

Science for a GM Free Sustainable Europe

Agro forestry and multi-culture in Asia
Implications for Europe

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Effect on yield of coconut, soil water holding capacity and number of calves born during 18 months

	Nuts/palm/ year	Copra/palm/ year KG	Water holding capacity
Non grazing	41.1	11.1	16.9
Grazing	47.9	13.3	18.3
Grazing + rice straw	50.6	14.2	18.9
Grazing + rice straw + rice bran	57.4	16.7	17.6

Pathirana *et al.*, 1995



Effect of grazing and supplementation of female cattle grazing under coconut on age at calving, calving interval and milk yield. Grazing (G), grazing + rice straw (G + RS), grazing + rice straw + rice bran (G + RS + RB)

	Age at calving month	Calving interval	Milk yield kg/d
Grazing	57	20	0.87
Grazing + rice straw	47	18	1.53
Grazing + rice straw + rice bran	40	13	2.36
SE	1.9	0.31	0.07



Effect of grazing and supplementation with rice straw and rice bran on soil properties after 6 years.

	Water holding capacity mm/m	Content in coconut leaf		
		N	P	K
Non grazing	17.01	1.89	0.15	1.21
Grazing	18.23	1.86	0.15	1.18
Grazing + rice straw	19.72	1.92	0.16	1.48
Grazing + rice straw + rice bran	18.98	2.23	0.18	1.76
SE	2.63	0.06	0.01	0.06



















**Effect of mixed cattle and goat grazing on yield of fresh fruits
in oil-palm cultivation in Malaysia.**

Year	Grazed area	Non-grazed area	Difference
<i>Fresh fruit bunches (mt/ha/yr)</i>			<i>mt</i>
1980	30.55 (C)*	25.61	4.94
1981	17.69 (C)	15.87	1.82
1982	25.12 (C & G)	22.97	2.15
1983	23.45 (C & G)	18.29	5.16
Mean	24.45	20.69	3.52

*C = cattle: C & G = cattle and goats.

Source: Devendra, 1991



Integrated system of rice, rice -duck, rice fish, and rice fish and duck on net benefit for farmers

Systems	Rice (R)	Duck Rice (DR)	Fish Rice (FR)	Duck Fish Rice	
				DFR	LDFR
Inputs:					
- For rice	6.62	3.92	7.36	3.92	3.92
- For duck	-	8.70	-	8.70	52.92
- For fish	-	-	15.58	13.90	13.90
Total	6.62	12.62	22.94	26.52	70.74
Outputs:					
- From rice	8.56	8.03	9.23	9.85	10.44
- From duck	-	14.50	-	14.50	68.02
- From fish	-	-	22.22	46.39	47.92
Total	8.56	22.53	31.45	70.74	126.38
Net benefit	+ <u>1.94</u>	+ <u>9.91</u>	+ <u>8.51</u>	+ <u>44.22</u>	+ <u>55.64</u>





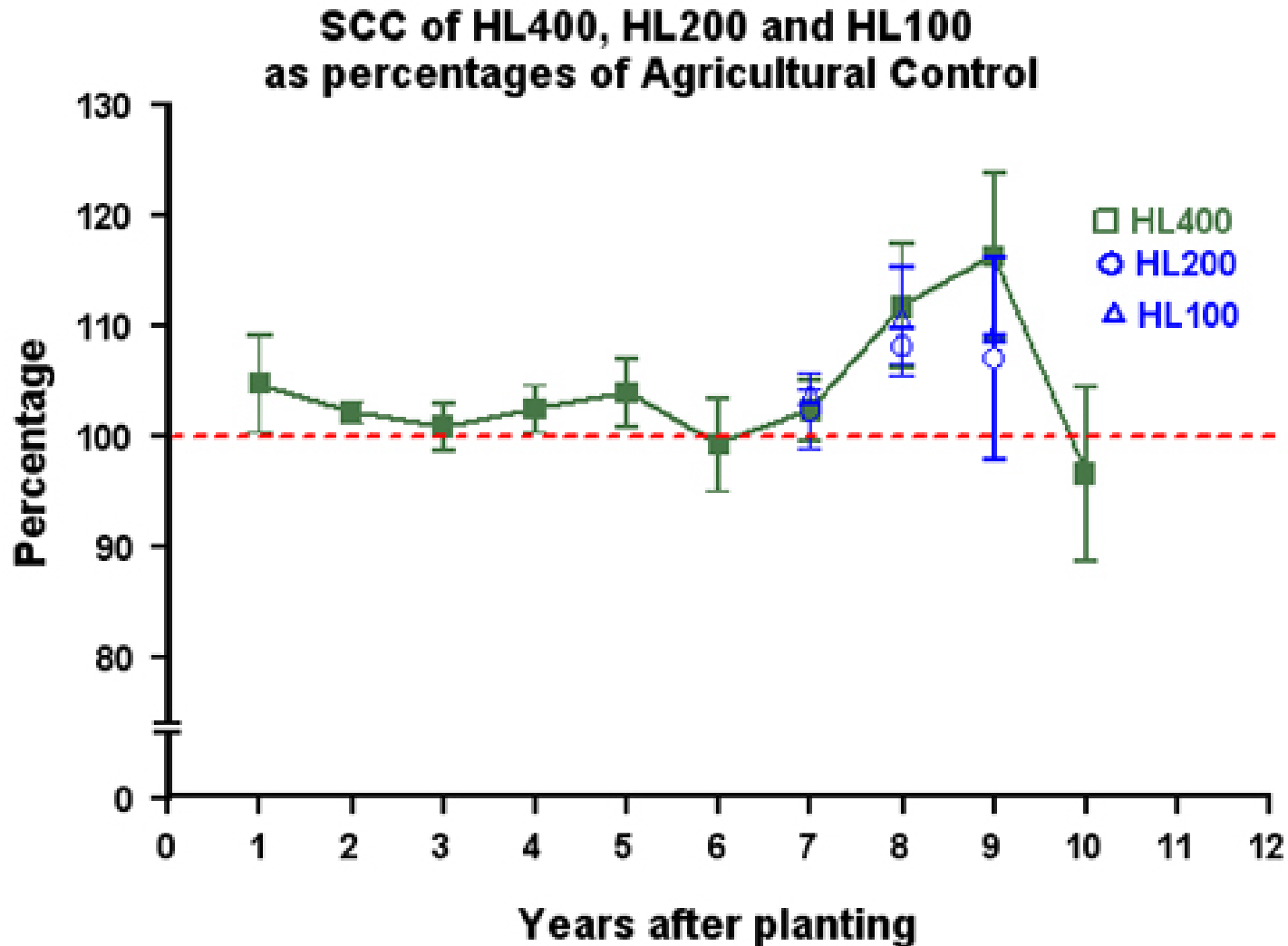








Agroforestry - what have we found out?







Conclusions

Agricultural productivity in silvopastoral agroforestry:

- can be greater than conventional agriculture in dry years provided that light is not limiting;
- will eventually be reduced when tree canopies create significant shading;
- can be controlled at some desired level through canopy pruning.

Silvopastoral agroforestry can make more efficient use of resources for **total biomass** production than conventional agriculture and can also lead to greater biodiversity.

Conclusion 2:

Well managed

- **Agroforestry and multi-culture can be a win win situation**
- **Better soil fertility**
- **More biodiversity**

Environment bonus

- **Carbon sequestration in forests**
- **More bird life**
- **Little or no use of herbicides and insecticides**
- **In forest animal production as a bonus with often positive effects on forest products**

Rumen environment studies

- ***Use of nylon bag technique. Incubating standard substrate in rumen of animals receiving tree fodders.***
- ***Gas production test with and without polyethylene glycol.***
- ***New systems of feed evaluation and management of feeding tree fodders urgently required.***



