

# Trees for Palestine

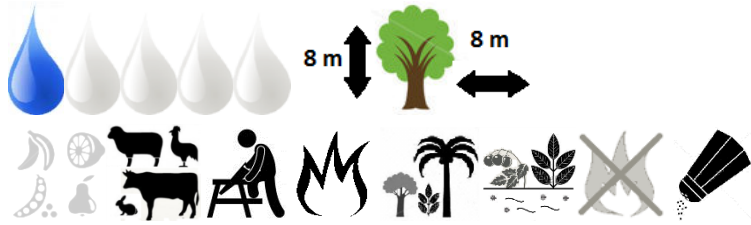
## Booklet II: Frost intolerant species

Fostering Adaptation to Climate Change among Farming Systems in the northern Jordan Valley project





## Acacia tortilis, umbrella thorn



### Why?

Gum arabic, a food additive, can be gained from this tree. The umbrella thorn, including the species *Acacia raddiana* and *Acacia tortilis*, provides excellent animal fodder and is a very productive tree. The dried leaves and the grounded fruits can be used for stall fed animals. It is a very useful tree for beekeepers and attracts numerous pollinators. During the first two years, the tree should be protected from grazing so it can become useful as a wind break. Through this characteristic as well as being a nitrogen-fixing species, the tree provides benefits for crops which can be intercropped with the umbrella thorn. It also stabilizes the soil and can therefore be used to afforest deserts and hill slopes.

The dense and hard wood can be used both as fuel wood since it is fast-growing and its coppicing behavior and for timber for small objects and furniture.

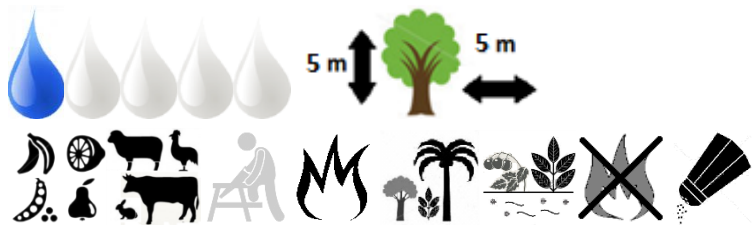
### How?

Propagation from fresh seeds and pretreatment includes: boil for 5 minutes, allow to cool, leave to soak for 24 hours before sowing. Treat alternatively with 50% concentrated sulfuric acid in which the seeds are put for 40-50 minutes, rinse thoroughly, leave to soak for 24 hours before sowing.

Branches are cut and dropped for sheep and goats who eat the leaves but also strip the mineral- and oil-rich bark from the branches, which is nutritionally important.



## Balanites aegyptiaca, desert soapfruit



### Why?

The pulp of *Balanites aegyptiaca* can be eaten fresh, dried, ripe or even unripe and the tender shoots and the young leaves are edible. Oil can also be extracted from the kernels. Everything including dried and fresh leaves is a profitable fodder during the dry season.

The hard and durable wood produces little smoke when burned and is also used to produce charcoal. Due to its slow growth rate and the small logs, timber production has a minor importance.

The mostly evergreen tree provides shelter and shade and attracts numerous insect species. It is therefore a useful tree for beekeeping. The tree is nitrogen-fixing and helps to improve the soil quality. A soap, which pollutes greywater only marginally, is gained from the fruit. *Balanites aegyptiaca* grows in the hottest and driest areas.

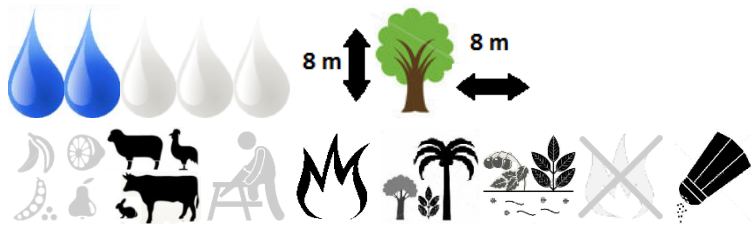
### How?

Soaking the fruits in water for some hours helps to separate the pulp from the stones. The germination can be sped up by putting the seeds into boiling water for 7-10 minutes and then cooling them slowly. Use the freshest seeds possible. *Balanites aegyptiaca* is planted along the banks of irrigation canals for stabilization.





## Faidherbia albida, winter thorn



### Why?

Products directly gained from *Faidherbia albida* are animal food and fuel wood. The leaves as well as the pods are very good animal food. The timber is useful but not of high quality.

Only the *Faidherbia* and the *Moringa* are summer deciduous. These trees are especially valuable in planting dry lands because they have no leaves and therefore do not require water when this resource is most scarce, so conserving water in the soil. In this way the food forest achieves a positive water balance meaning the soil humidity increases year upon year. During the dry season, when the tree is foliated, it shades animals and crops.

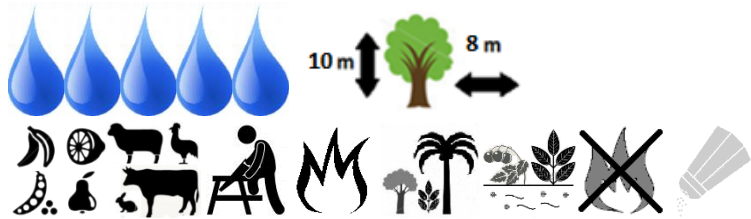
Winter thorn is extremely deep rooted and a source of fertilization for the whole system. It also fixes nitrogen and therefore helps to provide a fertile soil for intercropped plants.

### How?

Use the freshest seeds possible. Pretreatment for the seeds includes boiling for 10 minutes and then cooling them slowly. Soak for 24 hours before sowing.



## Leucaena leucocephala, leucaena



### Why?

This tree continuously produces: tender green pods, green seeds and leaf tips that are a nutrient rich food, delicious when cooked; highly valuable animal food; huge quantities of foliage, flowers, fruits and bark and also pollen and nectar for apiculture; copious fuel wood and straight wooden poles. *Leucaena leucocephala* is very fast growing and, despite being drought tolerant, it will greatly increase productivity with adequate irrigation.

Because *leucaena* never rests, it provides important services all year. It has the highest recorded rate of nitrogen fixation of any tree and is therefore the best choice for improving soil fertility.

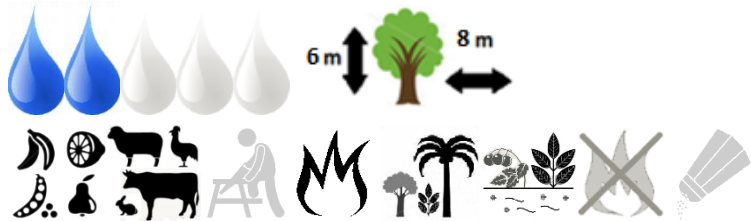
### How?

Propagation from seed is easy. Use ripe, fresh seeds sown at maximum 1 centimeter depth. Boil seeds for 1 minute and soak them for 24 hours before sowing for more prompt and synchronous germination.





## Moringa peregrina, palestinian moringa



### Why?

The leaves, roots and seeds are exceptionally nutritious, containing a wealth of minerals and vitamins. The seeds also provide an oil with a pleasant taste. Very high quality food can be produced on the poorest soil. The highly nutritious leaves are used as animal fodder for goats, sheep and poultry. A further product of this beautiful, thornless tree is fuel wood. An exceptional service of Moringa peregrina seeds is its ability to clarify water. Putting seed powder into wastewater helps to filter bacteria and viruses out of it and makes the water usable again.







Only the Faidherbia and the Moringa are summer deciduous. These trees are especially valuable in planting dry lands because they have no leaves and therefore do not require water when this resource is most scarce. They conserve water in the soil. In this way the food forest achieves a positive water balance, meaning the soil humidity increases year upon year. There is strong indication that the species fixes nitrogen and therefore provides a fertile soil for intercropped plants.




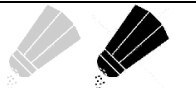
### How?

Soak the seeds for 48 hours before sowing. Moringa is tolerant of poor, dry soils and grows especially well on the rocks of desert Wadis.



## Symbols

Symbols	Explanation
	<p><b>Water requirement:</b> the tree needs a minimum annual rainfall of:</p> <ul style="list-style-type: none"> <li>➤ Less than 100 mm</li> <li>➤ 100-200 mm</li> <li>➤ 200-300 mm</li> <li>➤ 300-400 mm</li> <li>➤ more than 400 mm</li> </ul>
	<p><b>Tree dimensions</b></p>
	<p><b>Food:</b> The <i>food</i> icon shows if the tree produces edible and appetizing plant parts like fruits.</p>
	<p><b>Animal Food:</b> The rating of a trees animal food includes the amount and the quality of the fodder.</p>
	<p><b>Timber:</b> Rates the amount and quality of animal fodder produced by the tree.</p>
	<p><b>Firewood:</b> Most of the trees have the <i>firewood</i> symbol since every wood can be burned. Trees without this symbol produce either too little or too</p>

	much wood and sometimes emit a poisonous smoke when burned.
	<p><b>Utility:</b> This symbol shows if a tree has a positive effect on other plants, for example: acting as a wind break, attracting different birds and insects, or if it can be intercropped with other plants.</p>
	<p><b>Soil improvement:</b> This icon represents all benefits gained from a tree regarding the improvement of soil fertility. If a tree fixes nitrogen or if its roots penetrate the soil deeply to make nutrient matter available, the tree receives this symbol.</p>
	<p><b>Fire resistance:</b> A tree which receives this icon can be planted around a piece of land to protect crops from fires.</p>
	<p><b>Salt tolerance:</b> High salinity restrains most plants from growing. However, some trees can tolerate a relatively high salinity or even act as a desalinating agent. These species are awarded the <i>salt tolerance</i> icon.</p>

This agroforestry booklet has been prepared by MA'AN Development Center with the assistance of Bustan Qaraaqa. It is part of the project

“Fostering Adaptation to Climate Change among Farming Systems in the northern Jordan Valley

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