

Intercropping refers to cultivation of two or more crops on the same land in a mixture or in a regular spatial arrangement. Intercropping in tea serves to maximise land productivity and to minimise the economic and environmental risks involved in growing a monocrop. Added advantages are favourable cost benefits and increased employment. Intercropping has become more widespread in the last two decades or so, both in smallholdings and in plantations.

Intercropping Tea with Rubber

During the early 1980s the TRI, in collaboration with the Rubber Research Institute (RRI), undertook successful studies on intercropping tea with rubber, *Hevea brasiliensis*, on several estates in the low country. As a result, a subsidy scheme was formulated by an inter-ministerial committee which subsequently received Cabinet approval. More TRI-RRI trials on tea-rubber intercropping began in 1990, and based on them the subsidies were extended to all suitable low-country lands. Guidelines were issued in 1997.

Requirements: Lands suitable for both tea and rubber in the low country, that is at elevations below 600 m (2,000'). Where the soil is unsatisfactory, rehabilitation is necessary before tea is planted. The tea and rubber should be planted simultaneously.

Spacing: Rubber as monocrop, 450 trees/ha, 3.6 m X 6.0 m (12' X 20'); as mixed crop, 340 trees/ha, 12.0 m X 3.6 m (40' X 12').

Land utilisation: Tea 75 per cent (of monocrop stand), rubber 75 per cent, total 150 per cent.

Yield and income: Tea as mixed crop 1,500 – 2,000 kg/ha/year, Rs 150,000 – 200,000 @ Rs 100/kg made tea (tea as monocrop 2,000 – 2,500 kg/ha/year, Rs 200,000 – 250,000); rubber as mixed crop 750 – 850 kg/ha/year from 7th year, Rs 37,500 – 42,500 @ Rs 50/kg (rubber as monocrop 1,000 – 1,200 kg/ha/year, Rs 50,000 – 60,000); total from intercropped tea and rubber, Rs 187,500 – 242,500.

Intercropping Tea with Coconut

Similar studies were undertaken on intercropping tea with coconut, *Cocos nucifera*, in collaboration with the Coconut Research Institute (CRI). Information was already available from existing tea-coconut intercropping systems in smallholdings. Based on these, guidelines were issued in 2000. Three systems are possible: intercropping tea and coconut simultaneously, intercropping coconut in tea lands, and intercropping tea in coconut lands. To avoid too much shade on the tea, coconut is best planted in the east-west direction.

Requirements: Lands suitable for both tea and coconut in the mid- and low country, that is at elevations below 1,200 m (4,000').

Spacing: Coconut as monocrop, 160 palms/ha, 7.8 m X 7.8 m (26' X 26'); as mixed crop same spacing as in the existing monocrop but in new planting 134 palms/ha, 12.0 m X 6.0 m (40' X 20'). Tea as mixed crop 8,500 – 10,800 trees/ha, 1.0 m (3.5') X 0.6 m (2') or 1.2 m (4') X 0.6 m (2') depending on growth habit of the clones.

Land utilisation: Tea 60-70 per cent (of monocrop stand) in existing coconut lands and 75 per cent in new plantings, coconut 100 per cent in existing coconut lands and 75 per cent in new plantings, total 150-160 per cent.

Yield and income: Tea as mixed crop 1,200 – 1,500 kg/ha/year, Rs 120,000 – 150,000 @ Rs 100/kg made tea (tea as monocrop 1,500 – 2,000 kg/ha/year, Rs 150,000 – 200,000);

Intercropping in Tea Lands

Dr. W.W.D. Modder

Director, Tea Research Institute of Sri Lanka

coconut both as mixed crop and monocrop 3,000 – 4,000 nuts/ha/year in existing coconut lands; Rs 15,000 – 20,000 @ Rs 5/nut; total from intercropped tea and coconut, Rs 135,000 – 170,000.

Intercropping Tea with Export Crops

Smallholders in the mid-country have been cultivating pepper, coffee and cloves mixed with tea for many years. However, with these crops becoming increasingly important economically and in the export sector in particular, planned mixed cropping now receives greater attention.

Among the export crops, pepper (*Piper nigrum*) is the most compatible with tea of all types. The pepper vines are easily trained to grow on shade trees such as *Gravellia robusta* and *Glicicidia maculata*. The pepper variety 'Paniyur' is the most suitable because it does not harbour any parasitic nematodes which affect tea.

Requirements: Lands with vegetatively propagated (VP) or seedling teas (ST) in the mid- and low country, that is at elevations below 1,200 m (4,000').

Spacing: Pepper as monocrop, 1,750 vines/ha, 2.4 m X 2.4 m (8' X 8'); as mixed crop, 275 vines/ha, 6 m x 6 m (20' x 20') trained to every other *Glicicidia* tree planted at 3 m x 3 m (10' x 10') in young tea.

Land utilisation: Tea 100 per cent (of existing

monocrop VP or ST stand), pepper 16 per cent, total 116 per cent.

Yield and income: Tea as mixed crop 1,000 – 2,500 kg/ha/year (depending whether VP or ST), Rs 100,000 – 250,000 @ Rs 100/kg made tea; pepper as mixed crop 200 – 250 kg/ha/year, Rs 40,000 – 50,000 @ Rs 200/kg (pepper as monocrop 750 – 1,000 kg/ha/year, Rs 150,000 – 200,000); total from intercropped tea and pepper, Rs 140,000 – 300,000.

Of the coffee varieties, *robusta* does well in the mid country (600 – 1,200 m) and *arabica* in the up country (above 1,200 m).

Requirements: ST lands at all elevations with average to poor stands (less than 60 per cent).

Spacing: Coffee as monocrop, 430 plants/ha, 3.0 m X 3.0 m (10' X 10'), as mixed crop, 275 plants/ha, 6 m x 6 m (20' x 20').

Land utilisation: Tea 100 per cent (of existing monocrop ST stand), coffee 64 per cent, total 164 per cent.

Yield and income: Tea as mixed crop 800 – 1,000 kg/ha/year (depending on vacancies), Rs 80,000 – 100,000 @ Rs 100/kg made tea; coffee as mixed crop 300 – 400 kg/ha/year, Rs 150,000 – 200,000 @ Rs 50/kg processed coffee (coffee as monocrop 750 – 1,000 kg/ha/year, Rs 37,500 – 50,000);

total from intercropped tea and coffee, Rs 95,000 – 120,000.

Cloves are best planted, at a spacing of 12 m x 12 m (40' x 40'), at the boundaries of tea fields since they have a large compact canopy which casts a thick shade on the tea.

Intercropping Tea with Fruit Crops

Intercropping fruit trees, such as citrus, mango, avocado and rambutan, with tea is also possible. They are generally more suited to tea fields having a low plant density. In order to prevent excessive shading of the tea, the lopping of some of their branches will be necessary.

Intercropping Young Tea with Legumes

Since tea is normally planted in rows 1.2 m (4') apart, the inter-row spaces in young tea could be used for planting short-term, seasonal crops such as grain legumes (cowpea, soybean, green gram and black gram). This is especially beneficial to smallholders, since it gives them an income during the initial, unproductive phase of tea cultivation. Intercropping green legumes will also minimise weed growth, and improve soil by the addition of organic matter from the crop residues.