

## Section 7: Nursery management

An essential part of nursery management is planning the production schedules and data collection. We describe four helpful tools: nursery calendars, plant development registers, nursery inventories and records of nursery experiments. These are needed for both production management and research. We also discuss the importance of staff training, particularly in the use of pesticides and general safety issues.

### *Plans and schedules*

Nursery production is highly seasonal. This is particularly pronounced when producing trees for agroforestry research, as the demand for species or numbers of seedlings will vary considerably depending on current research priorities. Flexibility and planning are therefore essential.

There are four main tools for planning nursery operations:

- a **nursery calendar** to help plan necessary actions and purchases of seed, supplies and equipment.
- a **plant development register** for collecting species-specific information about seed treatment, germination requirements and duration, plant development, special requirements for potting substrate, watering, shading or disease control.
- a **nursery inventory** to keep track of the species and numbers of seedlings in different stages of development.
- a record of ongoing nursery **experiments**.

All four can be maintained in tabular form designed for ease of data capture onto computer programs. Computerized systems have increased the flexibility of data collection and analysis, making it easy for a nursery manager to correlate the collected information to necessary actions rapidly.

**Planning tools****nursery calendar**

A nursery calendar is an essential tool in nursery planning. The date for sowing seeds can be calculated by counting backwards from the anticipated date of planting, taking into consideration the number of days needed for germination and further seedling development until the right stage for planting. Different species have different requirements for the planting out period (before or during the rains). The time in the nursery also depends on the site on which the seedlings are to be planted. Seedlings for drier sites may need to be larger and need more time in the nursery. Customers might need to be reminded of this when they order plant material to meet certain deadlines. It is also worth anticipating problems with poor germination and/or damping-off to allow time to sow a second time.

Once a nursery calendar has been developed, it will help greatly in making decisions about the need for extra labour and requisition of supplies. Consider the likely delays in procuring and shipment of goods, especially when ordering from abroad. Place orders early enough to allow timely arrival.

**plant development register**

Keep a register for each species by seedlot, with information about seed sources used, pretreatments, sowing date, time to germination, germination percentage, percentage of germinants pricked out, potting substrate, microsymbionts used (origin and type), plant development and condition under which produced. Include pests encountered and control treatments, if any, as well as data of plant and/or substrate nutrient analyses.

All this information is important for nursery research and might later help explain unexpected results. It can also be used to compare results with published information and alert you to possible problems originating in the nursery, for example if the development is much slower than is reported elsewhere. It might open additional research areas, for example it might lead to trying different substrates, shading or fertilizer treatments. Good documentation about species handling and development is also necessary when staff changes.



**Example of a nursery calendar**

In Muguga, Kenya, the best field planting season is usually between 1 April and 15 May. The researcher wants a *Leucaena* species trial planted with seedlings of about 20 cm size on about 15 April. The nursery manager has calculated the researcher's requirements as shown below.

	<i>Leucaena leucocephala</i>	<i>Leucaena diversifolia</i>	<i>Leucaena trichandra</i>
days needed from pricking out to planting out	100	110	90
days needed from germination to pricking out	12	12	10
days needed from sowing to germination	8	8	8
safety margin in case of poor germination or damping off	15	15	15
total days needed	135	145	123
sowing date	1 December	21 November	13 December

**Staff training**

A good nursery operation relies on continuity of staff who are professional, careful and honest. Although the casuals or technical workers do most of the work described here, everyone in the nursery ought to have as much knowledge about agroforestry tree propagation as possible. Understanding — even in a simplified way — the processes in a germinating seed, a rooting cutting or a growing seedling, and the importance of high humidity, watering,

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Consider staff training as part of your responsibilities. It is not time wasted—it is your investment in a safer and more productive nursery.

shading, etc. will help prevent many errors in daily work. Only when all workers feel that they are part of the nursery operation, when they understand the part they play and when they feel proud of it, can a tree nursery work efficiently and productively.

All workers, not only those applying the chemicals, ought to know the basics of handling pesticides. Use gloves and safety equipment — this should be standard practice and not something to laugh about.

Staff training can take the form of scheduled courses or of regular (weekly, monthly) staff meetings covering a particular topic. This can be reinforced by repeating explanations of techniques during work.

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### *Further reading*

International Labour Organization. 1989. Tree nurseries. An illustrated technical guide and training manual. Special Public Works Programmes booklet no. 6. Geneva, Switzerland: ILO. 127 pp.

Landis TD, Tinus RW, McDonald SE and Barnett JP. 1994. Nursery Planning, Development and Management. vol. 1, The container tree nursery manual. Agriculture Handbook 674. Washington, DC, USA: US Department of Agriculture, Forest Service. 188 pp.