

Enhancing the farmer's income through modern agricultural practices

A farmer has to evaluate several options to increase the income of his household. Like any good businessman, he checks return on investment. The best option for him is where he can recycle the farm byproducts of last crop cycle to get output without any loss of quality or quantity. In this issue of the *Indian Farming*, the emphasis is on different options a farmer can opt to increase his income without increasing the cost.

Fertilizer is one of the costliest inputs in farming. Conversion of organic waste to produce biochar using the pyrolysis process is one of the viable options that can enhance natural rates of carbon sequestration in the soil, reduce farm waste and improve the soil physico-chemical properties, water holding capacity, nutrient adsorption capacity etc. With huge crop production, residue becomes co-product of crop production system, which can be returned to soil with the help of biochar preparation. It is necessary to develop low-cost biochar production units to make the technology affordable to small and marginal farmers.

For good crop production, conservation of soil moisture and minimization of surface evaporation are the most suitable interventions. Sudden downpour of rain invites high soil loss from the agricultural field leading to erosion of uppermost soil layer. The new improved technology of growing grasses towards the slope end of field boundary and at the uppermost field boundary may hold the key to a cheap, practical solution for controlling soil erosion on a huge scale in tropical and semi-arid regions. In Ladakh state of India, which is a cold arid desert with scarce water resources, high evapo-transpirational losses, harsh dry winds, and harsh and tough climatic conditions, are hindering the agriculture. Using water harnessing techniques such as mulching, drip irrigation and hydrogel, improve best suited morphological parameters which further improve future reproductive growth of crops.

Weeds, being hardier in nature compete with plants for nutrients, water, sunlight and space during entire vegetative and early reproductive stages of crops, they transpire valuable conserved moisture, absorb nutrients from the soil and the relative density significantly reduce crop yields. The associated weeds exploit ideal environmental conditions provided for optimal crop productivity in an agro ecosystems, thus reducing the productivity of crops. Proper weed management strategies are required to enhance the crop production to meet the demand of growing populations.

Dairy products, the important ingredients of our food basket, depend upon high yielding animals, their health management and nutrition. From selection of pedigree animals to animal nutrition has been given due importance in this issue. This year the heavy monsoon rains has caused havoc in several areas causing floods and landslides. In such cases protecting and saving human life becomes the first priority of disaster relief. Therefore, farmers should work with meticulous planning before a disaster occurs. Animals are the main source of livelihood to the poorest of the poor and to the landless. To minimize the loss of livestock during different disasters, training programme on "Management of Animals in Emergencies" were initiated by some universities. The nodal agency of the Country incharge of disaster management (In India it is the Ministry of Agriculture and Farmer Welfare) should specifically draw its attention to disaster management in animals. A separate cell has to be established for the purpose in the department dealing with veterinary service.

Farmer Interest Group (FIG) is a budding concept in terms of rural development and social welfare. FIGs have produced tangible assets and improved living conditions of the members and also helped in changing much of their social outlook and attitudes. These groups can have online Agriportals catering the market information needs for farmers, which will be helpful to the farmers to sell their produce in any market where good price can be obtained. This can be a part of information center at village level.

Through the intervention of Artificial Intelligence, a major breakthrough can be achieved in doubling farmer's income. AI is a branch of Science which deals with helping machines which find solutions to complex problems in a more human-like fashion.

Application or refinement of technology for all categories of farmers (including large, small, marginal and landless farmers) for improving their livelihood security, through feedback from farmers is a must.