Agricultural Biotechnology Program

Agronomy 3
(Crop Production)
AG 0103

(3 CREDIT HOURS)

LECTURE 1

By

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Course Description

This course expresses the basic principles involved in the production of field crops stressing the importance of field crop management and other agronomic practices that can bring about improve crop yield under good management practices.

Course objectives:

At the end of this course, students would be able to:

(i) Acquire skill in crop production

(ii) Apply various agronomic practices that can bring about improved crop yield.

(iii) Control pest weed and diseases for enhanced yield.

Method of Grading

S/N	Grading	Score (%)
1	Practical activities Attend Assignments Technical Report Practical Test Oral Exam	**40** 5 5 5 15 10
2	Final Examination	60
	Total	**100**

Course Delivery Strategies

Lecturing method complimented with field work is adopted for this course.

Method of Lecture Delivery/ Teaching Aids

Power Point Presentation. *Use of white board

Course Outline:

Week	Topic	Lecturer
1	Introduction	Prof. Nasser El-Gizawy
2	Maize	Prof. Nasser El-Gizawy
3	Wheat	Prof. Nasser El-Gizawy
4	Rice	Prof. Nasser El-Gizawy
5	Faba bean - Fenugreek	Prof. Nasser El-Gizawy
6	Chick pea - Lentile	Prof. Nasser El-Gizawy
7	Clover	Prof. Nasser El-Gizawy
8	Cotton	Prof. Nasser El-Gizawy
9	Flax	Prof. Nasser El-Gizawy
10	Sun flower	Prof. Nasser El-Gizawy
11	Soy beans – sesame	Prof. Nasser El-Gizawy
12	Sugar cane	Prof. Nasser El-Gizawy
13	Sugar beet	Prof. Nasser El-Gizawy
14	Revision	Prof. Nasser El-Gizawy

Reading List

- An Introduction to Agriculture and Agronomy http://www.newagepublishers.com/samplechapter/001757.pdf, October 2015.
- Onwueme, I. C. and Sinha, T. D. (1999). Field Crop Production in Tropical Africa.Netherlands: CTA, Wageningen, Pp. 1-14.

Activity (1)

- What is the meaning of agriculture ?

Agriculture

- Growing plants and receiving animals for food , clothing, and other useful products is called **agriculture**.

Activity (2)

- What is the meaning of crops ?

Crop

- When plants of same kind are grown and cultivated at one place on a large scale, it is called a ***crop***.

  For Example- Crop of wheat means that all the plants grown in a field are that of wheat.

A Crop:-

Activity (3)

- What is the meaning of crop production(agronomy) ?

Crop production(Agronomy) as a science

- Agronomy is the branch of agriculture that treats of the principals and practice of crop production and field management, the terms was derived from two Greek words, agro (field) and nomus (to manage)

CROP PRODUCTION; ART, SCIENCE AND BUSINESS

Crop Production is the art and science of the genetic improvement of crops to produce new varieties with increased productivity and quality.

The advanced genetic and molecular techniques have resulted in new varieties of crop plants, medicinal plants and ornamentals.

Classification of crop plants

- Crop plants may be classified on basis of a morphological similarity of plants. From the agronomic stand point they may be classified on basis of use, but some crops have several different uses.

Agronomic classification

I- Economic importance:

- Cereal or grain crops
- Legumes for seed
- Forage crops
- Fiber crops
- Sugar crops
- Oil crops

Division of field crops, depending on the economic importance ؟

Agronomic classification

- Cereal or grain crops:

Cereals are grasses grown for their edible seeds, the term cereal being applied either to the grain or to the plant itself. They include wheat, rice, maize, barley and other.

Agronomic classification

- Legumes for seed:

The chief legumes grown for their seeds are field beans, chick pea, lentil and other crops

Agronomic classification

- Forage crops:

Forage refers to vegetable matter, fresh or preserved utilized as food for animal. Forage crops include grasses, alfalfa, clover and other crops.

Agronomic classification

- Fiber crops:

The fiber crops include cotton, flax and rami

- Sugar crops:

The sugar beet, sugar cane are grown for their sweet parts from which sucrose is extracted and crystallized.

- Oil crops:

The oil crops include peanut, soybeans, sunflower, sesame, the seeds of which contain useful oils.

Agronomic classification

II- Special purpose classification:

- Cover crops: cover crops are those seeded to provide a cover for the soil.
- Catch crop: catch crop are substitute crops planted too late for regular crops or after the regular crop has failed. Clover are often used for this purpose.
- Silage crops: crops which cultivated for silage such as sorghums.

Agronomic classification

III- Classification as to growth habit:

- Annuals: is the plant which its life cycle is completed in one season as corn, wheat and rice
- Biennials plant that require two seasons to attain full development, mature seed and die are biennials. Red clover is a biennial plant.
- Perennials: some plant live for several years. They may produce seed each year but they do not die with seed production. Perennials plant are usually the trees.

Agronomic classification

IV- Classification as to growth season.

- *Kharif Crops:* The crops which are sown in the rainy season are called ***kharif crop***. The rainy season in India is from June to September.

  For Example- Paddy, maize, soyabean, groundnut, cotton, etc.

- *Rabi Crops:* The crops grown in the winter season are ***rabi crops.*** Their time Period is generally from October to March.

  For Example- Wheat, gram, pea ,mustard, and linseed.

Activity (5)

- What is the Basic Practices of field crop Production?

Basic Practices of Production

- *Cultivation:* of crop involves several activities.

This activities are referred as ***agricultural practices***.

This activities are-

1) Preparation of soil
2) Sowing
3) Adding Manure and Fertilisers
4) Irrigation
5) Protecting from weeds
6) Harvesting
7) Storage

1)Preparation of Soil

- The preparation of soil is the first step before growing a crop. One of the most important tasks in agricultural is to turn the soil and loosen it. This allow the roots to penetrate deep into the soil. The loose soil allows the roots to breath easily even when they go deep into the soil.

  The loosened soil helps in the growth of earthworm and microbes present in the soil. These organisms are friends of the farmer since they further turn and loose the soil and add humus to it.

Tilling

- The process of loosening and turning the soil is called ***tilling*** or ***ploughing***. This is done by using a plough.

2)Sowing

- *Selection of seeds:* Sowing is the most important part of crop production. Before sowing, good quality seeds are selected. Good quality seeds are clear and healthy seeds of a good variety. Farmers prefer to use seeds which give a high yield.

Tools used for Sowing Seeds

- *Traditional Tool:* The tool used traditionally for sowing seeds is shaped liked funnel. The seeds are filled in the funnel, passed down through two or three pipes having sharp ends. These ends pierce into the soil and place seeds there.

Traditional method of sowing:

Tools used for Sowing Seeds

- Seed Drill: Now a days the seed drill is used for sowing with the help of tractors. This tool sows the seeds uniformly at proper distances and depths. It also insures that seeds get covered with the soil.

A Seeds Drill:

3) Adding Manure and Fertilisers

- The substances which are added to the soil in the form of nutrients for the healthy growth of plants are called manure and fertilisers.

  Soil supplies mineral nutrients to the crop. These nutrients are essential for the growth of plants. In certain areas, f in the same farmers grow crop field. The field is never uncultivated or fallow. Because of this continuous growing of crops makes the soil poorer in certain nutrients. Therefore, farmers have to add manure to the field to replenish the soil with nutrients. This process is called ***manuring***. Improper or insufficient manuring results in weak plants.

Manure and Fetilisers

- Manure is an organic substance obtained from the decomposition of plant or animal wastes. It can be prepared in the Fields. It provides a lot of humus to the soil. It is relatively less rich in plant nutrients.
- Fertiliser is an inorganic salt. They are prepared in factories. It does not provide any humus to the soil. Fertilisers are very rich in plant nutrients like nitrogen, phosphorus and potassium.
- *For Example:* Urea, ammonium sulphate, super phosphate, potash,NPK(Nitrogen, phosphorus and potassium.

A Man Adding Fertilisers

4)Irrigation

- The supply of water to the crops at different intervals is called ***irrigation.***
- *Sources of irrigation:* The sources of irrigation are-wells, tubewells, ponds, lakes, rivers, dam and canals.

  Types of Irrigation:

  1)Traditional Method

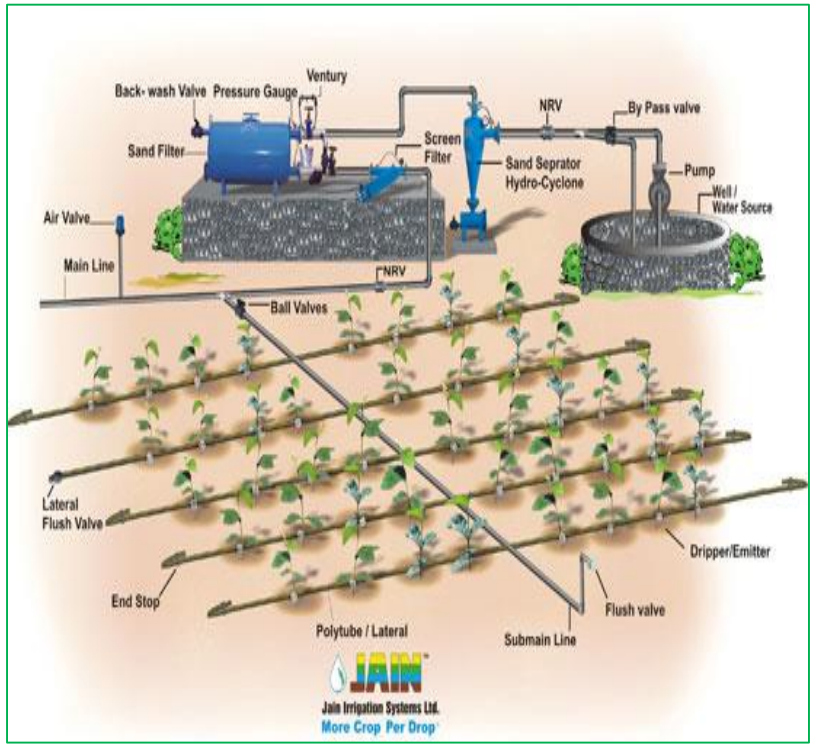
  2) Morden Method

Traditional Method of Irrigation

Some Other Traditional Methods Of Irrigation:

Morden Methods of Irrigation

Sprinkler System



Drip System

5)Protection from Weeds

- *Weeds:* In a field many other undesirable plants may grow naturally along with a crop. These undesirable plants are called ***weeds***.

  Weeds can be controlled by using certain chemicals called ***weedicides***.

  *For Example:*2,4-D

The manual removal includes physical removal of weeds by uprooting or cutting them close to the ground from time to time. This is done with the help of sickle or a seed drill.

A Man Spraying Weedicides

6)Harvesting

- Harvesting of a crop is an important task. Cutting of a crop after its maturation is called ***harvesting***. It can be done manually with the help of ***sickle*** or by a machine called ***harvester*** or ***combine***. In the harvested crop, the grain are separated from the chaff by the process of winnowing and threshing.

Sickle:

Combine:

7)STORAGE

- Farmers have to store grains in jute bags or metallic bin. However large scale storage of grains is done in ***silos*** and ***granaries*** to protect them from pests like rats and insects.

THE END