

MANUAL FOR GROWING SUBTROPICAL FRUIT TREES



**MINISTRY OF AGRICULTURE AND ENVIRONMENTAL
PROTECTION OF TURKMENISTAN**

**TURKMEN AGRICULTURAL UNIVERSITY NAMED AFTER
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TURKMEN AGRICULTURAL INSTITUTE

AGRICULTURAL RESEARCH AND PRODUCTION CENTER

**MANUAL FOR GROWING SUBTROPICAL
FRUIT TREES**

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The manual describes the terms and rules, characteristics of agro technical measures for the development of subtropical trees in various soil and climatic conditions of the country and pictures of subtropical trees used in production.

The manual is published for agricultural specialists, private landlords, tenants, teachers and students of higher educational institutions.

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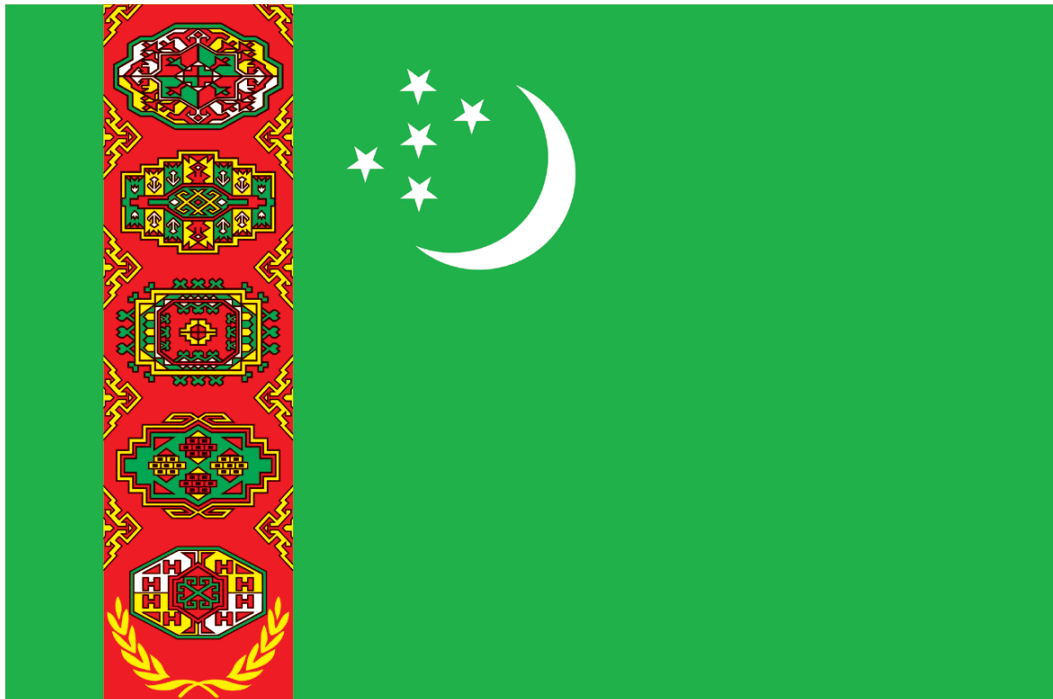
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**PRESIDENT OF TURKMENISTAN
GURBANGULY BERDIMUHAMEDOV**



THE STATE EMBLEM OF TURKMENISTAN



THE STATE FLAG OF TURKMENISTAN

THE STATE ANTHEM OF TURKMENISTAN

I am ready to give life for native hearth,
The spirit of ancestors descendants
are famous for.
My land is sacred. My flag flies in the world
A symbol of the great neutral country flies.

Refrain:

The great creation of people,
Native land, sovereign state,
Turkmenistan, light and song of soul,
Long live and prosper for ever and ever!

My nation is united and is veins of tribes
Ancestor's blood, undying flows,
Storms and misfortunes of times are
not dreadful for us,
Let us increase fame and honour!

Refrain:

The great creation of people,
Native land, sovereign state,
Turkmenistan, light and song of soul,
Long live and prosper for ever and ever!

INTRODUCTION

During the period of prosperity of our sovereign state, under the leadership of the esteemed President, large-scale work is being carried out in our country to improve the standard of living of our people, create a stable food abundance and provide our people with a sufficient amount of food.

To ensure the food security of our country, it is important to increase the area of orchards, including subtropical ones, and to increase their productivity.

In Turkmenistan, dates, pomegranates, figs and olives are mainly grown from subtropical trees. The fruits of subtropical gardens are distinguished by the fact that they contain a large amount of substances useful for human health - carbohydrates, organic acids, physiologically active substances, vitamins, micro and macro elements.

For example, dates are sweet and very nutritious. Fresh dates contain 13-27% sugar (glucose and fructose), various vitamins (P-0.04 mg /%, C-87.5 mg /%, carotene 6.3 mg /%) and potassium, calcium and iron. Contains organic iodine compounds. It is widely used in the treatment of diarrhea and duodenal ulcers.

Pomegranate juice contains 12-19% sugar, 0.3-3.0% organic acids and several useful physiologically active substances (ascorbic acid - 5-12 mg /%, folic acid 0.04-0.08 mg /%, P - contains active catechins and leucanthocyanins (26). -46 mg /%). The presence of such substances in the composition allows the use of pomegranate fruits for medicinal purposes. Pomegranate juice lowers fever, regulates digestion and is effective in treating asthma, high blood pressure and cardiovascular diseases.

Figs differ from other fruits in that they are high in sugar. Its dried fruits contain up to 70% sugar. Its fruits also contain up to 3% minerals, which is 2-4 times more than other fruits. Fig fruits are rich in vitamins A and B. When eaten fresh and dried, figs regulate digestion and quickly restore the strength of the human body. Figs have medicinal properties. It is widely used in folk medicine to treat diarrhea, diseases of the gastrointestinal tract, throat, liver and kidneys.

Olives are rich in fats, proteins, sugar, pectins and vitamins (B, C, P). It also contains calcium, phosphorus and iron salts. It is a valuable product because it produces good quality olive oil. Fruits are oily,

fleshy, contain 20-25 (60)% fat. Olive oil is widely used in the canning industry, perfumery, cooking and medicine. Compared to other fats, it is completely absorbed by the human body (98%) and has a positive effect on the liver and digestive organs. High-calorie salty foods are prepared from its fruits.

As you know, on November 21, 2019, at a working meeting with the leaders of the agro-industrial complex of Turkmenistan, the President set a top priority to scientifically substantiate the cultivation of subtropical trees in the country and increase the production of subtropical fruits.

In this regard, at present, thanks to the efforts of the President, appropriate work is being carried out in our country to scientifically improve the cultivation of subtropical gardens and introduce new varieties of them, such as oranges, tangerines and kiwi. In the regions of the country, appropriate work is underway to allocate land plots to farmers and entrepreneurs for the cultivation of subtropical trees.

The manual describes the characteristics of the main varieties of subtropical orchards (dates, pomegranates, figs and olives) grown in our country, botanical and biological characteristics, agro technical measures for their cultivation, their duration and information on countermeasures.

VARIETIES OF SUBTROPICAL TREE

Characteristics of date varieties

(Türkmen perwaýysy) The Turkmen variety of dates was created at the Research and Production Experimental Center "Magtymguly" of the Turkmen Agricultural University named after S.A. Niyazov. The tree is tall, with maternal and paternal flowers collected on the same tree. A medium-sized fruit weighs an average of 150 grams. Refers to varietal species. Pollinated fruits are red, non-pollinated fruits are light in color and contain 8 seeds. Germination period is 188-204 days. The fruits of this variety ripen in late September - early October. Palms that bear fruit for 9-10 years can produce up to 12-17 kg of fruit per year. The fruits remain intact for 40-50 days and are considered suitable for long-distance transportation. This variety is also used as a good pollinator.

Pollinators: Garrygala pollinator.

Garrygala-5 variety was created at the "Magtymguly" Research and Production Experimental Center of the Turkmen Agricultural University named after S. A. Niyazov. This tree belongs to tall, unchanging species. This variety is monoecious, capable of providing pollination with paternal flowers annually. After a year, it gives a good harvest. The fruit weighs 130-150 grams, light in color, juicy, unripe sour, after full ripening has a very pleasant taste. It contains up to 20% sugar. The fruit is 8-10 cells, the seeds are large. Germination period 196-212 days. The fruits ripen at the end of September. 9-10-year-old trees bear up to 12 kg of fruit per year. The fruits remain intact for 30-40 days and are considered suitable for long-distance transportation. It is considered a very good cultivar as a pollinator.

Turkmen hurmasy. The Turkmen variety of dates was created at the scientific and production experimental center Magtymguly of the Turkmen Agricultural University named after S. A. Niyazov. The tree belongs to tall, monoecious, medium-sized, variable varieties. The fruit is round and dense, weighing 200-250 grams.

The pollinated fruits are orange-yellow in color, semi-succulent, very tasty. It contains up to 20% sugar (Fig. 1).

The fruits are lighter in color, more juicy, sour in taste and are suitable for full ripening. Fruit of 9-10 seeds. The growth period is 195-212 days.



Figure 1. Turkmen hurmasy variety

The fruits ripen at the end of September. A 10-year-old tree can produce up to 20-25 kg. in year. The fruits are kept intact for two months and are considered suitable for long-distance transport.

Gyzyl mive. It is widely cultivated in Turkmenistan. It has a highly proliferating, wide-branched appearance. It has a long, dark brown stem and a pale gray bark. The leaves are 17 cm long and 9 cm wide (Fig. 2).



Figure 2. Date variety Gyzyl mive

It has many branches with a protective layer, and grows well. Among the fruits, seeds are rare. The sugar content in fruits is 19.9%, acidity is 0.11-0.14%. They eat fresh fruit. The fruits ripen on October 26-30. Unripe fruits are dark brown in color. The yield of this variety is 120-150 kg per tree, it is a heat-resistant and frost-resistant variety. 20-30 days after harvest, the fruits soften and turn into a sweet, aromatic fruit. The fruits are long lasting and are considered suitable for long distance transport.

Pollinators: Turkmen pervaiysy variety.

Hasylyly. The tree is 8-10 meters tall, with dense foliage. The bark of the main branches and columns is gray (Figure 3).

This palm species has only mother flowers. The fruits are round, large. Fruits are 6-8 cm long and 8 cm wide, weigh an average of 150-200 gr, about 400 gr. The bark of the fruit is light yellow, hard. The fruit thread is thick. The taste of the fruits formed from the pollinated flowers is also sweet, even before they are fully ripe. When the fruit pulp is fully ripe, it softens and turns dark yellow. The bark of the fruit is thin, with a sugar content in the fully ripe fruit of 13.5% and an acidity of 0.13-0.16%. The crop is harvested from October 25 to November 15. Mature fruit trees bear up to 80-100 kg of fruit. The fruits are kept intact for two months and are considered suitable for long-distance transport. They eat fresh fruit. The date palm is also made from them.

Pollinators: Sary Zenji variety.



Figure 3. Hasylyly variety of date

Sary Zenji date variety. The tree is medium in size, elongated in shape, with thick, flat, elongated leaves. The pillar of the tree is gray. This variety of dates has paternal and maternal flowers. Paternal flowers bloom for 20 days, and maternal flowers bloom for 7-10 days (Figure 4).

The variety of dates Sary zenji is characterized by cold resistance up to -200C. The fruits are round, elongated, weighing 100-120 g, the bark of the fruits is red, the pulp is dense, brownish-black or close to black. Fruit of 7-8 seeds. The fruit can be eaten before it is fully ripe. Long-term storage reduces the sugar content of fruits. When fully ripe, the sugar content is 12-17.5%, the acidity is 0.13-0.15%.



Figure 4. Sary zenji date variety

The fruits ripen on October 10-15. Productivity from a fruiting tree is 50-60 kg. The fruits are kept intact for two months and are suitable for long-distance transportation. Fruits are eaten fresh and made into confectionery. Pollinators: Turkmen pervaiysy dates.

Characteristics of pomegranate varieties

Garrygala-1 variety. Garrygala-1 pomegranate variety was created at the Scientific and Production Experimental Center "Magtymguly" of the Turkmen Agricultural University named after S.A. Niyazov (Fig. 5).

A 10-year-old tree of this variety reaches a height of 2-8 m and a size of up to 3 m. This variety is moderately cold resistant.

The fruit weighs 390 g. The outer bark of the fruit is of medium thickness, yellow in color, the cover is light red, with lines. Under the influence of sunlight, the bark turns red and cracks, but the fruits are not severely damaged. Severely damaged by pests and diseases.

The grain is medium in size, light red in color, sweet, with an average weight of 416 mg per 1 g. and 2.03 gr. for 100 seeds. It contains 31.9% water, 17.10% dry matter, 14.20% sugar, 1.24% organic acids.



Figure 5. Garrygala-1 pomegranate variety

The fruits ripen by the end of September. Each tree in the garden, between the ages of 25 and 26, bears 17 kg of fruit. The fruit has a shelf life of up to 4 months and is considered suitable for long distance transport. Pollinators: Garrygala-2 variety.

Garrygala-2 variety. Garrygala - 2 pomegranate variety was created in the research and production experimental center Magtymguly of the Turkmen Agricultural University named after S. A. Niyazov.

A 10-year-old tree of this variety has a height of 2-8 meters and a size of 2.7 meters. This variety is frost-resistant. Fruit bark cracking is moderate and not strongly affected by sunlight. The average consumption of marketable fruits is 46%, and at a high level - 76%.

The fruits are not damaged by the sun's rays, but are severely damaged by pests. Cracking of the outer shell of the fruit is medium. The average fruit weight is 220 grams, while the older ones are 420 grams. The appearance of the fruit is 4.5 points and the taste is 4.4 points. The outer shell is of medium thickness, dark red. The grains are large, dark red, sweet and sour, weighing 460 mg, 100 seeds weighing 1.89 grams, hardness 3.4 points. It contains up to 55.1% water, 18-26% dry matter and 13.48% sugar. Acidity 1.17%, ascorbic acid 13.89 mg per 100 grams of fruit. The fruits ripen by the end of September - beginning of October. Each 6-10 year old tree weighs 7 to 19 kg of fruit. The fruit has a shelf life of up to 6 months and is considered a suitable variety for long distance transportation.

Pollinators: Garrygala-1 variety.

Garakel variety. The Garakel pomegranate variety was created at the Magtymguly Research and Production Experimental Center of the Turkmen Agricultural University named after S. A. Niyazov. The ten-year-old tree is 3 meters high and 2.7 meters in size. This variety is moderately cold resistant. Fruit weight is 394 grams. The appearance of the fruit is 3.0 points and the taste is 3.1 points. The outer shell is thin, light yellow in color, the coating is red, everything is completely reticulated. The bark of the fruit cracks and sunlight has little effect on the fruit. The fruits are heavily contaminated with pests. Grains are medium in size, light red, sweet in taste, weighing 356 mg per grain and 2.30 grams per 100 seeds. It contains up to 44.9% water, 20% dry matter, 17.51% sugar. 0.64% acidity and 8.45 mg of ascorbic acid per 100 g of fruit. The fruits ripen by the end of September - beginning of October. Up to 13 kg of fruits are harvested from each 7-year-old tree. The fruits can be stored for up to 3 months and are considered suitable for long distance transport.

Pollinators: Garrygala-1 variety.

Gulgune yumshak chigitli (Pink with soft seeds). The soft-flowered pomegranate variety of pomegranate was created in the scientific and production experimental Magtymguly center of the Turkmen Agricultural University named after S. A. Niyazov. The ten-year-old tree is 2-7 meters high and 2.7 meters in size. This variety is cold resistant. The average yield of the marketable fruit is 74%, and the high level is 85%. The outer bark of the fruit is less cracked. The fruit weighs an average of 294 grams, while the larger ones weigh 339 grams. The appearance of the fruit is 3.4 points and the taste is 4.0

points. The outer shell is of medium thickness, light yellow in color, and the cover is pink, reticulate. Resistant to sunlight. It is considered to be moderately resistant to pests. Grains of medium size, light red, sweet and sour, with a grain mass of 336 mg, a grain size of 100 seeds, a mass of 0.87 g, a hardness of 4.0 points. It contains up to 44.7%, 17-70% dry matter and up to 15.08% sugar. It contains 1.94% acidity and 17.72 mg of ascorbic acid per 100 grams of fruit.

Variety Nohur. The Nohur pomegranate variety was created in the Bakharly district of the Akhal region. The ten-year-old tree is 2.9 meters high and 3.4 meters in size. This variety is moderately cold resistant. Each 22-year-old tree produces 16 kg of fruit. Fruit weight - 400 grams. The appearance of the fruit is 4.0 points and the taste is 3.8 points. The outer shell is thick, the color is light yellow, the coating is red, reticulate. The fruits are severely damaged by pests. The bark of the fruit cracks, and sunlight has a certain detrimental effect on the fruit.

The grains are medium in size, pink in color, sweet in taste, weighing 498 mg per grain and 2.26 grams per 100 seeds. Hardness indicator - 2.9 points. It contains 42.1% water, 17.5-0% dry matter and 14-14% sugar. It contains 0.40% acidity and 12.98 mg of ascorbic acid per 100 grams of fruit. The fruits ripen at the end of September. It can be get 15 kg of fruit from a 10 year old tree. The fruits can be stored for up to 3 months. It is considered suitable for long distance transportation. The fruits ripen by the end of September - beginning of October. You can get 13 kg of fruit from a 7-year-old tree. The fruits can be stored for 3-4 months and are considered suitable for long distance transport.

Pollinators: variety Karakel.

Irki shirin (Early sweet). This variety of pomegranate was created at the Magtymguly Research and Production Experimental Center of the Turkmen Agricultural University named after S. A. Niyazov. The ten-year-old tree is 2.6 meters high and 2.5 meters in size. This variety is cold resistant. The average consumption of marketable fruits ranges from 59% to 81%. The fruit weighs an average of 280 gram-s, and the largest weighs 370 grams. Fruit appearance - 4.6 points, taste - 4.5 points. The outer shell is thin, dark red in color. Moderately resistant to pests. It is resistant to sunlight. The outer bark of the fruit is less cracked. The grains are medium in size, dark red and red in color, sweet and sour taste. 1 grain weighs

424 mg, 100 seeds - 1.16 grams, hardness - 4.8 points. It contains up to 55.1% water, 23.80% dry matter and 18.28% sugar. Acidity 1.24%, ascorbic acid 15.11 mg per 100 grams of fruit. The fruits ripen by the end of September - early October, 32 kg of fruit are harvested from a 7-year-old tree. The fruits can be stored for up to 5 months. It is considered suitable for long distance transportation.

Pollinators: variety Karakel.

Gara bagul (Black Rose) pomegranate variety was created at the Magtymguly Research and Production Experimental Center of the Turkmen Agricultural University named after S. A. Niyazov. The ten-year-old tree is 3.5 meters high and 3.5 meters in size. This variety is moderately cold resistant. Average consumption of marketable fruit ranges from 33% to 40%. The average weight of the fruits is 195 grams, the older ones are 490 grams. Fruit appearance - 4.1 points, taste - 4.0 points. The outer shell is thicker and dark red in color. Not resistant to pests. The fruit is less exposed to sunlight. The outer bark of the fruit is slightly cracked. The grains are large, dark red, sweet and sour taste, the weight of 1 grain is 441 mg, the weight of 100 seeds is 2.39 grams, the hardness is 2.4 points. It contains up to 41% water, 21.23% dry matter and 13.46% sugar. It contains 2.66% acidity and 19.02 mg of ascorbic acid per 100 grams of fruit. The fruits ripen in September. From a 6-10 year old tree, 14-41 kilograms can be harvested. The fruits can be stored for up to 4 months. Suitable for long distance transport.

Pollinators: Gulgune variety with soft seeds.

Gulgune. Pomegranate variety was created at the Magtymguly Research and Production Experimental Center of the Turkmen Agricultural University named after S. A. Niyazov. The ten-year-old tree is 3 meters high and 3 meters in size. The variety is frost-resistant, high-yielding (Fig. 6).

The fruit weighs from 211-250 grams to 480 grams.

The appearance of the fruit is 4.6 points, the taste is 4.0 points, the bark of the fruit is thick, dark red. The seeds are large, red, and sour in taste. 100 seeds weigh 2.19 grams and have a hardness of 2.6 points. It contains up to 42.4% water, 19.30% dry matter and 15.60% sugar. Acidity 1.17%, ascorbic acid 13.00 mg per 100 grams of fruit. Not resistant to pests and sunlight. The fruits ripen in September. Fruit trees at the age of 6-10 years give an average of 8 to 30 kg. The fruits

can be stored for up to 6 months. It is considered suitable for long distance transportation. Pollinators: variety Garakel.



Figure 6. Gulgune pomegranate variety

Turkmen pomegranate. It was created at the Magtymguly Research and Production Experimental Center of the Turkmen Agricultural University named after S. A. Niyazov.

A ten-year-old tree is 3 meters high and up to 3-7 meters in size. Cold-resistant grade. The maximum fetal weight is 800 grams (Figure 7). The appearance of the fruit is 4.4 points and the taste is 4.6 points. The outer shell of the fruit is thick, light yellow in color. The seeds are large, dark red, sweet and sour in taste. 100 seeds weigh 2.36 grams and have a hardness of 2.8 points. It contains up to 37% water, 19.82% dry matter and 14.80% sugar. It contains 1.19% acidity and 10.69 mg of ascorbic acid per 100 grams of fruit. The fruits are stored for up to 6 months. Not resistant to pests and sunlight.

The fruits ripen in late September - early October. On average, 7-18 kg of fruit is harvested from a 6-10-year-old fruit tree. The yield of the plant increases over the years. A 27-year-old tree can harvest 50 kg of fruit. The fruits can be stored for up to 5 months and are convenient for long-distance transportation.

Pollinators: variety Garakel.



Figure 7. Turkmen variety of pomegranate

Gyrmyzy gabyk (*Pomegranate variety with raspberry peel*). A ten-year-old tree is 3-7 meters high and up to 2-3 meters in size. Average frost resistance of the variety. The fruit weighs 192 to 470 grams (Fig. 8).



Figure 8. Pomegranate variety with raspberry peel

The appearance of the fruit is 4.3 points and the taste is 4.8 points. The outer bark of the fruit is thin, light yellow in color. Seeds are large, red in color, sweet and sour taste. 100 seeds weigh 2.04 grams and have a hardness of 2.2 points. It contains up to 40.2% water, 19.52% dry matter and 16.50% sugar. 1.37% acidity, 7.87 mg of ascorbic acid per 100 grams of fruit. The fruits can be stored for up to 5 months. The fruit is resistant to pests and sunlight. The fruits ripen in late September - early October. From a 6-10-year-old tree, you can harvest from 7 to 28-29 kg. The fruits are considered suitable for storage up to 4-5 months and are suitable for long distance transportation.

Pollinators: variety Garakel.

Achyk dane (Open grain). The ten-year-old tree is 2.7 meters high and up to 2.7 meters in size. Cold-resistant grade. The maximum fruit weight is 710 grams (Figure 9).



Figure 9 Achyk dane variety Pomegranate

Fruit appearance - 3.1 points, taste - 3.5 points. The outer bark of the fruit is thick, light yellow in color. The seeds are medium in size, dark red in color and have a sour taste. 100 seeds weigh 2.09 grams and have a hardness of 2.1 points. It contains up to 44.2% water, 19.9% dry matter and 16.88% sugar. It contains 0.82% acidity and 10.33 mg of ascorbic acid per 100 grams of fruit. The fruit is resistant to pests and sunlight.

The fruits ripen in late September - early October. 10-year-old fruit trees yield 10 kg, while 27-year-old fruit trees weigh 27-28 kg. The fruits are stored for up to 4 months. It is considered a suitable variety for long-distance transport of fruits.

Pollinators: A variety of pomegranate *Gyrmyzy gabyk*.

Characteristics of fig varieties

Ak mengiz. It grows in a highly developed form of shrubs, the stems are thick, long, green-brown in color. The leaves are large, five-pointed, the petals are short. The fruit is large, round pear-shaped, weighing 4x5 cm, weighing 40-60 grams. When the fruit is fully ripe, it turns greenish yellow. The bark of figs is thin, and when fully ripe, it divides into vertical and transverse cracks. The appearance is bluish in color, the taste is sweet. High quality figs can be obtained from this tree. Consumption of figs saves 30-35%, in dried form 76.6% of sugar and 0.84% of acid. The fruit is eaten fresh and prepared for drying (fig. 10). The fruits begin to ripen on August 10-15 and end on October 15. The yield ranges from 20-25 kg to 35-40 kg.



Figure 10 Fig variety Ak mengiz

Fruits are stored for a short time and are convenient for transportation over short distances.

Pollinators: self-pollinating.

Gadyrly. This fig variety was created in the Republic of Uzbekistan. The variety has a highly growing, dense foliage. The pillar is gray, the stems are yellow, dark brown for 1-2 years. Leaves are simple, with 3-5 palms (Fig. 11).



Figure 11. Gadyrly fig variety

The fruit weighs 30-40 grams with a rounded pear-shaped slightly ribbed edge. The bark is greenish-yellow with a grayish tint. Fleshy with few small seeds. It contains 23-24% sugar and 0.1% organic acids. Figs contain 30%, and sugar 70-75%. The fruits of this fig tree begin to ripen from July 24-26 and are harvested until August 20. At harvest, 25-50 kg of ripe fruits can be harvested. Fruit storage is short-lived and suitable for long distance transportation. Figs are eaten fresh, they make jam.

Pollinators: self-pollinating.

Gok gabyk. The tree has medium, slightly branched, sparse leaves. The leaves have 5-6 claws, and the branches are thinner than the rest. The fruits are large, slender, pear-shaped, 4x6 cm in size, weighing an average of 50-80 grams. The fruit is green and turns yellow when fully ripe. The bark is soft, thin, and the bark is illuminated by sunlight. The pulp is dark, yellow in color, contains a large amount of sugar. The fruit is fragrant, strongly burned under the influence of the sun. Dried sweets contain 59-62% and in ripe form 20-23% sugar. Fruit consumption - 28-29%. The fruits ripen from

July 12-15 and continue to ripen until the end of October. The yield of 1 base is 22-25 kilograms (Figure 12).



Figure 12. Gokgabyk fig variety

Fruit storage and suitability for long distance transport are moderate. The fruits of this fig tree are eaten fresh, and jam is made.

Pollinators: self-pollinating.

Melevshe. The tree of this variety has medium-sized, branched, dense leaves. Figs are considered to be an early maturing variety.

The fruit is medium in size, sometimes small, the weight of the fruit is 28-30 grams, pear-shaped, veins with lobules are visible inside. The bark of the fruit is thin, the stone is covered with fruit dust, it is dark blue, the fruit pulp is soft, sweet in taste, and the color is dark red (Fig. 13). This variety is capable of bearing fruit twice a year, the first time in June and the second in August-September. In total, you can collect 27-30 kilograms. Fruit storage is moderate and suitable for long distance transportation. The fruit is eaten fresh, jam is made.

Pollinators: self-pollinating.

Yuka gabyk. The tree has medium-sized, branched, dense leaves. Fruits are medium in size, weighing 30-38 grams, flat, pear-shaped, with slightly cut veins. The bark of the fruit is thin, the surface is covered with thick fruit dust, it is dark blue, the fruit is soft, sweet, has rich acidity, the flesh is dark red, good quality fleshy. Early ripe varieties of figs. Able to give a crop twice a year, the first time in June,

and the second in August-September. A 10-year-old tree can yield 25-30 kg per root (Fig. 14).

Fruit storage is moderate and suitable for long distance transportation. Figs are eaten fresh, jam is made.

Pollinators: self-pollinating.



Figure 13. Melevshe variety of figs



Figure 14. Yuka gabyk variety of figs

Characteristics of olive varieties

Olive Gyrgyzy-1 variety. It was created at the Magtymguly Research and Production Experimental Center of the Turkmen Agricultural University named after S. A. Niyazov.

An evergreen intermediate tree with a height of 5-6 meters gives consistently high yields even in arid natural conditions. Under natural conditions, Etrek region is heat-resistant. Winter months are easily tolerated at -14°C . Begins to bear fruit at the age of 7 after planting. The flowers are bisexual, the petals are fragrant and horst form.

The fruits are located separately and close to each other, forming 4-5 clusters. Fruits are round in shape, weighing 4.5-5 grams. The bark of the fruit is black, covered with a protective layer. The flesh of the fruit is pale, close to the bark, light blue in color. The bones are large, 1.6x9 cm in size, elongated. The ratio of fleshiness to the total mass of fruits is 80-83%. This variety yields a harvest in a year. The fruits ripen in late October - early November and are ready for harvest. When the fruit is fully ripe, it is harvested by hand by shaking its branches. 10-23 kilograms of fruit are obtained from a 10-year-old olive tree. Growth period 225-230 days. Used for fruit processing (Figure 15).

Pollinators: Olive variety Gyrgyzy-2.



Figure 15 Olive variety Gyrgyzy-1

Olive variety Gyrgyzy-2. Olive variety It was created at the Magtymguly Research and Production Experimental Center of the Turkmen Agricultural University named after S. A. Niyazov. This olive variety grows at a fast pace. This variety reaches a height of 4-4.5 meters at the age of 10 years. Has a wide dense spherical size. The leaves are large, pointed. The fruits are located singly on the branches. Resistant to heat and drought. Frost-resistant up to -14 0C in winter. Fruits are elongated, large, weighing 6.2-8 grams. The bark of the fruit is thin, shiny, black. The bark of the fruit is covered with large white dots and the top is covered with a thick protective layer. The flesh of the fruit is pale in color, and the part adjacent to the skin is pale blue. The seeds are 1.6x2.7 cm in size. The ratio of meatiness to the total mass of fruits is 85.8-88.1%. The fruits ripen in late October - early November and are ready for harvest. This olive variety yields a harvest in a year. 10-20 kilograms of fruits are harvested from a 10-year-old fruiting tree. High quality products are obtained from processed fruits (Figure 16).

Pollinators: Gyrgyzy-1, Bereketli varieties.



Figure 16. Olive variety Nikitin-2

Bereketli. It was created at the Magtymguly Research and Production Experimental Center of the Turkmen Agricultural University named after S. A. Niyazov.

The tree grows strongly, lives for 10 years, it reaches 4.5 meters in height and has a dense size. The branches grow vertically. Resistant to dry hot weather, cold -14°C in winter and various soil conditions. Fruits are round in shape, weighing 7.5-9 grams. The bark of the fruit is thin, dark blue, dark in color. Fruit bark with whitish glossy dots. The surface of the bark is covered with a protective layer. The flesh of the fruit is soft, dark blue in color and sweet in taste. The location of the seeds is lavender. The width is 1.2x0.9 cm, the two ends are stretched. The surface is uneven. The ratio of the fruit pulp to the total fruit weight is 83-90%. The ripening period of this olive variety is 215-230 days.



Figure 17. Bereketli variety of olives

The fruits begin to ripen in October, and it is harvested in November 10. When the fruits are fully ripe, they are harvested by hand, shaking the branches. 16-26 kg of fruits are harvested from a 10-year-old fruiting tree. Used for fruit processing. The yield is high in the Etrek district of the Balkan region of Turkmenistan and is cold-resistant (Fig. 17).

Pollinators: Olive variety Gyrgyzy-2.

CITRUS FRUIT TREE VARIETIES

Characteristics of lemon varieties

Hasylyly variety. In the conditions of Turkmenistan, it is distinguished by abundant yield when grown in pits. That is why this main lemon variety is grown in our country. The tree of this variety is medium-sized, thick-leaved, the fruits are sour. The leaf lives for 2-3 years. The sheet is replaced gradually. Forms a large number of flowers and fruits. The flowers are small, white, with a strong aroma. This lemon variety blooms en masse for 12-15 days in early April-May (Fig. 18). The outside of the fruit is flat, shiny, yellow. The bark of the fruit is thin and easily separates from the meat part. The fruits of this variety contain 3.78% citric acid and 73.4% vitamin C. Each of the fruits weighs 130 grams and has a round shape. The first lemon fruits ripen at the end of October - the first half of November. Basically, he produces 80-90 kilograms of fruit. The fruits are durable and suitable for long distance transportation. Reproduced by rods and twisting.



Figure 18. Hasylyly lemon variety

Galyng gabyk. Grown in greenhouses and pits. The tree is medium-sized, thick-leaved, with expanding branches, the growth rate is 45-60 centimeters per year. The branches are prickly, the leaves are light green (Fig. 19). The fruits are large (8x6 centimeters) in diameter,

round, light yellow in color, the bark is smooth, dense, the flesh is light yellow. the fruit is sweet, with a few medium-sized seeds.

The fruits ripen in December. High-yielding seedlings begin to bear fruit in 2-3 years. Lemon, when grown in holes, produces 80-100 kg of fruit. The fruits are durable and suitable for long distance transportation.



Figure 19. Galyng gabyk lemon variety

Characteristics of mandarin varieties

Sary- 80. The tree of this variety is medium-sized, thick-leaved, slender. The leaf lives for 2-3 years (Fig. 20).

Fruits are medium in size (75x100 grams), round, elongated, dark yellow in color. The bark of the fruit is thin and easily detaches from the outer bark. The inside of the fruit is soft, dark yellow in color, sweet and sour taste. Mandarin fruits ripen in early November. 600 fruits are regularly harvested. The fruits are stored for a long time until February-March and are suitable for long-distance transportation. Reproduced by rods and twisting.



Figure 20. Sary-80 variety of mandarin

Sary-23. (Yellow 23) The tree of this variety is medium-sized, leafy, elongated. The fruits are large, pear-shaped, dark yellow. The bark of the fruit is thin and easily detaches from the outer bark. The inside of the fruit is soft, light yellow in color, with a sweet and sour taste (Fig. 21). Mandarin fruits ripen in November.

The yield is high, the total yield is 400-500 fruits. The fruits are long-lasting and are suitable for long-distance transportation. Propagate by rods and twisting.



Figure 21. Sary-23 Mandarin variety

Characteristics of orange varieties

Saryja (Gamlin). The tree of this variety is medium-sized (3–3.5 m), and leafy (Fig. 22).



Figure 22. Orange variety Saryja

Fruits are medium in size (100x150 grams), thin, round. The bark of the fruit is thin, reddish-yellow, and easily separates from the outer bark. The inside of the fruit is dark yellow in color and has a sweet and sour taste.



Figure 22. Orange variety Saryja

Orange fruits ripen at the end of November. 600-700 fruits are continuously harvested. The fruits are stored for a long time until February-March and are suitable for long-distance transportation.

Iri miveli apelsin (Large orange fruit). The tree of this variety is tall (3–3.5 meters), leafy (Fig. 23). Fruits are medium-sized (100x120 grams), thin, round. Fruit bark is thin, not flat, yellow, easily detached from the outer bark. The inside of the fruit is yellow, the taste is sweet.



Figure 23. Iri miveli apelsin

Orange fruits ripen at the end of November. 600-800 fruits are harvested continuously. The fruits are stored for a long time until April and are suitable for long-distance transportation.

BOTANICAL AND BIOLOGICAL FEATURES OF SUBTROPICAL FRUIT TREES

Botanical and biological features of dates. The eastern palm is a long-lived, tall (12-15 meters) fruit tree. The main and lateral roots are well developed. The leaf is large, oblong-rounded, thick. The main trunk is gray, and the bark of long-lived trees is cracked. Annual branches are brown. With the annual development of dates, the stems differ in two periods - when the plants grow in spring, and in summer, when the embryo grows rapidly. The oriental date is a fast growing and fruity tree originating from the humid subtropical zone. In the conditions of our country, it begins to yield in 3-4 years, and the full yield is 7-8 years. Fruits are large (over 400 grams), varied in appearance and color, mostly reddish or orange. Heat requirement for dates. Among subtropical fruits, dates are frost-resistant and tolerate well cooling down to -22°C . Cold temperatures of -25°C cause great harm to the oriental palm. But when in early spring the shoots begin to wake up, when the temperature drops to -5°C , which is considered dangerous for them.

Botanical and biological properties of pomegranate. A pomegranate is a shrub 2-3 (5) meters high. Its branches grow and buds form and bloom until autumn. Ripening period 180-220 days. Fruits of early ripening varieties ripen in September, late ones - in October - early November. Pomegranate is a cross-pollinated plant and begins to bear fruit in the 3rd year, at 7-8 years old with a full harvest and yields at 35-40 years. Pomegranate roots can grow up to 3 meters deep and spread around. Fruits larger than 500 grams, depending on the characteristics of the variety, are mostly pink, light red or deep red.

Heat demand for grenades. The pomegranate is one of the cold-resistant gardens, where, due to the cold of -220°C , its upper part from the ground completely dies. Therefore, it can be grown in areas with air temperatures below -150C (Dashoguz region), burying it for winter. Pomegranate is a drought tolerant fruit, but it is also tolerant of high soil moisture. Fruits ripen well in hot summers, dry summers and long autumn, of good quality.

Botanical and biological characteristics of figs. Figs are bushes up to 3-5 meters high or fruit trees up to 10-12 meters high. It is a dioecious plant. Their genitals are located on separate plants.

Many varieties of figs can bear fruit even if pollination has not passed. Its main roots reach a depth of 1.5 meters, and the lateral ones - up to 3 meters. Figs bear fruit twice a year, the first in July and the second in August and September.

Heat requirement for figs. Figs are frost-resistant and can grow normally in winter when the temperature does not drop below -12-15°C. Some of its varieties can withstand temperatures down to -20°C. Proper care of figs to increase their frost resistance has a positive effect on the timely growth and strengthening of the stems.

Botanical and biological characteristics of olives. Olives are evergreen trees reaching 5-6 (8-12) meters in height. It is also distinguished by longevity. In the south-west of Turkmenistan, it begins to grow in late March - early April, shoots appear in April, blooms in May, and its fruits ripen from October to early December. Olives are harvested in the 6-7th year of growth, and from the 13th year they begin to give higher yields. Provides warmth in dry, dehydrated conditions. The olive tree can bear fruit for over 150 years.

Heat requirements of olives. The heat transfer of olives is higher than that of pomegranates and figs. Its leaves are exposed to cold at -17°C, below -3-5°C for fruits, below -3-4°C for leaves and below -1-2°C for flowers. The demand for olives in the world. Olives are also in high demand for light. With sufficient light, its fruits ripen early and evenly. In low light, for example, in dense light, its fruits do not ripen. The olives are drought tolerant. The structure of its leaves and twigs allows it to use water more economically, but still gives good results when the olives' water needs are met. Its drought tolerance also depends on the characteristics of the variety. Small-fruited varieties are more resistant to dehydration than large-fruited ones.

BOTANICAL AND BIOLOGICAL PROPERTIES OF CITRUS FRUIT TREES

Botanical and biological properties of lemon. Lemon belongs to the citrus family of the Rutaceae family. Lemon is a small (up to 4 meters) fruit tree. In the conditions of Turkmenistan, 3-4 periods of branch development can be observed during the ripening of lemons. These periods of development are followed by periods of rest. The length of the growing and resting periods will vary depending on weather, care, tree age and yield. Lemon leaves live for 2-3 years. The sheet is replaced gradually. Lemon bears harvest 3-4 years after planting and is then harvested annually.

The need for heat of a lemon. Lemon is considered a heat-loving plant. It starts to grow at 10°C. The optimum temperature for the formation and growth of fruit embryos is 17–18 ° C. Flowering occurs at a favorable temperature. So on one root you can see buds, flowers, embryos and ripe fruits. In Turkmenistan, in greenhouse conditions, lemons bloom en masse, usually in spring - in April and May.

The need for water of a lemon. Lemon is a highly sought after plant. For its normal development and harvesting, the optimum soil moisture should be 70-80%. Excessive soil moisture leads to decay of tree roots, and low humidity causes the abscission of embryos, buds and flowers.

The need for light of a lemon. Lemon is considered a light-loving plant. In low shade, lemon branches grow slowly, become less deciduous, and yield declines. Lack of light is associated with disruption of the normal life of plants and a decrease in the production of photosynthesis.

Nutrient requirements for lemon. Lemon is one of the most fertile fruits in the world. Its development and productivity depend on the level of normal storage in the soil of nutrients, especially nitrogen, phosphorus and potassium.

The need for soil. The rapid growth and bountiful harvest of lemons largely depends on the preparation of the soil in the greenhouse for mixing. The upper 40-50 cm layer of the mixture, in which the lemon is placed, is removed from the upper soil layer and mixed or crushed with a sand layer at the rate of 20-30 kg per root and 50 gr superphosphate and 10: 1 in the sand. The soil prepared in this

way creates favorable conditions for good rooting and rapid growth of lemons.

Botanical and biological features of tangerine. Mandarin (*C. reticulata* B.) has a high yield and regular annual fruiting in citrus trees. The genus *Rutaceae* belongs to the genus *Citrus*. Mandarin fruits are also called small-fruited oranges. A tangerine tree 3-4 meters high, slow-growing, with a fruit size of 30 to 100 grams, a short spherical fruit tree. Depending on the biological characteristics, shape and taste of the fruit, varieties of mandarin are divided into groups. The leaves of the tangerine tree change every 3 years. Young leaves grow during the first year and store a lot of nutrients. Therefore, the yield of citrus fruits to a certain extent depends on the density of the leaves of the trees and the number of branches.

Heat requirement for tangerines. Citrus tangerines are more frost-resistant. It is frost-resistant down to -8°C , but an air temperature of -10 - 12°C can adversely affect the plant. For the development of mandarin, a favorable air temperature of 16 - 18°C is required. Mandarin is considered unstable to heat. When the air temperature exceeds 30°C , its leaves dry out and growth stops. In order for the tangerine to grow and bear fruit normally, the air temperature must be above 10°C for 190-210 days during the growing season. There are varies from 1 to 2°C between types of mandarin fruit. Trees begin to grow when the soil becomes stable and the air temperature reaches 8°C . At a temperature of 3 - 50°C , citrus fruits are in a state of rest.

Water requirement for tangerines. This plant is moisture-loving. The moisture requirements are the same as for lemon and orange plants.

The need for light for tangerines. Mandarin also belongs to the light-loving plants, like the lemon tree. Even in greenhouses and on shady summer days, the branches of the plant grow slowly, the leaves wrinkle and the yield decreases. But experiments have shown that some of its varieties are semi-shade-tolerant and are also grown indoors.

The need for soil for tangerines. Mandarin soil requirements are similar to those of lemon, and its rapid growth and abundant harvest depends largely on the preparation of the soil in the greenhouse for sowing. The top 40-50 cm layer of soil in which the tangerine will be planted must be strong. In each seedling hole, mix with 5-8 kilograms of rotten manure, 50 grams of superphosphate and

10: 1 sand. In the soils prepared in this way, favorable conditions are created for good rooting and rapid growth of mandarin. Optimum soil moisture should be at least 60%.

Botanical and biological properties of oranges. The orange belongs to the citrus family of the Rutaceae family. Orange - bitter orange, a variety of mustard (*Bigardia, C.aurantium L.*) Fruits are sour and aromatic. In many countries, bitter orange is used as a pod of sweet oranges. The orange tree is tall (7-12 meters) and spherical in shape.

Heat demand for oranges. Among citrus fruits, oranges are considered to be heat-demanding plants. The growing season for oranges is divided into spring-summer, summer and autumn. When grown outdoors, oranges fruits are frozen at $-1.2-2.5^{\circ}\text{C}$, leaves at $-3-4^{\circ}\text{C}$, 2-3- branches at $-5-6$ (7) 0°C and main branches at $-8-9^{\circ}\text{C}$. Orange is cold-resistant compared to lemon. A favorable climate for growing, like other citrus fruits, is $16-18^{\circ}\text{C}$. It is also resistant to temperatures of 45°C during the summer months. In order for oranges to form a normal fruit, the air requires temperatures above 10°C for 220-240 days during the growing season. Moisture requirement for oranges. Orange is a more drought-resistant plant than lemon, but with normal air and soil humidity, it grows well and gives high yields. A high yield of oranges also depends on the pod in which they are harvested.

The need for an orange for light. The light requirement of an orange can vary depending on the air and soil temperature. The demand for light also increases with high soil and air temperatures.

The need for an orange for soil. The need for a plant in the soil also depends on its subsoil. Orange prefers light, moist, fertile soil. Orange seedlings are often used as a three-leafed (wild-growing) seedling. The bitter Pomeranian orange pod is resistant to slightly saline soils. It is proposed to conduct research on the development of this fruit in the Etrek and Magtymguly districts of Turkmenistan.

AGRICULTURAL TECHNOLOGY FOR THE CULTIVATION OF SUBTROPICAL FRUIT TREES

Growing young trees. With the selection of suitable sites for planting subtropical fruit trees and regular agricultural activities, they become less productive and give higher yields. For young trees to take root well, the seedlings must be good of quality. Then they are planted in well-prepared soil and it is important that agro technical measures are carried out in a timely manner and with high quality. Good rooting of planted young seedlings, complete restoration of the root system, good growth of branches, care and regular maintenance of the soil to ensure their normal growth, timely harvesting for the last 2-3 years, timely application of organic and mineral fertilizers, timely watering, pruning of branches and protecting young orchards from pests and diseases. Subtropical gardens require more correct execution of these works.

Choosing a place for planting subtropical trees. Subtropical trees show little interest in soil. They are also able to grow on light sandy, stony, clayey soils. However, saline soils close to unpaved ones are unfavorable for them. These trees are more suitable for planting seedlings, soils with a water depth of 3-4 meters, non-saline, medium and heavy texture. For their cultivation, areas close to fresh water sources, mountainous, hilly slopes are suitable.

Plowing and cleaning of weeds. On which the seedlings of subtropical trees will be planted, must first be cleared of large weeds. Then one of the herbicides such as Roundup and Glyphs should be sprayed against perennial weeds such as reeds and tar at 6-8 liters per hectare. A convenient time for this work is from October 25 to November 15 and should be carried out before the onset of cold weather. 15-20 days after the introduction of herbicides, plowing is carried out to a depth of 50-60 cm with special techniques.

Fertilizer before plowing. Plots intended for planting seedlings of subtropical gardens, before plowing, should be fertilized with 30-40 t / ha, 400 kg of superphosphate, 100 kg of potassium chloride and 100 kg of urea. This measure creates favorable conditions for the seedlings to grow well. The optimal pre-fertilization period is from October 25 to November 10 in areas where seedlings will be planted in autumn, and from November 1 to December 10 in areas where seedlings will be planted in spring. Thus, fertilized young trees are not

fertilized for 2-3 years. It is recommended to feed subtropical gardens 2-3 years old with weak growth with nitrogen fertilizers (carbamide or ammonium nitrate) at the rate of 50 kilograms per hectare (also an active ingredient). Fertilization is carried out at a distance of 0.5-1.5 meters from the fruit tree.

Leveling the soil and preparing the soil for planting. Correct leveling of the areas designated for planting subtropical gardens will ensure that the seedlings are accustomed to rooting and harvesting on time, ensuring that the seedlings are properly watered. This work should be done in section using a rangefinder leveler. After the ground is leveled, holes are dug for planting seedlings of subtropical trees. The depth should be 50-60 centimeters in diameter and 60-70 centimeters. The best time for this is November 5-20 for autumn plantings and from February 20 to March 15 for spring plantings.

Selection of species and varieties of subtropical trees. Subtropical trees are of great importance in choosing the types and varieties of gardens depending on soil conditions, drought, heat in the summer months and cold air in the winter months. Tips for growing the following species and varieties of subtropical trees in different parts of the country, taking into account the above:

Dates, pomegranates, figs in Akhal, Mary regions, southern regions of Lebap region and Serdar, Bereket districts of Balkan region;

Pomegranates, olives, dates, figs in Magtymguly and Etrek districts of the Balkan region;

If pomegranates and figs are stored underground in the Dashoguz region and in the northern districts of the Lebap region.

Recommended varieties for growing subtropical fruit trees:

Persimmon dates: Hasylyly, Sary Zenji, Garrygala -5, Gyzyly mive, Turkmen hurmasy, Turkmen pervaiysy.

Pomegranate: Nohur, Gyrgyzy gabyk, Turkmen nary, Gulgune, garrygala-1, Garrygala-2, Achyk dane, garakel, Gulgune yumshak chigitli, Irki shirin, Gara bagul and others.

Figs: Ak mengiz, Gadyrly, yuka gabyk, Melevshe, Gok gabyk and others.

Olives: Bereketli, Gyrgyzy-1, Gyrgyzy-2 and others.

Planting seedlings of subtropical trees. When planting fruit trees, especially subtropical ones, it is very important to plant seedlings on a regular basis. When planting gardens, a number of them should be suitable for maintenance with equipment. Depending on the type of subtropical trees planted, it is recommended to plant their seedlings along the following lines:

Dates: 7x7, 7x6 meters for tall varieties, 6x6, 6x5 meters for medium varieties .

Pomegranate: 5x4, 4x3 meters.

Figs: 6x6, 5x6 meters

Olives: 10x10 meters, 10x8 in fertile soils; 8x8, 7x7 meters, 8x6 meters on less fertile soils.

When planting subtropical trees, it is important to choose seedlings of pollinating varieties.

Seedlings of subtropical fruit trees in two periods: autumn - from 5 to 30 November; spring - planting is recommended from February 25 to March 30. When planting seedlings in the fall, its base is buried 3-4 cm above the root collar, and when planting in spring, 2-3 cm above the ground.

Seedlings for planting are cut so that their height is 70-80 cm. Before planting, you should carefully examine the seedlings and branches, select weak or diseased roots. You should also knock out pegs 50-60 centimeters high so that the wind does not blow, and the seedlings should be tied with a rope. This will help keep the sprout at its core.

Watering subtropical trees. After planting seedlings of subtropical gardens, timely watering is necessary for their good rooting. Watering for growth. Although subtropical gardens are drought tolerant, they produce high yields and good quality fruit only when their water needs are fully met. Young, newly planted trees especially need water. Therefore, in the year of planting their seedlings, 10-12 times more water is watered for growth by 600-700 m³ per hectare. Estimated time and number of catchments: 1 April, 2 May, June, 3 July, 2 August, 1 September and 1 October.

Subtropical trees, or fruit trees, are also in high demand. For example, for a normal harvest, you need to keep 10-12 olive and pomegranate seeds, 8-10 sticks of dates and figs. The irrigation rate in the gardens has been increased to 800-1000 m³/ha.

Conducting humidification. In winter, young and other productive trees need to be watered twice a year. The first is carried out from 10 to 30 January, and the second from 10 to 28 February with a flow rate of 1500-2000 m³ of water per hectare. The preservation of these waters in saline soils is even more important. Because they wash away the salt of the earth. It is also advisable to plant alfalfa and barley in the middle of trees to reduce the salinity of saline lands.

Pruning and finishing subtropical trees. Young trees are pruned annually to ensure quick harvests. At the same time, the branches that are broken, diseased and interfering with the work of the technicians are first cut off. Then other branches are pruned to get the desired shape. The pruning and processing of subtropical trees is mainly done during the winter months and requires a lot of manual labor. It is convenient to carry out finishing work in the period from December 15 to March 15, when the air temperature does not exceed 6-10⁰C. In the process of pruning, it is necessary to alternately place the side branches in the main pillar of the tree and maintain harmony of the surface part with the root system of the tree. This guarantees normal growth of the fruit tree and a good harvest. Subtropical trees are pruned in the following order: in the winter or spring of the second year after planting, all shoots up to 65-70 cm high are cut off. Every 55-60 centimeters from the upper rods, 2 or 4 side branches are placed. The remaining branches are cut and shortened. They are then placed on the 2nd and 3rd branches to form an orchard. In recent years, the branches have been shortened, the tree has been pruned. Pruning the branches encourages the growth of the side rods, and pruning helps the light fall better. Older, weaker and less productive trees are pruned heavily (rejuvenating). Then the main trunk and main branches of the tree are shortened. This pruning increases their productivity by increasing the number of young branches they produce.

Processing of subtropical trees. Clearing rows of young and productive subtropical gardens from weeds, mixing organic and mineral fertilizers, regulating soil moisture and permeability, creating favorable water and climatic conditions for the soil throughout the year by rooting gardens around the root of the gardens should be processed 3 times at a depth of 18-20 centimeters. In young gardens, the first of them are carried out in autumn-November, and the second

and third in May and June. Among fruiting orchards, they are cultivated in March, May and June.

Fertilizing subtropical trees. It is important that young subtropical trees grow normally and in a timely manner and support high tree yields, and that they are scientifically fed with organic and mineral fertilizers. As a rule, when laying fruit trees, 30-40 tons of objects, 400 kilograms of superphosphate, 100 kilograms of potassium chloride and 100 kilograms of urea are produced per hectare. They are then fed with nitrogen fertilizers a year before harvest. Then, for the first time, 100-150 kg of urea per hectare is introduced and for the second time - 150-200 kg of ammonium nitrate per hectare. The first feeding in May, the second in June. Also, 150-200 kg of carbamate and 200-250 kg of ammonium nitrate per hectare are added annually to the trees. In autumn and winter, it is important to fertilize them with organic and mineral fertilizers in order to get a high yield from trees. Research shows that 30-40 tons of fruit trees per hectare every 3-4 years have a positive effect on their yield and fruit quality. Yielding trees should also be given 400 kg of superphosphate, 100 kg of potassium chloride and 100 kg of carbamate per hectare per year. The optimal fertilization period is considered to be the period from November 1 to December 10.

Protection of subtropical trees from the cold. Late flowering of subtropical trees in spring eliminates the risk of freezing in spring. But reducing their frost resistance is important to protect against low temperatures during the winter months. Therefore, in winter it is recommended to water in cold weather and smoke the beds with straw mixed with manure. In the Dashoguz region, pomegranates and figs protect from the cold only by burying them for the winter. Then the branches of the trees are bent and buried with earth 20-25 centimeters thick. Work is underway in late October - early November. They are due to open in March.

Protecting the yield of subtropical trees. Subtropical fruit trees, especially those that support the harvest of dates and pomegranates, are distributed, supporting the fruitful branches of these trees in case they are threatened with cracking. Also, before the fruits of subtropical gardens ripen, they are sprayed with a 1.0-3.0% solution of synthetic growth agents, such as Ertel and Tur, so that they do not fall to the ground. The selection of varieties that bloom and ripen evenly at the base of subtropical trees also helps protect crops to some

extent. Under the influence of strong winds, the rows of fruit trees should be oriented from east to west in order for the fruit to fall less. One of the main ways to reduce the impact of winds is to create a forest protection zone.

Removing rooted tree shoots. Many types of subtropical trees produce a large number of shoots from the stem and root. If they are not pruned in time, they will have some detrimental effect on tree growth and harvest, especially when the tops of pomegranates and figs fall to the ground cold, resulting in more shoots. Therefore, shoots and roots of subtropical gardens should be removed regularly from April to September.

AGROTECHNICS FOR THE CULTIVATION OF CITRUS TREES

The natural climate of Turkmenistan is considered suitable for the cultivation of lemons, tangerines and oranges in modern greenhouses and blends. It was reported that experimentation and production work in our country allowed for higher yields of lemons even when grown locally in a mixture.

Citrus orchards should be 2 meters deep, 7 meters wide and 6 meters high when closed. Mixes should be between 50 and 80 meters long and run from east to west. The soil chosen for growing in the citrus garden mix should be placed on level ground and provided with water throughout the year. The mixture should not be placed in saline soils near groundwater.

The rapid growth and bountiful harvest of citrus orchards is largely dependent on the preparation of the soil for sowing. The layer of soil that prepares the lemon for mixing should be rich in fat and salt. In each seedling hole, prepare by mixing 20-30 kg of rotten manure, 50 g of superphosphate and sand 10: 1.

Citrus trees to grow recommended varieties:

Lemons: Hasylyly, Galyng gabyk.

Mandarin: Sary-80, Sary-23.

Orange: large fruit orange, Saryja.

Reproduction of citrus trees

In the conditions of Turkmenistan, citrus orchards are cultivated in the following order: Shoots intended for citrus trees should be 10-12 centimeters long, 4-5 mm thick and have 2-4 mature shoots. Rods prepared in autumn (October) and early spring (late February - early March) give the best results. When planting twigs, 2-3 top leaves are left in it. The lower end of the rod is cut off from the bottom of the shoot, and the upper end is cut with a sharp knife at a distance of 1 centimeter from the shoot. To prevent the prepared core from infecting insects and diseases, it is necessary to use wood ash. The distance

between the prepared shoots is planted at a distance of 6-8 centimeters. The rooting of the twigs takes about 25-30 days.

Planting seedlings of citrus trees. When grown in a modern greenhouse, rooted citrus orchard seedlings are recommended to be planted from March 20 to April 10, and in the fall in October. When planted in autumn, the plants take root until winter and begin to sprout in early spring. Plants are planted in rows in a mixture or in a greenhouse in 3 rows. The outer rows are placed 1.3 meters from the wall of the mixture or greenhouse. For example: the distance between rows of lemons should be 2.2 meters, and the distance between plants in a row should be 2 meters. Depending on the type of citrus orchards, it is recommended to plant their seedlings along the following lines:

Lemon: 2.5x2; 1.5x2 meters.

Mandarin 2x3; 1.5x2; 1.5 x2; 3x4 meters.

Mandarin: 1.5x3; 3.6x4.5; 2.1x5.5; 2x2; 4x4; 4.5x4.5 meters

Citrus trees are planted to a depth of 30-40 centimeters to a depth of 40x40 centimeters. Then, of course, you need to add 4-5 kilograms and 50 grams of superphosphate to the soil in each hole. When planting seedlings, their extra branches are cut off, and if they do not plant root soil, they are shortened. The root of the plant must be planted so that it is 3-4 centimeters above the ground. Seedlings are watered immediately after planting. To water, a hole is made 25-30 centimeters from the row of the plant. 1-2 days after transplanting, the plants are examined, their base is leveled, bent roots are restored, and water is retained. The soil must be soft and well-moistened for the seedlings to take root well.

Watering citrus trees. Caring for lemons, tangerines and oranges in the year of planting includes regular watering and soil cultivation, pest, disease and weed control. Changes in air temperature throughout the year, especially in winter, should be constantly monitored. The first year after planting is watered every 5-6 days, depending on soil and weather conditions. In this case, the depth of water is 12-15 centimeters, and it is caught in trenches stretched at a distance of 25-30 centimeters on each side of the plant. The water layer should be well watered to a depth of 40-50 centimeters with a small flow of water. Suppression of watering is not recommended, as this leads to infection of the plant with fungal diseases. After watering, loosening is carried out in wet soil. The period between watering increases in citrus trees two years and older. The optimum moisture

content of citrus trees for a good harvest is estimated at 75-80% of the maximum soil moisture. To maintain such humidity throughout the year, trees that yield a crop should be watered 25-28 times, i.e. one irrigation in January, February, March, 2 irrigations in April, 3 irrigations in May, 3 June in June, 4 watering in July, 4 watering in September, 3 watering in September, watering on October 2 and 1 watering each in November and December. Especially during flowering and fertilization of citrus trees, it is important to maintain normal soil moisture. Excessive or poor watering during this period leads to the decay of flowers and buds. In young trees it is necessary to soften the soil 3 times a year every 2-3 years, and in fruit-bearing citrus gardens. Once a year, deep loosening and adding fertilizers should be carried out.

Fertilizing citrus trees. Organic and mineral fertilizers should be applied under each tree, taking into account the following. 2-3-year-old trees are given, of course, 8-10 kilograms, 100 grams of superphosphate, 40 grams of potassium chloride, 50 grams of ammonium nitrate or urea; 3-4-year-old trees, of course, are given 15 kilograms, 200 grams of superphosphate, 100 grams of potassium chloride and 150 grams ammonium nitrate or urea. 5-6-year-old trees are given, of course, 20 kilograms, 300 grams of superphosphate, 150 grams of potassium chloride, 200 grams of ammonium nitrate or urea. For trees over 6 years old, these fertilizers should be applied at the rate of 25 kilograms, 500 grams, 200 grams and 250 grams. Nitrogen and potash fertilizers are mixed with manure and the plants are fed 3 times in spring and summer, and superphosphate is used in the fall. In addition to basic fertilizers, each tree is given 100-150 grams of crushed sulfur once every 3 years, and when the plant is watered with a potassium manganese solution (15-20 grams per 100 liters of water) (1-2 times a year), the yield increases and the quality of the fruits improves. Sprinkle 100 grams of soil per plant or water with a copper-copper solution (50-100 grams per 100 liters of water) and this prevents chlorosis of trees.

Pruning citrus trees. Caring for a young tree plays an important role in cutting it down. Its purpose is to form a beautifully shaped, healthy and dense foliage with a lateral branch along the edge. Citrus trees must have a main trunk 15-20 centimeters high. From it, lateral branches 40-45 centimeters long are formed along the line. On the sides, minor side branches are placed 15-20 centimeters long. The

base of citrus trees is formed by regular pruning. Strict adherence to the rules of felling and pruning allows you to keep the tree to the required size, fertilize, water, soften, and pest control well. In the years following the formation of the base of a citrus tree, buds should not be allowed to appear on its branches. To do this, it is necessary to cut off free, vertically growing and excess branches in a timely manner. In fruiting citrus trees, the long branches are shortened and converted into fruit trees. The ends of the branches are trimmed when they reach a length of 25 centimeters, which, after ripening, are trimmed to a length of 18-20 centimeters. After each growth period, the growing branches are pruned, and the main pruning is carried out after the annual harvest.

Shelter and opening of the fossa. To protect citrus trees from the cold, in the conditions of our country, the surface of the fossa is covered with plastic wrap at the end of October - beginning of November. The surface of the fossa should be covered twice with a film, and between them there should be 5-6 centimeters of an airtight space. For ventilation, it is better to put 1.5-2 meters of windows when the hole dries. Opening times are related to the weather, but they are mainly held in April.

DISEASES AND PESTS IN SUBTROPICAL GARDENS AND CONTROL MEASURES

Diseases and pests found in subtropical trees. In subtropical trees, there are various diseases and pests that impair the quantity and quality of the fruits formed. In subtropical trees in winter, deep felling, loosening, weeding and deep rooting of weeds in subtropical trees lead to a reduction in the number of pests. Pruning of diseased branches, which are formed in the autumn-winter-early spring period, also contributes to the reduction of pests. Various pests and diseases are common in subtropical trees. The date palm and its fruits are mainly infected with leprosy, gout (anthrax), anthracnose, gray fruit rot and drying of branches (phimoses). Insects that infect worms, insects, colds, juices, shields and larvae are harmful.

In the pomegranate tree, its fruits are mainly affected by spotting, fruit rot, gray rot and brown fruit rot, as well as branch cancer, clusterosporiosis. Pests such as pomegranate beetle, brown fruit beetle, juices, apple worms, grasshoppers, pomegranate fruits, fruit juices are harmful from pests.

Figs and their fruits are severely damaged and fall off by pests such as lice, grape worms and fruit rot.

The main diseases of the olive tree include ring spots, fruit rot, and the pests are olive groves, leaf stalks, olive groves, cherry trees, and grapes.

Disease and pest control measures. Disease-resistant tree varieties should be planted. Proper tree care should be carried out to increase the immunity (resistance to pests) of the trees. In autumn, diseased branches and branches damaged by pruning should be cut off with a healthy section of 3-5 centimeters and burned in a special place. The resulting wounds, swellings and cracks should be treated with a 1% solution of copper foam and treated with special oils. It is necessary to deal with harmful insects and weeds in the garden. Bordeaux solution is one of the most effective and environmentally friendly remedies for various diseases and pests of subtropical trees. When the leaves begin to fall in the fall, the trees can be prevented from diseases and treated by spraying the trees with a 3% Bordeaux solution, and in the spring spraying with a 1% Bordeaux solution for the third time before flowering (February), after flowering and 15 years. -20 days later.

Method for preparing Bordeaux solution. To prepare a 1% solution of Bordeaux per 100 liters of water, 1 kg of copper and 1 kg of unbleached lime (or 2 kg of slaked lime) are required. The liquid (solution) is prepared in wooden containers. First, 1 kilogram of lime is diluted in a bucket, 50 liters of water are added to it, the milk of lime is filtered and extracted. In another bucket, dissolve 1 kg of copper in 50 liters of hot water. Then add the dissolved water from a copper cup to the poorly watered solution and add it to the lime water (not vice versa). Before use, you should prepare a Bordeaux solution. The finished solution should be sky blue (bluish) and glossy. If there is little lime, its color turns green and the trees are burnt. This is why more additional lime needs to be added to it. It is advisable to spray trees in cool weather (morning or evening) so that the trees do not burn. When spraying with sprayers, they must be accustomed to all parts of the tree, that is, to bark, branches, leaves and branches. Currently, fungicides containing the active ingredient Ciprodinil (Gore, 0.35 kg / ha), Tiram (Granuflo, 3.0 kg / ha) and silver chloride (Abiga-peak, 10 l / ha) have successfully proven themselves in world practice. It is used against diseases in gardens. Pests Gold (Lamda-sigalotrin, 50 g / l), Awaunt (Indoxacarb, 150 g / l), Aktara (Thiamethoxam, 250 g / kg), Bestcard (Kiromazin, 750 g / kg), Goldplan (Acetamiprid, 20 g / kg), Ephedor (Imidoclaprid, 350 g / l), Jetsis (Deltamethrin, 25 g / l), Karate (Lamda-sigalotrin, 50 g / l), Coragen (Chlorantranlyprol, 200 g / l), Imidor (Imidacloprid, 200 g / l), indocaria (indoxacarb, 150 g/), vertimec (abamectin, 18 g / l) and other types of insectoacaricides have been added to the list of permitted substances in our country. When pests appear, spray the garden with one of the indicated means. Spraying with acaridae insecticide and fungicide kills both diseases and pests, reducing costs. To prevent pests from becoming resistant to the sprayed material, they must be replaced. It is recommended to take measures to completely eliminate emerging pests. Subtropical trees grow healthy and yield high yields if agro technical measures are carried out in a timely manner and comprehensive pest control measures are carried out throughout the year.

DISEASES AND PESTS FOUND IN CITRUS TREES AND CONTROL MEASURES

Diseases and pests found in citrus trees. In Turkmenistan, the most common pest of citrus orchards is the soft false scutellum. It causes great harm to the upper part of the plant: its leaves, branches and fruits. With it, the fungus severely damages the leaf, which disrupts its normal functioning. In autumn, these mushrooms also cover the surface of the fruit. This pest occurs when the greenhouse and the mixture are poorly ventilated, when inside it there is high humidity and dense branches of the plant.

Pest and disease control measures. Insecticides Best alpha 100 KE (0.5-0.6 l/ha), Enjeo 24.7% (0.3 l/ha), Gold plan against false shields and other pests of citrus orchards (juices, lice, late blight) (0,3 kg/ha) is sprayed. Between them, you should spend 7-10 days and spend 2 times. If necessary, insecticides are reused. Fungicides Topaz 10%, 0.2 l/ha or Ridomil gold (2.5 kg/ha) are used against diseases (fungal fungi). In hot weather, spray is sprayed in the morning and evening. During the flowering period, and 30 days before ripening and harvesting, the use of pesticides is stopped. In summer, you should regularly rinse the dust of plants with water. The inside of the greenhouse and mixtures must be free of weeds to prevent diseases and pests.

COLLECTION AND STORAGE OF SUBTROPICAL FRUITS

The timing and methods of harvesting in subtropical orchards is determined by the type of fruit, the variety and how it will be used. For example, it ripens in October and December depending on the type of fruit. You can start harvesting when the fruits are completely colored. But their suitability is determined by the dental density of the fetus. Non-mixed varieties begin to soften and the mixers can be left and eaten after softening. The fruit can also be stored on the tree itself until winter. The fruits are harvested before they are ripe for export. They are stored in special rooms for full ripening of the fruit. In a dark room, the fruits ripen quickly at 0-1 ° C and can be stored for up to six months without spoilage. Pomegranate fruits are harvested gradually as they ripen. The more the fruit remains on the tree, the sweeter it is and the more sugar accumulates in it. After collecting the pomegranate fruits, they are placed in a row on special shelves. The fruits intended for storage are dried in the shade for several days under a canopy after harvest. Moreover, they remain in good condition until spring. Figs also do not ripen at the same time, and the fruits must be picked when they are fully ripe. Fig fruits are short-lived because they are very tender. Therefore, its harvested fruits can be eaten fresh for 4-5 hours, and the rest can be dried. Olive fruits are harvested by hand or by shaking on a tarp. To prepare the oil, the fruits are harvested of dark purple color with a slight crunch of the bone. Normal-sized, yellow-white, bright fruits are used for canning.

HARVESTING AND STORAGE OF CITRUS TREES

Citrus fruits need to be harvested on time. Prolonged or delayed work has a detrimental effect on the quality of the fruit, leading to a thickening of the bark, dryness of the inner flesh and a decrease in its sweetness. Increasing the ripening period of the crop also prevents the plant from storing energy for next year's harvest. Therefore, it is advisable to start picking citrus fruits when the fruits turn yellow. The cooked fruit is then harvested twice. At the third harvest, the rest of the fruits are harvested.

Citrus fruits are harvested with special scissors so that there are no damaged areas. The harvested fruits are carefully placed in containers or bags and removed from greenhouses and holes. There they must be divided into groups by size and placed in special containers. For processing, damaged and small fruits are used. Containers for storing fruit should be covered with paper on all sides. Harvested fruits should be packed immediately after shipment as they soften, lose weight and deteriorate in quality. This harms the lemon, tangerine and orange growers.

Table 1

Rules and deadlines for agro-technical measures to be taken in the cultivation of young subtropical orchards

No	Agrotechnical measures	Rule	Deadlines	
			Southern districts of Akhal Balkan Lebab and Mary regions	Nothern districts of Dashoguz and Lebab regions
1	2	3	4	5
1	Weed removal	6-8 liters per hectare of herbicides such as Roundup Glyphs against perennial weeds	25.10-15.11	01.11-05.12
2	Fertilizer feeding before plowing	dung - 30-40 t/ha, urea –100 kg/ha, Ssuperphosphate – 400 kg/ha, potassium chloride – 100 kg/ha	25.10-10.11 01.11-10.12	01.11-10.12
3	Deep drift	50-60 cm	25.10-15.11	01.11-10.12
4	Trimming	deliberately	05-20.11	20.02-15.03
5	Making holes for planting subtropical fruit trees	depth 50-60 cm, width 60-70 cm	05.11-20.11 20.02-15.03	25.02-30.03
6	Planting seedlings in gardens	According to the drawing: dates: 7x7, 7x6, 6x6, 6x5 metr; pomegranate: 5x4, 4x3 metr; fig: 6x6, 5x6 metr; Zeytun: 10x10, 10x8; 8x8, 7x7, 8x6	05.11-30.11 25.02-30.03	25.02-30.03

Continue of table 1

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
7	Watering planted seedlings	Time of planting 500-600 m ³ /ha	10.11-05.12 25.02-30.03	05.03-05.04
8	1st wet water supply	1500 m ³ /ha	10-30.01	25.02-05.04
9	2 nd wet water supply	2000 m ³ /ha	10-28.02	20.02-05.03
10	Tree pruning	Cutting off diseases branches that cause dry fractures	15.12-15.03	20.02-20.03
11	Inter mitten treatment	18-20 cm	The 1 st in the November, the 2 nd and the 3 rd in the May and June	
12	Irrigation water for growth	8-10 times, 500-600 m ³ /ha	01.04-02.09	01.05-01.09
	1 st water supply	500 m ³ /ha	01.04	01.05
	2 nd water supply	500 m ³ /ha	10.05	10.05
	3 rd water supply	500 m ³ /ha	20.05	20.05
	4 th water supply	500 m ³ /ha	10.06	10.06
	5 th water supply	500 m ³ /ha	22.06	22.06
	6 th water supply	500 m ³ /ha	10.07	10.07
	7 th water supply	500 m ³ /ha	22.07	22.07
	8 th water supply	500 m ³ /ha	08.08	08.08
	9 th water supply	500 m ³ /ha	22.08	22.08
10 th water supply	500 m ³ /ha	02.09	01.09	

Continue of table 1

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
13	1 st time feeding with nitrogen fertilizer	urea - 100-150 kg/ha	01-20.05	05-25.05
14	2 nd time watering after feeding with nitrogen fertilizer	Ammonium nitrate - 150-200 kg/ha	10-25.06	15-30.06
15	To take countermeasures to pests and diseases	The recommended insect acaricides are fungicides and Bordeaux solutions in accordance with the norm	In the event of pests and diseases	

Table 2

Rules and deadlines for agro-technical measures to be taken in the cultivation of young subtropical orchards

T/b	Agrotechnical measures	Rules	Deadlines	
			Southern districts of Akhal Balkan Lebap and Mary regions	Nothern districts of Dashoguz and Lebap regions
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
1	Clean weeding	Perennial weeds are 6-8 liters per hectare of round herbicides such as Raundap and Glyphos.	05.11-10.12	01.11-05.12
2	Fertilizer before plowing	Fertilize - 30-40 t / ha every 3 years, Urea - 100 kg / ha, Superphosphate - 400 kg / ha, Potassium chloride - 100 kg / ha	05.11-10.12	01.11-05.12
3	Driving	30-35 cm	10.11-15.12	01.11-10.12
4	Cut down trees and design	Dry, broken, obstructive, diseased branches	15.12-05.03	20.02-20.03
5	1 st wet water supply	1500 m ³ /ha	10-30.01	10.01-10.02
6	2 st wet water supply	2000 m ³ /ha	10-28.02	20.02-05.03

Continue of table 3

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
7	Intermediate treatment	18-20 cm	Each time after water is caught	
8	2nd time feeding with nitrogen fertilizer	Ammonium nitrate – 200-250 kg/ha	10-25.06	15-30.06
9	2nd time feeding with nitrogen fertilizer	Ammonium nitrate – 200-250 kg/ha	10-25.06	15-30.06
10	Pest and disease control measures	Recommended insecticide- acaricides, fungicides and bordeaux solutions	In the event of pests and diseases	
11	Capturing growth water in gardens	5-6 times, 800-900 m ³ /ha	05.05-30.08	25.05-30.08
	1 st water supply	900 m ³ /ha	05.05	25.05
	2 nd water supply	900 m ³ /ha	05.06	25.06
	3 rd water supply	900 m ³ /ha	01.07	15.07
	4 th water supply	900 m ³ /ha	20.07	25.07
	5 th water supply	900 m ³ /ha	15.08	15.08
	6 th water supply	900 m ³ /ha	30.08	30.08
12	Removal of tree roots	Completely remove when the stump comes out	May-September	April-September
13	Harvesting	Depending on the size of the hand power	05.07-10.11	05.07-30.10

Table 3

Rules and deadlines for agro technical measures to be taken in the cultivation of citrus orchards

No	Rules of Procedure	Deadline	Time	
			In the young tree	In the fruit-bearing tree
1	2	3	4	5
1	Excavation and Preparation Width	7.0 m, length 50 - 80 m, depth - 2.0 m, height - 6.0 m	01–20.09 20.02–10.03	–
2	Fertilization of greenhouses, mixed soil and organic mineral fertilizers	Course - 20-30 kg / m ² , Superphosphate - 50 g / m ²	05–25.09 25.02–15.03	–
3	Sliding or kicking	30–35 cm deep	10–30.09 01–20.03	–
4	Alignment	by hand	25.09–20.10 15.03–05.04	–
5	Digging pits for planting trees	40x40 cm, 30-40 cm deep	01–31.10 20.03–10.04	–
6	Layer film on the mixture	2 layers, spacing 5-6 cm	25.10–15.11	25.10-15.12
7	Planting seedlings	By line: Lemon: 2.2x2; 2.5x2; 1.5x2 meters; Orange: 2x3; 1.5x2; 3x4 meters; Mandarin: 1.5x3; 3.6x4.5; 2.1x5.5; 2x2; 4x4; 4.5x4.5 meters	01–31.10 20.03–10.04	–
8	Irrigation of planted seedlings	500-600 m ³ / ha	01.10–01.11 20.03–11.04	–

Continue of table 3

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
9	Feeding with organic and mineral fertilizers	2-3 years per tree: Lesson - 8-10 kg, Superphosphate - 100 g, Ammonium nitrate - 50 g, Potassium chloride - 40 g. 3-4 years per tree: Lesson - 15 kg, Superphosphate - 200 g, Ammonium nitrate - 150 g, Potassium chloride - 100 g. Year 5-6 per tree: Lesson - 20 kg, Superphosphate - 300 g, Ammonium nitrate - 200 g, Potassium chloride - 150 g; For trees older than 6 years: Lesson - 25 kg, Superphosphate - 500 g, Ammonium nitrate - 250 g, Potassium chloride - 200 g.	15.03–15.11	15.03–15.11
10	Growth watering	25-28 times, 40-50 cm depth, 5-6 days in the 1st year, 8-30 days in recent years (depending on the weather)	During the year	During the year
11	Supplemental Feeding with Nitrogen Fertilizers	In the Fruit Tree: 3 times; Ammonium nitrate per 100 g or Urea 80 g per tree (each time). In young trees: 3 times per tree Ammonium nitrate - 60 g or Urea - 50 g	01.05–30.07	01.04–01.06

Continue of table 3

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
12	Softening the row and the base of the tree	3 times 6-8 cm deep	01.04–30.09	01.05–30.09
13	Weed weeding	3 times	01.04–30.10	01.03–30.11
14	Cutting and felling of trees	Cut, dry and broken branches and pruning of branches (3 times)	01.06–31.07 01.08–30.09	01.02–31.03 01.06–31.07 01.08–30.09
15	Tree Washing	5 times	01.06-31.10	01.05-31.10
16	Pest and disease control measures	Pest control: best alpha 100 KE (0.5- 0.6 l / ha), enjeo 24% (0.3 l / ha), supportive 9–03kg / ha against diseases: topaz 10 % (0.2 l / ha), ridomil gold MS 68 (2.5kg / ha)	During the year	
17	Discovery	When the threat of a cold snap is completely removed in the spring	01–10.04	01–10.04
18	Harvesting and Storage	When Fruits Begin (2-3 Times)	–	01.11–10.12

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**TURKMEN AGRICULTURAL UNIVERSITY NAMED AFTER
S.A.NIYAZOV**

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AGRICULTURAL RESEARCH AND PRODUCTION CENTER

**MANUAL FOR GROWING SUBTROPICAL FRUIT
TREES**

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