Among other intercrops, growing banana under coconut is the most popular among coconut growers (Picture 1). The reasons attributed being easy availability of planting materials, their quick growth, ready market and high returns. The trials conducted by the Coconut Research Institute on the effect of banana on coconut yield showed a 20% nut yield increase. The beneficial effects being the increase in the soil moisture, soil fertility, good estate management and the reduction in soil erosion.

1. Selection of suitable lands

Banana can be grown in coconut lands in the wet, intermediate and dry zones. In the wet zone, it is grown as a rain fed crop. However, supplementary irrigation increases production and profitability of banana intercropping in the intermediate and dry zones.

a. Age of the coconut stand: In general new plantings (26'x26'), the suitable age of the coconut stand should be up to 05 years from planting and above 30 years.

b. Slopping lands: Upper portion of the slope is not suitable, as banana will be subjected to water stress during dry periods. Also lands subjected to water logging are unsuitable.

C. Lands where the coconut production exceeds 5000 nuts per acre per year too are unsuitable, as banana plants will be deprived of sufficient sunlight.

d. Very sandy and hard gravelly soils are also unsuitable. The most suitable Being the loamy soil.
2. Suitable varieties

Coconut lands in the wet zone are suitable for planting Ambul, Ambum and Anamalu varieties, while for the intermediate and dry zone soils Kolikutti, Ambu are recommended. Ash plantains, Mondam, and Atemaru are popular for cooking purposes and out of these only Ash plantains are not recommended for the wet zone. Other varieties such as Seen Kesel, Rathambale, Bin kesel are grown in small scale. Dept. of Agriculture has realised a new Ambul selection called 'Nadhee'-which produce high quality fruits.

3. Suitable planting material

Of the three types, Kadupath, Kanya and Diya, 'Kadupath' suckers are most suitable due to high growth rate. Although 'Kanya' is somewhat suitable type 'Diya' is not recommended (Picture 2).

![Picture 2: Different types of suckers](image)

4. Planting systems

4.1. Mature coconut lands (palms over 30 years): In Sri Lanka most coconut plantings are at 8.5 m x 8.5 m (26' x 26') distances. The growth in 'Ambul' is more rigid than in 'Kolikutti'. In consideration of the above, it is recommended to plant two rows of 'Kolikutti' in one avenue of coconut, and only one row of 'Ambul' in one avenue of coconut (Picture 3 & 4).

![Picture 3: Planting system for Ambul type](image)

Where coconut has been planted at distances below 8.5 m x 8.5 m between two palms, if sunlight is limiting, it is recommended that planting banana of all types be limited to one row method as shown in Picture 3.
4.2. New/Replanting of coconut (up to 5 years)

The method detailed out in Picture 4 can be adopted. But the method detailed out in picture 5 is the most suitable method for wide avenue planting systems of coconut, where more number of banana plants could be accommodated. In the avenue system banana or any other suitable intercrop could be successfully cultivated.

Depending upon growth of coconut seedlings, banana plants in close proximity may be removed if necessary at a later stage.

5. Planting

Planting holes of size 0.6 m x 0.6 m x 0.6 m (2' x 2' x 2') will be sufficient. The holes should be filled with a mixture of top soil and organic manure before planting the suckers. In addition 500 g of saphos phosphate and 1 kg of dolomite should also be incorporated into the soil.

Usually lopping of the banana leaves is done prior to planting. However it is not advisable at all to cut off the trunk before planting. Planting should be done with the onset of monsoon rains, where irrigation is not practiced.

Note: Suckers should be free of Bunchi Top and Panama Diseases. Suckers with Banana weevil damage should also be rejected or such materials should be treated with Furadan (6-10 g in 4.0 l of water and dip in 5-10 minutes).
6. Fertilizer application

Application of fertilizer is important for healthy growth of banana. The following fertilizer mixture is recommended by the Department of Agriculture and should be applied after two months from planting and afterwards at four monthly intervals, (see the table). Where irrigation is not possible, application intervals should be extended to 6 months.

<table>
<thead>
<tr>
<th></th>
<th>g/sucker (wet Zone)</th>
<th>g/sucker (intermediate Zone/Dry Zone)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea</td>
<td>110</td>
<td>120</td>
</tr>
<tr>
<td>Rock Phosphate</td>
<td>150</td>
<td>-</td>
</tr>
<tr>
<td>Concentrated Super Phosphate</td>
<td>-</td>
<td>80</td>
</tr>
<tr>
<td>Muriate of Potash</td>
<td>190</td>
<td>250</td>
</tr>
<tr>
<td>Total</td>
<td>450</td>
<td>450</td>
</tr>
</tbody>
</table>

In the wet zone (intercropped with coconut) application of 450 g of Kieserite or 600 g of dolomite per bush in every six months is recommended.

Fertilizer should be slightly forked into the soil without damaging the roots.

7. Water supply

Banana grows vigorously if they are irrigated during dry months. Moisture requirements for this crop in the wet zone are minimal. In the intermediate zone when water becomes scarce it is advisable to use a mulching material such as coir dust. In the dry zone failure to supply sufficient water to banana intercropped with coconut has been proved by experiments that the number of bunches harvested per hectare is less with fewer fruits in combs.

8. Excess suckers

Too many suckers produced by the banana plant retard the growth of mother plant, and reduce the size of the bunch. Therefore the grower's attention is drawn to the following important practices regarding the maintenance of suckers.

a. Until the fourth month, do not allow any sucker to grow

b. At the fourth month, allow only one healthy sucker to develop

c. At the time of flowering, allow another sucker to develop

d. When the bunch is matured and is ready for harvesting allow another sucker to develop

To avoid injury to the main corm during removal of excess suckers, always
9. Weed control

Weed growth is less in well-managed coconut lands intercropped with banana, and slashing the weeds will be sufficient. In addition the application of the weedicide, 'Paraquat' may also be practiced. Ensure that weedicide does not get into the developing suckers. Mulching banana bases with coconut fronds and dry banana leaves, prevents weed growth.

10. Diseases

10.1. Bunchy top disease

This is a common disease caused by a virus found particularly in the wet zone and could be affected at any growth stage of banana. Main symptoms of the disease are stunted appearance of trees. A virus causes this. The best remedy would be to prevent the disease. All affected banana bushes should be uprooted and destroyed. This disease spreads by Banana Sucking Thrips.

10.2. Panama disease

It has been observed that this disease is spreading fast in coconut estates in the wet and intermediate zones (eg. Nattandiya, Dankotuwa). Kolikuttu is the most susceptible. This is especially seen in banana mixed cropped with pineapple. The external symptoms of this disease are fast yellowing of the lower leaves and drying of the bunch just before maturity. When the stem of an affected banana plant is sliced, the mid portion appears black and rotten, confirming the panama disease. Although systemic fungicides such as Benlate could be used effectively for the control of this disease they are yet expensive, and the cheapest would be to remove all the affected bushes and destroyed.

As a measure to minimize the spread of the panama disease, the application of coir dust as a mulch should be limited. The basal portion of the corm should not be covered with coir dust, and also the application of fertilizer components with a high content of nitrogen such as urea should be reduced to the recommended level.

Knives and implements used to cut the diseased plants should never be used instantly to lop leaves in healthy plants as this would act as a mode of 'disease carrier' from affected to healthy plants. It is also equally important to identify the diseased plants. In affected banana plantations, replanting of banana should be delayed. Ambul variety is found to be resistance to Panama disease. Ambul could be used to fill vacancies of affected banana plantations.
10.3. Anthracnose disease

The symptoms of this disease are the drying the young bunches, partially drying of the combs thus reducing the fruit numbers. Ash plantains are the most susceptible.

Removal of all disease affected parts of banana (eg. bunches etc), maintenance of sanitation of the cultivation are importance to control disease. If the disease prevails incessantly a suitable fungicide should be applied at the early bearing stage. Benomil, Mancozeb, Maneb are the recommended fungicides.

10.4. Cegatoca leaf spot disease

This is also caused by a fungus. Symptoms are appearing yellow colour spost on leaves, then those spots will be dried to brownish colour. At the acute level, leaves show excessively drying.

Removal of excess shade, removal and burning of affected leaves, good drainage of the soil are helpful to manage the disease.

11. Pests

11.1. Banana weevil

This is a black weevil about 2.0 cm long, which burrows into the stem for feeding and breeding causing retardation. In order to prevent the damage of this pest especially at the bearing stage, application of a matchbox full of Carbofuran granules to the soil around the bush is popular among growers. Taking into consideration the toxicity of the agrochemicals and dangers encountered in handling, it is recommended to immerse the young banana plant (suckers) in a suitable insecticide solution before field planting, to prevent the weevil from entering the stem. Sliced pieces from removed stems can be treated with an insecticide and placed in the field as a trap to attract these weevils.

12. Enclosing the bunches

After complete formation of the fruits, the remaining unopened 'bud' at the distal end should be removed to facilitate covering of the entire bunch, a large basket made out of plaited coconut leaves to accommodate the whole bunch, or a 'cylindrical bag' made out of polythene could be used for this.
bunch yields well-formed and healthy fruits, and if the date is marked, the harvesting could be done in time. Trials conducted have shown that covering the bunches with baskets made of coconut leaves are more advantageous and cooling as against polythene bags.

Note: Please refer the Advisory leaflet issued by the Dept. of Agriculture for more details on diseases and pest control.

13. Bearing and harvesting

Generally banana commences flowering 10-12 months after planting. The period taken for maturity depends on the type. For example Ambul takes 13 weeks for maturity while in Kolikuttu the period extends up to 16 weeks. Accordingly it will be possible to harvest banana in the first year after planting. In these types Ambul and Kolikuttu, the fruit changes from green to light green while reaching maturity. It is advisable to cover the harvested bunches using banana leaves to avoid damage during transport.

14. The harvest

In Banana, the period taken up to flowering, and the yield depend mainly on the agro climatic zone. Trials conducted at the CRI have indicated that the best area for banana cultivation is the wet zone, whereas the intermediate and dry zones ranked second and third without irrigation. It was further recorded that Kolikuttu grown in the wet zone without water supply yielded 115 fruits in a bunch, whereas this number dropped to 80 and to 45 respectively in the intermediate and the dry zone. Therefore, a supplementary irrigation system is required for Kolikuttu especially in the dry zone.

A banana stand could be maintained satisfactorily for a period of 4-5 years, and is not advisable to continue further. All new stands should be planted with new planting materials.