

Farming System and Sustainable Agriculture

S.S. Walia & U.S. Walia

The land holding of the farmer is decreasing day by day due to urbanisation and there is no chance for horizontal increase in agricultural land. To increase the income of the farmers, few steps for vertical increase in agricultural production have been discussed in this book. A detailed and comprehensive information regarding the historical background of farming system, farming system and its components, integrated farming system and allied enterprises, integrated farming system models in different agroclimatic zones, role of integrated farming system in agriculture and livelihood security, resource cycling and flow of energy in different farming systems, role of crop residues in agriculture, farming system of dryland agriculture, role of agroforestry in farming system, scope of organic farming in farming system have been given. A detailed information regarding the latest concepts of agronomy like conservation agriculture strategies in cropping system, sustainable agriculture, scope of hydroponics techniques in agriculture have also been discussed. In the end tools for determining production and efficiencies in cropping and farming system have also been given.

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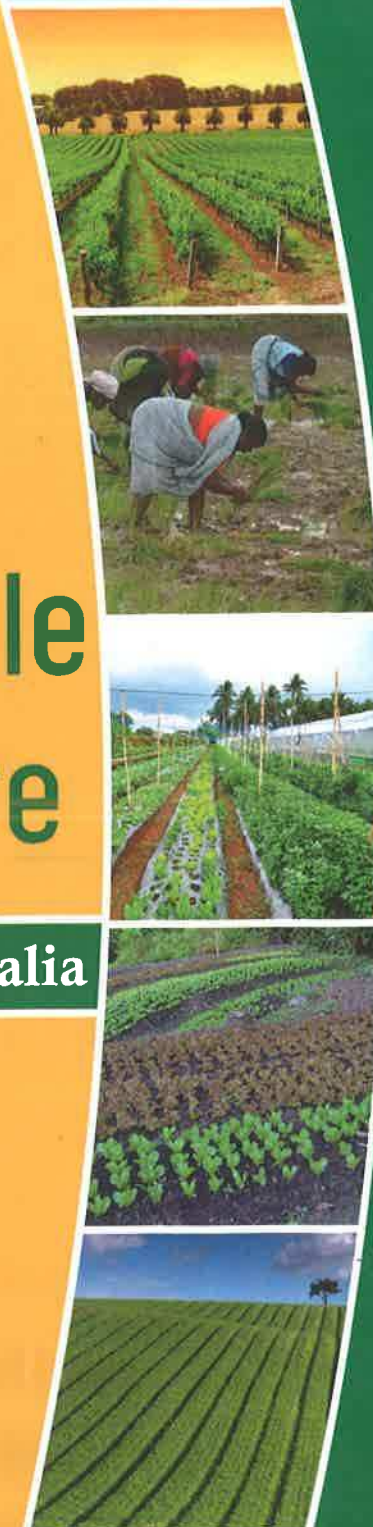
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PREFACE

Agriculture is the largest enterprise in India which is at present and will continue to be the lifeline of the Indian economy in the foreseeable future. However, due to urbanization, agricultural land is shrinking and human population is increasing day by day and so there is a need for vertical increase in agricultural produce to feed the increasing population. Due to changing climatic conditions, there is a need for reorientation of the presently practised agricultural technologies. At the same time there is a need to save/conservate the natural resources. Crop yield can be improved with the adoption of improved production and protection technologies for raising field crops. For better crop profitability, judicious use of inputs like viable seeds of improved varieties, timely sowing, optimum plant stand, required amount of fertilizers, irrigation water and pesticides (insecticides, fungicides and herbicides) should be done.

This book contains detailed and comprehensive information regarding components of farming system, historical background of farming system, allied enterprises of Integrated Farming System (IFS), models of IFS in different climatic zones, role of IFS in livelihood security, resource cycling and flow of energy, role of crop residues in different farming systems and farming system of drylands agriculture. It also discusses in detail the latest concept of agronomy like conservation agriculture, sustainable agriculture, scope of hydroponics in agriculture, scope of organic farming in agriculture, role of agroforestry in farming system. etc.

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The Indian economy is predominantly rural and agriculture oriented. In agriculture, 85% of the holdings are less than two hectares and the declining trend in the average size of the farmer holdings, poses a serious problem. Majority of them are dry lands, which depend on erratic monsoon rains. The rest of the area is cultivated with supplemental irrigation. The farmers concentrate mainly on crop production, which is invariably subjected to a high degree of uncertainty income and employment.

In India the cultivable land is 143.8 million hectares and there is very little possibility of extending it further. Therefore, to meet the requirement of food grains for increasing population, the only option open is effective utilization of time and space in agriculture. The time concept relates to increasing the intensity of cropping under assured irrigated conditions, whereas space utilization pertains to building up of vertical dimension through multi-tier cropping and farming system approach. Thus by making use of these time and space concept either in irrigated or in rained areas, the productivity per unit area per unit time can be substantially enhanced. Therefore the only way to increase agricultural production in the small/marginal units of farming is to increase the productivity per unit time and area. This may be achieved by selecting early maturing varieties with equal yields or by improving agronomic techniques like judicious use of fertilizers, pesticides and other inputs.

System approach

Management practices are developed for individual crops and recommendation are made for individual crops. The residual effect of individual crops is not considered in crop based recommendation. In this resources are not utilized efficiently. To a farmer management practices for all crops are considered that are to be grown on a piece of land. Therefore system approach is applied to agriculture for efficient utilization of all resources, maintains sustainability in production and obtaining higher net returns.

Farming is a dynamic biological and open system with human or social involvement. Being primarily biological with a high degree of dependence on weather variables and changing socio-political environments. Farming is inherently more risky than any other system. Farming system can also mean different things to different people. Farming is the process of harnessing solar energy in the form of economic plant and animal products and system implies a set of inter related practices/processes organized into a functional entity.