

PRINCIPLES AND CONCEPTS OF CROPPING SYSTEMS

(Part- 3)

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Crop interaction

Intercropping

- ❖ Interaction between the component crops may be competitive, non-competitive or complementary
- ❖ A combination of tall and short crop (millet /groundnut) or short and long duration (groundnut/pigeonpea) reduces competition for sunlight
- ❖ Water is used more efficiently by crops that extract water from different soil depths due to different rooting depths or produce more canopy thus reducing evaporation from soil surface
- ❖ A combination of cereal and legume crops reduces input of nitrogen

Crop interaction

Sequential cropping

- ✓ **Interaction is non-competitive**
- ✓ **Some preceding crops have an allelopathic effect on the succeeding crop**
- ✓ **Soil fertility is reduced by the preceding crop**
- ✓ **Residual effect of Farmyard manure(FYM) or phosphorus (P) fertilizer can be seen on the succeeding crop**

Crop management

Inter cropping

- ❖ **Use less competitive crops**
- ❖ **Adjust time of sowing – staggered planting in aggressive & non-aggressive crop combination**
- ❖ **Adequate nutrient application as per requirement of component crop**
- ❖ **Weed control – less weed infestation compared to monocrops**
- ❖ **Pest & disease control – less pests and diseases due to crop diversity**

Crop Management

Sequential cropping

- ❖ **Use short duration & photo insensitive varieties**
- ❖ **Harvest the first crop at physiological maturity to avoid terminal drought of second crop**
- ❖ **Add additional amount of N if the preceding crop is sorghum or millet**
- ❖ **Reduce N quantity if the preceding crop was a grain legume**
- ❖ **If FYM or P fertilizer are applied to the preceding crop, reduce the input of N and p to the succeeding crop**

The **plant characteristics** that influence cropping systems are:
Plant height, crop canopy, nutrient & water requirements, root
structure and plant products

Farm sustainability depends on the efficient use of natural
resources (soil, water, energy, and plant diversity) depending on
the requirements of the farmers

A sustainable system aims to **optimize** the production rather
than **maximizing** it

An ideal sustainable cropping system is one which includes crop combinations meeting :

- ❖ **Soil and water conservation**
- ❖ **Efficient use of water and energy**
- ❖ **Enhance and maintenance of soil fertility**
- ❖ **Maintenance of crop yield level: and**
- ❖ **Farm (including crop) diversity**