Table of contents **Page**

Part II
Germplasm under evaluation

Introduction

Agriculture is one of the most important economic sectors in Iran. It is enough to point out that its share in national economy with creation of 50 percent of the total work places, 4/5 of total "Non - Oil" exportations and 9/10 providence of alimentary industry needs to rough material. Also horticulture plays a significant role in the productive scene of Iranian agriculture. For a rapid understanding of its economical position we may give a look to some of horticulture crops like pistachio, date palm, saffron, pomegranate, apple, cherry and many other crops. Spontaneously, becomes evident importance of the germplasm in all of its aspects.
This attempt is to fill the lack of an edition that could reflect the situation of fruit germplasm in Iran. I hope this first intent could satisfy partially the existing research prerogatives on Iranian fruit germplasm and can be useful for future research or any other scientific activities use. Therefore, here we tried to present the results of recent works of cultivar evaluation made on the fruit collection during 2003 – 2005, together with existing records belong to the previous evaluation results. The relative years of evaluation are clarified for each crop. This became possible only by effort of my colleagues as contributors. The main purpose of this publication is that of giving an organized, homogeneous and complete projection from existing native and introduced cultivars in the fruit collections. Kamal Abad Research Station, considered as National Fruit Collection of Iran, is located in Karaj, 40 km west of Teheran. This is the oldest Iranian research station in the field of fruit crops. Even if many qualitative and quantitative characters and a great number of registered records were available in the research reports of cultivar adaptation and evaluation tests results, but we tried to highlight only the most indicative characteristics for each fruit crop. This is the first global presentation of information on Iranian fruit crop germplasm and relative pomology studies, divided in two distinct parts. In the first part, are shown the results of researches of adaptation tests on pome and stone fruit cultivars, nuts and small

fruits. In this part you may find the most important characters of fruit cultivars such as: bloom phenology, maturation time, and other characters related to fruit quality like color, taste, total soluble solid, pH, acidity, Shelf life, etc. Clearly, the characters vary in different fruit. In the second part we have presented the introduced and native collected germplasm defining briefly the location, number of plants, phase (quarantine, propagation, etc.) and the donor country. To facilitate the search of a certain subject in this book, the crops are collected commonly in appropriate tables based on botanical family. Each crop is divided as Natives, Introduced and or Hybrids. All the cultivars belonging to each group of germplasms within the crop are presented in alphabetical order.

Short History of Seed and Plant Improvement Institute

The first Iranian experience in scientific agricultural activities began with establishment of Falahat School or "Superior Institute of Agriculture" focusing on cereals, in 1922. Five years later the works were extended to sugar beet and cotton. After Second World War, in 1960, the " Seed and Plant Improvement Institute" (SPII) initiated formally to work, and one year later in 1961, Horticulture Office was modified in Horticulture Department. In the last decade, were established other three new specialized institutes for Date palm, Pistachio and citrus all separating from Horticulture Department of SPII. Seed Control and Registration Department of SPII changed into a new homonym institute just in 2004. Actually, "SPII" has eight different Departments consisting in: Horticulture, Cereals, Oil seeds, Maize and forage crops, Potato and onion, Genetics, Vegetables and Statistics. SPII together with other research institutes are engaged in applied research in all the branches of agriculture sciences under Agriculture Research and Education Organization (AREO), in Ministry of Jihad Agriculture.

History of Horticulture in Iran

Wild apple vegetation had been originated in central Asia, Tadjikestan, since 20.000 years ago (Jokofschi, 1966). Horticultural activities had been initiated in remote years in ancient Persia because of existence of wild vegetations of many fruit crops since 6500 years ago. Through 3500 years the wild types were domesticated, and among sour and bitter ecotypes were formed or selected new sweet taste fruit types by continuous selections. Almost in 1600 A.C. during Persian Hakhamanesh empire, Dario organized fruit plantations of different crops such as orange, apple, grape and pomegranate in particular orchards called "Pardis" meaning paradise in which dwarf types of apple were used both for ornamental means "crabs" or as rootstocks (Kazlovskaya, 2003). Our researches show that many Iranian native cultivars of apple have as origin Khorasan and Azarbaijan provinces, both located geographically in southern neighborhood of Kyrgyzstan, known as origin point of apple (See tables of Native Apple cultivars). Today we may find the remaining natural forests spread in north - sought east and North West of Iran. Wild plants of pear, apple, hawthorn, walnut, berberry, oak, fig and many other species are easily found as wild types, especially in the forests of Kurdistan, Mazandaran, Khorasan, Semnan provinces (Sabeti, 1955). Even after those far centuries, traditional citrus orchards are diffused in Fars province nearby the Persepolis, Passargod and many other parts of ancient monotheist kingdom of Persia. Existing traditional orchards of pistachio, date palm, citrus, apple, grape, saffron cultivations and many other fruit crops are only a few examples of historical background of horticulture in Iran.

Organization of Horticulture Research

At present Horticulture Department follows all the researches related to 23 fruit crops including pome and stone fruits, nuts, olive, small fruits, etc. In addition, department of horticulture consist in 21 research stations through the country with 82 researchers working on some horticultural crops mainly fruit crops
Collection of native and foreign germplasm, firstly apple, began mainly by Professor Manii and others in Karaj fruit collection since 1934 (Manii, 1995). Other more, scientists and amateur began importing commercial cultivars of foreign apple, pear and other fruit crops to the country since 1955.
Though many modern orchards have been established in the recent decades, still traditional orchards are making a significant part of Iranian real horticulture. These orchards are the fruit of a patient, laborious and intelligent selection made by native anonymous growers during centuries. To keep these worthy genetic resources were foreseen a new fundamental and expensive program of germplasm collection through all Iranian provinces, since 2002. It will support the realization of a more sustainable horticulture, and avoids the awful risks of unconscious gene delete acting as human being heredity. Through this national research project, Horticulture Department of Seed and Plant Improvement Institute have mostly terminated the collection of worthy genotypes of many fruit crops, within Iranian traditional orchards and among wild types, too. Other projects of germplasm collection are to be continued yet. These promising genotypes will be evaluated through new research projects of fruit tree improvement, in the second phase. Part of this germplasm is presented in the present publication. Clearly, we act in a near contact to National Iranian Gene Bank of Genetic Department located in SPII.

Pomological Evaluation of Germplasm

So, the focus was done on the most important traits as commercial point of view. The introduced germplasm in this book is divided in two distinct parts. The first part is related to those cultivars of fruit crops that have passed the adaptation test in different provinces of Iran and mostly in Karaj Research Station. All the data belonging to this first group of germplasm, entitled as "Germplasm and pomology" include phenology and pomology records for each of introduced fruit cultivar. They are grouped and presented in specific tables on the basis of crop species and origin. You find them regrouped as native, foreign called imported and or promising hybrids. The list of cultivars is in alphabetical order within each group. This presentation type was chosen to facilitate the search of the data in a systematic and quick way of the requested information. Naturally, the evaluated characteristics vary from stone fruits to pomes and differ completely in nuts and strawberry. There are presented also the collected data related to phenology of flowering including: The beginning of boom, full bloom, the end of boom and total period or length of flowering. Phenology of maturation in Karaj pedoclimatical conditions is shown, too. In the Pomological analyses of pome fruits special attention is paid to important traits such as: Fruit shape, Color (both Ground Color and Over Color), Peel Thickness, Flavor, Percent of total soluble solids (T.S.S), Flesh Quality and Color, Storage Life. Others have explained widely also vegetative traits as plant vigor, growth habit of limited diffused commercial cultivars (Hampson, 2003). For stone fruits special attention is paid also to Fruit Weight, Sugar Percent, pH and Fruit Acidity, while for nuts the criteria changes totally. Some particular characters measured in walnut cultivars are Kernel Percent, Kernel Color, Oil percent, Protein percent and Hollowness. For almond are presented also Shell type, Kernel rate (%), Double kernel, Bearing Habit, yield (%) characteristics. In hazelnut they have presented nut Diameter and Length, Weight, Shell weight, Kernel weight, Oil percent and

flowering type. The definitions of these characteristics will be presented in detail. Nomenclatures of cultivars were checked (Morgan, 2003) and infraspesific hybrids (Luby, 2003).

Newly Introduced Cultivars

The second part of the book shows the situation of collected local genetic material or introduced cultivars in different phases of quarantine, propagation or evaluation.

Within each cultivar are also clarified the number of plants, location and the year of introduction.

Definition of the Term's for apple:

Origin = The country where the cultivar is discovered as accidental seedling, cultivated as local cultivar through very old selections made by last generation of local growers, or released through a classic breeding method, or generated by new methods of mutagenesis (radiation, regeneration by tissue culture) or found as natural mutant in orchards. In the case of plant species, origin will be defined on the basis of natural habitat where they found as wild vegetation.

Beginning of Bloom = when 10 % of total flower buds go to bloom

Full Bloom = when 70 % of total flower buds go to bloom

End of Bloom = when only 10 % of total flowers remain on the tree, or when petal fall cover 90 % of total number of flowers.

Blooming Period = The period in which flowering density arrives to 10(%) till it reaches to petal fall phase.

Ripening = when mostly 70 % of fruits are ready to be picked for direct consumption, so it differs completely from "harvest time" for other purposes for instance increasing storage life or resistance against mechanical damages during transportation. The ranking for phenology registration can be expressed more precisely by indication of the day, or in a more approximately mode: early, mid or late flowering. The same concept is valid for maturation phenology. It can be expressed also as Early, Mid and Late cultivar. Clearly, increasing the evaluation's years, the results will be more reliable.

Flavor = A collective sense of taste, aroma, juiciness and crispness based on sensorial reception of individual consumers expressed by at least 5 persons through panel test analyses.

Flesh Quality = Ranking is Based on taste, normally by taste (sweet, sour, sweet- sour), juiciness, crisp, aroma and flavor

Ground Color = the main color of peel as background, it varies from green in different tonality, yellow or Pale yellow

Over color = the secondary color that appears on the Ground Color, normally red or orange colors in too many different measures and intensities. It can be as very small to big spots, strips and or dots.

Russeting = A symptom caused by both genetic susceptibility and pedoclimatical factors. Ranking is made by zero to 10, as a standard scale to define precisely the level of damage (Hajnajari, 2002)

Shape = A high range of forms may be found, from flat to ellipsoid, from Globose to oblong-wasted like a ring bell (Watkins, 1982).

Size = measured by length, diameter, their relation and defined as small, medium, large

Peel Thickness = expressed as Thin, medium and Thick
Russet Class

Storage Life = The total period of time in which the picked fruits can be stored in controlled conditions without significant changes in flavor, juice content, taste and other pomological characteristics like acceptable tolerance to physiological storage symptoms (softening, increasing scald, browning, etc..). It is expressed as very good, good, medium, and weak

Definition of the Term's for stone fruits:

Stone cling = Flesh not easily separated from the seed

Stone free = Flesh easily separated from the seed

Time of Ripening = The yearly mean date in which the fruits become edible

Ripening duration = The period in which the major part of the yield per tree ripens

Definition of the Term's for walnut:

Beginning of Bloom = When 5 % of flowers, male and female, are opened

End of Bloom = When 5 % of flowers, male and female, are opened

Pollen Shed Beginning = When 5 % of male flowers begin pollen shed

End of Pollen Shed = When 95 % of male flowers begin pollen shed

Definition of the Term's for almond:

Self compatible = The plant is genetically self fertile or fertilized by its own pollen, so does not need pollinizer

Self incompatible = When fruit set is possible through cross pollination

Percentage of double kernel = The percentage of double Kernel in Samples of 100 nuts

Kernel rate = Kernel percent related to total nut (shell and kernel)

Definition of the Term's for strawberry:

Note: All the presented data for strawberry are collected from the plants in field conditions and not in nursery or others.

Full bloom = the period in which blooming reaches the highest intensity

Ripening = When the berries are perfectly colored and are easily picked from the plants

Fruit ripening period = considering the scaling rhythm of flowering in this crop, consequently ripening is shown in a temporal range.

Berry's No per cluster = Number of matured and immature berries produced in each cluster

Size uniformity = the genetic behavior of the cultivar to produce berries of acceptable homogenous size within fruit ripening period

Yield per plant (g) = Weight of matured harvested berries in each plant

Abbreviations:

UR*	**Under Registration**
UE**	**Under Evaluation**
dd	**Days**
g	**Gram**
Syn.	**Synonym**
Quara.	**Quarantine**
Green H.	**Green house**
Kamal A.	**Kamal Abad Research Station**
Adapt.	**Adaptation Test**
Cold R.	**Cold Room**
Prop.	**Propagation**
Eval.	**Evaluation**
12 ha. N.	**12 ha. Nursery**
400 ha. N.	**400 ha. Nursery**
Native O.C.	**Native Old Cultivar**
Bloom Begin	**Beginning of blooming**
Bloom End	**End of blooming**
Bloom period	**Temporal length of blooming**
Br. Red	**Bright Red**
Vin. Red	**Vinous Red**
5 Rib Point.	**5 ribbed pointed**
Attrac.	**Attractive**
Yel.	**Yellowish**
T.S.S (%)	**Total soluble solid in Percent**
UN. K.	**Unknown**
SC	**Self compatible**
SI.	**Self incompatible**
Purp.	**Purplish**

Part I
Germplasm and pomology


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Table 1-1 Some Phenological and Pomological Characteristics of Introduced Apple Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Belle De Boskoop	Belle de Pontoise	Calville Blanc D'Hiver	Empire All Red	Fuji
Origin	Netherlands	France	France	U.S.A	Japan
Bloom Begin	04 Apr.	12 Apr.	13 Apr.	11 Apr.	12 Apr.
Full Bloom	12 Apr.	17 Apr.	11 Apr.	17 Apr.	17 Apr.
Bloom End	23 Apr.	24 Apr.	23 Apr.	23 Apr.	25 Apr.
Blooming Period (days)	14	12	12	12	13
Ripening	21 Sep.	30 Oct.	Late	Late	28 Sep.
Shape	Flat Globose	Flat	Flat	Globose-Conical	Globose
Size	Large	Large	Medium Large	Large	Large
Ground Color	Yellow Greenish	Green pale yellow	Greenish yellow	bright green	Green to yellow
Over Color	red spot	Vin. Red	Dark Red	Bright Red	Red strip
Peel Thickness	Thin	Thick	Thin	Thin	Medium -Thin
Russet Class	6	5	2	1	1
Flavor	Sour Sweet	Sour Sweet	Sweet	Sweet	Sour Sweet
T.S.S (%)	23	19.6	13	12.2	11
Flesh Color	Cream	pale Green to White	pale Green to cream	pale Green to white	Cream
Flesh Quality	Juicy- Firm medium	Juicy- Firm medium	Juicy- Firm Good	Juicy- Firm Good	Juicy- Soft medium
Storage Life	Good	Good	Good	Good	Good

Table 1-2 Some Phenological and Pomological Characteristics of Introduced Apple Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Glocken apfel	Golden Delicious	Golden Smoothee	Goldjon	Granny Smith
Origin	Central Europe	U.S.A	U.S.A	Italy	Australia
Bloom Begin	10 Apr.	19 Apr.	14 Apr.	13 Apr.	10 Apr.
Full Bloom	16 Apr.	24 Apr.	17 Apr.	19 Apr.	17 Apr.
Bloom End	25 Apr.	28 Apr.	25 Apr.	23 Apr.	24 Apr.
Blooming Period (days)	15	9	11	10	14
Ripening	01 Sep.	03 Oct.	03 Oct.	21 Sep.	28 Sep.
Shape	Oblong-Wasted	Globose	Globose	Globose-Conical	Globose
Size	Large	Medium	Medium	Large	Large
Ground Color	Green to Bright Yellow	Green	Bright Yellow	Green to Yellow	Dark Green
Over Color	Bright Red striped	Gold flush	-	Bright Red	White spots
Peel Thickness	Medium	Thin	Thin	Medium	Thick
Russet Class	1	3	2	1	1
Flavor	Sweet- Sour	Sweet	Sweet-Sour	Sweet-Sour	Sour
T.S.S (%)	13.2	12	8.8	14.3	10.4
Flesh Color	Bright Green	Br. Cream	Greenish	Pale Yellow	White
Flesh Quality	Juicy-Firm Medium	Juicy Firm Good	Juicy-Firm	Juicy-Firm	Juicy-Firm
Storage Life	Good	Very Good	Very Good	Excellent	Good

Table 1-3 Some Phenological and Pomological Characteristics of Introduced Apple Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Gravenstein	Jeanne Hardy	Jonathan	McIntosh	Northern Spy
Origin	Italy – Sought Tyrol	France	U.S.A	Canada	U.S.A
Bloom Begin	06 Apr.	11 Apr.	12 Apr.	17 Apr.	03 Apr.
Full Bloom	12 Apr.	17 Apr.	17 Apr.	19 Apr.	25 May
Bloom End	23 Apr.	23 Apr.	24 Apr.	23 Apr.	20 Apr.
Blooming Period (days)	17	12	12	11	17
Ripening	Mid Early	01 Sep.	01 Aug.	19 Aug.	Late
Shape	Flat	Globose-Conical	Globose - Flat Globose	Flat	Globose
Size	Large	Medium Large	Medium	Medium	Medium
Ground Color	Green yellowish	Green yellowish	Green yellowish	Green	Green yellowish
Over Color	-	Red	Half Red	Deep Purp. Red Flush	Dark Red Flush
Peel Thickness	Thin	Medium	Thin	Thin	Thick
Russet Class	2	2	3	1	1
Flavor	Sour	Sour-Sweet	Sweet - Sour	Sweet - Sour	Sweet
T.S.S (%)	8	17.2	16.8	9.2	7.9
Flesh Color	Bright Yellow	Cream	Bright Green	White	Bright Green
Flesh Quality	Juicy-Soft	Juicy-Firm Medium	Firm Good	Juicy-Firm Good	Juicy-Firm Good
Storage Life	Medium	Good	Good	Good	Very Good

Table 1-4 Some Phenological and Pomological Characteristics of Introduced Apple Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Orleans	Red Astrachan (Starkan Roge)	Red Delicious	Red Rome Beauty
Origin	U.S.A	Russia	U.S.A	U.S.A
Bloom Begin	12 Apr.	12 Apr.	11 Apr.	13 Apr.
Full Bloom	17 Apr.	17 Apr.	13 Apr.	18 Apr.
Bloom End	26 Apr.	29 Apr.	23 Apr.	24 Apr.
Blooming Period (days)	14	17	12	11
Ripening	21 Sep.	11 Sep.	19 Sep.	01 Sep.
Shape	Globose-Conical 5 rib. pointed	Globose – Flat	Oblong - Conical 5 rib.pointed	Flat - Globose
Size	Large	Medium	Large	Medium
Ground Color	Green	Green	Bright Green	Pale Yellow
Over Color	Red spot	Red Flush	Red Flush Red strips	Dark Red Red Stripes
Russet Class	-	2	0	2
Peel Thickness	Thick	Thick	Thick	Thick
Flavor	Sweet	Sour	Sweet	Sour – Sweet
T.S.S (%)	11.6	7	16.4	17.8
Flesh Color	Cream	Bright Green	Cream	Pale Cream
Flesh Quality	Juicy-Firm	Juicy-Firm	Juicy-Firm Good	Juicy-Firm Medium
Storage Life	Good	Good	Good	Very Good

Data obtained in 2004, 2005 (2, 3 and 4)

By: Hajnajari Hassan

Table 1-5 Some Phenological and Pomological Characteristics of Introduced Apple Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Red Spur Cooper	Richared Delicious	Reinette De Caux (Dutch Mignonne)	Starking
Origin	U.K	U.S.A	Netherlands	U.S.A
Bloom Begin	22 Apr.	11 Apr.	10 Apr.	15 Apr.
Full Bloom	25 Apr.	17 Apr.	12 Apr.	17 Apr.
Bloom End	28 Apr.	24 Apr.	21 Apr.	24 Apr.
Bloom Period (days)	6	13	11	9
Ripening	31 Aug.	Mid Early	21 Sep.	18 Sep.
Shape	Conical 5 Rib Point.	Globose - Conical 5 Rib Point.	Flat	Conical 5 Rib Point.
Size	Medium	Large	Large	Large
Ground Color	Green	Green - yellow	Green yellowish	-
Over Color	Bright Red	Dark Red	Red Orange	Bright Red Stripped
Russet Class	1	1	5	1
Peel Thickness	Medium	Thin	Medium	Thick
Flavor	Sour	Sweet	Sour	Sweet
T.S.S (%)	10.2	10	16	17
Flesh Color	Bright Green	Bright Green	Bright Cream	Bright Yellow
Flesh Quality	Weak	Juicy-Firm	Juicy-Firm Medium	Juicy-Firm Good
Storage Life	Good	Good	Good	Good

Table 1-6 Some Phenological and Pomological Characteristics of Introduced Apple Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Stayman's Winesap	Wealthy	Yellow Spur	Yellow Transparent
Origin	U.S.A	U.S.A	U.S.A	Russia
Bloom Begin	12 Apr.	12 Apr.	14 Apr.	12 Apr.
Full Bloom	16 Apr.	17 Apr.	16 Apr.	16 Apr.
Bloom End	25 Apr.	24 Apr.	24 Apr.	19 Apr.
Bloom Period (days)	01 Aug.	27 Sep.	31 Aug.	16Jul.
Ripening	13	12	10	7
Shape	Flat	Flat	Globose-Conical	Globose -Flat
Size	Large	Large	Medium	Medium
Ground Color	Green	Green Yellowish	Green	Bright Attrac. Yellow
Over Color	Bright Red Spot	Blood Red Flush	Pale Gold	-
Russet Class	1	3	1	0
Peel Thickness	Thin	Medium	Thin	Thin
Flavor	Sour	Sour	Sweet Sour	Sour -Sweet
T.S.S (%)	9	17	10.8	13
Flesh Color	Bright-Yellow White	Bright Green	Cream	Green to yellowish
Flesh Quality	Firm	Juicy-Firm	Juicy-Firm Good	Juicy- Soft Good
Storage Life	Good	Good	Good	Medium

Data obtained in 2004, 2005 (2, 3 and 4)

By: Hajnajari Hassan

Table 2-1 Some Phenological and Pomological Characteristics of Native Apple Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Akhlemad–e- Mashad	Ardabil No.1	Ardbil No. 2	Dirres – e- Mashad	Ghandak-e-Kashan
Origin	Khorasan	Azerbaijan	Azerbaijan	Khorasan	Kashan
Bloom Begin	03 Apr.	03 Apr.	21 Apr.	04 Apr.	29 Mar.
Full Bloom	10 Apr.	04 Apr.	14 Apr.	06 Apr.	01 Apr.
Bloom End	23 Apr.	19 Apr.	17 Apr.	12 Apr.	13 Apr.
Bloom Period (days)	20	16	7	38	15
Ripening	28 Sep.	06 Jul.	28 Aug.	28 Sep.	14 May
Shape	Globose - Conical	Globose	Flat – Globose	Globose Conical 5 rib. Poin	Globose
Size	Medium	Large	Large	Medium	Small
Ground Color	Dark Green	Green	Green Yellowish	Green	Green to Br. Yellow
Over Color	Pale Red Stripped	Red Stripped	Red	Bright Red	-
Russet Class	2	0	1	1	0
Peel Thickness	Thin	Thin	Thick	Thin	Thin
Flavor	Poor sweet	Sweet	Sour - Sweet	Sweet	Sweet
T.S.S (%)	15.8	13.2	19.2	14.2	9.4
Flesh Color	Bright Green	White	Bright Green	Bright Green	Bright Yellow
Flesh Quality	Juicy-Firm	Firm	Juicy-Firm Medium	Juicy-Firm	Soft
Storage Life	Very Good	Good	Good	Good	weak

Table 2-2 Some Phenological and Pomological Characteristics of Native Apple Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Ghermez – e-Rezaeiieh	Golabe - Sahneh	Haji - e -Karaj	Narsib – e-Mashad	Nayane Aranghe
Origin	Azerbaijan	Kurdistan	Karaj	Khorasan	Karaj
Bloom Begin	04 Apr.	03 Apr.	01Apr.	14 Apr.	03 Apr.
Full Bloom	06 Apr.	06 Apr.	03 Apr.	17 Apr.	06 Apr.
Bloom End	22 Apr.	18 Apr.	14 Apr.	24 Apr.	17 Apr.
Bloom Period (days)	18	15	14	10	14
Ripening	06 Sep.	15 Sep.	28 Jun.	06 Sep.	03 Sep.
Shape	Globose	Globose	Globose-Conical	Globose	Globose-Conical
Size	Medium	Small	Medium	Medium	Medium
Ground Color	Green Yellowish	Bright Green Yel.	Yellow	Green	Green - Yellow
Over Color	Dark Red stripped	Red stripped	Br. Red Flush	Red stripped	-
Russet Class	1	1	2	1	2
Peel Thickness	Thin	Thin	Thin	Thin	Thin
Flavor	Sweet	Sweet	Sweet	Sour	Sweet
T.S.S (%)	10.4	13	10.6	14	12.2
Flesh Color	White	White	Bright Cream	Bright Cream	White to Green
Flesh Quality	Juicy-Soft	Soft	Soft	Soft	Juicy-Firm Good
Storage Life	Good	Weak	Medium	Medium	Medium

Table 2-3 Some Phenological and Pomological Characteristics of Native Apple Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Payzeh Zard–e-Mashad	Sheikh Ahmad	Shesheie – e- Tabriz	Soltani-e-Shabestar	Zonouz – e-Marand
Origin	Khorasan	Azerbaijan	Azerbaijan	Azerbaijan	Azerbaijan
Bloom Begin	12 Apr.	02 Apr.	15 Apr.	03 Apr.	10 Apr.
Full Bloom	15 Apr.	04 Apr.	19 Apr.	04 Apr.	12 Apr.
Bloom End	21 Apr.	16 Apr.	20 Apr.	15 Apr.	19 Apr.
Bloom Period (days)	9	14	5	12	9
Ripening	15 Oct.	31 Jul.	06 Sep.	16 Jul.	25 Jul.
Shape	Flat - Globose	Conical - Oblong Rib.	Globose - Flat	Globose-Conical	Flat - Globose
Size		Medium	Medium	Small	Medium
Ground Color	Bright Green	Yellow	Bright Yellow	Green Yellowish	Bright Green
Over Color	Red stripped	Orange Strip	Br. Red stripped	Red stripped	Red Flush
Russet Class	1	0	1	0	1
Peel Thickness	Thin	Thin	Thick	Thin	Thick
Flavor	Sweet	Sweet	Sour	Sweet	Sweet
T.S.S (%)	7	11.8	15.8	12.6	8.4
Flesh Color	White	White Greenish	Cream to Yellow	White	White
Flesh Quality	Juicy-Soft	Juicy-Soft Good	Firm Medium	Juicy-Firm Good	Juicy-Firm
Storage Life	Good	Medium	Good	Good	Good

Data obtained in 2004, 2005 (2, 3 and 4)

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Table 3-1 Some Phenological and Pomological Characteristics of Introduced Pear Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Anjou	Alvert	Andomax Red	Bartlett (Williams)	Beurre Bosc (Kaiser)
Origin	France	France	France	UK	France
Bloom Begin	02 Apr.	11 Apr.	10 Apr.	10 Apr.	10 Apr.
Full Bloom	10 Apr.	13 Apr.	14 Apr.	12 Apr.	12 Apr.
Bloom End	18 Apr.	25 Apr.	21 Apr.	18 Apr.	20 Apr.
Ripening	Medium −late	Late	Medium	Medium − late	Medium − late
Shape	Thick Conical	Globose	Conical	Thick Conical	Long-Conical
Ground Color	Yellow	Yellow	Green− Yellow	Yellow-Red	Yellow Russet.
Flavor	Sweet	-	Moderately sour	Sweet	Sweet
T.S.S (%)	12.7	12.8	16.1	10.7	15.5
Flesh Quality	Soft	Juicy	-	Soft	Juicy
Storage Life	Medium	Semi Long	Very Short	Medium - Short	Semi-Long
Fire Blight Susceptibility	Medium-Low	Medium	Medium	High	Medium

Table 3-2 Some Phenological and Pomological Characteristics of Introduced Pear Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Beurre Hardy	Beurre Diel	Beurre Giffard	Beurre Alexandre Lucas	Beurre d`Amanlis
Origin	France	France	France	France	France
Bloom Begin	08 Apr.	05 Apr.	11 Apr.	11Apr.	08 Apr.
Full Bloom	11 Apr.	10 Apr.	14 Apr.	14 Apr.	11 Apr.
Bloom End	21 Apr.	18 Apr.	21 Apr.	18 Apr.	19 Apr.
Ripening	Medium	Late	Very-Early	Medium-Late	Medium
Shape	Conical	Thick Conical	Conical	Conical	Conical
Ground Color	Yellow - Russeting	Green	Yellow	Yellow	Yellow
Flavor	Sweet	Moderately-Sweet	Sweet	-	-
T.S.S (%)	15.5	14.4	10.2	12.6	14.8
Flesh Quality	Soft-Juicy	Low Juice	-	-	-
Storage Life	Very Short	Medium	Short	Medium	Short
Fire Blight Susceptibility	Medium	Very-High	Medium-High	Medium	Medium-High

Table 3-3 Some Phenological and Pomological Characteristics of Introduced Pear Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Beyrut	Bulglar No II	Bulglar No III	Comice	Coscia
Origin	France	-	-	France	France
Bloom Begin	10 Apr.	13 Apr.	15 Apr.	11 Apr.	30 Mar.
Full Bloom	13 Apr.	16 Apr.	17 Apr.	13 Apr.	6 Apr.
Bloom End	27 Apr.	23 Apr.	19 Apr.	20 Apr.	12 Apr.
Ripening	Late	Late	Late	Very Late	Medium
Shape	Thick Conical	Conical	Conical	Conical	Conical
Ground Color	Dark-Green	Yellow	Yellow	Green	Light-Green
Flavor	Sweet	-	-	-	Sweet
T.S.S (%)	14.5	11	14	-	19.8
Flesh Quality	Soft	-	-	-	Soft-Juicy
Storage Life	Medium	Short	Short	Medium	Short
Fire Blight Susceptibility	Medium	High	Medium	---	High

Table 3-4 Some Phenological and Pomological Characteristics of Introduced Pear Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Conference	Doyenne du Comice	Duchesse	Favorit de Clapps	Louise Bonne
Origin	France	France	France	France	France
Bloom Begin	12 Apr.	-	02 Apr.	11 Apr.	08 Apr.
Full Bloom	15 Apr.	-	12 Apr.	13 Apr.	10 Apr.
Bloom End	18 Apr.	-	17 Apr.	22 Apr.	15 Apr.
Ripening	Late	-	Late	Early - Medium	Mediu m
Shape	Thick Conical	Conical	Thick Conical	-	Thick Conical
Ground Color	Green	Green	Yellow	Yellow	Yellow
Flavor	Sweet	Moderat ely-Sour	Sweet	-	Sweet
T.S.S (%)	11.4	16.4	13.0	10.1	14.6
Flesh Quality	Soft-Juicy	Hard	Soft-Juicy	-	Soft-Juicy
Storage Life	Medium	Very Long	Semi-Long	Very Short	Short
Fire Blight Susceptibility	Medium	Medium	Medium-High	Medium-Low	Mediu m-Low

Table 3-5 Some Phenological and Pomological Characteristics of Introduced Pear Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Character.	Palestine	Passe Crassane	Passe Culmar	Red Bartlette	Spadona	Packhams Triumph
Origin	-	France	France	UK	-	-
Bloom Begin	04 Apr.	04 Apr.	09 Apr.	08 Apr.	01 Apr.	07 Apr.
Full Bloom	12 Apr.	08 Apr.	11 Apr.	11 Apr.	06 Apr.	09 Apr.
Bloom End	16 Apr.	15 Apr.	17 Apr.	19 Apr.	14 Apr.	18 Apr.
Ripening	Medium	Medium-late	Late	Late	Medium	Late
Shape	Conical	Thick Conical	Small Conical	Thick Conical	Conical	Thick Conical
Ground Color	Green-Russet	Green-Russet	Dark-Green	Red	Yellow-Green	Yellow
Flavor	Sweet	Sweet	Low Sweet	Sweet	Sweet	Sweet
T.S.S (%)	12.1	13.5	12.8	11.7	10.8	11.0
Flesh Quality	Soft-Juicy	Soft-Juicy	Hard-Low Juice	Sandy-Semi-hard	Soft-Juicy	Soft-Juicy
Storage Life	Very Short	Semi-Long	Semi Long	Semi-Long	Short	Medium
Fire Blight Susceptibility	Medium	Medium	High	Medium	Low	Medium-Low

Data obtained in 1985-1990 (2), 1998-2004, 2005 (1, 3 and 4)

By: Atefi Jamal and Abdollahi Hamid

Table 4-1 Some Phenological and Pomological Characteristics of Native Pear Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Dom Kaj	Khoj	Mohammad Ali	Sardrood	Se Fasleh
Bloom Begin	30 Mar.	12 Apr.	-	02 Apr.	11 Apr.
Full Bloom	06 Apr.	15 Apr.	-	12 Apr.	13 Apr.
Bloom End	12 Apr.	18 Apr.	-	17 Apr.	22 Apr.
Ripening	Medium	Late	-	Late	Early - Medium
Shape	Conical	Thick Conical	Conical	Thick Conical	-
Ground Color	Light-Green	Green	Green	Yellow	Yellow
Flavor	Sweet	Sweet	Moderately-Sour	Sweet	-
T.S.S (%)	19.8	11.4	16.4	13.0	10.1
Flesh Quality	Soft-Juicy	Soft-Juicy	Hard	Soft-Juicy	-
Storage Life	Short	Medium	Very Long	Semi-Long	Very Short
Fire Blight Susceptibility	Medium-Low	Medium	High	Medium-High	Medium-High

Table 4-2 Some Phenological and Pomological Characteristics of Native Pear Cultivars Grown Under Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Se Fasleh	Sebri	Seif Tabriz	Shah Miveh	Shahak
Bloom Begin	11 Apr.	08 Apr.	04 Apr.	01 Apr.	05 Apr.
Full Bloom	13 Apr.	10 Apr.	12 Apr.	09 Apr.	14 Apr.
Bloom End	22 Apr.	15 Apr.	16 Apr.	16 Apr.	19 Apr.
Ripening	Early - Medium	Medium	Medium	Medium -Early	Early
Shape	-	Thick Conical	Conical	Conical	Conical
Ground Color	Yellow	Yellow	Green-Russet.	Yellow	Yellow
Flavor	-	Sweet	Sweet	Sweet	Sweet
T.S.S (%)	10.1	14.6	12.1	11.7	12.1
Flesh Quality	-	Soft-Juicy	Soft-Juicy	Soft-Juicy	Soft
Storage Life	Very Short	Short	Medium	Short	Very Short
Fire Blight Susceptibility	Medium-High	Medium -Low	Medium -High	Medium-High	Very High

Data obtained in 1985-1990 (2)
Data obtained in 1998-2004, 2005 (1, 3 and 4)

By: Atefi Jamal and Abdollahi Hamid

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Table 5- 1 A Few Commercial Characteristics of Introduced and Native Nectarine Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Ghermez Paiize	Independence	Nectared 6	Nectared 9
Origin	Iran	U.S.A	U.S.A	U.S.A
Bloom Begin	19Apr.	18Apr.	18Apr.	22Apr.
Full Bloom	21 Apr.	20 Apr.	21 Apr.	24 Apr.
Bloom End	27 Apr.	25 Apr.	25 Apr.	29 Apr.
Fruit Weight (g)	64,5	78	95	98
Yield/tree (kg)	13	16	22	18
Fruit Acidity	-	-	1,12	1
T.S.S (%)	-	21	23.5	19
pH	4,7	-	4,5	4,5
Ripening Time	3rd week of July	3rd week of July	2nd week of August	3rd week of August
Ripening duration	82	91	153	112
Fruit Shape	Cordite	Round	Cordate	Cordite
Stone	Cling Stone	Cling Stone	Cling Stone	Cling Stone
Flesh Firmness	-	medium	medium	medium
Storage	-	good	good	good

Data obtained in 1994-1996 (6,7)

Table 5- 2 A Few Commercial Characteristics of Introduced and Native Nectarine Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Quetta	Stark Red Gold	Sun Gold	Sun King
Origin	U.S.A	U.S.A	U.S.A	U.S.A
Bloom Begin	16Apr.	17Apr.	16Apr.	19Apr.
Full Bloom	20Apr.	20Apr.	21Apr.	22Apr.
Bloom End	25Apr.	26Apr.	25Apr.	27Apr.
Fruit Fresh Weight (g)	117	96	100	90
Yield/tree (kg)	19	28	22	18
Fruit Acidity	1,33	1,8	1,2	83,3
T.S.S (%)	20	20.5	18	20
pH	4,5	4,7	4,5	4,4
Ripening Time	2nd week of August	2nd week of August	2nd week of August	3hird week of June
Ripening Duration	107	108	110	78
Fruit Shape	Round	Round	Round	Round
Stone /Flesh Freeness	Cling Stone	Cling Stone	Cling Stone	Cling Stone
Flesh Firmness	firm	intermediate	firm	firm
Storage	good	good	Very good	good

Data obtained in 1994-1996 (6,7)

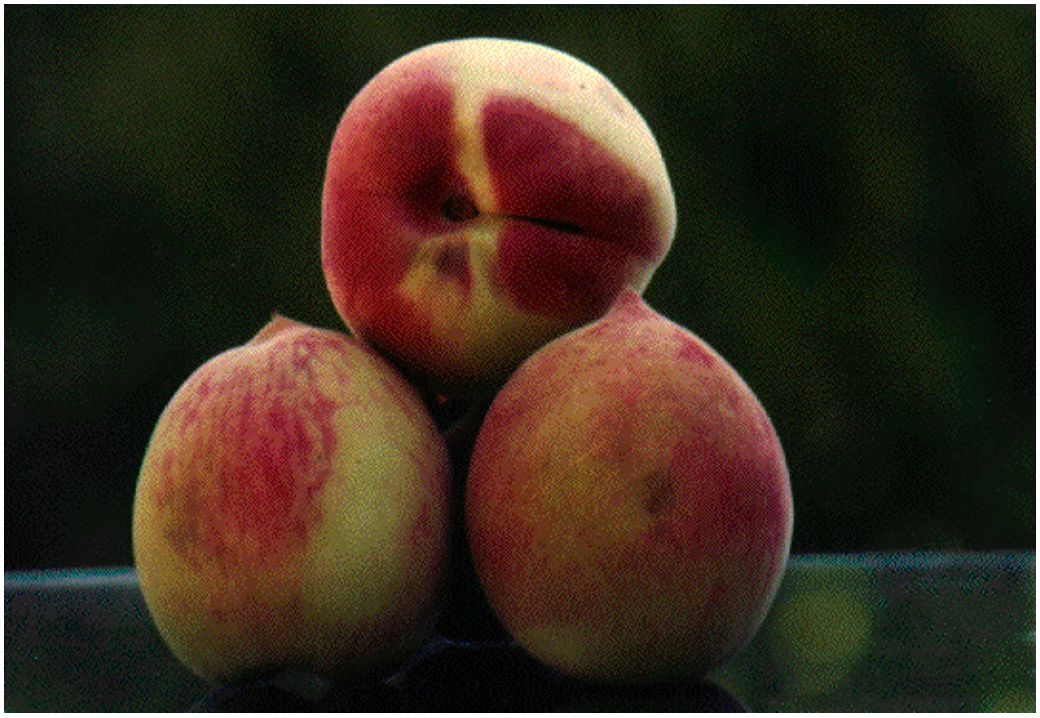

Table 6- 1 A Few Commercial Characteristics of Introduced and Native Peach Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Boby Gold 5	Disky Red	Early Red	Haji Kazemi
Origin	Iran	U.S.A	U.S.A	Iran
Bloom Begin	19Apr.	21Apr.	20Apr.	20Apr.
Full Bloom	22Apr.	23Apr.	22Apr.	22Apr.
Bloom End	25Apr.	29Apr.	25Apr.	29Apr.
Fruit Fresh Weight (g)	118	133	75	146
Yield/tree (kg)	39	23	22	22
Fruit Acidity	0..93	0.75	0.79	0.89
T.S.S (%)	18.5	18	19	22.5
pH	4.6	4.5	4.7	4.7
Ripening Time	2nd week of August	2nd week of July	1st week of July	3rd week of August
Ripening Duration	109	73	71	113
Fruit Shape	oval	Round	Round	oval
Stone /Flesh Freeness	free	-	Cling Stone	free
Storage	-	good	good	good
Specific characters	Sensitive to *Taphrina deformans*		-	Resistance to Aphis

Table 6-2 A Few Commercial Characteristics of Introduced and Native Peach Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Red Heaven	Spring time	Shasta
Origin	U.S.A	U.S.A	U.S.A
Bloom Begin	20Apr.	19Apr.	19Apr.
Full Bloom	22Apr.	22Apr.	20Apr.
Bloom End	25Apr.	24Apr.	25Apr.
Fruit Fresh Weight (g)	145	74	110
Yield/tree (kg)	42	29	51.5
Fruit Acidity	0.68	10	0.92
T.S.S (%)	18.5	18.5	19.5
pH	4.5	4.8	6.9
Ripening Time	3rd week of July	2nd week of June	2nd week of august
Ripening duration	66	67	109
Fruit Shape	Oval	Round	oval
Stone /Flesh Freeness	free	free	free
Storage	good	good	
Specific characters	Excellent Quality	Sensitive to *Taphrina deformans*	Sensitive to *Taphrina deformans*

Data obtained in 1994-1996 (5, 7)


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Table 7- 1 A Few Commercial Characteristics of Native apricot Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Gheisi Isfahan	Ghorban	Naderi	Ordobar
Bloom Begin	23.03	25.03	23.03	25.03
Bloom End	3Apr.	7Apr.	4Apr.	9Apr.
Ripening Time	3rd week of June	first week of July	2nd week of June	2nd week of June
Ripening duration	70	90	73	71
Fruit Fresh Weight (g)	41	52	46	52
Fruit Shape	Cordate	Round	Round	Round
Yield/tree (kg)	76	75	75	75
Stone /Flesh Freeness	Free	Free	Free	Free
Height (m)	5	5	5.5	5.5
T.S.S (%)	13..5	19.6	13.4	24.4

Data obtained in 1994-1996 (9)

By: Rahim G.S. Bayat and Bouzari Naser

Table 7-2 A Few Commercial Characteristics of Native Apricot Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Sefid	Sefide Rezaiieh	Shams
Bloom Begin	24.03	24.03	22.03
Bloom End	06Apr.	07Apr.	04Apr.
Ripening Time	2nd week of July	1st week of July	3rd week of June
Ripening duration	96	72	77
Fruit Fresh Weight (g)	37	50	46
Fruit Shape	Round	Round	Round
Yield/tree (kg)	68	80	56
Stone /Flesh Freeness	Free	Free	Free
Height (m)	5.5	5.5	4.5
T.S.S (%)	15.4	24	21..5

Data obtained in 1994-1996 (9)

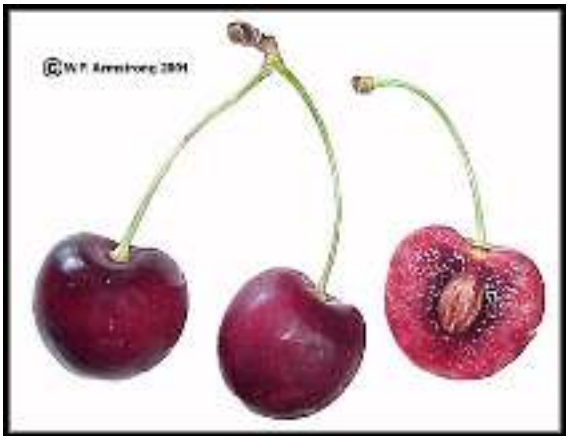

Table 8-1 A Few Commercial Characteristics of Introduced Cherry Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Bella Marca	Bigarreau Napoleon	Bing	Bolghar	Dirras Italia
Origin	Italy	France	U.S.A	Bulgaria	Italy
Bloom Begin	10Apr.	17Apr.	12Apr.	-	13Apr.
Full Bloom	15Apr.	19Apr.	16Apr.	-	18Apr.
Bloom End	27Apr.	30Apr.	27Apr.	-	30Apr.
Fruit Shape	Cordate	Round	cordate	Round	Cordate
Skin Color	Mahogany	Red	Maroon	Red	Mahogany
Flesh Color	Dark Red	Cream	Pink	Pink	Pink
Fruit Fresh Weight (g)	3.7	3.2	7.1	3.6	6
Flavor	Intermediate	Acid	Intermediate	Acid	Intermediate
Flesh Firmness	Soft	Soft	Firm	Soft	Firm
T.S.S (%)	15.5	14.4	20	11.7	17.4
Yield/ tree (kg)	21		24	-	26

Table 8-2 A Few Commercial Characteristics of Introduced Cherry Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Ferracida	Ferrovia	Lambert	Mikerz	Mont morency
Origin	France	Italy	U.S.A	U.S.A	France
Bloom Begin	11Apr.	14Apr.	14Apr.	14Apr.	17Apr.
Full Bloom	16Apr.	19Apr.	17Apr.	19Apr.	23Apr.
Bloom End	24Apr.	29Apr.	30Apr.	30Apr.	04May
Fruit Shape	Cordate	Cordate	Cordate	Cordate	Round
Skin Color	Mahogany	Mahogany	Mahogany	Red	Red
Flesh Color	Dark Red	Dark Red	Pink	Cream Pink	Cream
Fruit Fresh Weight (g)	6.9	6.5	8	4.1	3.5
Flavor	Sweet	Intermediate	Intermediate	Acid	Acid
Flesh Firmness	Firm	Firm	Firm	Soft	Soft
T.S.S (%)	19.8	16	17	16.4	12.3
Yield/tree (kg)	22	20	20	-	-

Table 8-3 A Few Commercial Characteristics of Introduced Cherry Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Napoleon	Protiva	Victoria
Origin	France	Italy	U.S.A
Bloom Begin	11Apr.	14Apr.	14Apr.
Full Bloom	16Apr.	19Apr.	17Apr.
Bloom End	24Apr.	29Apr.	30Apr.
Fruit Shape	Cordate	Cordate	Cordate
Skin Color	Mahogany	Mahogany	Mahogany
Flesh Color	Dark Red	Dark Red	Pink
Fruit Fresh Weight (g)	6.9	6.5	8
Flavor	Sweet	Intermediate	Intermediate
Flesh Firmness	Firm	Firm	Firm
T.S.S (%)	19.8	16	17
Yield/tree (kg)	22	20	20

Reported in 1997, 8 (1, 8),
Data obtained in 1994-1996

Table 9-1 A Few Commercial Characteristics of Native Cherry Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Abardeh	Arak	Daneshkadeh	Derong hezna	Dirras Daneshkadeh
Bloom Begin	12Apr.	13Apr.	19Apr.	13Apr.	13Apr.
Full Bloom	16Apr.	18Apr.	28Apr.	15Apr.	15Apr.
Bloom End	29Apr.	29Apr.	05May	29Apr.	29Apr.
Height (m)	5.61	5.97	4.80	4.86	4.86
Fruit Shape	Cordate	Round	Cordate	Cordate	Cordate
Skin Color	Orange Red	Orange Red	Cream	Mahogany	Mahogany
Flesh Color	Cream	Cream	Cream	Pink	Pink
Fruit Fresh Weight (g)	6.6	5.4	5.4	8	8
Flavor	Sweet-sour	Sour	Sour	Sweet-sour	Sweet -Sour
Flesh Firmness	Soft	Soft	Soft	Firm	Firm
T.S.S (%)	21.5	17.5		16.7	14.5

Reported in 1997, 8 and 2000 (1, 2, 3, 4, 8),
Data obtained in 1994-1996

Table 9-2 A Few Commercial Characteristics of Native Cherry Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Ghazvin	Ghermez Bagheh No	Ghermez Rezaeieh	Haj Yousefi	Hamadan
Bloom Begin	13Apr.	13Apr.	13Apr.	11Apr.	14Apr.
Full Bloom	18Apr.	18Apr.	-	-	18Apr.
Bloom End	30Apr.	28Apr.	28Apr.	27Apr.	30Apr.
Height (m)	4.93	5.54	5.19	4.70	6
Fruit Shape	Cordate	Cordate	Cordate	Cordate	Round
Skin Color	Light Pink	Cream	Orange Red	Orange Red	Orange Red
Flesh Color	Light Pink	Cream	Cream	Cream	Cream
Fruit Fresh Weight (g)	7	7	8	8	3.4
Flavor	Sweet-sour	Sweet-sour	-	-	Sweet-sour
Flesh Firmness	Firm	Soft	Firm	Soft	Soft
N. of Spurs per shoot (1 m)	-	-	2.66	2.61	-
T.S.S (%)	16.3	18.7	-	17.4	21
Self compatibility	SI	-	-	SI	-

Reported in 1997,8 and 2000 (1, 2, 3, 4, 8),
Data obtained in 1994-1996

Table 9-3 A Few Commercial Characteristics of Native Cherry Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Hybrid No:1 Karaj	Mahali Karaj	Sefid Rezaeieh	Shabestar	Shoaos Saltaneh	Soratieh Lavasan
Bloom Begin	13Apr.	12Apr.	02Apr.	31.03	-	13Apr.
Full Bloom	-	17Apr.	-	05Apr.	-	16Apr.
Bloom End	27Apr.	28Apr.	17Apr.	16Apr.	-	28Apr.
Height (m)	5.22	4.89	-	-	-	4.48
Fruit Shape	Cordate	Round	-	Cordate	Cordate	Cordate
Skin Color	Mahogany	Cream	Cream	Dark Pink	Red Yell.	Orange Red
Flesh Color	Dark Red	Cream		Dark Pink	Cream	Cream
Fruit Fresh Weight (g)	6.2	3.5	7.1	7	3.3	5.4
Flavor		Sweet	-	Sweet-sour	Sweet - sour	Sweet
Flesh Firmness		Soft	-	None	Soft	soft
N. of Spurs per shoot (1 m)		17.17	-	-	-	-
Self compatibility	SC	SC	SC	-	SC	SC
T.S.S (%)		19.7	-	-	-	21.2

Reported in 1997, 8 and 2000 (1, 2, 3, 4, 8),
Data obtained in 1994-1996

Table 9-4 A Few Commercial Characteristics of Native Cherry Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Meshkin Shahr	Mojtahedi	No 28	No 46	Rafat	Sefid Ghermez Baghno
Bloom Begin	14Apr.l	-	13Apr.	-	-	14Apr.
Full Bloom	19Apr.	-	16Apr.	-	-	17Apr.
Bloom End	30Apr.	-	27Apr.	-	-	28Apr.
Height (m)	5.92	-	5.03	-	-	5.24
Fruit Shape	Cordate	Round	Cordate	Cordate	Cordate	Cordate
Skin Color	Dark Red	Cream	Cream	Cream	Cream-yellow	Orange Red
Flesh Color	Dark Red	Cream	Cream	Cream	Cream-yellow	Cream
Fruit Fresh Weight (g)	3.1	3.9	3.9	7.2	6.3	5.6
Flavor	Sweet	Sweet	Sweet	Intermediate	Intermediate	Intermediate
Flesh Firmness	Soft	Soft	Soft	Firm	Soft	Soft
N. of Spurs per shoot (1 m)	15.7	-	-	-	-	19.7
Self compatibility	SC	-	-	-	-	SC
T.S.S (%)						

Reported in 1997, 1998 and 2000 (1, 2, 3, 4, 8),
Data obtained in 1994-1996

Table 9-5 A Few Commercial Characteristics of Cherry Native Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Syahe Daneshkadeh	Syahe Ghazvin	Syahe Mashhad	Syahe Zoodras	Zardeh Daneshkadeh
Bloom Begin	15Apr.	13Apr.	1.25	11Apr.	12Apr.
Full Bloom	25Apr.	17Apr.	1.29	15Apr.	17Apr.
Bloom End	30Apr.	27Apr.	2.1	26Apr.	29Apr.
Height (m)	3.6	4.71	5.02	5.79	5.01
Fruit Shape	Cordate	Cordate	Cordate	Cordate	Cordate
Skin Color	Mahogany	Mahogany	Mahogany	Dark Red	Orange Red
Flesh Color	Pink	Dark Red	Pink	Dark Red	Cream
Fruit Fresh Weight (g)	5.5	4	13	4.4	8.4
Flavor	Sweet	Sweet	Sweet	Sweet	-
Flesh Firmness	Firm	Soft	Firm	Soft	Firm
N. of Spurs per shoot (1 m)	19	22.3	21.8	-	30.1
Self compatibility	SC	-	SC	SC	-
T.S.S (%)	17	14	15.9	21	17.6

Data obtained in 1994-1996 (1, 2, 3, 4, 8)

Table 10-1 A Few Commercial Characteristics of Native Plum Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Baraghan	Dehno	Ghermeze Damavand	Malaier	Rezaiieh	Seif
Bloom Begin	26 .03	29 .03	13 Apr.	31.03	27 .03	13 Apr.
Bloom End	09 May	12 May	21 May	15 May	11 May	21 May
Fruit Fresh Weight (g)	31	42	39	30	23	31
Yield/tree (kg)	80	60	70	70	60	56
Height (m)	5.5	5.5	4.5	5.5	7.5	4.5
Stone	Cling Stone		Free	Cling Stone	Cling Stone	Semicling Stone
Skin Color	Mahogany		Mahogany	yellow	Red	-
T.S.S (%)	17.4		13.4	14.9	12.5	14

printed in 1997 (9), Data obtained in 1983-1993

Table 10-2 A Few Commercial Characteristics of Native Plum Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Santa Rosa	Saadi	Sorkhe Arak	Sultani	Tokhme morghi
Bloom Begin	29.03	26 .03	28 .03	28 .03	12 Apr.
Bloom End	12 May	10 May	10 May	12 May	20 May
Fruit Fresh Weight (g)	56	40	24	40	35
Yield/tree (kg)	60	60	80	60	54
Height (m)	6	5.5	5.5	6	5.5
Stone /Flesh Freeness	Cling Stone	Cling Stone	Cling Stone	Cling Stone	Free
Skin Color	Mahogany	Red	Mahogany	Red	-
T.S.S (%)	10.6	11.8	13.4	13.7	13.8

printed in 1997 (9), Data obtained in 1983-1993

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Table 11-1 A Few Phenological and Pomological Characteristics of Introduced Walnut Cultivars Grown In Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Chandler	Franquette	Hartley	Lara
Origin	California	France	California	France
Leafing Date	1/24	1/29	1/24	1/26
Susceptibility to Frost	Low	High	Medium	Medium
Pistillate Flowering-Beginning	2/2	2/4	2/3	2/6
Pistillate Flowering-End	2/13	2/19	2/6	2/12
Pollen Shedding-Beginning	1/27	2/2	1/27	1/28
Pollen Shedding-End	2/2	2/10	2/7	2/8
Kernel Color	Bright	Bright	Bright	Bright Amber
Kernel (%)	43	34	38	44
Oil (%)	66	66	65	66
Protein (%)	18	17	22	17

Table 11-2 A Few Phenological and Pomological Characteristics of Introduced Walnut Cultivars Grown In Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Pedro	Ronde de Montignac	Serr	Vina
Origin	California	France	California	California
Leafing Date	1/23	1/28	1/19	1/26
Susceptibility to Frost	Low	Medium	High	Very High
Pistillate Flowering-Beginning	2/2	2/3	1/29	2/3
Pistillate Flowering-End	2/12	2/12	2/8	2/13
Pollen Shedding-Beginning	1/27	2/16	1/23	1/27
Pollen Shedding - End	2/1	2/16	1/29	2/2
Kernel Color	Bright Amber	Bright	Bright	Bright
Kernel (%)	44	46	57	46
Oil (%)	66	69	70	68
Protein (%)	17	17	19	19

Data obtained in 2004 (1, 2, 4)
By: Atefi J., Haghjooyan R. and D. Hassani

Table 12-1 A Few Phenological and Pomological Characteristics of Native Selected Genotypes Grown In Kamalabad (Karaj) Pedoclimatical Conditions.

Promising Cultivar	B 21	K 72	Z 30	Z 53
Origin	Karaj	Karaj	Karaj	Karaj
Leafing Date	1/13	1/16	1/15	1/10
Susceptibility to Frost	High	-	Low	Low
Pistillate Flowering-Beginning	1/27	1/30	1/23	1/30
Pistillate Flowering-End	2/6	2/7	2/5	2/7
Pollen Shedding-Beginning	1/27	1/27	1/31	1/25
Pollen Shedding-End	2/4	2/1	2/7	2/1
Kernel Color	Bright	Bright Amber	Bright	Bright Amber
Kernel (%)	55	52	52	54
Oil (%)	62	69	68	66
Protein (%)	17	16	15	13

Table 12-2 A Few Phenological and Pomological Characteristics of Native Selected Genotypes Grown In Kamalabad (Karaj) Pedoclimatical Conditions.

Promising Cultivar	Z 60	Z 63	Z 67
Origin	Karaj	Karaj	Karaj
Leafing Date	1/13	1/18	1/15
Susceptibility to Frost	Low	Low	High
Pistillate Flowering-Beginning	1/27	1/29	1/29
Pistillate Flowering-End	2/6	2/8	2/8
Pollen Shedding-Beginning	1/25	1/24	1/26
Pollen Shedding-End	2/1	1/31	2/31
Kernel Color	Bright	Bright	Dark Amber
Kernel (%)	48	47	49
Oil (%)	65	69	69
Protein (%)	17	14	15

Data obtained in 2001-2005 (1, 2, 4)
By: J. Atefi, R. Haghjooyan and D. Hassani.

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Almond germplasm of Iran

Table 13-1 A Few Commercial Characteristics of Native Almond Cultivars Grown In Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Azar	Sahand	Sharood 12	Sharood 15	Sharood 16
Pollinizer	Fragnnes , Nonpariel	Nonpariel , Ne Plus Ultra	Super Nova, Genco	Falsa Barese , Super Nova	-
Fertile type	SI	SI	SI	SI	SI
Blooming	Very late	Very late	Very late	Medium -Late	Very late
Fruit Ripening	Medium	Medium	Medium -Late	Medium	Medium - Late
Shell type	Semi hard	Hard	Semi hard	Paper	Soft
Bearing Habit	Mixed	Spur	Spur	Mixed	Mixed
Double kernel (%)	1-5	12-20	0-2	5-8	5-8
Kernel rate (%)	37-40	25-30	35-40	55-60	40-45
Kernel Taste	Medium	Good	Good	Medium	Medium
Kernel color	Light brown	Brown	Light brown	Light yellow	Light yellow
Yield	High	High	High	Medium	Medium

Table 13-2 A Few Commercial Characteristics of Native Almond Cultivars Grown In Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Sharood 17	Sharood 18	Sharood 21	Shekofeh
Pollinizer	Flep Ceo, Genco	Tuono,Super Nova	Tuono, Genco	Fragnnes, Ne Plus Ultra
Self compatibility	SI	SI	SI	SI
Blooming	Medium - Late	Medium - Late	Late	Very late
Fruit Ripening	Medium - Late	Medium	Medium	Early
Shell type	Paper	Paper	Soft	Paper
Bearing Habit	Mixed	Mixed	Spur	Mixed
Double kernel (%)	10-12	3-5	5-10	5-10
Kernel rate (%)	55-60	60-65	45-50	55-60
Kernel Taste	Good	Medium	Good	Excellent
Kernel color	Light yellow	Light yellow	Light brown	Light brown
Yield	Medium	Medium	High	High

Data obtained in 1992 -1996 (1)

Table 14-1 A Few Commercial Characteristics of Introduced Almond Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Falsa Barese	Flep Ceo	Fragiolu	Fragnes	Genco
Origin	Italy	Italy	Italy	France	Italy
Pollinizer	Falsa Barese	Flep Ceo	Falsa Barese	Tuono, Nonpariel	Genco
Fertile type	SC	SC	SC	SI	SC
Blooming	Medium -Late	Medium -Late	Medium - Late	Very late	Medium - Late
Fruit Ripening	Medium -Late	Medium -Late	Medium	Medium - Late	Medium - Late
Shell type	Hard	Hard	Hard	Semi hard	Hard
Bearing Habit	Mixed	Spur	Mixed	Spur	Mixed
Double kernel (%)	10-18	10-15	10-15	0-2	12-14
Kernel rate (%)	22-25	25-28	23-26	40-45	20-25
Kernel Taste	Good	Medium	Medium	Good	Medium
Kernel color	Light brown	Light brown	Light brown	Light brown	Light brown
Yield	Medium -High	High	Medium-High	High	Medium-High

Table 14-2 A Few Commercial Characteristics of Introduced Almond Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Marcona	Ne Plus Ultra	Nonpariel	Supernova	Tuono
Origin	Spain	U.S.A.	U.S.A.	Italy	Italy
Pollinizer	Ne Plus Ultra, Genco	Nonpariel, Genco	Ne Plus Ultra , Fragnnes ,Tuono	Super Nova	Tuono
Fertile type	Self Incomp.	Self Incomp.	Self Incomp.	Self Compat.	Self Compat.
Blooming	Early	Very late	Very late	Late	Very late
Fruit Ripening	Medium -Late	Medium	Medium	Medium – Late	Medium - Late
Shell type	Hard	Soft	Paper	Hard	Hard
Bearing Habit	Mixed	Mixed	Mixed	Spur	Spur
Double kernel (%)	5-10	10-12	1-5	15-20	20-30
Kernel rate (%)	25-30	45-50	60-70	27-32	30-35
Kernel Taste	Good	Medium	Excellent	Good	Good
Kernel color	Light brown	Light brown	Light yellow	Light brown	Light brown
Yield	High	High	High	High	High

Data obtained in 1992 -1996 (1)
By: A. Imani

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بشعيلة

Table 15-1 A Few Phenological Morphlogical and Pomological Characteristics of Native and Introduced Hazelnut Cultivars Grown In Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Fertile de Coutard	Gerecheh	Gherdoei	Negeret	Paeizeh
Origin	France	Iran	Iran	France	Iran
Blooming Begin	15/11	20/11	10/11	20/11	5/11
Blooming End	10/12	15/12	15/12	10/12	10/12
Harvest Time	6/1	5/15	6/25	6/1	6/25
Flowering type	Protogyny	Protandry	Homogamy	Protogyny	Protogyny
Weight (g)	9/11	1/7	2/2	8/51	2/1
Length (mm)	22	16	15	17	15
Diameter (mm)	18	17	16	15	17
Shell Weight (g)	1/3	1	1/2	0/83	1
Kernel Weight (g)	1/1	0/70	1	0/75	1/1
Nut / glum	5/55	8/58	5/54	2/51	6/67
Kernel Nut / fruit	5/44	2/41	5/45	8/48	4/52
Oil Percent	64	65/15	62	64/4	64/19
Protein Percent	14	13/47	15/10	15/40	13/83
Yield (t/ha)	1.4	1.0	0.8	1.2	0.8

Table 15-2 A Few Phenological Morphlogical and Pomological Characteristics of Native and Introduced Hazelnut Cultivars Grown In Kamalabad (Karaj) Pedoclimatical Conditions.

Cultivar / Characteristics	Pashmineh	Rasmi	Rond du Piemount	Shastac 2
Origin	Iran	Iran	France	Iran
Blooming Begin	15/11	08/11	12/11	20/11
Blooming End	15/12	15/12	09/12	15/12
Harvest Time	6/25	5/15	5/15	6/25
Flowering type	Homogamy	Protandry	Protogyny	Homogamy
Weight (g)	1/6	1/7	4/45	1/8
Length (mm)	13	16	18	18
Diameter (mm)	14	17	16	16
Shell Weight (g)	0/83	1	1	1
Kernel Weight (g)	0/72	0/70	1/2	0/78
Nut fruit glum	2/51	8/58	6/67	5/55
Kernel Nut fruit	8/48	2/41	4/52	5/44
Oil Percent	69/03	65/15	67/1	63/51
Protein Percent	13/35	13/47	13/74	14/78
Yield (t/ha)	0.8	1.0	0.9	1.2

Data obtained in 2000 -2003 (1)

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Table 16-1 A Few Phenological and Pomological Characteristics of Introduced Strawberry Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions

Cultivar / Characteristics	Aliso	Black more	Chandler	Catskill	Fresno
Origin	USA	USA	USA	USA	USA
Yield per plant (g)	98.41	42.86	69.55	77.20	58Aug.
Blooming (Full Bloom)	March (20-30)	March (20-30)	April (1-10)	March (20-30)	March (20-30)
Period of fruit ripening	17May-4 June	17-30 May	17-30 May	17-30May	17-30May
Berry's No per cluster	5	5	6	8	5
Berry's Weight (g)	9.6	3.6	4.0	3.8	5.6
Berry's color	Orange-Red	Orange	Orange-Red	Orange-Red	Orange-Red
Size Uniformity	Low	High	Low	Low	Middle
Growth habit	erect	prostrate	prostrate	interme diate	interme diate
Vigor	Medium -week	Medium -week	week	Medium -strong	strong
Fruit shape	conic	Globose -conic	conic	conic	conic
Achene's Color	yellow	yellow	yellow	-	yellow
Flesh color	Light red	white	white	-	Orange-red

Data obtained in 2003 -2004 (1,2)

Table 16-2 A Few Phenological and Pomological Characteristics of Introduced Strawberry Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions

Cultivar / Characteristics	Kordestan	Mc. Donance	Missionary	Sequoia
Origin	IRN	-	USA	USA
Yield per plant (g)	102.96	172Oct.	58.61	96.51
Blooming (Full Bloom)	April (1-10)	April (1-10)	April (10-20)	March (20-30)
Period of fruit ripening	10-30 May	17-30 May	23-30 May	14-30 May
Berry's N. per cluster	6	10	5	4
Berry's Weight (g)	4.4	7.1	5.3	8.0
Berry's color	Red	Red	Red	Orange-Red
Size Uniformity	Middle	Middle	Low	Low
Growth habit	intermediate	prostrate	prostrate	intermediate
Vigor	medium	week	medium	strong
Fruit shape	Long conic	oblate	Globose -conic	Globose -wedged
Achene's Color	Brownish yellow	green	yellow	
Flesh color	Orange-red	Orange-red	pink	orange

Table 16-3 A Few Phenological and Pomological Characteristics of Introduced Strawberry Cultivars Adapted To Kamalabad (Karaj) Pedoclimatical Conditions

Cultivar / Characteristics	SP 1	Tennesee Beauty	Tioga	Yalova
Origin	-	USA	-	TUR
Yield per plant (g)	75.20	89.35	113Jul.	132.95
Blooming (Full Bloom)	April (1-10)	March (20-30)	April (15-22)	April (1-10)
Period of fruit Ripening	10-23 May	17-30May	17 May-4 June	17-30 May
Berry's No per cluster	7	8	10	10
Berry's Weight (g)	3.6	5.3	4.0	7.4
Berry's color	Red	Orange-Red	Red	Red
Size Uniformity	Low	Low	Middle	High
Growth habit	prostrate	prostrate	intermediate	intermediate
Vigor	strong	medium	strong	strong
Fruit shape	conic	Long conic	Bi-conic	conic
Achene's Color	red	red	yellow	red
Flesh color	red	-	orange	Orange-red

Data obtained in 2003 -2004 (1, 2)

By: Rahim G.S. Bayat

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