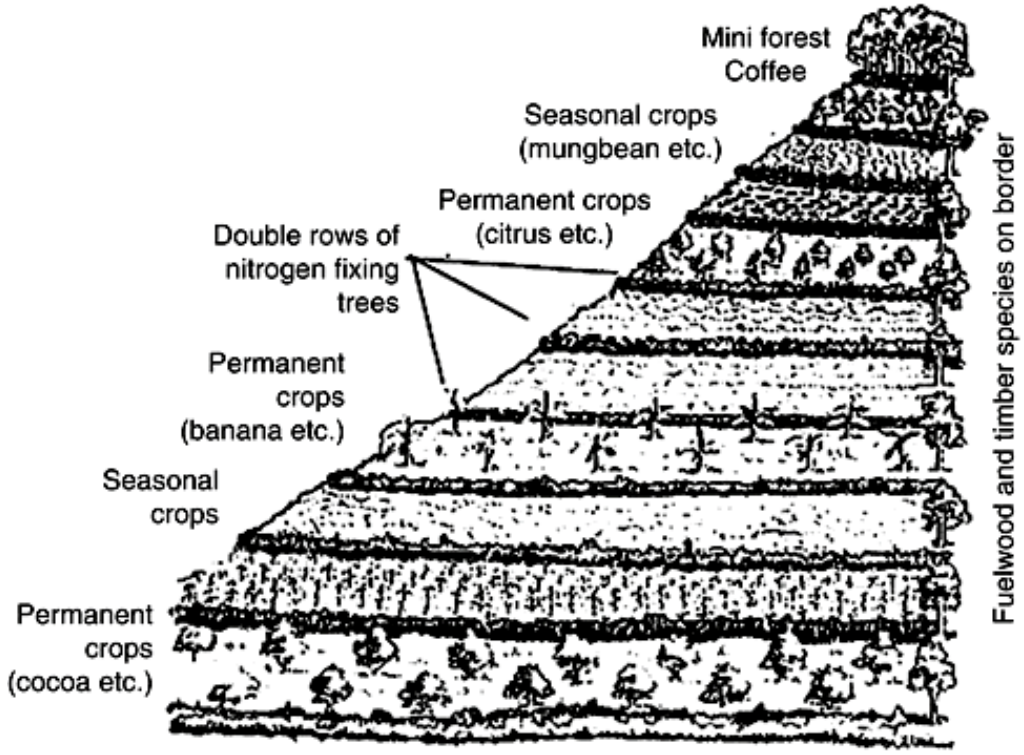
A Guide on

How to Grow Crops with Trees

in the SALT System

(SALT 3)



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Introduction

In the Philippines, about 70% of the total land area is sloping. With increasing population pressure, more and more of this sloping land has been brought under intense cultivation. Just consider: The country had about 17 million hectares of forests in 1934 when the population was less than 15 million. However, when the country's population had more than doubled in 1969, forestlands dwindled to about 10.4 million hectares. The forest lands further decreased to around 8.5 million hectares in 1976 and 7.4 million hectares in 1980, as population rose to 43 and 48 million, respectively.

And out of nearly 15 million hectares of classified forest land in the country, more than 15 million hectares are already categorized as badly denuded and much of the remainder is in various stages of degradation.

The following are the 10 steps to guide on how to grow crops with trees in the SALT System:

Step 1: Set Up the Agroforestry Nursery

Ensure sufficient supply of planting materials for your agroforest farm by setting up your own nursery. Establish an accessible nursery (3 meter by 5 meters for nursery and about 5 feet by 10 feet) with the following fixtures: potting shed, transplant shed, and seedbeds. Basic materials like watering cans for sprinkling seedlings, shovel, and spade, should also be made available.

Step 2: Care and Manage Your Seedlings

For better growth and field survival, the production of healthy and vigorous planting stock is necessary. Here are some timely tips:

Sowing the seeds

Most forest tree seeds are hard to germinate so they need scarification. There are several methods of seed scarification. For most forestry seeds, the most common methods are mechanical, water soak or hot water treatment. The most common problem encountered in seedling establishment is damping off and insect defoliators.

Step 10: Maintain Your SALT-3 Farm

For one, trim the hedgerows regularly. Trim the hedgerows once they start to shade the agricultural crops. Spread trimmings evenly throughout the field to check weeds, equally distribute your nutrient additions, and also conserve soil moisture. Practice crop rotation in your food crop production.

From the MBRLC experience, establishing a 2-hectare SALT 3 farm costs about P6,000.00 Cost and return analysis conducted on the 5th year of operation showed that the technology can generate cash net profit of P1,500.00 per month. Its return on investment (ROI) is 7.97%.

But on top of this economic benefit, an upland farmer who follows the system has a farm that is well-protected and ameliorated soil due to integration and diversification scheme, thus resulting in a sustainable farming system.

Source, lifted from:

- Sustainable Corn Production in Sloping Areas (SCOPSA) Handout, Training Module by Mindanao Baptist Rural Life Center
- Sustainable Agroforest Land Technology (Salt-3): A Guide On How To Grow Crops With Trees In The Salt System retrieved from http://www.pcaarrd.dost.gov.ph/home/momentum/afin/index.php?option=com_content&view=article&id=417:sustainable-agroforest-land-technology-salt-3-&catid=87&Itemid=2

Table 2. Harvesting Plan of Trees

Year	Species	Harvesting Method	Uses
1	None	Selective	Fuelwood/charcoal: Leaves for feeds, etc.
2	Sesbania sesban	All-out	Fuelwood/charcoal: Leaves for feeds, etc.
3-5	Sesbania sesban	All-out	-do-
	Leucaena diversifolia	All-out	-do-
	Samanea saman	Selective	-do-
	Pithecelebium dulce	Selective	-do-
	Mahogany	Selective	Fuelwood and light construction, etc.
	Narra	Selective	-do-
	Acacia-mangium	Selective	-do-
	A. auriculiformis	Selective	-do-
6-14	Bamboo and rattan	Selective	Furniture, light construction, etc.
	Acacia auriculiformis	All-out	-do-
	Acacia mangium	All-out	-do-
	Narra, mahogany	Selective	Timber and furniture
15-25	Rattan	Selective	Timber and furniture
	Narra, mahogany	All-out	-do-
	Samanea saman	All-out	-do-

Step 9: Harvest Your Agroforest Products Regularly

Timely harvesting of crops saves waste (see Table 2). All households and useful products must be gathered, processed and marketed. In the forestry components - forage from tree prunings, fuelwood and roundwood from thinnings commence during the second year. Thin out regularly your forestry area until the timber crop spacing requirement is complied with. In some instances, minor forest crops can be planted under the trees.

Sow the seeds in a sterilized seedbed to avoid damping off. Sterilization may be done by pouring boiling water in the soil media where you will sow the seeds. Keep the seedbeds moist at all times. Mulch and shade the plants.

Transplanting

Prune the roots of species that can be outplanted bare root (mahogany, teak, etc.). Do not allow weeds to compete with your transplants. Use compost soil or topsoil mixed with dried manure during transplanting.

Before transplanting them to the field, harden the seedlings first by gradually exposing them to sunlight and more open conditions. Do this over a period of 6 months in order to develop sturdy, well-developed crown and many fine, fibrous lateral roots.

Step 3: Find the Contour Lines and Establish Your Food Crops on the Lower Portion of the Farm

Find the contour lines of the farm's half lower portion by using an A-frame. Plant the identified contours with any of the following hedgerow species: Flemingia macrophylla (example: malabalatong), Desmodium rensonii, Gliricidia sepium (example: kakawate), Leucaena diversifolia (example: ipil-ipil), and L. leucocephala. In poorer acidic soils, Flemingia (example: kalaikai, payang-payang) and Indigofera tyesmani (example: Tayuman) are recommended.

Plant preferred short-term crops (examples: ginger, maize, upland rice, sweet potato, mung bean, melon, etc.) on every first and second strips. Plant long-term crops (citrus, cacao, coffee, banana, black pepper, etc.) on every third strip. These can be intercropped with fruit trees (rambutan, durian, lanzones, guava, mangosteen, etc.) following appropriate planting distances. Multi-storey cropping may also be practiced (e.g., pineapple + cacao + durian) in one strip.

The earlier you establish your food and cash crops, the better off you will be in meeting your immediate needs. Follow the SALT-1 steps in establishing your food crops.

Step 4: Prepare the Site for Your Wood Crops or Trees

Locate the woodlot at the upper half of the project so that the agricultural component on the lower portion will benefit from the conserved moisture and nutrients from the wood crops.

On areas with steep slope and highly erodible soils, extra care must be exercised so as not to induce soil erosion when clearing the area. You can use either partial or complete removal of vegetation whichever is more favorable to you. Avoid burning.

Step 5: Compartmentalize and Space Your Trees

For a 3-fold objective of soil rehabilitation, firewood production and timber growing, you can maximize the use of land space by following the high density strategy of establishing small-scale woodlots. (Refer to Table 1 for further details about spacing).

Table 1. Spacing (Initial and Final) of trees.

Component on top-down sequence	Hectare	Spacing (in meters)		Duration
		Initial	Final	
Rain Tree (Samanea saman)	1/4	1 x 1	8 x 8	Long term (15-25 years)
Rattan (Calamus merilli) as intercrop with rain tree	1/4	8 x 8	8 x 8	Long term
Narra (Pterocarpus indicus)	1/8	2 x 2	4 x 4	Long term
Katuray (S. sesban) as intercrop with narra and mahogany	¼	1 x 1	1 x 1	Short term (1-5 years)
Mahogany (S. macrophylia)	1/8	2 x 2	4 x 4	Long term
Acacia auriculiformis	1/16	2 x 2	2 x 2	Medium term (6-14 years)
Acacia mangiua	1/16	2 x 2	4 x 4	Medium term
P. dulce and Formosa mixed	1/8	1 x 1	1 x 1	Short term
Acid ipil-ipil (Leucaena diversifolia)	1/4	1 x 1	1 x 1	Short term
Bamboo (botany variety)	on border	8 m between hills	8 m between hills	Long term
Hedgerows or agriculture component	1/4	4-6 apart	4-6 apart	Long term

Step 6: Outplant Your Trees

This may be done at the start or up to the middle of the rainy season so that seedlings can get established prior to the dry season.

Follow the contour when outplanting. Be sure not to break the earth-ball when setting the seedlings into the planting hole. The upper part of the earth-ball should be level or slightly deeper than the edge of the hole. Soil is filled into the spaces and tamped firmly all around.

For fast recovery of the seedlings, apply animal manure. Mulch the seedlings to insure higher linability.

Step 7: Intercrop Your Tree Crops

Short- and medium-term and cash crops (ginger, sweet potato, yam bean, cassava) can be intercropped in the forestry component during the first two years. Long-term ones like black pepper and rattan can be incorporated at the start of the second year.

For effective soil management, see to it that non-legume short-term crops are replaced by leguminous ones and vice versa in every cropping.

Step 8: Do Tree Stand Improvement

Apart from regular ring-weeding and liberation cutting, improve the stand of your trees. Remove the malformed trees. Prune unnecessary branches. Prune only the branches within the 505 of its total height from the ground to the top. But don't over-prune; otherwise, you will make your trees stunted.

Replant the missing hills if you feel the replanted trees can still catch up. However, replanting is laborious and expensive and should be done only to maintain required spacing or density. This is also recommended only when mortality is more than 30%.