificial mixes on root systems.
Z. demonstrate how to properly prepare artificial mixes for various plant growing requirements.

AA. identify various components of artificial soil mixes and their effect on plant culture.
BB. discuss the value of plants grown in artificial soil mixes as compared with plants grown in mineral soils.
CC. determine the various types of life that is naturally inherent in soils.
DD. discuss the principles of ionic exchange.
EE. define soil pH and its effect on soils and nutrients.
FF. explain the pH scale.
GG. determine plant tolerance to soil acidity/alkalinity.
HH. demonstrate how to alter soil pH values.
II. explain the difference between the different kinds of lime.
JJ. explain how to acidify soils.
KK. make soil pH recommendations.
LL. make accurate soil pH tests.
MM. determine the essential plant nutrients.
NN. discuss the role of the major plant nutrients.
OO. discuss the role of the minor plant nutrients.
PP. explain the methods of nutrients' entry into plants.
QQ. identify the measure the nutrients in the soil.
RR. determine the effect of soluble salts on plants.
SS. measure soluble salt in soil/media.
TT. discuss the importance of inorganic fertilizers in the soil media.
UU. discuss the importance of organic fertilizers in plant production.
VV. make fertilizer recommendations on the basis of soil test results and plant needs.
WW. determine the presence of nutrients by tissue testing.
XX. calculate the costs of fertilizer applications.
YY. identify components or organic fertilizers.
ZZ. calibrate various methods of fertilizers' applications.

Major Topics

1. Soil Formation
2. Soil Texture – Its Effect on Plant Root Systems
    a. Soil Separation
    b. Value of Porosity for Soil Air Content
    c. Soil Water/Moisture
    d. Mineral Soils and Modifications
    e. Soil Test
3. Organic Soils – Its Effect on Plant Root Systems
4. Artificial Soil Mixes
5. Soil pH – Its Effect on Plant Life
6. Plant Nutrients – Effect on Plant Development
7. Fertilizers

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member, but will include the following:

1. 3 Written Exams
2. Quizzes
3. Lab Exercises
4. Student Project
5. Attendance and Participation
6. 2 Saturday Class Practicals