

**39th SESSION
INTERNATIONAL PEPPER
COMMUNITY**

**PRODUCTIVITY IMPROVEMENT
THROUGH INTERCROPPING PEPPER
WITH
TEA AND COCONUT**

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SRI LANKA



- Total land area: 6.56 million ha.
- Located between: 5° 55' and 9° 51' latitudes and 79° 42' and 81° 53' longitudes
- Population: 20 million
- Three major agro climatic zones (based on rainfall pattern)
 - Wet zone
 - Intermediate zone
 - Dry zone

PEPPER – *Piper nigrum*

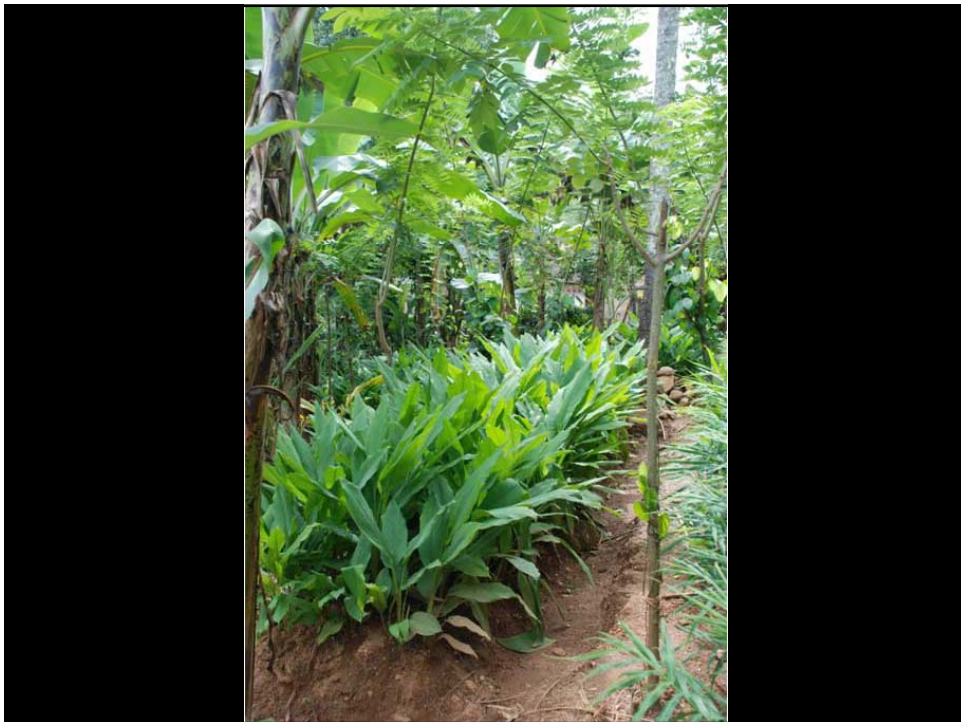
- Total extent of cultivation: 30931 ha. (2010)
- Total exports: 12218 MT
- Total income: 42.65 million
- Cultivated as;
 - Mono crop
 - Home garden crop
 - Intercropped with coconut and tea

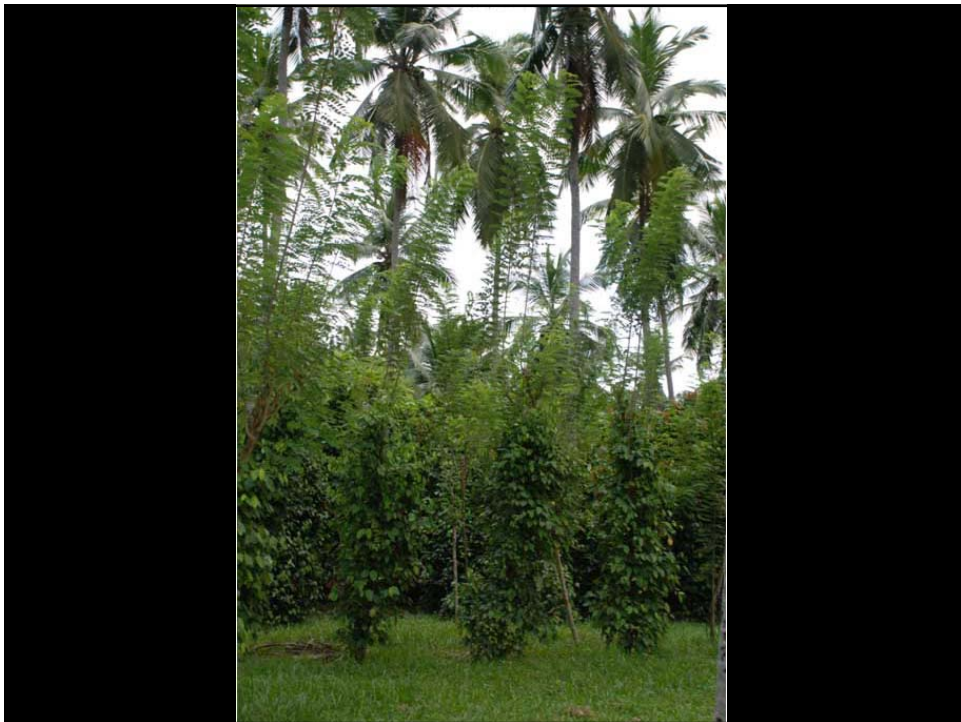
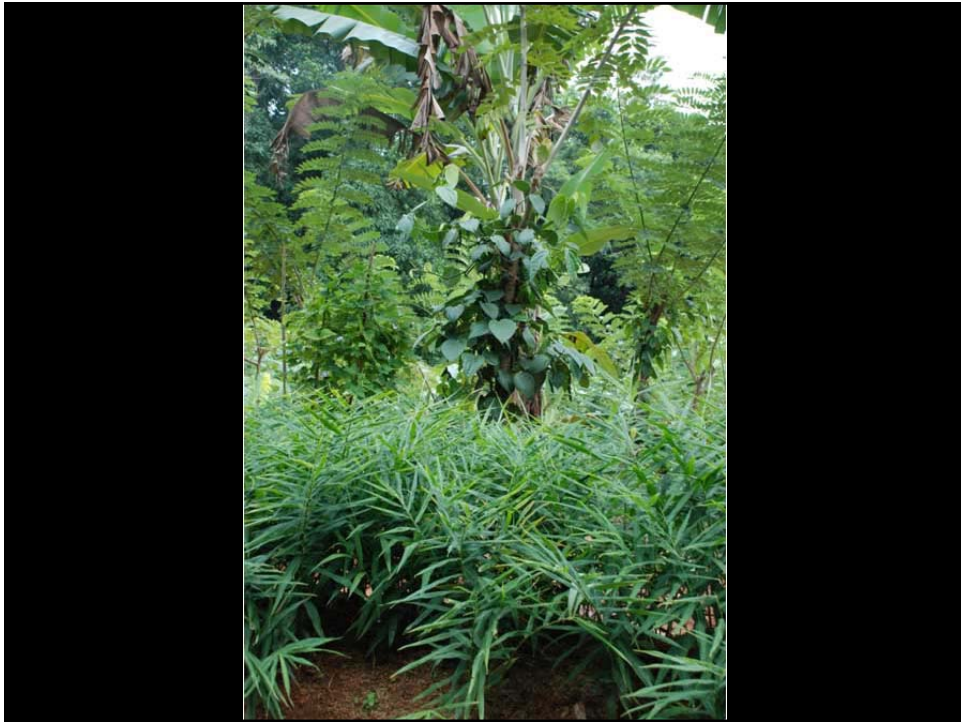


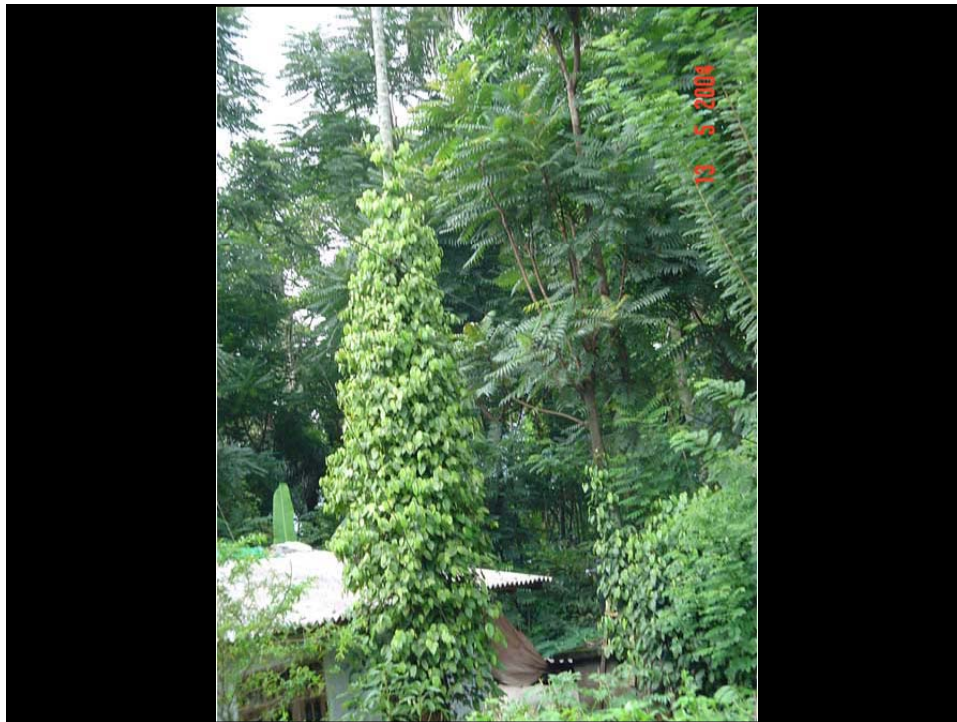
COCONUT – *Cocos nucifera*

- Total extent: 400000 ha.
- Mainly a small holder crop
- A staple diet of the Sri Lankan people
- 80% of total annual production is used for local consumption
- Balance 20% for export









TEA – *Camelia sinensis*

- Total extent: 188972 ha.
- Out of that
 - medium altitude – 56863 ha.
 - lower altitude – 79836 ha.
- Total production: 329.4 million kg
- Export income: \$1.2 billion



INTERCROPPING

- “Cultivation of a mixture of crops planted in defined pattern of spatial arrangement.”

(Bavappa and Jacob 1982)

Intercropping pepper in coconut lands

- Both crops are widely grown in wet or intermediate zone of low/mid country
- Gliricidia trees (*Gliricidia sepium*) on which the pepper vines are trained are more compatible with coconut and tolerant to shade under coconut
- Produces more favorable micro climates. (reduced evaporation, lower temperature, higher humidity)

- Foliage of gliricidia improves physical, chemical and biological properties of soil

Table 1.2. Effect of mixed cropping on soil fertility (0-15cm depth)

Cropping System	Bulk	Physical		Chemical			Biological
	density (g/cm ³)	Soil moisture	OC %	Total N (ppm)	Avail. P	Exch. K	Earthworm pop./m ²
Coconut only (control)	1.56	9.06	0.86	957	9.6	0.14	28
Coconut + Cocoa	1.26	18.55	1.42	1184	29.4	0.18	214
Coconut + Coffee	1.23	12.91	1.36	1022	27.8	0.15	218
Coconut + Pepper	1.27	11.2	1.27	1461	55.9	0.12	191
Coconut + Clove	1.19	11.3	1.2	1154	32.3	0.18	204
Coconut + Cinnamon	1.25	10.69	1.46	1249	28.9	0.16	233

Source: Liyanage & Dassanayake (1993)

- This green manure improve the soil fertility

Table 1.1. Effect of gliricidia prunings on soil fertility

	Organic carbon (%)	Bulk density (%)	Water holding capacity (mm/m)
Gliricidia	1.73	1.39	99.59
Leucaena	1.21	1.45	75.89
Control	0.83	1.49	41.5

Source: Liyanage & Jayasundara (1988)

Economic benefits

- Reduction in fertilizer costs
- Raise the monetary land value
- Generation of additional income
- No negative impact on coconut yield
- Increase total productivity of land

Table 1.3. Net returns due to coconut alone and coconut with pepper (Rs./ha.)

Year	Coconut alone	Pepper alone	Coconut and Pepper together
1978	3675	-4380	3670
1979	2594	-2285	1621
1980	5800	-2760	3915
1981	5515	5690	11205
1982	7080	14700	26680
1983	8706	21170	29876
1984	10171	26925	37096
Total returns	43541	59090	114063

Source: Coconut Bulletin, 3 (1986)

Intercropping pepper in tea lands

- Availability of gliricidia trees in tea lands (as a shade tree)
- Traditionally farmers grow pepper as a intercrop
- Widely accepted by farmers
- Pepper is the crop most compatible with tea
- For a systematic intercropping system, pepper should be spaced 6m apart

Table 2.2. Mean annual yield and income that could be achieved from a tea and pepper intercropping system in mid country

Crop	Annual Yield (kg/ha.)	Annual Income (Rs/ha.)
Tea	4000-10000 Fresh leaf	240000/= - 600000/=
Pepper	1000-1300 Fresh seeds	160000/= - 211200/=
Total (Tea +Pepper)		400000/= - 811200/=

Source: Premathilaka (2002)

Advantages of pepper intercropping

- Maximum productivity from the land
- Increase land value
- Improve the land management
- No adverse effect on main crop
- Maximum utilization of light and space
- Risk arising from fluctuating market prices is minimized
- Generation of additional employment

Constraints faced by the pepper intercropping activities

- Lack of technical know-how
- Drought
- Price instability
- Timely availability of labor
- Non availability of planting materials
- Thefts
- Traditional thinking

Conclusion

- Pepper is a valuable intercrop in coconut and tea lands
- It improves the productivity of land and crop
- It is a perfect solution for modern day crisis of shortage of agricultural lands
- More attention should be paid to popularize these intercropping systems by the government

THANK
YOU.