



FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

- In areas where soil is eroded during rains and drainage is poor, soil is cultivated and cover crops are grown between the rows during rains.
- The crop may and may not be turned into soil.
- These crops not only increase water retaining capacity of soil and biological complex of the soil but also add organic matter when ploughed in besides checking erosion. As cover crops, legumes should be preferred because they add extra N in soil through fixation of atmospheric-N in their nodules.
- They also suppress weeds during rainy season.
- Crops like greengram, blackgram, cowpea, cluster bean, soybean should be preferred during kharif season while pea, fenugreek, broad bean and lentil can be preferred in winter season as cover crops.

Advantages

1. Adds organic matter in soil.
2. Improves soil condition.
3. Improves soil fertility.
4. Increases water retention capacity of soil.
5. Increases biological complexes of soil.
6. Checks soil erosion.
7. Checks nutrient losses through soil erosion.

Table: Intercrops in Different Horticultural Crops

Sl. No.	Crop	Duration for intercrop	Recommended Intercrops
1	Apple	4 years	Tomato, Cabbage, Beans, Strawberry, Early potato, Peach and <i>Valeriana wallihi</i>
2	Banana	5 months	Green gram, Cowpea, Cauliflower, Cabbage, Yam, Elephant foot, Onion, Black gram, Turmeric, Brinjal, Colocasia, Dioscoria, Chillies and Okra
3	Ber	2 years	Green gram, Moth, Cluster bean, Cowpea, Cumin and Chillies
4	Citrus	4 years	Beans, Carrots, Tomatoes, Berseem, Senji, Onion, Potato, Chillies, Pulses, Cucurbits, Okra, Gram, Peas, Potato and Cabbage
5	Date palm	5 years	<i>Citrus medic</i> , Guava and Sapota

6	Grape	1 year	Vegetables relevant to area.
7	Guava	3 years	Cauliflower, Peas, French bean, Cowpea, Cluster bean, Black gram, Green gram, Okra, Onion, Turmeric, Garlic, Cabbage, Chillies and Papaya
8	Litchi	7 years	Turmeric, Ginger, Pointed gourd, Sweet potato, Tomato, Radish, Cabbage, Turnip, Brinjal, Cucurbits, Green gram, Black gram and Cowpea.
9	Mango	5 years	Phalsa, Papaya, Guava, Banana, Peach, Strawberry, Pineapple, Cowpea, Cucurbits, Okra, Cabbage, Knolkhol, Beet, Onion, Carrot, Cauliflower, Tomato and Cluster bean.
10	Papaya	6-9 months	Cabbage, Cauliflower, Chillies, Radish and Tomato.
11	Peach	3-4 years	Soyabean, Pineapple, Cowpea and Turmeric.
12	Pomegranate	4 years	Berseem, Luceme, Cowpea, Green gram, Cucurbits, Cabbage, Cauliflower, Bean, Peas, Tomato, Carrot, Onion, Potato and Brinjal.
13	Sapota	7 years	Banana, Papaya, Pineapple, Broad bean, Tomato, Brinjal, Cabbage and Cauliflower

Minimum Tillage

- In this method inter space is maintained without any traditional soil tillage like ploughing, disking, harrowing, etc.
- This is receiving widespread adaptation in uneven topography.
- Here sod, weeds, cover crops and other vegetation are killed by herbicides in springs which forms a layer of dead plant material on soil surface.
- This controls erosion, conserve moisture and release nutrients.

Sod Culture

- In this system, in the space between trees, grasses are allowed to grow without tillage or mulching.
- Sometimes cover is mixed with grasses to improve fertility such as grasses are simply mowed and the surface is kept neat and tidy.
- This system is commonly followed in temperate region of Europe and America for apple and pear orchards and does not exist in tropical and subtropical region of India due to scarcity of available nutrients and soil moisture in most part of the year.

- It is the best system for the control of soil erosion and maintenance of soil organic matter and soil structure.
- In this case manures and fertilizers are not applied individually to trees but provided with sod all over the field and the system is satisfactory for deep rooted crops.

Modifications in Sod System

- Grasses are allowed to grow without cutting is not desirable because organic matter is lost.
- Grasses are grown cut as required and removed for making hay not desirable because organic matter is lost here also.
- Grasses are grown cut and left behind to decompose.
- Grasses are grown and pastured i.e., animals are allowed to graze.
- Temporary sod. Sod is allowed for two years or so, then soil is ploughed, cultivated and sod is reseeded.
- Sod is not being followed in India due to lack of cool and moist weather.
- Lack of aeration, rat holes in sod prove harmful and trees die.
- Nutrient deficiency is also common especially of potassium.

Mulching

- Mulching is the practice of covering the soil around the plants to make conditions more favourable for growth and conserve the available soil moisture.
- In this management system the open soil is put under loose cover of straw, hay, crop residue, leaves, saw dust and plastic.
- It is essentially a surface barrier against evaporation and checks weed growth reducing competition for nutrients.
- This is one of the important [soil management](#) practices adopted in certain countries in orchards.
- It offers a number of advantages at the same time suffer from disadvantages too.

Advantages

1. Conserves moisture by suppressing weed growth, regulating soil temperature and protection from sun and wind.
2. Improves soil structure.
3. Reduces soil temperature fluctuations.
4. Increases soil organic matter level.
5. Controls erosion.
6. Improves water infiltration rate.
7. Improves nutrient availability through better soil condition micro flora.
8. Avoids competition for nutrient and moisture with main crop.
9. Controls weed growth.

Disadvantages

1. High cost.
2. Transportation.

3. Disease and pest infestation through dead plant material.
 4. Fire hazards.
 5. Roots grow shallow due to the effect through soil temperature and moisture. Therefore, in first year mulching may not be advisable.
- Among all the mulching materials, plastic mulches are becoming popular especially black polythene mulch, where weed control is desired. Mulching is common in tropics especially in crops like [banana](#), citrus, pineapple. Some of the recommendations made for different crops are being presented in the following table.

Table: *Recommended mulches for different fruit crops*

Sl No.	Crop	Mulch material
1	Banana	Polythene, Straw mulch, Banana trash and Sugarcane trash.
2	Mango	Straw mulch especially effective against spongy tissue.
3	Pomegranate	Sugarcane trash, Paddy husk and Groundnut husk.
4	Ber	Sugarcane trash, Wheat straw, Black polythene, Trash of <i>Sachrarum munja</i> and Local grasses.
5	Sapota	200 gauge black polythene.
6	Grape	Black polythene.
7	Acid lime	Dry leaf mulch.
8	Strawberry	Black polythene, Cut grasses and Pine needles.
9	Guava	Organic mulches.
10	Lemon	Dry grasses and Black polythene.
11	Coorg mandarin	Dry leaf mulch and Weed scraping.
12	Sweet lime	Dry grasses.
13	Date palm	Local weed <i>bui (Aerva persica)</i> .
14	Pineapple	Black polythene, Saw dust and Dry leaves.
15	Apple	Oak leaves, Black alkathene and Conifer leaves.