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LECTURE – 3

FARMING SYSTEM COMPONENTS AND THEIR MAINTENANCE



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Plant interactions

➤ **Interactions between component crops**

In intensive cropping, crops are grown in association (intercropping) or in sequence (sequential cropping). In such situations there is possibility of interaction between the component crops. The interaction is mainly due to response of one species to the environment as modified by the presence of other species. Interaction may be competitive or non-competitive or complementary.

➤ **Interactions in intercropping**

1. Light
2. Moisture and Nutrients
3. Allelopathy
4. Annidation



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Interactions in Sequence Cropping

- Competition for light, water and nutrients as in mixed crop communities does not occur when sole crops are grown in sequence.
- It occurs only in relay cropping where there is a short span of overlapping between two crops in a sequence and the relay crop experiences the shortage of light.
- Crops are raised one after another to keep the land occupied by the crop for longer period.
- If the crop development is slow, much of the solar radiation reaches the ground, favouring weed growth and increasing evaporation losses from the soil surface.



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Management of Intercropping Systems

- **Seed bed**
- **Varieties**
- **Fertilizer applications**
- **Sowing**
- **Water requirement**
- **Weed management**
- **Pest and diseases**
- **Harvesting**



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- Seedbed preparation for different crops varies depending on the crop. Deep rooted crops respond to deep ploughing while for most of the cereals shallow tillage is sufficient. The crops with small seed require fine seedbed. Certain crops like cotton arid maize are planted on ridges, while most of the other crops are grown on flat seedbed. Since more than one crop is involved in intercropping, the seedbed preparation is generally done as per the needs of base crop.
- **Varieties:** The varieties of component crops selected for intercropping system should be less competing with the base crop and the peak nutrient demand period should be different from the base crop. The difference in duration between the components in intercropping should be a minimum period of 30 days. The short duration sorghum hybrids like CSH-6, CSH-9 are suitable for intercropping with long duration red gram varieties like C 11 and LRG 30 because of wider gap between maturity periods.



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- **Sowing:** Sowing practices are slightly altered to accommodate intercrop in such a way that it causes less competition to the base crop. Sowing of base crop is done either as paired row, paired wider row or skip-row planting. The sowing of base crop and intercrop is also done in fixed ratios.
- **Fertilizer Application:** The amount of nutrients present in the component crops indicates the requirement of fertilizers for the intercropping system. The nutrient uptake is generally more in intercropping system compared to pure crops. When legumes are associated with cereal crop in intercropping system, a portion of nitrogen requirement of cereal is supplemented by the legume.



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- ***Water Requirement:*** Intercropping systems are generally recommended for rainfed crops to get stable yields. The total water used in intercropping system is almost the same as for sole crops, but yields are increased. Thus water-use efficiency of intercropping is higher than sole crops.
- ***Weed Management:*** Weed problem is less in intercropping system compared to their sole crops. The higher plant population and complete covering of the soil earlier in intercropping system reduce weed infestation. In late maturing crops that are planted on wide rows, presence of early maturing crops helps to cover the vacant inter row space and keep weeds under check.



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- ***Pests and Diseases:*** Pests and diseases are believed to be less in intercropping system due to crop diversity than in sole crops. Some plant combinations may enhance soil fungistasis and antibiosis through indirect effects on soil organic matter content. The spread of the disease is altered by the presence of different crops. Little leaf of brinjal is less when brinjal is sheltered by maize or sorghum.



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Management of sequential cropping Systems

- **Seed bed**
- **Sowing**
- **Varieties**
- **Fertilizer applications**
 - *Soil Supplying power*
 - *Nutrient Uptake by Crops*
 - *Residual Effect of fertilizer*
 - *Legume effect*
 - *Crop residues*
 - *Efficiency of crops*



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- **Water requirement**
- **Weed management**
- **Pest and diseases**
- **Harvesting**