

Unit – 01: Agronomy and its scope

Definition of Agriculture

The term agriculture is derived from the Latin words “*ager*” or “*agri*” meaning “*soil*” and ‘*cultra*’ meaning ‘*cultivation*’. Agriculture is a very broad term encompassing all aspects of crop production, livestock farming, fisheries, forestry etc. Thus, agriculture may be defined as the art, the science and the business of producing crops and livestock for man’s use and employment.

Branches of Agriculture

There are several disciplines of basic and applied sciences which can be considered as branches of agriculture. Some of the important branches of agriculture are listed here.

1. Agronomy
2. Horticulture
3. Soil Science
4. Genetics and Plant Breeding
5. Plant Pathology
6. Crop physiology
7. Agricultural Entomology
8. Forestry
9. Animal husbandry
10. Fishery science
11. Agricultural Economics
12. Agricultural Engineering
13. Agricultural Microbiology

The details about all these disciplines will be taught in their respective disciplines.

AGRONOMY

The term “*Agronomy*” is derived from Greek words “*Agros*” meaning “*field*” and “*nomos*” meaning “*to manage*” thus the agronomy may be defined as the branch of agricultural science which deals with principles and practices of soil, water and crop management. In a broader sense, agronomy is the branch of agricultural science which deals with the production of various crops which includes food crops, fodder crops, fibre crops, sugar, oilseeds, etc. and the effective management of all the resources (*viz.* soil, seed, water, nutrient, etc.) used in the production of these crops with the aim of achieving higher production.

Scope of Agronomy

Agronomy is a central discipline among all the disciplines involved in crop production. It is the discipline which coordinates all other disciplines for better crop production. Therefore, as and when any advancement takes place in any of the disciplines of agriculture, the agronomic practices need to be modified accordingly. With the advancement of knowledge and better understanding of plants and environment, agricultural practices are modified and new practices are developed for high productivity. And thus, agronomy science becomes imperative in agriculture in the following areas.

- Identification of proper season for cultivation of wide range of crops is needed which could be made possible only by Agronomy science.
- Proper methods of cultivation are needed to reduce the cost of cultivation and maximize the yield and economic returns.
- Availability of chemical fertilizer has necessitated the generation of knowledge on the method, quantity and time of application of fertilizers.
- Availability of herbicides for control of weeds has led to development of vast knowledge about selectivity, time & method of its application.
- Water management practices play great role in present day crisis of water demand and Agronomy is the branch of agriculture which attempts answer the questions like ‘when to apply?’, ‘how to apply?’ and ‘how much to apply?’.
- Intensive cropping is the need of the day and proper time and space intensification not only increases production but also reduces the environmental hazards.
- New technology to overcome the effect of moisture stress under dry land conditions is explored by Agronomy and future agriculture depends on dry land agriculture.
- Packages of practices to explore the full potential of new varieties of crops are the most important aspects in crop production which could be made possible only by Agronomy.

Role of Agronomist

Agronomist is a scientist who is dealing with the study of problems of crop production and adopting/recommending practices of better field crop production and soil management to get high yield and income.

- An agronomist is the key person in the agricultural production system who practically implements or recommends the time, dose and method of application of technologies developed by all the other disciplines of agriculture.

- Agronomist is the person who tries to find the answer to questions like ‘when and how to plough a field?’, ‘when and what to sow in that field?’ ‘when, how and how much to irrigate?’, etc.
- He is also involved in the selection of suitable crops and varieties to suit or to match varied seasons and soils. e.g., red soil - groundnut, black soil - cotton, sandy soil – tuberous crops, saline soil – Finger millet (*Ragi*). In *Kharif* if water is sufficient go for rice and if water is not sufficient go for maize, sorghum.
- Evolves efficient method of cultivation (whether broadcasting, nursery and transplantation or dibbling, etc.) provides better crop establishment and maintain required population.
- He has to identify various types of nutrients required by crops including time and method of application (e.g., for long duration rice (150-60-60 kg NPK), short duration: 120:50:50 kg NPK/ha Application P&K basal and N in three splits).
- Agronomists are responsible for every decision made in farm management. (What type of crop is to be produced? How much area to be allotted for each crop? How and when to market? How and when to take other management activities?) All the decisions should be taken at an appropriate time to efficiently use resources available.

Relation of agronomy to other sciences

Agronomy is a main branch of Agriculture. It is a synthesis of several disciplines like soil science, Agricultural chemistry, crop physiology, plant ecology, biochemistry and economics.

- ✓ Soil Science helps the agronomist to thoroughly understand the soil’s physical, chemical and biological properties to effect modification of the soil environment.
- ✓ Agricultural Chemistry helps the agronomist to understand the chemical composition and changes involved in the production, protection, and use of crops and livestock.
- ✓ Crop physiology helps to understand the basic life process of crops to understand functioning of each part of plant to determine their input requirement like nutrients etc.
- ✓ Plant ecology helps us to understand the associated environment in which the crops grow like the influence of weather (Temperature, Rainfall etc.).
- ✓ Biochemistry shows the way in which biochemical process takes place in crops which helps to understand critical requirements to favorably activate this process.
- ✓ Economics paves the way for profit and loss analysis in farming.

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