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CROP PRODUCTION: ART, SCIENCE AND BUSINESS

Agriculture is the oldest and most important avocation of the world. The human society is dependent upon agriculture for its food, clothing and shelter. At certain stages of human development it used to be the only known means of living. Even to-day, in the highly developed industrial countries, agriculture plays a major role as the supplier of raw materials for industries and commerce apart from its basic role in supplying food, clothing and shelter. Therefore the welfare of a state to a large extent is dependent upon the prosperity of its agriculture.

Agriculture may be defined as the art, the science and the business of producing crops and livestock for economic purposes. The word agriculture is derived from the Latin term *Ager cultura* meaning field cultivation. The term includes sciences of crop and animal husbandry, horticulture, dairy, forestry, fishery etc.

Agronomy deals with the principles and practices of field crop production. The term is derived from the Greek word *Agros nomos* meaning field to manage. In the management of field along with the soils and crops, the sciences of Biology, Chemistry, Physics, Economics etc. are made use of. Thus for better management of crop production, a knowledge of such allied sciences is found necessary.

THE ART OF CROP PRODUCTION

In defining agriculture it has been indicated as the art, science and business of producing crops and livestock. As an art it embraces a knowledge of the way to perform the operations of the farm in a skilful manner, but does not necessarily include an

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understanding of the principles underlying farm practices. The skill may be both physical and mental. Some farmers are able to do farm operations quickly, more efficiently than others and with great ease. They are said to be skilful in their art. The ability and capacity to plough well, to make a good hay stack, to handle the animals properly, to handle the farm implements and proper sowing of seeds, manures, fertiliser etc. are examples of physical skills which are obtained through experience. Similarly, deciding the proper time for agricultural operations like ploughing, selection of cropping pattern to suit the soil and climate, adopting improved agricultural practices, timing of production to get better prices are examples of mental skills involved in farming. Both the physical and mental skills are essential for successful farming.

THE SCIENCE OF CROP PRODUCTION

Science is generally defined as a body of truths, systematised and arranged in such a way as to show the operation of general laws and principles. Such a body of knowledge is obtained through systematic study and research. Scientific principles are freely used in our quest for increasing production of quality crops and in their ultimate disposal to earn better price and income. Recent advances made in the fields of plant breeding and genetics, technology of production, use of fertilisers, pesticides, fungicides, herbicides and growth regulators, introduction of labour saving machineries, theories and concepts in the fields of mathematics, statistics and economics etc. have completely revolutionised agriculture for increased crop production.

In plant breeding and genetics, strains were evolved to suit different conditions of soils, climate and consumer tastes. Photo-insensitive, fertility responsive high yielding strains available in rice and wheat have induced green revolution in different parts of the world. Hybrid vigour in maize, pearl millet and sorghum have been properly harnessed in making available numerous strains and varieties doubling their yield. Collection of germplasm materials from countries around the world have helped in evolving strains resistant to pests and diseases. Research findings in isolating genes responsible for quality proteins have helped in screening varieties rich in lysine, methionine and tryptophane.

Attempts are made to evolve strains to shorten their duration and for reducing straw-grain ratio so that crops can be cultivated in different agro-climatic conditions tailored to individual location.

The recent findings in the field of atomic science had greatly helped in the studies of soils, nutrition of crops, movement of water in soil and the related fields.

In the fertiliser technology both in their manufacture and application, the farmer is given the chance to utilise different types suited to different soil, climate and crop condition.

After the Second World War, the availability of DDT (Dichloro-diphenyl-trichloroethane) and BHC (Benzene hexa chloride) in the market had greatly helped the farmer in reducing the loss of crops due to pests. At present he is armed with a series of new chemicals for reducing the losses caused by pests. Similarly a number of new chemicals are used for the control of diseases and weeds.

THE BUSINESS OF CROP PRODUCTION

Agriculture is considered as a way of life in most of the under-developed countries. In these countries agriculture is carried on at subsistence levels. Traditionally farming is handed over from father to son and no effort is taken to increase agricultural production on business lines. In the developed countries, the farmer raises the crop and livestock with the object of getting more income. An industry run on business motive will work more efficiently and diligently with the object of getting more profit from less investments. Similarly in agriculture the land is the workshop from where greater returns are expected. To obtain these returns, the factors like land, labour and capital are utilised in such a way that greater profits are obtained. Agriculture has been mechanised and commercialised with the main object of promoting business to greater profits. Just like any industrial business, the farming operations also comprise such problems as production, consumption, barter, trade, employer and employees, marketing, transportation, international trade, economic interdependence, taxation, customs and tariffs in their relation between the farmer and other persons such as merchants, manufacturers, tax collectors and transporters. In order to tide over these factors and to earn greater profits, agriculture is mechanised and commercialised

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to run as a business.

Starting from the selection as an enterprise for one's livelihood, agriculture is treated as any other business in the developed countries. The availability of employment opportunities in those countries induces thinking on the pros and cons of selecting agriculture for their livelihood. By making inventories on the availability of land, labour and capital, the selection of different branches of farming such as field crop production, livestock rearing, growing of horticultural crops, dairying etc. are decided. If the land available is small, additional land is acquired and organisational abilities are properly made use of. In the absence of sufficient land not available one may go in for part-time employment in other business.

After the decision has been taken for farming, the choice of growing a particular crop to a particular area is decided on the possibility of earning the maximum profit. Similarly the exact amount of inputs such as fertiliser, pesticides, fungicides, herbicides etc. are decided on the profit motive. Due to the consumer's market with a variety of agricultural inputs available, the farmer is making his choice of purchases with an eye on profit. For making the correct decision in all aspects of farming, the new tool of linear programming is made use of. The farmer is supplied with innumerable alternate plans for efficient farm management within the resource restrictions of land, labour and capital. The farmer who has taken up agriculture on these business lines is well educated and knows the trick of his trade and enjoys the most modern amenities.