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" INNOVATIVE AGRICULTURAL TECHNIQUES TO BOOST ENTREPRENEURIAL SKILLS OF FUTURE FARMERS"

FARMERS FOR FUTURE

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CAN AGRICULTURE CHANGE?

How has agriculture changed over the years?

Farms have changed a lot in the last 50 years. Farms are bigger, livestock are usually raised inside, yields are higher, less manual labor is needed, and it's not common to see dairy cows, beef cattle, pigs, and poultry on the same farm.

The green revolution spread many of these changes to farms throughout the world, with varying success. Other recent changes in agriculture include hydroponics, plant breeding, hybridization, gene manipulation, better management of soil nutrients, vertical gardens and improved weed control.

hydroponics

is a method of growing plants without soil. You can grow hydroponically all year long. Hydroponics uses less water than traditional soil-based systems. Hydroponic growing allows for faster growth and higher yields than traditional soil-based growing systems.

plant breeding

is the science driven creative process of developing new plant varieties that goes by various names including cultivar development, crop improvement, and seed improvement.

hybridization

is growing two plants together in a special way to help the plants develop the natural traits we like. Hybridization differs from Genetically Modified Organisms (GMOs) because hybridization takes advantage of traits natural to the plant, where GMOs insert traits that are not natural to the plant.

gene manipulation

Some benefits of genetic engineering in agriculture are increased crop yields, reduced costs for food or drug production, reduced need for pesticides, enhanced nutrient composition and food quality, resistance to pests and disease, greater food security, and medical benefits to the world's growing population.

better management of soil nutrients

Nutrient management planning helps to reduce contamination to waterways by plant nutrients. Without proper management, nutrients can dissolve in soil water and go into surface or ground water through leaching or runoff.

Vertical gardens

are gardens in which the plants are supported to grow along vertical.

Here is a list of some of the advantages of growing a vertical garden!

- A vertical garden saves your space.
- A vertical garden helps you to plant a variety of plants. Vertical gardening is safe.
- A vertical garden is a protective shield.
- Vertical gardens insulate your building
- Vertical gardens give you privacy.

improved weed control

Weed control includes many techniques used to limit weed infestations and minimize competition.

These techniques attempt to achieve a balance between cost of control and crop yield loss, but weed control is used only after the problem exists; it is not prevention.

E.g. smart cameras see the way to better weed control

Computer and positioning sensor operates a hydraulic side-shift system that moves shares from side to side to keep the steel between the rows, removing weeds and leaving the crop behind.

As for performance, we can travel in a cereal crop at speeds up to 18kph.

What are the modern methods of farming?

- mechanized farming
- use of fertilizers, chemicals, pesticides, herbicides, insecticides, etc. to prevent crops from weeds and insects.
- use of high yielding varieties (HYV) for farming so as to get a high yield.
- mixed farming
- multiple cropping

mechanized farming

Mechanized agriculture is the process of using agricultural machinery to mechanize the work of agriculture, greatly increasing farm worker productivity.

In modern times, powered machinery has replaced many farm jobs formerly carried out by manual labour or by working animals such as oxen, horses and

use of fertilizers, chemicals, pesticides, herbicides, insecticides, etc. to prevent crops from weeds and insects

Generally chemical fertilizers and pesticides are effective and convenient in use for production and disease management of plants but they are potential threat for the health and environment of soil, plant as well as humans.

use of high yielding varieties (HYV) for farming so as to get a high yield.

High-yielding varieties (HYVs) of agricultural crops are usually characterized by a combination of the following traits in contrast to the conventional varieties:

- Higher crop yield per area (hectare)
- Dwarfness
- Improved response to fertilizers
- High reliance on irrigation and fertilizers - see intensive farming
- Early maturation
- Resistive to many diseases
- Higher quality and quantity of crops can be produced.

Most important HYVs can be found among wheat, corn, soybean, rice, potato, and cotton. They are heavily used in commercial and plantation farms.

mixed farming

is a type of farming which involves both the growing of crops and the raising of livestock.

Such agriculture occurs across Asia and in countries such as India, Malaysia, Indonesia, Afghanistan, South Africa, China, Central Europe, Canada, and Russia.

multiple cropping

defined as harvesting more than once a year, is a widespread land management strategy in tropical and subtropical agriculture.

It is a way of intensifying agricultural production and diversifying the crop mix for economic and environmental benefits.

Ways to improve agricultural production

- Implementation of land reforms. Land reforms are the first and most important point for improving productivity.
- Interplant.
- Plant more densely.
- Manuring.
- Plant many crops.
- Water use and soil management.
- Sustainable agriculture.
- Raised beds.

Interplant

is about to plant a crop between (plants of another kind) also : to set out young trees among (existing growth)

Plant more densely

Plant density, or plant spacing, describes the amount of space left between plants when planting a garden, field or other landscaping plants.

The more closely spaced plants are, the higher the density.

Manuring

Manures are plant and animal wastes that are used as sources of plant nutrients. They release nutrients after their decomposition.

The art of collecting and using wastes from animal, human and vegetable sources for improving crop productivity is as old as agriculture.

Plant many crops

A multicrop composed of two or more annual crops grown simultaneously on a piece of land within a single growing season.

Mixed cropping, also known as polyculture, inter-cropping, or co-cultivation, is a type of agriculture that involves planting two or more plants simultaneously in the same field, interdigitating the crops—like interlocking your fingers—so that they grow together.

water use and soil management

Water and soils are among the natural resources that constitute the building blocks of ecosystems and of the agriculture and forestry sectors they support. Without action, the pressure on these natural resources is likely to increase as a result of growing population, evolving food demand patterns and the effects of a changing climate.

Raised beds

Raised bed farming refers to the agricultural technique of building freestanding crop beds above the existing level of soil. Sometimes raised beds are covered with plastic mulch to create a closed planting bed. Raised beds may be rectangular in shape or have an irregular shape

Sustainable agriculture

is farming in sustainable ways meeting society's present food and textile needs, without compromising the ability for current or future generations to meet their needs.

It can be based on an understanding of ecosystem services.

Sustainable agriculture and food production technology

Sustainable food producers have an important role to play in achieving the targets of the Paris Agreement. For some countries' producers, smart and efficient food production technology will be critical to reducing emissions. Some countries already have one of the world's most modern and high-tech food production systems - with widespread, fast-paced digitalisation.

What is more?
Can crops be grown in space?

The first growth test of crops in the Advanced Plant Habitat aboard the International Space Station yielded great results.

Arabidopsis seeds - small flowering plants related to cabbage and mustard - grew for about six weeks, and dwarf wheat for five weeks.

Plants grown in space include:

- Arabidopsis (Thale cress)
- Bok choy (Tokyo Bekana) (Chinese cabbage)
- Super dwarf wheat.
- Apogey wheat.
- Brassica rapa.
- Rice.
- Tulips.
- Kalanchoe.

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thank you for watching our presentation

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