Selecting Coconut Lands for INTERCROPPING

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Coconut is well adapted to a range of climatic and soil conditions, and in terms of land use coconut occupies nearly 28 percent of the total cultivated land. Although the area under coconut nearly 1.0 m acres, all this cannot be effectively utilized for intercropping as there are limitations imposed by the individual crops, depending on their adaptability and growth habits. It is in this context that we have to adopt certain criteria in selecting coconut lands for intercropping.

Climate

Of all the climatic factors, rainfall is the most important for successful intercropping. According to the intensity of annual rainfall major coconut growing Districts fall in several agro-ecological zones. For instance Districts of Colombo, Gampaha, Kalutara, Galle, Matara, Kegalle and certain areas (eg. Polgahawela, Dodangaslanda, Mawathagama) of the Kurunegala District fall into the low country wet zone (LCWZ) receiving an annual rainfall of 2500–1875 mm. The major part of the Kurunegala District and the entire Puttalam District belong to either low country intermediate zone (L.C.I.Z. – semi-wet) or low country intermediate zone (L.C.I.Z – semi-dry) or the low country dry zone (L.C.D.Z.) receiving an annual rainfall of 1200–1000 mm.

Of these, we are mainly concerned with coconut lands in the wet and intermediate zones which provide a favourable and well distributed rainfall for intercropping and thus eliminating competition for soil moisture between coconut and the intercrop (see Table 1).

Soil group:

In a given agro-climatic zone, several dominant soil groups can be identified. We have to select the soil group that is most suitable for a particular crop. The major soil groups under each agro-climatic zone and the crops that would fit into these categories are given in Table 1.

Percentage of light transmission

For a given planting density and system the percentage of light transmitted to the canopy floor depends mostly on the age of palms. The square system of planting giving a density of 64 palms to the acre is commonly seen in most plantations. In such plantations, sufficient amount of light is transmitted to the ground, from planting up to the 5th year or so and again from about the 20th year onwards until the 60th year. Depending on the availability of light crops can be selected under each category of age groups as shown in Table 2.

Terrain and soil depth

For flat lands it is advisable to select intercrops such as pepper, betel, clove, nutmeg, cardamom, citrus species, papaw, passion fruit, yams and tubers, and short term annual crops. In the case of sloping to undulating lands, it would be best to construct contour bunds and terraces, particularly in high rainfall areas. For such terrain selecting crops that will cover the ground adequately is recommended. eg. cacao, coffee, cinnamon, banana, pineapple, pasture, ginger and turmeric.

From the drainage point of view, opportunities for utilization of ill drained lands are relatively less. However, with a system of contour drains to eliminate surplus water the grower should be able to make use of such problem lands by cultivating water grass *(Brachiaria mutica)*, cinnamon, cashew and seasonal crops during the dry period. Other alternative would be to convert such ill drained land to a paddy field and allow the coconuts to grow on the bund.

One can further select the intercrops according to the depth of soil. The criteria should be to select deep rooted crops to deep soils

TABLE 1

SELECTION OF TECHNICALLY FEASIBLE CROPS FOR COCONUT INTERCROPPING

Agro-Eco. Zone	*Annual R F (mm)*	*District*	*Soil group*	*Intercrops*			
				Young plantations 0–5 years		*Mature plantations 20–60 years*	
L.C.W.Z.	1875–2500	Colombo	Red-Yellow	Ginger turmeric yams & turbers	Pineapple Passion fruit banana Pasture	– do – –do –	Cacao, Coffee, Pepper, cinnamon betel,
		Gampaha	Podzolic				
		Gampaha	Regosols	Yams & turbers chillies	banana Pasture	–do– –do–	cinnamon
		Kurunegala	Red-Yellow Podzolic & Reddish-brown Latosolic	Ginger, turmeric yams & turbers	Banana passion fruit pineapple Pasture	–do– –do– (Sugarcane)	Cacao, coffee, clove, nutmeg, pepper, pasture, betel + (Cardamon)
		Kegalle					
		Kalutara Galle & Matara	Red-Yellow Podzolic	Ginger, turmeric, yams & turbers	Banana, passion fruit pineapple Pasture	–do– –do– + (Sugarcane)	Cacao, clove, nutmeg, coffee pepper, cinnamon, betel pasture.
		Kalutara	Regosols	Yams & tubers, chillies	Banana Pasture	–do– –do–	Pasture, cinnamon
L.C.I.Z. (Semi-wet)	1875–1500	Kurunegala Puttalam	Red-Yellow Podzolic	Ginger turmeric, yams & tubers, pulses, chillies, vegetable	Banana, pineapple, passion fruit papaw Pasture	–do– –do–	Cacao, coffee, pepper, citrus, cinnamon, pasture, betel.
		Puttalam	Regosols	Yams & tubers, cereals pulses chillies	Banana Pasture	–do– –do–	Pasture, cinnamon
L.C.I.Z. (Semi-dry)	1500–1250	Kurunegala Puttalam	Reddish-brown Earths	Chillies, Yams & tubers, cereals, pulses, vegetable, tobacco	Banana papaw citrus pomergranate Pasture	–do– –do–	–do–
		Puttalam	Red-Yellow Latosols & Regosols	Chillies yams & tubers, pulses & cereals.	Banana Pasture	–do– –do–	–do–

(eg. cacao, coffee, cinnamon, clove, nutmeg, citrus) and shallow rooted crops to shallow soils (eg. cardamons, pasture, pepper, betel, annuals and semi-perennials).

Location of land

To achieve economic success from intercropping it is important to consider the location of land. This is particularly useful before selecting crops which cannot be consumed directly (eg. cacao, clove, nutmeg, cinnamon) and those perishable crops which cannot be stored (eg. passion fruit, vegetables, betel, papaw). For such crops it is imperative that there should be an established market in the vicinity of the land. For labour intensive crops such as chillies, grain, legumes and vegetables, availability of labour during the on-season would very much depend on the location.

Conclusion

Criteria of selecting coconut land is really the first step in planning a strategy for intercropping. Once intercrops are selected according to the above criteria the grower has to establish and manage them well to achieve the final goal of increasing the productivity and production of coconut plantations in the wet and intermediate agro-ecological zones.

TABLE 2

SELECTION OF CROPS BASED ON THE AGE OF PALMS

0–5 *years*	20–45 *years*	45–60 *years*
Pineapple	Cacao	Cinnamon
Passion fruit	Coffee	Betel
Banana	Pepper	Pasture & fodder
Papaw	Clove	Citrus
Pasture	Nutmeg	Pineapple
Ginger & turmeric	Cardamon	Banana
Cereals & pulses	Ginger & turmeric	Passion fruit
Yams & tubers (Sweet potato, Colocasia, Innala)	Pasture & fodder	Papaw
Chillies	Yams & tubers	Yams & tubers (Cassava, Colocasia dioscorea, Innala, Sweet potato)
Vegetables		Cereals & Pulses
		Chillies, Vegetables