

# **Seed collection, handling, storage and management**



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## **1. Introduction**

### **Why collect seeds?**

- **There is a strong need for conserving the diverse biological diversity of Afghanistan, including important native species and varieties.**
- **There is no market for forestry seeds; the only seeds that are available in the market are some of stone fruit seeds like almond and apricot (quality issue, e.g. pistachios).**
- **Peach and plum seeds can be found rarely in the fruit market.**
- **Many species only produce seeds once every three to five years.**
- **For this, it is necessary to collect their seeds for propagation.**

## **1. Introduction (cont.)**

### **Seed collecting methodology**

- **In Afghanistan, there is limited information available about seed quality, location of seed bearing trees, and time of seed collection.**
- **There is a need to survey the forests to determine the best seed collection sites:**
  - For different species of trees
  - Climate
  - Elevation (growing stages)
  - Season of ripening fruits and seeds
  - Year of good production
- **The best way to collect information about seed collection sites and collection time is for the Government (forestry technical staff) to survey the forest areas.**

## **1. Introduction (cont.)**

### **Seed collecting methodology (cont.)**

- Seed collection requires specially trained people with tools, cloths, and other materials.**
- Technical personnel from DNR/MAIL know about the techniques, timing, and quality (they have received training).**
- There is a need for training of local people in seed collection methodologies.**
- Trained local people can become trainers, training their own working teams.**
- Contracts have to be signed by the Government with the trained local people for collection of seeds.**

## **2. Selection of seed bearing trees**

- **Seed bearing trees are those that produce seeds.**
- **These trees have to be selected before collection time.**
- **For the selection of trees, the Forest Department must survey the sites.**

## **2. Selection of seed bearing trees (cont.)**

### **Inventory of the forest areas**

**The following points are very important for selection seed bearing trees:**

- Age and maturity of tree.**
- Health of tree.**
- Shape of tree.**
- Height of tree.**

### 3. Seed year

- Most trees produce seed each year but some don't, so we have to know the interval between seed years.
- For example:
  - Cedar trees produce every two years.
  - Many conifer trees in the natural forests produce seed every 3-4 years.
  - *Pinus eldarica*, *P. ponderosa*, *Ailanthus*, *Robinia*, *Ulmus*, and *Fraxinus* produce seeds each year.

#### 4. Time of seed collection

- The time of seed collection differs according to species and variety.
- For example:
  - Conifer trees: The proper time for collection of conifer seeds is October/November.



*Cedrus deodara*, Cedar Seeds

#### 4. Time of seed collection (cont.)

*Pistacia vera* L.:

**Pistachio forests of Northern Afghanistan: proper time for seed collection is July/August.**

**August/September is the correct time in Western Afghanistan (Badghis Province).**



**Pistachio Nuts**

#### 4. Time of seed collection (cont.)

##### Forestry species:

**The proper time for collection of *Ailanthus*, *Fraxinus*, and *Robinia* tree seeds is September/October.**

**The seeds of most other forestry species can also be collected in this same time period.**

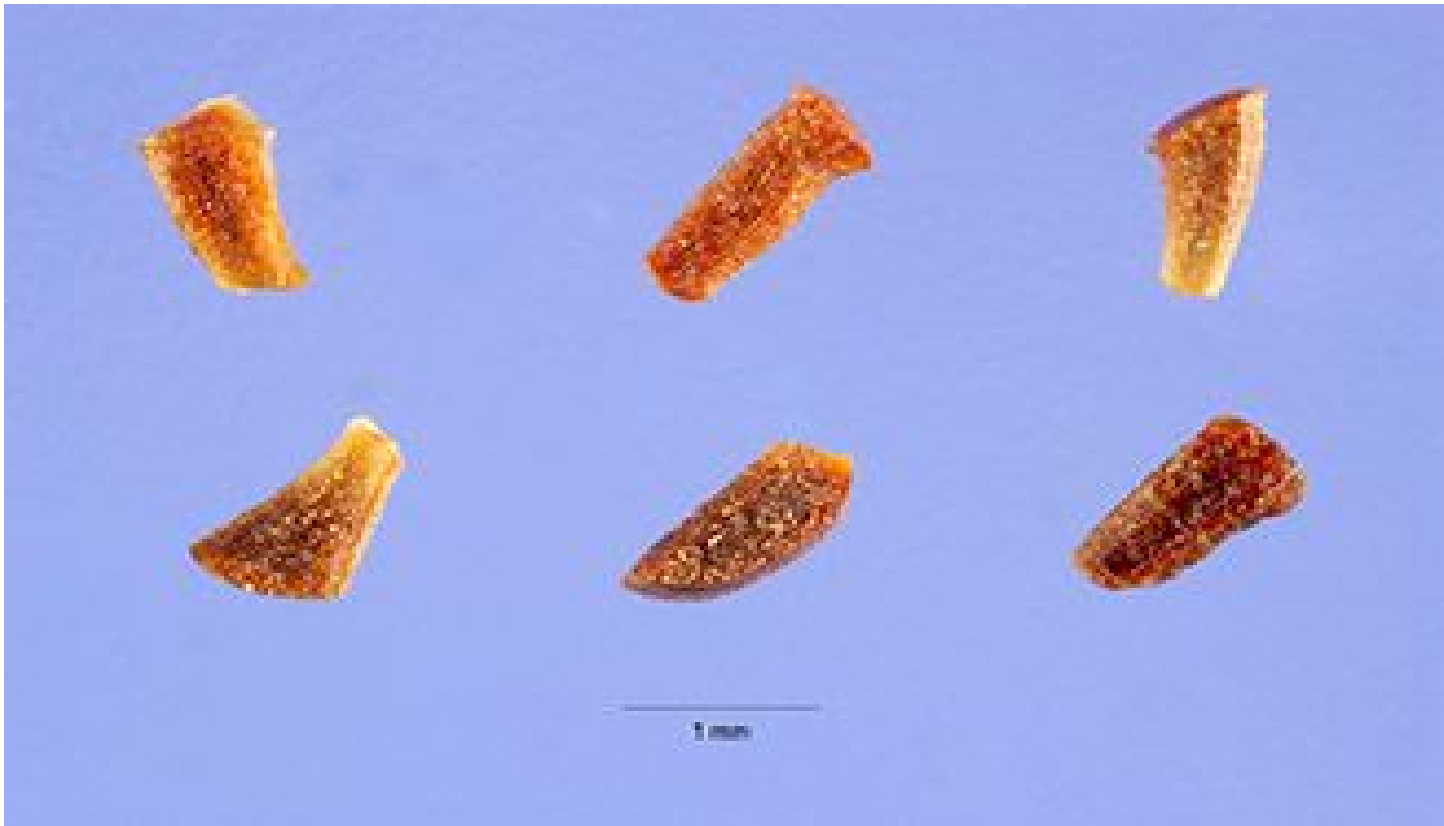


**Ailanthus Seeds**

#### **4. Time of seed collection (cont.)**

**Eucalyptus trees:**

**Proper time for seed collection is June/July.**



**Eucalyptus Seeds**

#### **4. Time of seed collection (cont.)**

##### ***Ulmus* trees:**

- **Elm seeds do not stay long (maximum of one week) on the tree after ripening.**
- **They are very light, round seeds that disperse quickly from the tree to other areas.**
- **Seed harvesting time is very short, and seed viability is also short.**
- **The seed must be planted as soon as possible or it will lose its germination capacity.**
- **Keeping the seed in storage is difficult.**
- **Proper time for collection is the end of April and early May.**

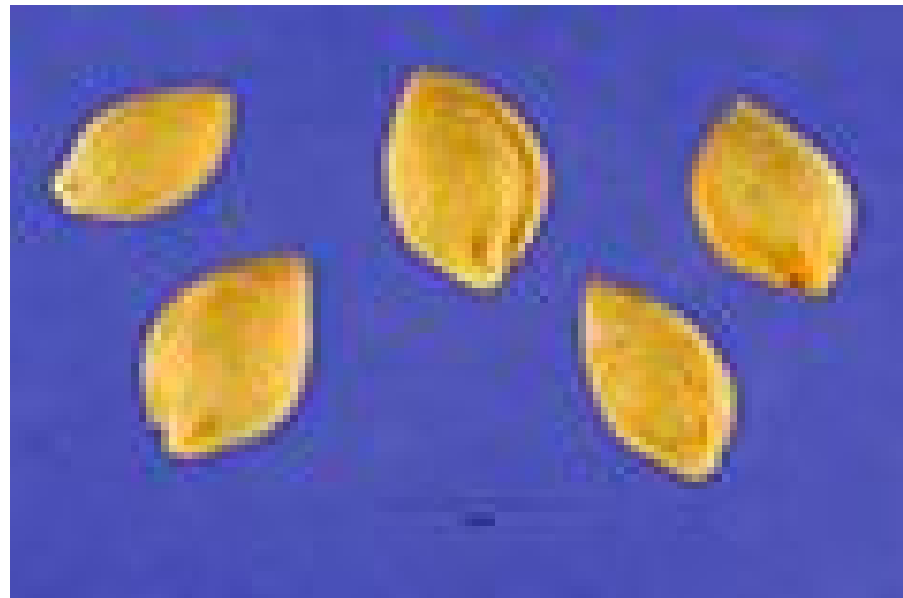


**Ulmus seeds**

#### **4. Time of seed collection (cont.)**

##### **Fruit trees:**

- **Most fruit trees begin ripening in June/July, and from that time the people start to collect fruits and seeds of fleshy fruits.**
- **Walnuts ripen in September/October.**



**Almond Nuts**

#### **4. Time of seed collection (cont.)**

##### **Grass and Herbaceous plants:**

**The proper time for seed collection is April to the end of July. A few species can be collected in August.**



**Grass Seed**

#### **4. Time of seed collection (cont.)**

**Shrubs like sage:**

**The best time for seed collection is August/September.**

#### **Species Information**

- It is worth mentioning that most of the very important trees grow or are located on mountain ranges.**
- Some of these species can be found inside natural forests (conifer, oak) or above them, and they also may be found in the northern provinces inside pistachio trees, upper elevations, central areas of the south and southwestern provinces.**

## **5. Species information**

### ***Pistacia Khinjuk* :**

**Found in large areas of Afghanistan including the following:**

**Eastern zone: Nangarhar, Laghman, Kunar and Nuristan Provinces.**

**Southwest: Zabul and Urzgan Provinces.**

**Found at elevations of 600 to 1,800 meters above sea level.**

**Shape: single stem with a round crown. After the stem is cut, it turns to bush with several trunks.**

**Male and female trees are separate.**

**This is a good plant for erosion control.**

**Root system is deep and spreads to strengthen resistance against drought and frost (to -20 degrees Centigrade).**

**Produces sap - dentists use for making artificial teeth.**

**Seeds can be planted in the nursery or direct seeded in the area.**

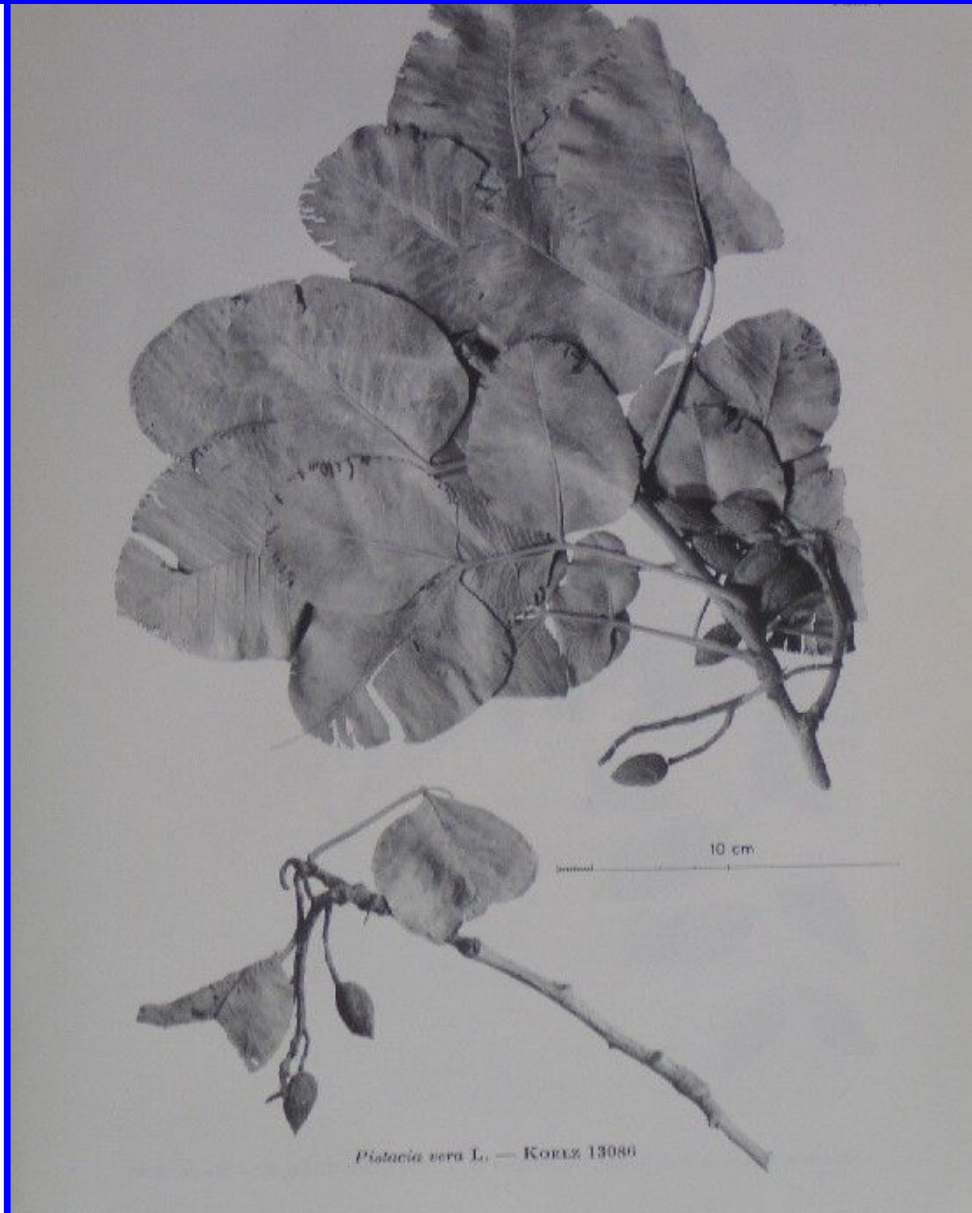
**Saplings can be grafted with *P. vera* buds.**

**Seed collection time is July/ August.**

## 5. Species information

### *Pistacia vera*

- Most valuable member of the *Pistacia* genus with a total world export value of \$544 million
- Found in Provinces of Samangan, Herat, Takhar, Kunduz.....



## **5. Species information (cont.)**

***Pistacia atlantica* or *afghanica*:**

- **This tree species grows between 1,800- 2,000 meters above *P. vera* in the north and west**
- **The shape is bunched or bush-like.**
- **The fibrous root system goes deep and spreads.**
- **Very drought and frost resistant (to -20 degrees Centigrade).**
- **Seed harvesting time for this tree is August/September.**
- **Seeds can be planted in the nursery or direct seeded in the growing site.**

## **5. Species information (cont.)**

### ***Helexelon spp.:***

- **Located in dry deserts in the north provinces along the Amu river and in southwest areas (Helmand, Nimroz, and Farah).**
- **Bush.**
- **Bush is very important for sand dune control.**
- **Root system is narrow, very long, and densely fibrous (net shape).**
- **The root system holds sand and soil in place and doesn't allow it to run or creep by wind.**
- **Seed collection time is May/June for a short time.**
- **Also, propagation by cuttings is possible.**

## 5. Species information (cont.)

*Pinus spp.:*

- **Located at a higher elevation than conifer trees in eastern Afghanistan and also above pistachio trees in north and west Afghanistan.**

## 5. Species information (cont.)

*Juniperus spp.:*

- **Located at a higher elevation than conifer trees in eastern Afghanistan and also above pistachio trees in north and west Afghanistan.**

## **5. Species information (cont.)**

### **Wild pear trees:**

- **Wild pear trees are found in Nuristan oak forests near agriculture lands.**
- **These trees are large in size, and they produce thousands of small fruits.**
- **The fruits are tasty and sweet.**
- **Good sucker producing trees.**
- **Seeds can be collected and planted in the nursery for sapling production.**
- **Badakhshan and Takhar Provinces, Lalma pear is available.**
- **Seeds can be collected from fruits.**
- **Ripened seeds are collected in August/ September.**

## **5. Species information (cont.)**

### **Wild apple:**

- **Wild apples are found in the mountain ranges of Fariyab, Nuristan, Laghman, Takhar, and Badakhshan Provinces.**
- **The size of the trees is dwarf.**
- **Produces small fruits.**
- **Can be used as stocks in the nursery.**
- **Ripening time of the fruits and production of seeds for collection is July to September.**

### **Wild Cherry:**

- **Wild cherry seen in Kunar, Nuristan, and the northeast provinces as well as in the Fariyab mountain ranges at elevations of 2,000 meters or more.**
- **Produces small, sour, tasty fruits.**
- **Seed harvesting time is June/July.**

## 6. Tools for seed collection and cleaning

The following tools are needed to collect tree seeds:

- Complete seed collection sets (saddles with ropes) for climbing tall conifer trees.
- Rope ladders for climbing trees.
- Bags for collection and transportation of the seeds.
- Bamboo ladders.
- Iron folding ladders.
- Baskets for collecting the fallen seeds.
- Gloves for workers.
- Tumbler.
- Seed cutter.
- Trays.



## 6. Tools for seed collection and cleaning (cont.)

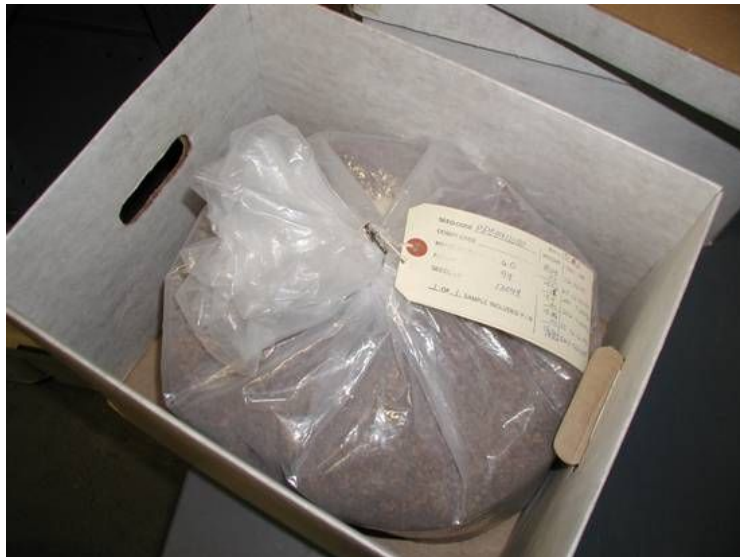
### **Label for seed cleaning:**

- Date of Seed Collection
- Date of Seed Cleaning
- Type of Seed
- Seed Weight after Cleaning in Kg
- Place of Seed Collection
- Altitude in meter
- Soil & Sand Weight in Kg
- Twigs, Awan & Wings in Kg
- Diseased / insect infested Seeds in Kg
- Clean Seed Weight in Kg
- Number of Bags
- Collector's Name

## 7. Seed storage

**After cleaning of seeds:**

- **Dry seeds in sunshine or warm area.**
- **Place in airtight plastic bags (protection from humidity).**
- **Label**
- **Protect from large variations in temperature, particularly heat.**



## 7. Seed storage (cont.)

### **Label for Seed Collection :**

- Date of seed collection
- Type of Forest
- Type of Seed
- Seed Weight in Kg
- Place of Seed Collection
- Altitude in meter
- Group Trees
- Single Tree
- Number of Bags
- Collector's Name
- Duty station

## 8. List of Afghan trees and seeds for planting and storing in nurseries and forestry centers

### Conifer trees:

1. Naju (*Pinus halepensis*)
2. Naju-e-siah (*P. nigra*)
3. Naju-e-ponderosa (*P. ponderosa*)
4. Sanawbar (*P. sylvestris*)
5. Nishter (*P. wallichiana*)
6. Srup (*P. morinda*)
7. Jalghoza (*P. gerardiana*)
8. Sarw (*Cupresses arizonica*)
9. Ilmanza (*C. deodara*)
10. Bijur (*Abis webiana*)



## 8. List of Afghan trees and seeds for planting and storing in nurseries and forestry centers (cont.)

### Evergreen fleecy leaved trees:

- Morpan (*Thuja orientalis*)
- Obakht (*Juniperus exelsa*)
- Obakht (*J. macropoda*)

### Evergreen broad-leaved trees:

- Baloot (*Quercus baloot*)
- Baloot (*Q. deletata*)
- Baloot (*Q. semicarpifolia*)

### Broad leaved deciduous trees:

- Gul barg (Acer/maple tree – naturalized species)
- Catalpa (Catalpa)
- Pista (*Pistachia vera*)

### Grass seeds:

- Kabal, G. composition.
- Kabal, G. Italian.

**Most of the forestry seeds are not available in the market and have to be collected directly from the trees in the forest.  
For this reason it is better to have seeds in storage for planting in the nurseries.**

**Thanks for attention**

**By: Mohammad Ismail Nasri**

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