



Core Skills Educational Factsheet 1: Orchard Establishment

Agriculture Education Program

People in Need Czech Republic

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Core Skills Educational Factsheet 1: Orchard Establishment

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1) Welcome to the Factsheet

You have in your hands the first Factsheet of the Core Skills Educational Materials Series developed by People in Need. When considering establishing an orchard, planning needs to be started a long time before planting. It should never be done at the same time. This factsheet provides most important practical information to consider when you establish an orchard in Afghanistan. We hope you will enjoy it and find useful. Please, get back to us with your feedback.

2) Business Planning

Let's look at orchard establishment in a modern way. Do you plan to be selling your harvest? Then the first step while establishing an orchard is economics - doing your business plan. This involves looking at your markets and current prices as well as your costs of production.

- How far are you from a good market? What will it cost you to get your product to market at the time of year you are producing? What is the price you can expect?
- Where your labor supply is and what will it cost? Is labor available or not? What are your initial costs and costs of operation?

This is just scratching the surface on economics, marketing and the business plan. You have to ask the question whether your farming venture is profitable or not. If the orchard is for your own consumption, you can skip this part.

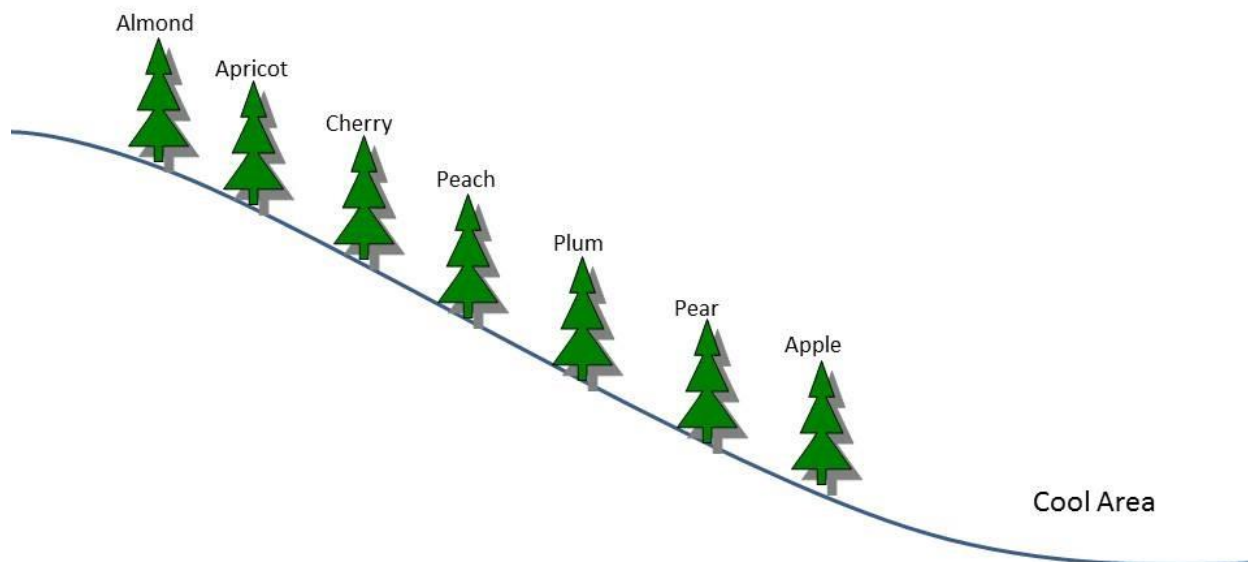
Note: For help with your business planning you can use materials developed by PIN – School Business Handbook. Get in touch with PIN staff to receive this book. Core Skills Educational Materials: Business Skills are also being developed by PIN.



3) Site Selection – Weather Conditions and Climate

Selecting the proper site and the correct type of fruit for production are the first steps in fruit orchard establishment and they go together with the business plan. Climatic conditions, such as altitude, temperature, sunlight, wind, frost and rainfall determine which kind of fruit can be produced in the area. Apart from the climate, there are other factors that must be considered too, like the soil type and water conditions.

Most of Afghanistan has a mountain climate with dry and cold winters, except for the lowlands, which have arid and semiarid climates. In the mountains and a few of the valleys bordering Pakistan, a fringe effect of the Indian monsoon, coming usually from the southeast, brings moist maritime tropical air in summer. Afghanistan has clearly defined seasons; summers are hot and winters can be bitterly cold. Summer temperatures as high as 49 °C (120 °F) have been recorded in the northern valleys. Midwinter temperatures as low as -9 °C (15 °F) are common around the 2000-m (6600-ft) level in the Hindu Kush. The climate in the highlands varies with elevation. The coolest temperatures usually occur on the heights of the mountains.



Land slope has positive and negative effect on temperature:

In the above picture the recommendation is to grow stone fruits such as almond, apricot, cherry and peach in the high elevations because they produce flowers quickly. And fruit trees such as apple, Plum and pear blooming later will be in parts of the lower area of the valley. So for the fruit which are blooming soon its not good to grow them in the area with cool weather because they are blooming soon and the cool weather causes frozen flowers.



- Slope aspect or directional exposure should be considered for its effect on fruit trees as they come out of dormancy. A southern-facing slope warms up faster in spring, while the opposite is true of a northern slope. Eastern-facing slopes are intermediate. slope in front of the **South (sun side)** has good sun and receives the most sunlight. This type of land in spring gets hot very soon, in the summer gets hot and dry and in fall gets cool later. The crop will have a long growing season on the southern slope.
- Slope to the **North (dark side)** acts opposite. In the warmer climates (southern or eastern Afghanistan) the northern slope can be beneficial for planting deciduous trees.
- Slope to the East and West is in the middle of both north and south slopes. If we compare slope to the West with slope to the East, slope to the West is warmer than the slope to East. (A research of temperature on slopes to east and west on cotton fields in Afghanistan was done by **Abdul Ahad Ahad**)

4) Site Selection – Soil Type

Fruit trees need a specific type of soil, sunlight and nutrients to be productive; however, not all fruit trees have the same requirements.

Use resources such as your local nursery, extension office or search online to find out what your particular type of fruit tree requires before planting and prepare your planting area and soil specifically for that tree (or change the desired kind of tree according to soil specifications). This will help ensure a healthy tree that produces a lot of fruit for you, year after year.

Topsoil and subsoil samples should be collected for analysis of pH; the plants usually develop well with the soil pH between 5 and 7.5. **(Afghan Orchard Keeping and Establishment) Written by Abdul Ahad Ahad** says the plants usually develop well with the soil pH between 5 and 8.5. Suitable pH, is 6 to 7 for the majority of horticultural crops. The specific pH suitable for different kinds of trees is shown in the table below.



Soil pH and Suitable Fruit Trees:

Fruit Trees	pH	The soil type and degree of interaction between the soil and the crops
Apple	5.0 – 6.8	Apple trees prefer an acidic soil
Mulberry	5.5 – 6.5	Mulberry prefers a moderately acidic range
Plum	5.0 – 6.5	Plum trees grow best in acidic to neutral soil, and seldom perform well in alkaline soil.
Apricot	6.0 – 8.0	Apricot is a weakly acidic soil - weakly alkaline soil loving plant.
Almond	6.5	Almond will tolerate acidic, neutral and alkaline pH levels.
Peach	6.0 – 6.5	Peach trees prefer slightly acidic soils. The trees like sandy loam soil and demand good drainage
Pear	6.0 – 6.5	Pear tolerate ranges from 5.0 to 7.5.
Orange	6.0 – 7.5	The soil pH orange needs is slightly acidic to neutral range.
Pomegranate	5.5 – 7.0	lightly acidic soil is best for pomegranate, They will still survive under considerably more acidic or alkaline conditions
Pistachio	7.1 – 7.8	Enjoying a slightly alkaline environment, the pistachio tree is actually hardy with some variation to its pH and can withstand higher alkalinity if necessary
Cherry	6.5 -7.0	All cherry trees thrive in a light, rather sandy soil. Avoid planting in heavy, compacted soils. A pH of 6.5 is suitable for cherries, but anywhere in the range of 5.5 to 8.0 is acceptable.
Lemon	5.5 – 6.5	They grow best in loamy or sandy loam soils. Salty, heavy clay and high caliche soils can all slow down plant growth.
Persimmon	6.5 – 7.5	These trees prefer a neutral soil
Olive	5.5 – 7.5	Olive trees prefer soil in the neutral range (5.5 – 7.5 pH)
Fig	6.0 – 6.5	The trees can tolerate moderate salinity. Ensure the soil is not highly acidic, as fig trees cannot tolerate low pH
Walnut	6.8 - 7.2	Walnut trees prefer near-neutral soil

5) Site Preparation

Fruit production development takes three to five years. During this period the orchard goes through different stages of development. The following table summarizes the main stages of fruit orchard development 3 - 4 months **before planting**.

Note: The later stages of orchard development are mentioned in the Core Skills Educational Factsheet 2: Orchard Management.

Table 1 Main Stages of Orchard Development before Planting



Time	Main Stage	Sub – Stage	Main activities
3 – 4 months before planting	Site preparation	Bush cleaning	Cleaning and weeding
		Land preparation	Loosening soil, tilling and Ploughing
			Manure application
			Leveling
			Fencing
		Orchard layout	Design pattern
			Establish row & plant distance
			Install irrigation system
			Digging holes

Source: Ferenc Sandor, ROP, Afghanistan 2008

6) Land Preparation

Loosening Soil, Tilling and Ploughing

Prepare soil thoroughly by plowing, tilling or spading before planting. The most important aspect in soil and land preparation is loosening of the soil. The process of loosening and turning of the soil is called tilling or ploughing. It is need to do deep ploughing that would loosen the soil, remove big pieces of soil. Which is done by plough?

Ploughing too deeply as well as intensively will turn up less structured soil into the topsoil level. Moreover, intensive ploughing destroys the structure of the soil and increases the leaching mechanism in it.

Manure Application

As a pre-plant fertilization add compost, animal manure and green manure can be worked into the soil to a depth of 1m, however, this should not be added directly to the tree planting hole at the time of planting, but in advance of planting so that rotting can occur and be completed prior to planting, otherwise root rot is likely.

Organic sources of N, such as urea should be applied during winter and/or spring, to allow for timely decomposition and release of nutrients. If nitrogen is to be applied, actually it is an artificial fertilizer rather than “organic” – it is being industrially produced from mineral sources but it can be possible to use it as an organic sources like usage of animal urine.

Manure is readily available as a source of organic matter to build soils and add small amounts of nutrients. Put simply, apply fresh manure only in the fall; but not in the spring or during the growing season.

Leveling

Land leveling is a measure used in surface irrigation, such as basin and furrow irrigation. It consist of preparing the irrigation plots in a way that no high or low spots disturb the uniform distribution of irrigation water on the field and ensuring the optimal slope for water movement across a field when irrigated.



In summary, the main benefits of levelling are:

- improved crop establishment,
- even water coverage of the field,
- even crop stand and maturation,
- reduction of weeds by up to 40 % (thereby a 75 % decrease of labour required for weeding),
- increase of farming area by 5-7 %,
- reduction of farm operation times by 10-15 %,
- average yield increase of 10- 20 %

Fencing

Windbreaks, fencing, wind erosion control measurements are belongs to the agro-forestry practices. Trees and shrubs can grow in and around the orchard protecting the soil and especially the young fruit trees during the growing period. There are some main methods to fencing and protecting young fruit tree orchards.

7) Selection of Trees and Varieties

Variety selection is very important and needs to be based both on market demand and your conditions for growing. The choice also depends on region and climate e.g. low chill, susceptibility to frost or rain (some fruit varieties are splitting of the stone and/or the flesh). Some stone fruit quickly becomes unfashionable and so there is a need to review and renew the varieties every few years by replanting.

Clearly, the first decision is what species to plant. Is a tree orchard the best use of your land and talents? Or is your site and marketing plan better suited for a somewhat shorter-term investment? If you are sure that you want to manage fruit or nut trees, will you focus on production of almonds, apples, apricots, cherries, grapes, citrus, peaches, pears, persimmons, plums or other fruits?

Chilling requirements

Stone fruit trees and certain other plants of temperate climate develop next year's buds in the summer. In the autumn the buds go dormant, and the switch to proper, healthy dormancy is triggered by a certain minimum exposure to chilling temperatures. Lack of such exposure results in delayed and substandard foliation, flowering and fruiting. The table below indicates how many hours of below 7°C are required by fruit trees most common in Afghanistan.

Fruit-tree	Chilling hours below 7°C	Susceptibility to spring frost	Comments
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Apricot	300-900	High	Spring frost causes extensive damage at below 4°C. Apricots thrive better under low humidity as high humid conditions in summer increase the incidence of diseases.
Peach	600-800	High	Peaches requires humid climate, sensitive to low temperature injury. Swelling buds are injured at – 6.5°C. Deep valleys are not ideal sites because cold air settles there.
Cherry	800-1500	High	Cherry requires colder climate, however cherry blossom is very sensitive to spring frost; therefore frost-free sites of hill slope and valley areas with and outlet for the cold air are preferred.
Plum	800-1000	High	Plum has moderate chilling requirements and ideal temperature conditions greatly vary with varieties of plums.
Pear	800-1500	Moderate	Pear can tolerate as low as -26°C temperature when dormant and as high as 45°C during growing period. Spring frosts are detrimental to pear production and temperature at -3.3°C or below kills the open blossom. Lowlands should be avoided for its planting.
Apple	1000-1500	Moderate	The average summer temperature should be around 21 -24 C during active growth period. Areas exposed to high winds particularly the hill tops are also not suitable for its cultivation.
Pomegranate	100-200	Moderate	They will grow best in areas with hot, dry summers and cool winters. The trees are more sensitive to cold weather than hot.
Almond	500-600	High	Almonds do best with hot summers and mild winters and do not adapt to other conditions especially well. Almonds do not usually grow at all in colder climates.
Pistachio	1000	Moderate	Pistachio trees can be damaged with temperatures of -9°C or lower.
Mulberry	400	Moderate	Temperatures ranging between 20 - 30°C are found to be most suitable for mulberry growth.
Walnut	600-700	Low	Temperatures below -15°C damage the tree during winter.
Olive	200-300	High	Olive cultivation require a temperature range of 7-35°C, however 15-20°C ideal. Olive trees and fruit can suffer severe damage at temperature of -2°C to -9°C.
Orange	0	Moderate	Oranges need temperatures of 12°C to 37°C to grow properly. They will be damaged at temperatures -6°C and lower.
Lemon	0	High	Lemons are grown in humid regions with temperatures between 13°C to 37°C. Lemon trees will be damaged already at temperature - 3°C.
Fig	100-200	Moderate	The fig tree lives in soils that are very well drained, sunny, hot and arid.

Source: United States Department of Agriculture; University of Florida

A **visit to a research farm or demo plot** for orchards and nurseries can provide you with the invaluable opportunity to see the trees growing, talk with the manager of the facility about production challenges such as pests and diseases, and even taste the fruit.



Note: You can see examples of some of the varieties of fruit trees on the Core Skills Educational Banner 12: Selection of Scion for your Rootstock.

Some of the best organizations in Afghanistan to visit are:

Afghanistan National Horticulture Development Organization
(ANHDO, <http://afghanistanhorticulture.org/>)

- The mission of the organization is to support and develop Horticulture in Afghanistan, to link the Public sector and the private sector, to provide services for post-harvest value chains
- ANHDO has a **Perennial Horticulture Development Project (PHDP)** with six field stations (**Perennial Horticulture Development Centers**) with many varieties of fruit trees over the country

Perennial Horticulture Development Centers of PHDP:

Kabul, Main Office Seed Secretariat Building, Badam Bagh Research Farm	Jalalabad Farme Jadid Research Farm Jalalabad Torkham Road
Herat Urdo Khan Research Farm District Enjil	Kandahar Kokaran Research Farm Kandahar City
Kunduz Agriculture Research Farm Kunduz City	Mazar Dehdadi Research Farm District Dehdadi

- Manuals of ANHDO for development of nurseries in Afghanistan can be found here: <http://www.afghanistanhorticulture.org/phdp/Publications.aspx>
- PHDP is also working with a large number of newly imported varieties which will be made available for production by the ANNGO members once evaluation is complete.

Afghanistan National Nursery Growers' Organization (ANNGO, <http://anngo.org.af/>)

- ANNGO was established as a part of the PHDP project and gathers some 25 local nursery growers associations in 22 provinces of Afghanistan.

Local Fruit Trees Nursery Grower's Associations Contact Addresses (source: ANNGO)

Province	Name	Office	Phone
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Ghazni	Hakim Sanay NGA	Orgon Old bus stop	799471946
Takhar	Takhar NGA	Agriculture Department	700700380
Maidan Wardak	Maidan NGA	Gulzar Markit	775181237
Helmand NGA	Helmand NGA	griculture Department	706906810
Zabul	Shahri Safa NGA	Jalal Khan Village	700382737
Balkh	Khulum NGA	Khulum District	799485749
Kunar	Kunar Ha NGA	Agriculture Department	700994374
Baghlan	Chonghar NGA	Puli Khumri	777881909
Paktia	Paktia NGA	griculture Department	799053446
Samangan	Aybak NGA	Sarak Gudam	799102397
Laghman	Laghman NGA	Chardihi Village	799670660
Badakhshan	Badakhshan NGA	Baharak City	775386708
Herat	Herat NGA	Agriculture Department	708462422
Bamyan	Kohmar NGA	Kohmar City	775851690
Parwan	Sayed Khail NGA	Sayed Khail	799752889
Nangarhar	Nangarhar NGA	Agriculture Department	775450552
Kunduz	Kunduz NGA	Agriculture Department	786166625
Parwan	Bagram NGA	Robat Village	700029628
Baghlan	Imam Qutiba NGA	Aria Markit	778812435
Balkh	Umulbilath NGA	Mazari Sharif	700049952
Baghlan	Andarab Ha NGA	Dih Salah City	707923932
Maidan Wardak	Dr.Wakil NGA	Sangi Syea Village	700249579
Kandahar	Kandahar NGA	Gadianu Sarak	700305406
Kabul	Paghman NGA	Duda Mast Village	700280657
Logar	Logar NGA	Pui Alam City	708370934
Kabul	Shakardara NGA	Kochan Village	798718114

Many different varieties of fruit trees available in Afghanistan are currently being preserved in the National Collection. They are physically available in the Perennial Horticulture Development Centers. You can **visit the centers and discuss the different qualities and specifications of the varieties with the managers.**

Almond

- A total of **90** different varieties of **Almond** are in the National Collection. These are physically available at the Perennial Horticulture Development Centers in **Mazar and Kunduz**:



Variety	Origin
KAJAK SAMANGAN	SAMANGAN
KAGHAZI CHAR DARA	KUNDUZ
KAGHAZI MAIDA	NANGARHAR
PISTA BADAM	BALKH
SATTARBAI BAKHMALI	BALKH
KAGHAZI DU POSTA	HERAT
CHANGAKI	KANDAHAR

Apple

- A total of **86** different varieties of **Apple** are in the National Collection. These are physically available at Perennial Horticulture Development Centers in **Kabul and Kunduz**:

Variety	Origin
HABIBI	PARWAN
GOW RAKHASH	BALKH
NAZAK BADAN	PANJSHER
MAHALI	WARDAK
RAHSH	BADAKHSHAN
QANDAK	SARI PUL
ZARD BEGI	TAKHAR

Apricot

- A total of **129** different varieties of **Apricot** are been currently in the National Collection. These are physically available at Perennial Horticulture Development Centers in **Mazar and Kabul**:

Variety	Origin
Amiri	NANGARHAR, WARDAK, KABUL, BALKH, KUNDUZ, PANJSHER, PARWAN
Pir Naqshi	BALKH
Qaisi	PARWAN, WARDAK, PANJSHER, NANGARHAR, HERAT
Charmaghzi	KUNARHA, WARDAK, NANGARHAR, HERAT, KANDAHAR
Nari Spin	KANDAHAR
Saqi	BAMYAN, WARDAK
Qandak	LOGAR

Citrus

- A total of **54** different varieties of **citrus** are in the National Collection. These are physically available at the Perennial Horticulture Development Center in **Jalalabad**:

Variety	Origin
MAHALI	NANGARHAR
Shisham Baghi	NANGARHAR
LISBON	NANGARHAR
META	KUNARHA
Chinotto	NANGARHAR
KAGHAZI	NANGARHAR
LISBON	NANGARHAR

Peach

- A total of **110** different varieties of **peach** are in the National Collection. These are physically available at Perennial Horticulture Development Centers in **Herat and Kandahar**:

Variety	Origin
GARMA	NANGARHAR, KANDAHAR
JAUZAY	BALKH, SAMAMNGAN, BAGHLAN
SARDAH	KANDAHAR, KUNDUZ, SAMANGAN, BAGHLAN
SHELIL SHAB RANG	HERAT, KABUL
SHELIL ZARD	KANDAHAR
Joy Sherin	BALKH
SARTANI	KUNDUZ, SAMANGAN, BALGHLAN



Pomegranate

- A total of **79** different varieties of **pomegranate** are in the National Collection. These are physically available at Perennial Horticulture Development Centers in **Jalalabad and Kandahar**:

Variety	Origin
SHERINAK	BALKH, NANGARHAR
MAY KHOSH SPIN	KAPISA
SABZAK DANI SORKH	FARAH
TASHKURGHANI	NANGARHAR, BALKH
KAGA SHIN	KAPISA
KANDAHARI	BALKH, NANGARHAR, KAPISA
MAY KHOSH	SARI PUL

Japanese Plum

- A total of **54** different varieties of **Japanese Plum** are in the National Collection. These are physically available at Perennial Horticulture Development Centers in **Herat and Kandahar**:

Variety	Origin
KUNDUZI ZARD	BALKH
SULTANPURI	NANGARHAR
SORKH	HERAT, KABUL
RED FLASH	KUNARHA
ZARD	HERAT, LAGHMAN
FORMOSA	WARDAK, KABUL, BALKH, PANJSHIR
FORMOSA SORKH	KUNDUZ

8) Orchard Layout and Design

Orchard layout influences the long-term health of the trees and the ease of field operations such as pruning, irrigation, fertilization, and weed and pest management. Everything is related: the decisions you make about the space between rows and between trees in the row will have an impact on everything from disease management to harvest operations.

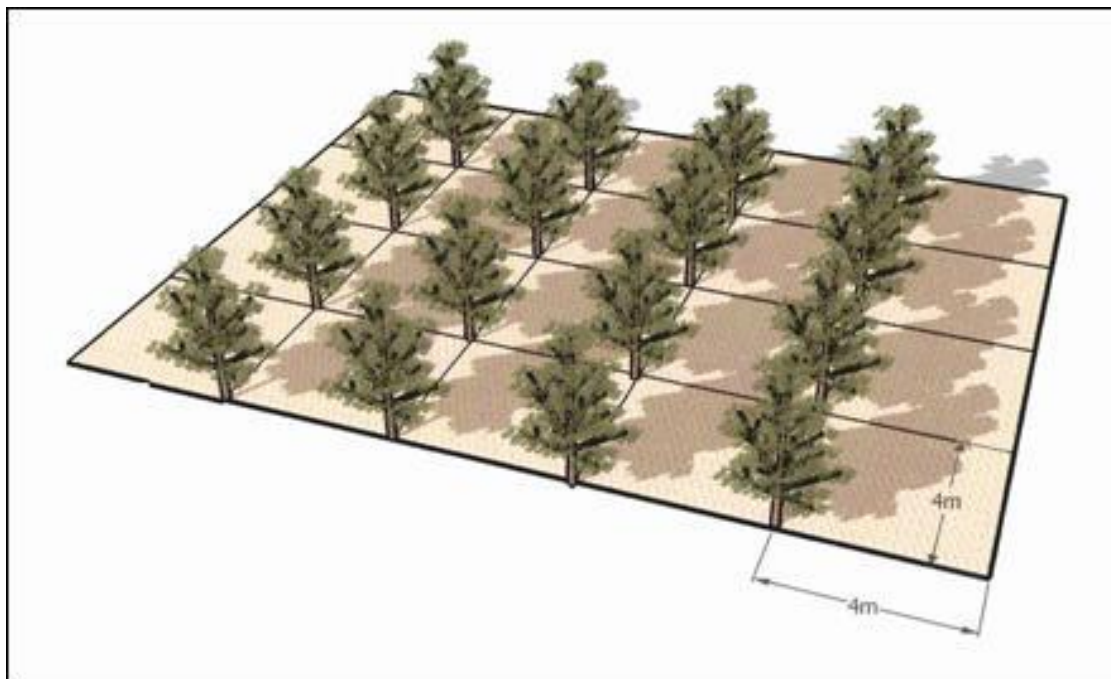
Usually the orchard layout follows a regular pattern. This pattern can be based on a variety of designs: square, rectangular, triangular, Diagonal or quincunx, etc. There are two main groups for patterns. Smallholders use mainly square or rectangular patterns, meanwhile Diagonal or quincunx patterns are more suitable for intensive, high yield production. The rootstock and shaping method also influence the planting pattern. You can See the patterns and their pros and cons below:

Square pattern:



- The simplest orchard pattern is the square – the distance between rows is the same as the distance between each tree
- As the middle square is empty, this system permits inter-cropping (cultivation of other crops between the trees)
- The advantage of the square is that it is easy to layout and allows machinery to run across and up through the orchard.

- In the morning and afternoon trees shade each other, so this method is suitable for the regions with more light (South and East of Afghanistan, lowlands).
- It is not appropriate for cold regions with less light (Central or Northern Afghanistan, highlands)



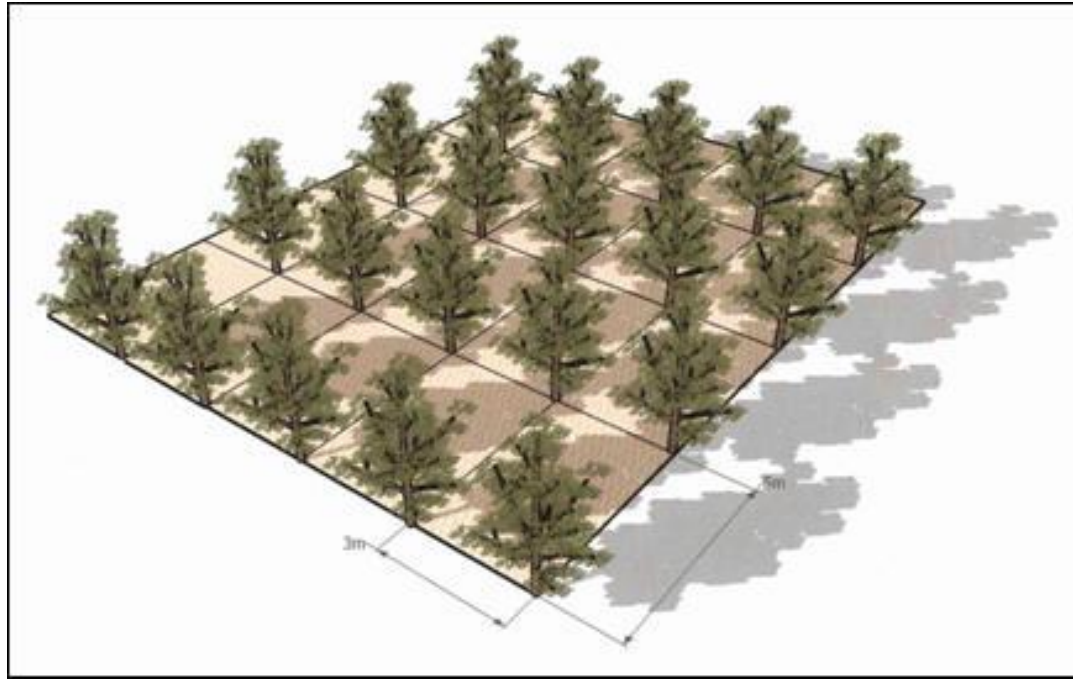
Square Pattern

Rectangular Pattern:

- In this system, trees are planted on each corner of a rectangle. As the distance between any two rows is more than the distance between any two trees in a row, there is no equal distribution of space per tree.
- The wider alley spaces available between rows of trees permit easy operations and even the use of machinery; operations like irrigation, pruning, spraying and harvesting will be easier.



- If in this method the length of the rectangle is located along the east and west, in the morning and afternoon trees shade less on each other and each tree will benefit from sunlight. This method is suitable for cold areas.



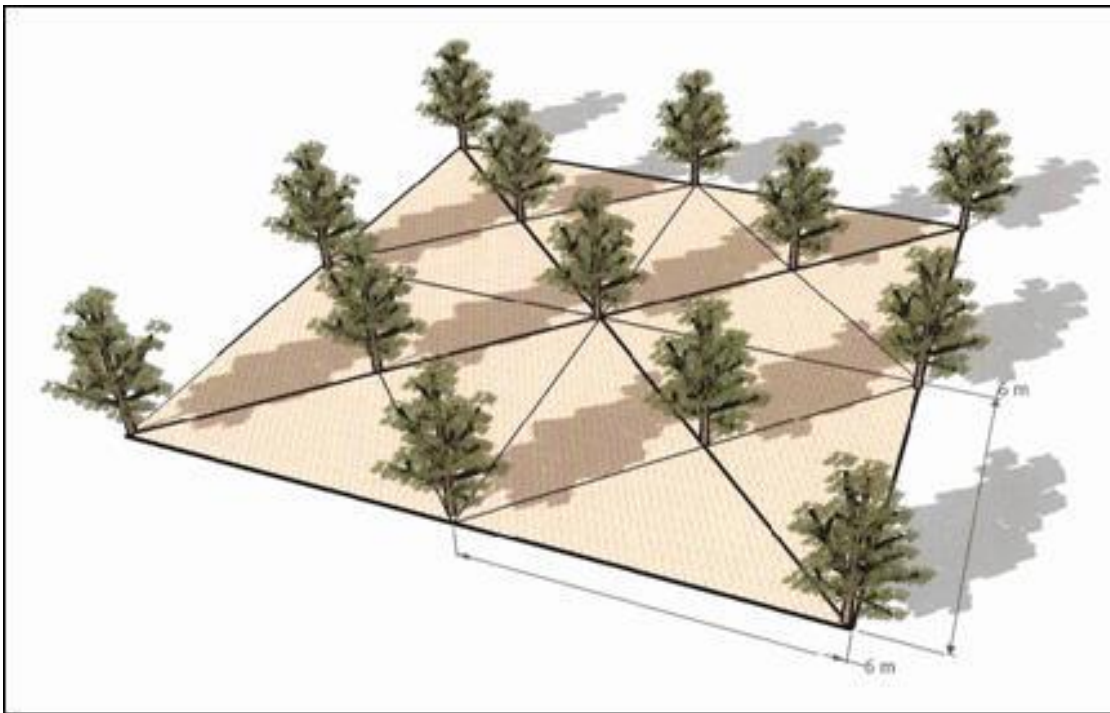
Rectangular Pattern

Diagonal or quincunx system:

- This pattern is similar to the square system but with an additional tree in the center of each planted square. The central (filler) tree may be a short lived one (removed after the trees grow higher).
- At each vertex of each square, an apple or pear seedling (fruit trees with long life cycle) can be planted. In the middle of the square, an early fruit producing tree can be planted. The filler trees should be removed after a few years when main trees come to bearing.



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Quincunx Pattern

Contour system:

- It is generally followed on the hills where the plants are planted along the contour across the slope.
- It particularly hilly land where there is greater danger of erosion and irrigation of the orchard is difficult. The main purpose of this system is to minimize land erosion and to conserve soil moisture.
- Good examples of this system can be seen in Northern Afghanistan with pistachio orchards



Contour system (left picture from WFP demo orchard in Tangi Shadian, Balkh province)



Spacing of fruit trees

Space between fruit trees not only effects agricultural operations in an orchard like using machines, spraying, pruning, harvesting etc., it also effects soil fertility, pests and diseases sunlight. Tree spacing is important for the fruit trees' life length. If the spacing is not considered and the trees are planted too close to each other it will result in decreased yield. Too much distance between trees also affects yield because it is a wasting of land.

Also, if we know the tree spacing and the distance between trees and rows, it makes it very easy for us to calculate the number of trees in an area. To calculate the number of trees we use this formula:

$$\frac{\text{area of planting}}{\text{distance between plants} \times \text{distance between rows}} = \text{number of plants in an area}$$

For example if we have 2000 square meter land and we want to establish an orchard with a distance between plants 5 meter and distance between rows 4 meter what will be the number of seedlings we need?

$$\frac{2000 M^2}{5 \times 4} = 100 \text{ plants in } 2000 M^2$$

Recommended distance between trees and rows for commercial orchards

Fruit Trees	Distance between trees and rows by meter	
	Tree	Row
Apple	5	6
Pear	4	6
Apricot	6	6
Peach	6	6
Plum	5	6
Cherry	6	6
Orange	5	6
Pomegranate	4	5
Lemon	4	5
Persimmon	7	8
Mulberry	10	10
Fig	5	5
Olive	7	7
Walnut	15	15
Pistachio	7	8
Almond	5	6

In the above table the distance between trees and rows are unnecessarily big. This is not a big mistake, but rather signals a difference in approach: bigger distance is typical for traditional orchards management, so from the table it is found that it is probably typical for Afghanistan. But planting the trees a little bit more dense means more trees per hectare, they can not grow as big (and therefore are easier to prune and



harvest) and even if the harvest is less per tree, the orchard combined will produce more. In research farms or smallholder farms the distances between trees and rows can be smaller.



Dehdadi Reaserch Farm in Mazar-e Sharif with smaller distance between trees

9) Planting of fruit trees

After all the preparatory stages mentioned above (site selection and preparation, land preparation, selection of varieties, orchard layout) you can start with the planting.

Preparation of the planting holes

- First mark the places for the trees according to the orchard layout. Use the planting board as shown on the pictures.





How to use planting board (Source: AAEP)

After you marked the place of seedling with a stick, before you start digging the hole, put the empty middle part of the board around the stick and put two more sticks on the sides. Now remove the board and start digging between the sticks. When you are planting the seedling, put the board again between the two sticks and locate the seedling in the middle. This will help you to keep the tree straight and the lines of trees will be in the right position.

- The planting hole should be approximately 60cm x 60cm x 60cm. Dig the hole after rain or water the soil before digging.
- Compost and manure is an important part of the whole preparation, because additional organic matter content improves the soil's physical properties and provides good nutrients for the plant.
- Each hole needs around half a wheelbarrow (5-10 kg) of compost-manure.
- While digging the hole, divide the topsoil from the subsoil and place them in two separate piles near the hole.
- When the hole is ready, mix the compost-manure with the topsoil and place it into the bottom of the hole (you can also add 25g of single super phosphate, but it is not absolutely necessary).
- Fill up the hole with the remaining subsoil. The soil level will be higher than the surface level, but this is normal.
- Mark the hole with a wood peg and wait a minimum of 2-3 weeks before planting the sapling. This period allows for the soil to settle down and for the compost-manure to mature. If we don't wait 2-3 weeks it's not a problem to mix the compost and fertilizer with soil and plant right away



The planting hole should be approximately 60cm x 60cm x 60cm (Source: AAEP)



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Top soil one side, sub-soil other side



Mix the compost-manure with the topsoil and place it into the bottom of the hole (You can also add to the mix 25g of single super phosphate, but it is not absolutely necessary). (Source of the picture: AAEP)



Use the planting board to help you to keep the tree straight and the lines of trees will be in a good position (Source of the picture: AAEP)



Supporting stake and bark mulch around the newly planted tree



Immediately after planting add some water