Cultivation on trunk beds is a technique in which trunks and branches from the fellings are buried under the soil of the orchard and the fruit trees. **These remains act as a sponge that offers a reserve of water and microorganisms to keep the soil alive, promote plant growth and increase the carbon content in the soil**. At the same time, the carbon introduced will remain removed from the atmospheric stock for 5 to 10 years.

Material to make trunk beds

Trunks, branches, leaves or any other type of biomass can be used to make the mounds. Normally logs are used from fellings in the forest that are not suitable for other uses (**Figure 1**). Regarding the diameter of the logs, it is preferable to use **dimensions greater than 20 cm** that allow larger volumes of buried wood to be obtained.

In relation to the plant material to make wooden beds, species with **different characteristics of hardness** can be used. **Hardwoods** decompose slowly, and logs can remain for more than **10 years** retaining water and releasing nutrients. On the other hand, **softwood species** have a faster decomposition that can take place after 5 years. If there are different types of wood, a good option is to mix hard woods at the bottom of the beds with softwoods and branches at the top.

To carry out this technique **some species of trees work better than others**:

• The species that work best are: alders, apples, poplars, birches, maples, oaks, holm oaks, willows, etc.

• **Species that work well are**: cherry, juniper or yew (with aged wood if possible), pine, fir or spruce (with logs cut years ago to avoid high levels of tannin), eucalyptus, etc.

• **Species to avoid are**: cedar, walnut and other tree species considered allelopathic, carob and similar species whose wood takes a long time to decompose, etc.



 $\ensuremath{\textit{Figure 1.}}$ Stack of logs used as the basis of the trunk bed technique. Photo: Marc Gràcia.

Log burial process

Depending on the type of crop on which they are going to be applied, the logs are buried very differently:

- a) When placed in fruit tree crops, the trunks are inserted into deep holes, 50 cm wide and 50 cm deep (Figure 2A). Branches and smaller debris are placed on top of the trunks. A layer of soil is placed on them and finally the fruit trees are placed (Figure 2B).
- b) For use in garden crops, the logs are stacked directly on the ground or in shallow trenches about 40 cm wide and 25 deep. The logs are laid on the bottom as a first layer; a thinner biomass layer of branches and small trunks is arranged on top (Figure 3A). Gaps between logs can be filled with litter and other debris. Once the plant material has been placed, it is covered with about 20 cm of the earth extracted from the trench (Figure 3B). Planting is takes place on the mounds, taking advantage of the north/south effect created by the logs (Figure 3B). Ideally the bed is prepared several weeks before planting, but planting can take place immediately.







Figure 2. Placing the trunk beds in the fruit crops: a) hole with the logs placed at the base; b) planting the fruit tree on top of the log bed.





Figure 3. Placing trunk beds in garden crops: a) arrangement of the layer of logs; b) the logs are covered with earth extracted from the trench itself.

Benefits of cultivation on trunk beds for farms and the environment

Cultivation on trunk beds makes it possible to take advantage of forest remains to improve soil conditions, agricultural production and the environment. The main benefits are:

- The gradual decomposition of wood is a **constant source of long-term nutrients for plants.** A large bed can provide a constant supply of nutrients for 10-20 years.
- Compost wood can generate heat, which can **increase the** growing season of plants.
- The aeration of the soil is increased because the branches and trunks gradually break up, which **improves soil drainage**.
- Trunks and branches act like a sponge: **rainwater is stored** and then released during drier periods.
- These trunk beds participate in the sequestration of carbon in the soil by introducing a slowly decomposing carbon that **helps mitigate climate change**.
- It means forest remains that are unsuitable for other uses can be used, which helps to **improve the profitability of agricultural farms**.