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Title: Fundamentals on Plant and Soil Microbial Interactions
(Theory and Practice)

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Preface

Soil is the earth's crust and composed of many organisms with full of diverse elements and minerals to enhance the growth of microbes and plants. Soils of different microclimatic site have different edaphic components. Activity of soil is due to diverse kind of fungi, bacteria, myxomycetes, actinomycetes, nematodes, millipedes and centipedes, algae and soil inhabiting arthropods. Not only these, many more diverse kind of organisms reside in the soil even they use soil components and uptake nutrients for their purpose. Nutrient cycling and exchange of various gases in soil is due to physical and chemical including bio-chemical process. This means that a good soil is a good habitat for many living organisms. Plants grow naturally in soil but after a long time their body deteriorate due to death and decomposition thereby. The decomposers' activities found not only in soil but in everywhere of biosphere i.e. aerial part of the plant and inside the plant cells also.

The research field and allied disciplines are correlated to this topic is due to mother connection and broadcast many wings in particular way. These are genetics, proteomics, cryopreservation, vegetable crop and floriculture study, horticulture and fruit technology, seed technology, agronomy, soil science and agricultural chemistry, entomology, mycology and plant pathology, nematology, agricultural chemicals and pollution study, plant physiology, biochemistry, agricultural economics, agricultural extension, ecology, forestry and pomology.

The above mentioned all disciplines have greater depth of study but main focus on the research and extension. Therefore, to attain the principal goal should be of the research scholars, students and faculties all are trying to develop innovative ideas to make better growth and development in terms of sustainable way for any kind of product. This will mitigate the problem but not a permanent way because one good proposal having well options to fulfil the positive goals through some criteria always associated with it as negative. Therefore other group of researchers are trying to solve the same problem that are negative and always harm the natural process in this harsh situation.

Chapter 16

Agriculture in the Past, Present and Future

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ABSTRACT

Modern people mainly depend on agriculture and it is modified and diverse from the ancient age people who were dependent on hunting and gathering their food from nature for their daily need. Civilized people are trying to develop techniques even tools to modify their needs to get better yield and better income for their livelihood. Day by day many people are coming in this platform to do research and extension in a managed way but some lacunae are there that are parallel way developing negative effect and harm the ecosystem and hamper the food security too. Different institutions and different research organizations are involved to set up a number of methods and trying to make good opportunity in a managed way. Our earlier forefathers did their work in a sequential way without any scientific research but their goal was result oriented and eco-friendly. So, now we need eco-friendly practice to cope the environmental degradation and planning is recommended to get better yield through sustainable way without damage the soil health and environmental degradation too. Therefore the paper reflects the past, present and future agricultural goals and better management through technology based way.

Key words: Agriculture, Past, Present and Future, Management, Future Work.

INTRODUCTION

Agriculture is the science or age old practice for cultivation of not only cash crops but also rearing animals on demand for food, wool, silk or gum. Agriculture is import for human beings because to live, all need ideal food, cloth and shelter hence to rear or cultivate wide range of plants and animals according to their needs. Agriculture is the backbone of a society as it provides employment opportunities

to very large percentage of people irrespective of their education, sex and age. The history of Indian agriculture is very old as evidence comes from Indus Valley Civilization (IVC) dates back 3300 BCE. The civilization was based on agriculture with diversity of crops. Vedic literature also recorded about agricultural practice. Actually when human changed their lifestyle from hunter to food gatherer they were forced to learn about cultivation and had to value it. According to Bhumivaragaha a 2500 years old Sanskrit text, agricultural lands were differentiated into 12 categories viz. (1) Urvara (means fertile soil), (2) Ushara (means barren soil), (3) Maru (means desert), (4) Aprahata (means fallow land), (5) Shadvala (means grassy land), (6) Pankikala (means muddy land), (7) Jalaprayah (means watery area or land), (8) Kachcha (means land contiguous to water), (9) Sharkara (means Land full of pebbles and piece of limestone), (10) Sharkaravati (means sandy soil), (11) Nadimatruka (means soil feed by water from river) and (12) Devamatruka (means rainfed area). Rice was domesticated crop along the bank of the river Ganga in sixth millennium BC. Ancient Indian also domesticated several crops like mustard, black gram, horse gram, pigeon pea, field pea, grass pea, mung bean, sesame, linseed (*Linum usitatissimum*), fennugreek, cotton, grapes, jujube, dates, mango, mulberry etc. Peninsular India was also fertile for crop production from dates back 10000-3000 years ago. There was evidence of production of line seed (*Linum* sp.), barley (*Horidium vulgare*), wheat (*Triticum aestivum/ durum/dicoccum*), pearl millet (*Pennisetum glaucum*), pulse (*Vinga radiata*), cotton (*Gossypium* sp.) etc. in the southern Indian states. As agriculture was the main state of livelihood for past human beings they stressed on better irrigation i.e. place near the river for their settlement. There was several evidence of well established civilization beside the bank of rivers as fresh water is the basic need for agriculture and drinking purpose. With the time lapse and to cope up with the food requirements people tried to implement several new agricultural techniques and double cropping also. India was the center of origin of many cultivated or domesticated crops like chick pea (*Cicer arietinum*), pigeon pea (*Cajanas cajan*), cow pea or black-eyed pea (*Vigna unguiculata*), mung bean (*Vigna radiata*), rice bean (*Vigna umbellata*), eggplants (*Solanum melongena*), cucumber (*Cucumis sativus*), radish (*Raphanus sativus*), yams (*Dioscorea alata* as *D. esculenta* as Asiatic yam; *D. batatas* as Chinese yam), tamarind (*Tamarindus indica*), mango (*Mangifera indica*), citrus fruits (*Citrus* spp.), sugarcane (*Saccharum officinarum*), coconut (*Cocos nucifera*), palm (*Areca /Borassus* etc.), sesame (*Sesamum indicum*), safflower (*Helianthus annuus*), cotton (*Gossypium hirsutum*), jute (*Corchorus* spp.),