MANUAL OF THE CULTIVATION OF VEGETABLES

MINISTRY OF AGRICULTURE AND ENVIRONMENTAL PROTECTION OF TURKMENISTAN

TURKMEN AGRICULTURAL INSTITUTE

AGRICULTURAL RESEARCH AND PRODUCTION CENTER

MANUAL OF THE CULTIVATION OF VEGETABLES

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In the manual, the results of research and best production practices of the Agricultural Research and Production Center of the Turkmen Agricultural Institute are based on agronomic measures for growing vegetables in the soil and climatic conditions of the country, rules and regulations for growing vegetables. It is recommend the advices of pests of the vegetables and their control measures.

The manual is published for agricultural specialists, private landowners, farmers, entrepreneurs, tenants, teachers, students of higher and secondary vocational schools, as well as the general public.

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INTRODUCTION

Thanks to the efforts of the distinguished President, during the period of prosperity of our Sovereign State, the agricultural sector of our country is rapidly growing and changing. Achievements in science and technology, advanced experience and new technologies are widely introduced into the industry.

Our highly esteemed President give a big task to strengthen the food security of the country and provide the population with the necessary vegetables throughout the year. For the successful solution of this important task, it is important to widely introduce scientifically grounded technologies of their cultivation into the production of new high-quality varieties of vegetables.

To get a high yield of vegetables, it is important to select areas with fertile soil, soils rich in organic matter, deep groundwater and put them into production, creating an early high yield.

The widespread use of the achievements of agricultural science in production, the timely and high-quality implementation of agro technical measures, the correct use of fertilizers on a scientific basis, the correct selection and correct management of seed production create an abundance of vitamin-rich vegetables, and work against pests.

Among the main vegetables used in our country are tomatoes, cucumbers, peppers, eggplants, cabbage, carrots and dietary beets, which are in great demand among the population. Therefore, the main task of farmers is to provide our population with a variety of vegetables produced in our country. This vegetable-growing manual is intended for farmers, landowners, tenants of farmers' associations, and entrepreneurs. The manual will also help students, teachers of higher and secondary educational institutions to master farming courses.

CULTIVATION OF TOMATOES, PEPPER, AND EGGPLANT

Growing seedlings in greenhouses and caring for them

Sowing for seedlings is carried out after the preparation of a previously prepared nutrient soil. When sowing, make sure that the seeds are carefully laid out to a depth of 0.5-1.0 cm. It is possible to use a manual seeder for sowing. Handmade wooden tool 6-8 inches can also be used for furrow. Then you will have to manually sow the seeds. The seeds are buried in the soil, leveling the seedlings. Doors or windows in the greenhouse are temporarily left open after the seedlings have germinated. This is because seedlings that grow in a stuffy place grow and weaken.

When the seedlings grow in a greenhouse, the air temperature should be 12-150C during the day and 10-120C at night, 3-6 days after germination. If it is sunny during the day, the temperature in the greenhouse should be 20-26 ^{0}C, and in a cloudy one - 18-20^{0}C. When sowing, the optimum soil temperature should reach 18-25^{0}C for its germination.

The climatic conditions of our country also make it possible to grow vegetables without seeds. But the possibility of growing tomatoes, peppers, eggplant and cabbage without seedlings does not negate the need to grow them seedlings. The main purpose of growing these crops from seedlings is to get an early harvest in June.

The harvest of early and high-yielding vegetables largely depends on the quality of the grown seedlings and their good germination. Sowing the seeds of these early-maturing varieties in greenhouses (in January), followed by replanting the seedlings, allows you to harvest earlier.

According to research and experience from leading industrial farms, growing vegetables in pots with manure accelerates their growth by 10-15 days and significantly increases their early and total yield. Therefore, it is necessary to grow seedlings of early and mid-season varieties only in pots with manure. When potted seedlings are transplanted outdoors, the root system is maintained to ensure good rooting and adequate nutrients early in growth.

In practice, it has been established that the composition of a mixture suitable for making rotten manure in pots under local

conditions should be as follows (depending on the size of the pot: 6x6 or 8x8 centimeters):
1. Rotten dung 70%, unsalted crushed soil of foothills 25%, new cow dung 5%;
2. 80% rotten manure, 15% from alfalfa soil and 5% new cow manure;
3. Manure - 70%, soil taken from the land where alfalfa was removed, soil - 15%, timber - 10% and new cow dung - 5%;

To further increase the nutrient content of the mixture, 20 kilograms of superphosphate fertilizer are added for each cubic meter of mineral fertilizer. From 1 ton of the prepared mixture, 2.5-3 thousand cans weighing 300-400 grams can be prepared. Banks are made on specialized manual or mechanized equipment. Seedlings of green crops are transplanted when one or two true leaves grow in pots.

During the growing season, seedlings should be watered regularly, and their bottom should be weeded regularly. The seedlings should be watered every other day by hand, spraying water, and if watered too often the humidity will increase, leading to disease (black feet, etc.).

During the development of the seedlings, the provision of root rotting soil contributes to the strengthening of their root system and good quality.

Planting vegetable seedlings in open areas

The initial dates for planting seedlings of tomatoes, peppers and eggplant in open areas are determined taking into account spring weather conditions. The initial dates for planting seedlings of green crops in open spaces are usually April 10-15 for the southern regions of the country and April 15-20 for the northern regions. During favorable spring times, experienced farmers occasionally open greenhouses and replant seedlings well adapted to the prevailing outdoor weather 10-15 days earlier. In the early stages, the transplanted seedlings take root well, their growth is accelerated, and as a result, the crop ripens early.

Like other vegetables, tomatoes are an important prerequisite for a good and high-quality harvest when they are 90 x 35-40 centimeters long. The issue of plant nutrition, that is, the number of plants per hectare, should be resolved on the basis of the need to mechanize the cultivation of tomatoes and their full use of nutrients in the soil.

Caring for green vegetables planted in open areas

In an open space, it is necessary to ensure that the seedlings sit directly on the 6-8 centimeters of the ridge. These actions prevent direct planting of the furrow and damage to the root system during machining.

The moisture is trapped so that the plants take root well before planting the seedlings. The pits are located slightly above the direction of the spill of the ridges. In addition to the water that the seedlings have planted, it is important to maintain growth water with it, which should be repeated every 2-3 days until the plants take root. At the same time, it is necessary to replace others with those who do not do. After that, the water for growing should be kept every 7-8 days until the plants begin to germinate, and after they begin to germinate, the plants are watered every 5-6 days. The irrigation rate for cultivation should be in the range of 600-700 cubic meters per hectare, depending on the weather, the mechanical composition of the soil and the degree of soil moisture. Accelerated and efficient pipe irrigation is considered a good method. From the first stages of vegetable growth until they reach full maturity, cultivation is carried out 3-4 times by cultivators. Then not only irrigation furrows are softened, but also inter-furrow litters. As flowers and fruits begin to form, it is necessary to soften the roots of the plants and do the housework by hand. To prevent rotting of the plant embryos, it is necessary to cover the tomato seeds along with the cuttings.

Experienced farmers use a method that excludes the manual closing of tomato roots, that is, their roots remain in place, and the irrigation furrows are transferred to the middle of the garden, the former irrigation furrows are buried and replaced with new ones. Only then do the furrows come together.

The need for nutrients in vegetables is maintained throughout the growing season. Mineral fertilizers should be combined with growing water as nutrients are important to them, especially during periods of rapid growth. Each time when fertilizing vegetable crops with mineral fertilizers, rotten manure is provided at 500-600 kilograms per hectare.

Top feed of tomatoes, peppers and eggplant during the growing season is carried out according to the following rules and terms: for the first time, 10-15 days after planting seedlings in the field, 100

kilograms of superphosphate per hectare, 150 kilograms of carbohydrates and 50 kg of potassium chloride, 150 kg of superphosphate and 150 kg of ammonia saltpeter.

At the third harvest (in August, September), it is recommended to apply 100 kg of ammonium nitrate per hectare, 100 kg of superphosphate and 500-600 kg of rotten manure per hectare, if necessary.

At the last feeding, nitrogen fertilizers are applied at a given rate, and frequent water retention contributes to the formation of additional yields at high temperatures.

CULTIVATION OF TOMATOES

Tomato biology

Tomatoes (Lycopersicum esculentum Mill.) It belongs to the grape family (Solanaceae Juss), Peru is considered the place of origin. It began to spread to European countries in the 18th century and to the Russian state in the 19th century. Among vegetables tomatoes are a high nutrient crop and are used in a variety of ways. Fresh tomatoes contain a large amount of sugars, acids and citric acid necessary for the human body, vitamins A1, B1, B2, S, PP, potassium, sodium and magnesium.

Tomatoes are a thermophilic plant. Its seeds begin to germinate at 10-12^{0}C. The temperature suitable for the growth and growth of plants is 25^0 ° C. At air temperatures below 15^{0}C, tomato flowering stops, and below 10^{0}C, the growth of seedlings stops.

Tomatoes are a light-loving plant. As the light decreases, its growth stops. Many varieties thrive on a 10-12 hour sunny day.

Tomato seedlings are large, with many leaves. Thus, the water from the leaves evaporates quickly, so during harvesting, 80% of the moisture in the soil is required. Lack of moisture during this period leads it to the fall of its flowers. With an average humidity of 45-60%, the plant grows well, with more than 60%, tomato flowering and harvesting are reduced, and there is a risk of getting a fungal disease. The moisture requirement of a tomato depends on its cultivation, that is, when the seedlings are planted in the field, their roots are close to the ground and require a lot of water. The root of tomatoes planted in the seeds of an open room sinks deeply; therefore, its drought resistance increases.

The growing season for tomatoes is long. Its duration is determined by favorable conditions after the release of seedlings in open areas. In early ripe tomato plants, the crop appears on 5-7 leaves, and in late varieties - on 10-11 leaves. The flowering of a tomato depends on its variety and conditions of development and blooms 50-70 days after sowing. 35-50 days after flowering, its fruits begin to turn red. The flowering period of small fruit tomatoes after flowering is short, while the flowering period of large fruit tomatoes lasts. The ripening period of a tomato grown by seedlings is 100-130 days or more.

Characteristics of tomato varieties

Currently, in the Agricultural Research and Production Center of tomatoes, varieties Kopetdag, Gok Yayla, Balkan, Serdar, Vatan, Early Ashgabat are widely used in production.

Kopetdag variety. This variety was created in our country by combining the varieties Goyigyzyl and Alpatiev 905 and introduced into production in 1990. From mass germination to harvest, 107-110 days pass. It is early ripen variety with medium-sized berries. The color of the leaves is light green, medium in size. The structure of the flower is simple, the first set of flowers is formed on 6-7 leaves.

The fruit weighs an average of 70-90 grams, round, smooth, red in color. The sugar content is 3.0%, vitamin C is 21.1 milligrams /%, and the taste is 4.0-4.5 points. From 1.0 tons of fruits, 2.0-2.5 kg of seeds is obtained. The average yield is 450-600 centners per hectare. The fruit is suitable for eating fresh, for juicing and for drying.

Figure 1. ***Kopetdag tomato variety***

Gok yayla variety. This variety was created in our country through a continuous selection process by combining Homes tag and Sovgat 105 tomato varieties. The variety was bred in 1994. From mass germination to harvest, 116-120 days pass. It is medium in size.

Leaves are medium in color and light. The bouquet is simple; the first bouquet is formed on 7-8 leaves.

The fruit is round, smooth, beautiful, red in color, weighing an average of 65-80 grams. The sugar content in tomato juice is 3.5%, vitamin C - 24.0 milligrams /%, and taste - 4.2-4.6 points. From 1.0 t of fruits, 2.0-2.5 kg of seeds are obtained, the average yield is 550-600 c / ha. The fruit is suitable for fresh consumption, juicing and drying.

Figure 2. ***Tomato variety Gok yayla***

Balkan variety. This tomato variety was created by mating the Volgograd 5/95 variety with the Crimson well variety. The variety was put into production in 2000. From mass germination to harvest, 125-130 days pass. The variety ripens late. Leaves are normal, dark green, slightly overgrown. The bouquet is simple; the first bouquet is formed on 8-9 leaves.

Fruits are round, dark red, multicellular, weighing 80-90 g. They contain sugar 3.0%, acidity 0.6%, vitamin C 23.15 mg /%, taste 4.0-4.2 points. From 1 ton of fruits, 2.0-2.4 kg of seeds are produced, the average yield is 400-540 centners per hectare.

Figure 3. ***Balkan tomato varieties***

Serdar variety. The tomatoes are created by mating the Volgograd 5/95 variety with the Uzbek variety. The variety was put into production in 2007. From mass germination to harvest, 118-122 days pass. The harvest begins to ripen in mid-June. It is drought-resistant, heat-resistant, and moderately disease-resistant. The seeds are medium in size and the leaf is medium in size too. The color of the leaves is dark green, medium in size, the surface is slightly creamy. The structure of the flower is simple; the first set of flowers is formed on 7-8 leaves.

Fruits are round, dark red in color, smooth outside, 4-6 cells in diameter, weighing an average of 135-145 grams. Sugar content 3.5%, acidity 0.7%, vitamin C 21.4 mg /%, palatability 4.4-4.6 points, average yield 400-450 c / ha. This variety is suitable for long distance transportation. The fruit is suitable for fresh consumption, for juice.

Vatan variety. This variety of tomatoes was created in our country by mating the varieties Volgograd 5/95 and Korol. A seedling of the variety takes 125-128 days from mass germination to ripening of the crop. Its tops are medium in size. It keeps neatly, and its

versatility protects the plant embryos from hot sunlight. The surface of the leaf is slightly creamy, the color is dark green, giving it a darker shade. The structure of the flower is simple, 3-4 tomatoes are formed from each handful. Leaf fertility may be excessive.

Fruits are round, dark red, smooth seeds, with an average weight of 85-105 grams, multicellular. Dry matter contains 6.7%, sugar 3.4%, acidity 0.45%, vitamin C 21.4 mg /%, taste level 4.0-4.4 points. The average yield is 400-440 c / ha, from 1 ton of fruits 2.0-2.5 kg of seeds are obtained.

Irki Ashgabat variety. This tomato variety was created in our country by combining the Fakel and Gok Yaila varieties. A seedling of the variety takes 105-110 days from mass germination to ripening of the crop. The leaves are light and light green. The bouquet is simple; the first bouquet is formed on 6-7 leaves.

The fruit is round, smooth, red in color, weighing an average of 65-70 grams. Its juice contains 3.0% sugar, 6.6% dry matter, 0.54% acidity, 19.8 mg /% vitamin C and 4.0-4.4 taste points. From 1.0 ton of fruit, 2.0 to 2.3 kg of seeds is obtained. The average yield is 450-500 kg / ha per hectare. The fruit is eaten fresh. This variety can keep fresh for a long time; therefore it is suitable for long-distance transportation.

Figure. 4. ***An early Ashgabat variety***

Margush hybrid. 80 days after germination matures during. The fruit is creamy red, beautiful, medium weighing 140-170 grams, taste

4 points. Its productivity is high, recyclable. Yield per hectare 216-324 s / ha.

Arcach F1 hybrid. Growing in a high-yielding, open field suitable for cultivation Open in Ahal province from 2020 was put into production for cultivation in the fields. The fruit is light red in color, round in shape, and the fruit ripens early. The average weight of the fruit is 150-158 grams. To my first collection of pigeons It takes 98-99 days for the fruit to taste 4.6 points.

Tomus F1 hybrid. It is high-yielding, early ripening. Comparable hybrids ripen 7 days early. Its total yield is one 335-378 s/ha per hectare, 68.0 s/ha higher than comparable hybrids yields.

Figure 5. ***Tomatoes Nusay (Nisa) F1 Hybrid***

Hasylly - hybrid F1, refers to high-yielding, early maturing hybrids. Productivity from comparable hybrids ripens 4 days earlier. The total yield is 373 c / ha, which is 63.4 c / ha higher than that of comparable hybrids.

Nusay F1 hybrid, refers to high-yielding, early maturing hybrids. Productivity from comparable hybrids ripens 6 days earlier. The total yield is 294.5 c / ha, which is 24.3 c / ha higher than that of comparable hybrids.

The use of a light-emitting white polyethylene coating allows tomatoes to be grown outdoors 3-4 weeks ahead of schedule. For

cultivation under polyethylene coverings, tomato varieties Kopetdag and Early Ashgabat should be used. Their seedlings should be grown in manure pots. Tomato seedlings are planted 25-30 days earlier than usual with plastic sheeting. Therefore, to grow tomato seedlings, seeds should be sown in greenhouses from January 5-20.

There are several ways to cover your tomato crop with plastic sheeting. The most convenient of them is a tunnel type with a diameter of 4-5 millimeters, a steel wire bent in the form of an arc. its length averages 1.6-1.8 meters across the width of the press, and the ends pierce the ground at a depth of 10-15 centimeters. These wires should occupy two rows of watering boxes and be routed 1–1.2 meters apart. Polyethylene sheets are fastened from three places (on top and on both sides) so that they do not hang over the plants, tying the ends of the ropes, tapping on the edges at both ends of the joint. The formed frame is covered with polyethylene on the ribs and buried on both sides in the ground. One side of the tunnel is temporarily open for ventilation of very short layers (50-80 meters).

Depending on the width of the coating and wire, the seeding line and the length of the tunnel, the following amount is applied per hectare: 800-1200 kg of polyethylene, 6-7 thousand wire bends (1200-1500 kg), 280-300 kg and 25-30 kg of hemp rope. Under the polyethylene coverings, humid air should be regularly maintained within the range of 45-55%. If the humidity is too high, tomato seedlings get sick, pollination of flowers becomes difficult, the growth and reddening of fruits slows down. Therefore, it is important to keep tomatoes in good condition during the growing season under plastic sheeting. However, given the fact that the cultivation of crops under polyethylene coverings (feeding, softening, weeding, etc.) requires large and additional labor costs, it is recommended to use this method on cleaner, more weed-free soils. After removing the polyethylene coverings, feeding this crop is no different from growing in an open space.

Growing tomatoes without seedlings

The method of growing tomato seedlings involves an expensive cultivation. This method is only profitable when early harvests are sold at high prices.

It is convenient to plant its seeds directly in open soils for a slightly later tomato harvest.

When tomatoes are grown in this way, the overall yield is reduced, the costs associated with growing seedlings are eliminated, and additional greenhouses are not required to grow seedlings.

An important aspect of combining seedless and seedling growing methods is that the tomato crop ripens continuously throughout the season, that is, it ripens at different times. It is advisable to consider 20% of the total area of tomato planting for seedlings. For sowing seeds, it is recommended to use the tomatoes ripened in the intermediate period of the Balkan, Vatan varieties. The optimal time for sowing tomato seeds in open ground is from February 15 to March 15 in the south of the country, March 15-20 in the north, and with a delay, the yield decreases significantly. Tomato seedlings sown with sharp seeds grow slowly in the first period, and it takes a lot of effort to clear early weeds.

Therefore, it is more profitable to plant it on weed-free areas with clean, fertile soil.

When tomato seeds are sown in open ground, they are planted to a depth of 1.5-2 centimeters with green seeders, pulling out the furrows. Seeding rate of tomato seeds is 1.5-2 kg per hectare. A seed mixture is added to the seeds to make the tomato seeds adapt to the soil (dry superphosphate can be used as a three-component seed).

If there was no rain from the moment of planting the tomato to the emergence of seedlings, watering is required 1-2 times. Seedlings are weeded when 2-3 true leaves begin to grow. The latest tomato seed care is no different from seedling tomato care.

Tomato fetus

One of the conditions for increasing the productivity of agricultural crops is the preparation of high-quality seeds and their sending to production. This requires strict adherence to methods to help maintain the purity of the variety. Sorting and selection of seeds for sowing is one of the prerequisites.

It is important to maintain the purity of the variety, to test the seed material of tomatoes, to regularly remove diseased roots affected by insects, mixed varieties before the plants begin to bloom. All of the above works must be accompanied with a letter of act in accordance

with the Regulation on the approval of seed crops. To avoid cross-pollination of seed tomatoes, the distance between varieties should be at least 100 meters outdoors, and 50 meters in protected areas in greenhouses.

Given the long-term tendency of Turkmenistan, tomato seeds are harvested at different times, so the quality of the seeds obtained is different. The quality of the seeds obtained from the fruit is good. The seeds of tomato fruits are obtained using special mechanisms. The resulting seeds are immediately washed in running water, regularly grown and dried in the shade 1.5-2 centimeters thick.

Storing tomatoes

Many scientists have proven that tomatoes can be stored for a long time.

In order for the tomatoes to remain until the end of the season, it is necessary to plant its late-ripening mixed varieties. They are suitable for long-term storage.

Tomatoes that need to be kept for long-term storage should not be watered too much, and tomatoes should not be picked immediately after prolonged rainfall. They crack.

Tomatoes destined for long-distance delivery should be picked when they are just starting to blush. For nearby places or for juicing and for making tomato paste, they need to be harvested after good redness.

During the harvesting period, it is necessary to pick the tomatoes without shaking their tops.

Tomatoes harvested for storage are selected in a dedicated cold room based on ripeness (blue, tall, slightly reddish), and buckets of tomatoes are lined up in a row, with paper lining or wood chips sprinkled on top of each row.

In a special refrigerator for storage, the row width should be 2, and the height should be 8-10 buckets. The length of the rows depends on the area of the room. A gap of 0.80-1.0 meters is made between the rows in order to monitor the condition of the tomatoes during long-term storage. The room temperature should not exceed 10–12 ° C and the relative humidity should not exceed 75%. The number of tomatoes intended for storage should not exceed 10 kilograms per container.

Tomatoes, fried at the specified temperature and humidity, are stored for 25-30 days, and mature tomatoes - for 50-60 days.

Figure 6. ***Tomato flowering period***

Agro technical measures for growing tomatoes

Autumn plowed areas are leveled in early spring. If the mechanical structure of the leveled area is heavy, light plowing to a depth of 18-20 centimeters should be carried out, and if it is sandy, chisel, rake and harrow work should be carried out.

One of the main activities in autumn agriculture, in conjunction with autumn-winter activities for laying the foundation for the future harvest in agriculture, is the cultivation of healthy, not shriveled seedlings in a greenhouse. In the greenhouse, 500-600 grams of tomato seeds are consumed in order to grow enough seedlings per hectare. When the seeds germinate within 8-12 days after sowing and 2-3 true leaves are formed on the seedlings, they are transferred to nutrient pots. Nutrient pots are made in special devices; it is possible to produce 2500-3000 pieces of nutrient pots weighing 300-400 grams per ton of final soil mixture. Seedlings are grown in pots for 45-55 days.

Seedlings grown in pots are planted outdoors in the southern regions of the country from March 25 to April 15, and in the northern regions from April 15 to May 5, depending on the weather.

The seedling planting pattern is varied, and all of them must be taken into account by the force of the action of the mechanisms on the crops. It is recommended to plant seedlings at a distance of 180 cm from each other and at the edge of the shallows - from 30 to 35 centimeters. It consumes 37,000 seedlings per hectare. The soil is regularly moistened so that the roots can take root normally.

Care consists in watering, leveling the rows with the help of mechanisms, covering the tops, grazing, and applying mineral fertilizers to them. Water for cultivation is kept for 5-6 days at the rate of 700 cubic meters per hectare. Tomatoes are watered 18-22 times per season.

During the growing season, tomatoes are fed 2-3 times with mineral fertilizers. For the first time, 15-20 days after planting, 150 kg of carbamate, 100 kg of superphosphate, 50 kg of potassium, and 600 kg per hectare are given.

During the development period, measures against diseases and pests are carried out within the framework and within the time frame recommended by the relevant chemicals.

Tomatoes grown for food are harvested from 5-6 days at the beginning of ripening and every 3-4 days during the mass ripening period.

The agricultural technique of seed-grown tomatoes is the same as for food-grown tomatoes. To maintain the purity of tomato varieties grown for breeding, their distance from each other should be 100 meters.

In the southern regions of the country, the period of sowing tomatoes from the seeds of an open space is from February 15 to March 15, and in the northern regions - from March 15 to April 1. Then 2-2.5 kilograms of seeds are consumed per hectare.

Based on years of research, it is recommended to take seeds from seedlings grown from seedlings before July 25 and from seedlings grown from seed before August 15.

Tomato seeds, fully grown in the off-season during farming, are harvested when they are physiologically ripe.

Tomato seeds are dried on tarps or cloth bags in the fields. The dried seeds are cleaned in a special seed cleaning machine and prepared accordingly.

Timely and high-quality implementation of these agro technical measures will allow you to grow a bountiful harvest of tomatoes.

CULTIVATION OF PEPPER

Pepper biology

Pepper (Capsicum annuum L.) belongs to the grape family (Solanaceae) and is believed to have originated in Central America. There is scientific evidence that it spread to European countries in the 15th century. The pepper is considered an annual plant, but scientists say that if you cut branches in subtropical zones and cover them with straw until winter passes, it will grow back in the spring.

The modern domestic sweet pepper varieties are made from wild bitter peppers. As a result of cutting the pepper, its fruits grow and the bitterness begins to decrease. As a result of its spread to more northern countries, in mild, wet weather, on fertile soils, the fruit of pepper grows, the inner cells increase, and the bitterness decreases. Both types of pepper (bitter and sweet) are widely used in the national economy. Pepper plays a huge role in human life. It is used in various forms for food, for minced meat, for a snack, salted, pickled. It is used in food to improve the taste. When vegetables are salted, canned, pickled, they are mixed with hot peppers, and various dishes are sprinkled with dried crushed powder.

Pepper due to the presence of the alkaloid capsaicin in it is bitter. The amount varies depending on the type of pepper and the growing conditions.

In sweet peppers, the amount of capsaicin is low. In terms of vitamin C content, pepper ranks first among other vegetables. Its ripe vegetable contains 64.5 milligrams /%, and its fully red fruits contain 289.4 milligrams /% vitamin C.

The stalk of the pepper becomes tender at a young age. When it reaches a height of 20-30 centimeters, its main trunk hardens and branches out. The pepper plant is of 2 types: vertically growing and 1-3 low branches, in addition to which there are also many-branched ones.

The leaves are often elongated in the form of an egg. One or two flowers form at the base of the leaves. Flowers bloom first on the first branches, then on the second branches, then flowers on the main trunk. For the flowering of pepper, a temperature of 22-30^{0}C and moderate humidity are required, which reduces its flowering if the crop is not harvested from time to time.

Pepper fruit is cone, pyramid, cylinder and round flat-round shape. There are 3-4 cells inside the fetus. It is empty and the seeds are collected at the base of the fruit.

Seeds are light yellow in color; the surface is smooth, slightly curved. The mass of 1000 seeds is 4-6 grams, depending on the variety, of which 150-200 seeds per 1 gram of pepper.

Characteristics of pepper varieties

Currently, two types of pepper are grown in our country: bitter and sweet. The varieties Astrakhan-147, Pil burun- 304, and sweet types as Sovgat, Datly, Dashkent, Nabat, Bitarap-20variets, and as well as imported hybrids are planted.

Ashgabat-147 variety. A variety that has already been introduced to Turkmenistan and is grown in many places. This pepper variety matures in the medium term, taking 110-118 days from mass germination to harvest. The fruit of the pepper is drooping, long, conical, curved when reddened. The fruit is 8-10 centimeters long, 2 centimeters in diameter, red in color, 1.5-2.0 millimeters thick. In terms of taste, this is one of the hottest peppers. This type of pepper is consumed fresh and dried. Productivity is 150-200 centners per hectare (Figure 7).

Figure 7. **Ashgabat-147 variety of bitter pepper**

Pil burun-304. Created in the Russian Federation. It was introduced in 1962 in all regions of our country. This cultivar matures in the interim period, and it takes 110-120 days from germination to harvest (Figure 8).

Figure 8. **Pil burun variety of bitter pepper**

The fruit of the pepper grows from top to bottom, and the tip of its ripe fruit is conical in shape and is bent. Its length is 12-14 centimeters, diameter at the base is 3-5 centimeters. Technically mature peppers have a bluish green color and a slightly bitter taste. When stored for sowing, the color turns dark red. The productivity is 200-230 kg / ha.

Sovgat variety. The assortment is early maturing, ripens in 120-125 days. The average weight of fruits when grown in vegetable form is 50-60 grams. The amount of dry matter in fruits is 7.8%, sugar content is 3.0%, vitamin C is 128 milligrams /%, fruit thickness is 4.0-5.0 millimeters, taste is 4.0-4.5 points. Productivity is 384-452 kg / ha.

Datly variety. It ripens in the intermediate period, ripens 94-111 days after germination. The average weight of the fruit is 50-80 grams; the thickness of the meat is 5-6 millimeters. The fruit contains 5.6% sugar and 220-240 mg /% vitamin C.

Figure 9. **Sovgat variety of sweet pepper**

Figure 10. **Dashkent variety of sweet variety**

Dashkent variety. Ripening variety 100-120 days pass from germination to harvest. Vegetables turn dark green when they are technically ripe. The average fruit weight is 90-115 grams. The thickness of the fruit pulp reaches 6.0-7.0 millimeters. Its sugar content is 5.4%, and vitamin C - 220-270 ml /%. The average yield is 350 400 kg/ha per hectare. The presentation of the fruit is high**.**

Figure 11. **Sweet pepper variety Bitarap- 20**

Figure 12. **Variety of sweet pepper Nabat**

Figure 13. **Sweet pepper variety Gyrmyzy F_1 hybrid**

Bitarap-20 variety. PBC-271 from the World Vegetable Center (ACIRO, Taiwan) has been regularly selected by breeders. This is an

early ripening variety that ripens 117-120 days after mass germination. The fruit is pendant; the skin is smooth, dark green. The fruit is elongated, cylindrical; the shell consists of 3-4 pieces, 4-5 seed cells. When the fruit is fully ripe, it turns red. The average weight of a commercial fruit is 75-80 grams, sweetness is 4.5 points. The average yield is 320-350 kg / ha per hectare.

Nabat variety. This variety was also imported from the World Vegetable Center (ACIRO, Taiwan) in our country and developed by a pedagogical breeding method from the PP0437-7031 field, which was tested at the Agricultural Research and Production Center. This variety is early maturing, and its fruits begin to germinate 114-118 days after mass germination. During the harvest season, the skin of the fruit is light lemon in color, and the shell is yellow during its biological maturity. Average weight of marketable fruit is 75-80 grams, meat thickness is 4-6 millimeters, and taste is 4.5-5.0 points. Productivity is 450-500 kg / ha.

Gyrmyzy F_1 hybrid. It belongs to the category of high-yielding, early maturing hybrids. The yield is on average 388.7 c / ha, which is 62.2 c / ha higher than that of comparable hybrids that ripen 4 days earlier.

Yanbash F_1 hybrid. It belongs to the category of high-yielding, early maturing hybrids. The yield is on average 415 c / ha compared to comparable hybrids 89.0 c / ha, ripens 3 days earlier.

Figure 14. **Yanbash F_1 Hybrid of Sweet pepper**

Blond F1 hybrid. This is a high-yielding early maturing hybrid. The yield is on average 410.8 c / ha, which is 84.0 c / ha higher than that of comparable hybrids.

Figure 15. **Sweet pepper's Bereket F_1 hybrid**

Berkarar F_1 hybrid. This is a high-yielding early maturing hybrid. The average yield is 379.7 c/ha, which is 71.0 c/ha higher than that of comparable hybrids.

Agro technics of growing pepper

To plant peppers, you must first select areas free of cabbage, carrots, onions, cucumbers and melons. When preparing the field for planting pepper per hectare, 30-40 tons of rotting manure, 300 kg of superphosphate and 50 kg of potash fertilizers are poured before plowing, followed by plowing to a depth of 30-32 centimeters. After leveling and raking in March, rows of 70 or 90 centimeters are drawn. Moisture is stored at the rate of 600-700 cubic meters per hectare in the pits where the seedlings will be planted. After land is found, holes are dug in the furrows and planted in a row with corn seedlings grown in nutritious pots. Planting seedlings in open fields begins in early April. Sowing is carried out in a line of 70x30cm or 90x20cm, at the rate of 47.6-55 thousand seedlings per hectare.

In the southern regions of the country, sowing of pepper and eggplant is carried out from April 10 to 25, and in the northern regions - from April 15 to 25.

During the growth period, the pepper is fed 2-3 times with mineral fertilizers. For the first time, 150 kilograms of carbamate, 100 kilograms of superphosphate and 50 kilograms of potassium chloride, 150 kilograms of ammonium nitrate and 150 kilograms of superphosphate give the second time when plants begin to bloom en masse. For every kilogram, they feed 600 kilograms of rotten manure per hectare. If the crops of pepper have repeatedly collapsed and flowering and budding decreased, it is recommended at this time to give it rotten manure weighing 400-500 kg with a small amount of mineral fertilizers.

During the growing season, corn is watered 15-18 times per hectare at the rate of 600 cubic meters per hectare. During the harvest season, the pepper should be watered frequently, i.e. every 4-5 days.

Pepper fruits are harvested in two ways, when they are ripe, that is, when they are used for food, they need to be harvested every 5-6 days in green form. The peppers are harvested after they are completely browned for processing and sealing in bottle containers. During the ripening period, that is, the fruits are harvested every 3-4 days, when they are technically ripe.

Figure 16. **Ripening period of the sweet pepper crop**

To obtain seeds, it is necessary to sow high-yielding seeds collected in previous years from the best seeds. Seeds to be sown a month before sowing should be dissolved in 3-5% sodium chloride

solution, and the immersed seeds should be washed and dried again in clean water.

The fetus germination technique is the same as that of ordinary pepper. To ensure that the beneficial economic traits and other biological characteristics of peppers and eggplant varieties are passed down from generation to generation, the selection process must be well conducted during all periods of the first breeding season, and cultivars must be cultivated in a good and timely manner. It:

- Pepper seeds must be grown in a greenhouse and transferred to food cans;
- Low-yielding, diseased plants, which are not a variety during the period of plant growth, should be removed from the field with roots;
- in an open space, the distance between crops should be at least 100 meters in accordance with the recommendations for biological non-interference of seeds.

During the growth of the fetus sown corner, regular sorting cleaning should be carried out:

- 1st time - during the seedling period;
- 2nd time - during the flowering period of plants;
- 3rd time - during the harvesting season of plants.

The fetus is harvested when the pepper is completely red. In doing so, it acquires a normal color along with its characteristic properties. At this time, approbation work should be done on the sowing fields. From 1 ton of ripe fruits, you can get 4-8 kg of seeds. Pepper seeds are harvested by hand. Leave the cuttings in the shade for 8-10 days next to the pepper floss to soften the edges of the pepper. Then the pepper thread needs to be sifted through the seed inside and dried on a clean sheet of paper. After drying, its stalk should be removed from the seeds and the drying area should be completely dry. The dried seeds must be passed through special seed cleaning machines. The seeds of the finished pepper seeds are smooth, yellow in color, flat in shape and slightly fruity. The mass of 1000 seeds is 4.5-8 grams. Seed germination of 1st grade must be at least 80%. It remains germinating for 3-4 years. Pepper seeds are only 0.5 in specially sewn coarse calico bags; 1.0; 3.0; should be stored in an amount of 5.0 kg. It is recommended to sow sweet pepper seeds that are stored for 1 year.

CULTIVATION OF EGGPLANT

Eggplants (*Solanum melongena L.*) belong to the grape family (*Solanaceae).* The origin of eggplant is considered to be India. There are 2 types of eggplant: east and west. Early ripe oriental species are planted in the countries of Central Asia. Eggplant is a widespread vegetable crop, especially in southern countries with favorable growing conditions. Eggplant is used as food and as a raw material for the processing industry. It is prepared for conservation, for eggplant caviar, chopped eggplant and various marinades. Eggplant contains sugar, calcium, phosphorus and iron.

Eggplant's biology

Eggplant is a widely used vegetable that loves warm weather. Eggplant seeds germinate at an air temperature of 20^0C. It grows well at 20-25^0C. During mass harvesting, the need for warm air is reduced. When the air temperature rises above 300C, there is not enough moisture in the soil and air, and then the eggplant buds begin to crumble.

Its moist and fertile soil requires a large amount of nitrogen, phosphorus and potassium fertilizers. Therefore, eggplant must be combined with mineral and organic fertilizers.

Characteristics of eggplant varieties

Various types of eggplant and hybrids are grown in different countries of the world. Varieties and hybrids are imported to our country from local varieties Gipchak, Aurora, Uzbekistan, as well as from the Netherlands.

Gipchak variety. An intermediate variety created in our country, from mass germination to harvest is 122-127 days. This variety grows in height up to 1 meter and even higher. The upper part of the head is branched; the leaves and branches are green and slightly pigmented. The leaves are large, ovoid, up to 20-25 centimeters long. This variety is fleshy, fresh, white and very tasty, with small seeds. The total yield is 220-250 c / ha.

Akdashayak variety. It is a medium-sized variety that takes 117-120 days from mass germination to harvest. The seedlings are compact, 60-75 centimeters high.

Figure 17. **Eggplant variety Gipchak**

Figure 18. **Eggplant variety-Akdashayak**

The fruit is cylindrical, the length of the marketable crop is 12-14 centimeters, the average weight of the fruit is 155-160 grams. The amount of dry matter in fruits is 9.3-10.8%, with a total yield of 240-300 c / ha.

Agro techniques for eggplant cultivation

Tomatoes, peppers, eggplant, peanuts belonging to the nightshade family should be planted in order. Their disease is common, and after 3-4 years they have to be planted again in the same place. It is best to plant eggplant in places where cucumbers, cabbage and onions were previously sown. The work of preparing the land for sowing is also the same as that of a pepper.

Eggplant leaves one plant in each dimple, 70 x 40; and is planted along a line of 90 x 30 cm. Then there are 35-37 thousand plants per hectare. The timing and cultivation of eggplant is the same as that of pepper

Crop rotation of vegetables

Crop rotation is a technique-based procedure for rotating crops in each field.

Vegetable farms in our country are recommended to have a 9-field crop rotation plot: 1-3 fields - clover, 4 – plants, 5 - orchards, 6 - vegetables, 7 - cereals and 8-9. Fields are vegetables, i.e. e. 1-3; 4; 5; 6; 7; 8-9.

The size of the fields can vary. They should be in a volume that allows you to fully mechanize growing and harvesting.

It is also important to consider previous crops when planting vegetables in rotation zones, as crops such as tomatoes, peppers and eggplant are best planted after cabbage, legumes, root vegetables and onions. Tomatoes, potatoes and peppers should not be planted where they were previously planted for at least three years because their diseases are common. Organic fertilizers are applied to areas where alfalfa is harvested from the second year. Mineral fertilizers are applied to all crop rotation fields. The ratio of nitrogen, phosphorus and potash fertilizers varies depending on the cultivated crop, mechanical composition and soil fertility.

Diseases and pests of tomatoes, peppers and eggplant

Vegetables are greatly damaged by shovels (Noctuidae, Chloridea armigera Hb.), mole-crickets (Gryllotalpa gryllotalpa L.), aphids (Aphididae), spider mites (Hemiptera), flies (Diptera), (Tetranystus). Trichogramma should be used against eggs of shovels and gabrobragon entomophages against worms. Chemicals include one of the insecticides, entovant, a vacant insecticide against worm-like pests, one of the insecticides containing abamectin in an antiseptic composition of mites, one of the insecticides containing acetamiprid against aphids, and other insecticides recommended for use against other pests.

Today tomato husks (Tuta absoluta) are found in vegetables grown in our country, which greatly reduces their yield. The tomato moth is a particularly dangerous pest of tomatoes belonging to the family of butterfly moths (Gelechiidae) Lepidoptera. It feeds on all types of plants except tomatoes, including potatoes (leaves and tuber), eggplant, hot and sweet peppers. Due to its rapid spread, it is highly polluting and the tomato moth is included in the list of quarantine pests.

The tomato moth grows at an air temperature of 8-350C, and at 300C it grows and multiplies better. In the winter months, butterflies (adults) hibernate in plant debris, soil in the phases of eggs and pupae, and worms die in winter. Pupae are stable in air up to -180C. The tomato is a fully evolved pest in the development of moths and goes through the phases of a butterfly (6-15 days), eggs (4-8 days), worms (10-20 days) and pupae (6-12 days) to form one generation. It produces an average of 13 generations per year. The female lays 7 to 260 eggs, laying an average of 73 percent of the eggs on the leaves, 6 percent on the fruits and stems, and the rest on various parts of the plant. The larvae hatch from the egg and infect leaves, stems and fruits within 80-82 hours (Fig. 19).

Large and small white spots appear on the leaves of tomato plants. The plant continues to grow, fruits infected with worms rot, melt, leaves and stems dry out, and a complete loss of yield occurs. In parts (leaves, fruits) where pests, pathogens and pathogens of fungal, bacterial are introduced, it is easily infected with these diseases (Fig. 20).

1 2

3 4

Figure 19. **Tomato moth: butterfly (1), larva (2), caterpillar (3) and pupa (4)**

Figure 20. **Tomatoes damaged by moths**

Control measures. Given that tomato moth is especially dangerous, it is important to carry out all kinds of measures to combat it. Good results are obtained by plowing the soil and cultivating the

soil from agro technical measures. This is due to the fact that the pest butterfly, its eggs, especially pupae, often lie in the ground in a state of silence (diapause), and they die as a result of exposure to direct sunlight. It is important to plant these resistant varieties and carry out crop rotation in the area where they grow. In addition, special pheromone traps and lamps should be used to catch butterflies in the fields.

Chemical control measures should be initiated as soon as signs of pest infestation appear. Using the recommended insecticides against all phases of the moth, such as a butterfly, egg, worm or pupa, gives good results.

With the onset of certain diseases of vegetable crops, this leads to premature drying, a decrease in the volume and quality of the crop. Currently, the most common diseases of this culture in the velayats of the country are mosaic, streak and rotting of the tops of tomatoes.

Tomato mosaic disease is caused by the tobacco mosaic virus (TMW). The viruses are rod-shaped and can infect tomatoes outdoors and in greenhouses. On diseased leaves, spotted spots appear (alternating light green and dark green colors), small leaves curl and resemble fern leaves and ropes. A diseased plant does not grow, its flowers and buds dry out, the amount of sugar in the resulting crop and the amount of organic acids decreases. The disease spreads and intensifies quickly, causing the tomatoes to dry out. In healthy tomatoes, mosaic disease is mainly transmitted through seeds, wind, water, insects (pests, aphids, lice), weeds, people who tend to tomatoes and through machinery.

Tomato streak disease is caused by the Nicotiana-1 tobacco virus and is often associated with other viruses, namely Nicotiana-1 virus + X eradication or Nicotiana-1 virus + Y eradication, or only X and Y viruses. The main symptoms of stroke are dark shiny stripes on the stems and leaves. The growth of the crop is cut off, the taste changes, and the plant, especially its top, dries up. The disease spreads in a mosaic manner, multiplying faster at temperatures of 15-20 ° C, slowing the disease at 22 ° C and stopping its growth at temperatures above 24 ° C.

Decay of the tops of tomatoes is caused by the influence of pathogenic bacteria (Pseudomonas lycopersici) or the formation of unfavorable soil and climatic conditions. The disease most often occurs when there is little moisture in the soil, followed by regular

rains, and then sudden hot weather and drought. Symptoms of the disease: The tops of tomato fruits rot into a brown, dark brown color.

Control measures. To prevent viral diseases of tomatoes, it is important to plant healthy seeds, hybrids, remove weeds and fight pests in a timely manner. Sowing seeds of diseased tomatoes or the presence of self-growing tomato plants leads to the spread of these diseases. Therefore, seeds for sowing should be taken only from healthy tomatoes and soaked for 20 minutes in a solution of 20% hydrochloric acid or 1% potassium manganese acid (potassium permanganate), and then rinsed with water and sowed. Alternatively, the water-soluble formalin (ratio 1: 300) should be recycled. Good results are obtained by spraying sprouted seedlings with 0.05% potassium permanganate solution or 0.1% boric acid solution 3 times (every three weeks). Measures such as rotating crops, removing crop residues from fields, and choosing non-saline soils for planting vegetables can help reduce these diseases.

CULTIVATION OF CUCUMBERS

Cucumber (Cucumis sativus L.) belongs to the pumpkin family (Cucurbitaceae). The humid tropical regions of India are considered the birthplace of cucumber. It became widespread in European countries in the 16th century. The short development period, the elimination of good taste when eaten fresh and salted, led to the widespread distribution of the cucumber. Despite the low calorie content of other vegetables, the presence of mineral salts and vitamin C increases human appetite and improves digestion.

Cucumber biology

Home of the cucumber, the same plant contains its maternal and paternal flowers. But he also has two and a half family members. The plant can only contain maternal or paternal flowers. The main root of a cucumber does not go deep into the soil, but its lateral roots are highly developed, they are mainly located in the soil layer 20-30 cm. Cucumber roots are sensitive to heat, especially when the seeds germinate. Seeds require 23-25ºC to germinate.

Cucumber seedlings have many branches and are inscribed in the ground. The branches of the first order are formed from the main branch of the beetle, from which branches are formed in the order of 2-3, but these targets are shorter. In early ripening varieties of cucumbers4, they begin to sign at the base of the 5th leaf. However, in later varieties, branches begin to form under 6-8 leaves. The first true cucumber leaf is formed 5-6 days after seed germination.

In the process of development of cucumbers, the paternal flowers are the first to form, which turn out to be abundant. Maternal flowers appear 4-6 days after paternal flowers, most often solitary, but early-maturing varieties can form 3-5 maternal flowers. The hermaphrodite cucumber form is common, but in some varieties these flowers are closer to the maternal or paternal species.

During the growing season, cucumbers have a large number of paternal flowers on the main stem and maternal flowers on the lateral branches. In early ripe varieties of cucumbers, flowers begin to form 30-40 days after the mass germination, and in later varieties - after 50-60 days. After pollination of the mother flowers of the cucumber, the embryo first grows to its length and then begins to grow.

Mother flowers ripen in 7-12 days after pollination (depending on the variety). The fruit of cucumber is multi-seeded, more often three, and sometimes 4-5 pieces. Cucumbers differ in appearance, size, and smoothness and stone color. Fruits are considered small if they reach 8 centimeters long, 8-12 centimeters wide, 12-18 centimeters wide and 18 centimeters high. The surface of ripe cucumber fruits can be smooth or pale, green, dark green or similar in color.

The quality of a cucumber fruit is determined by its properties such as taste, aroma, perspiration, firmness, slow yellowing and ability to dissolve salt.

Characteristics of cucumber varieties

Currently, the farms of our country have varieties of cucumbers as Gevers-3, Anev-1, Ashgabat, Diyar, created at the Agricultural Research and Production Center. In addition, a large number of imported hybrid cucumbers have been planted. In recent years, cucumbers Superina F1 (257.0 c / ha), Fronto F1 (280.0 c / ha), Azamat F1 (250.0 c / ha), Safa F1 (240.0 c / ha), Nada F1 (221.0 c / ha), Murza 274 F1 hybrids (200.2 c / ha) are planted in all provinces.

Gavers-3 variety. Ripens in the intermediate period, and the seeds ripen in 47-50 days after mass germination. The stems are thick, large-leaved; the length of the main branch is 130-150 centimeters. The fruit is smooth, green, and oval; 13-15 cm long, 4-5 cm wide, 3 seed chambers, the average weight of one fruit is 114-124 grams. It contains 1.92% sugar, 7.09 mg /% vitamin C. The fruit is suitable for sweating and salting. Seed cucumbers consist of large, light brown, small complex meshes with an average weight of 600-700 grams. The seed yield is 1-1.2%. It is moderately resistant to pollen. When it is sown in spring, the yield is 220-230 c / ha.

Anev-1 variety. An early ripening variety begins to bear fruit in 44-46 days after mass germination. The average fruit weight is 105-110 grams, length is 10-12 centimeters and size is 3.5-4.0 centimeters. The fruit contains 5.4% dry matter, 2.02% sugar, 7.35 mg /% vitamin C, which is suitable for perspiration. The total yield is 175-180 c / ha.

Figure 21. **Cucumber variety Gavers-3**

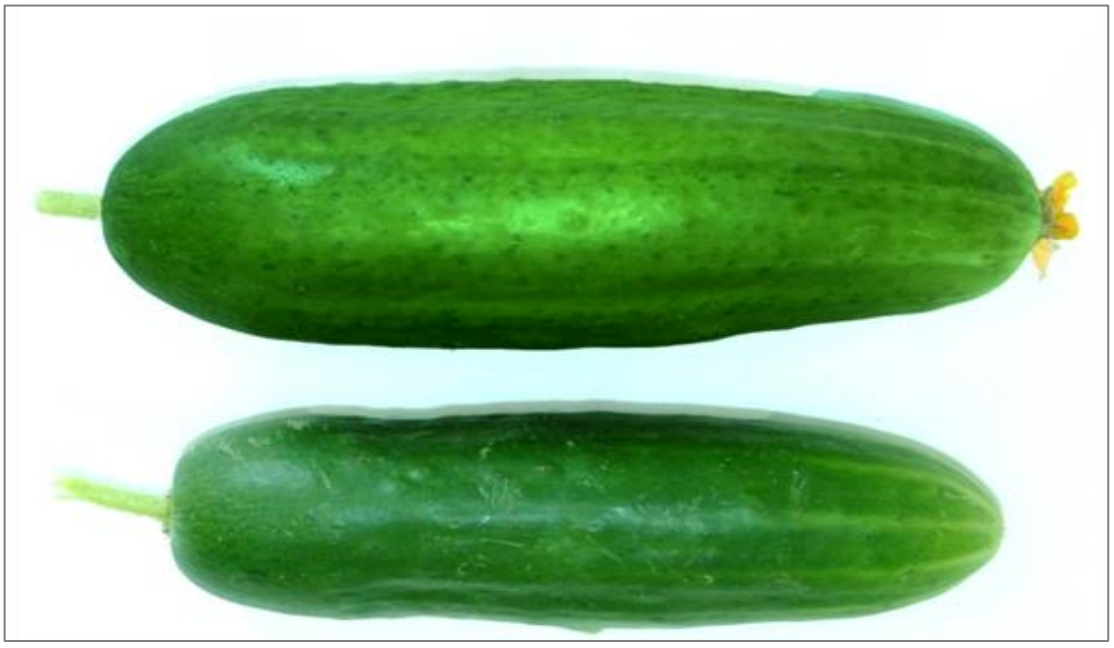

Figure 22. **Cucumber variety Anev-1**

Ashgabat variety. ACIRO from the World Vegetable Center (Taiwan) was created as a result of regular single breeding at the Agricultural Research and Production Center at 08TWFC C-18, 35x37 (Sabell x Nowruz). An early ripening variety begins to fruit in 43-45 days after mass germination. The main branch of the cucumber is 120-140 centimeters, lateral 5-6, the leaves are large, the tip is pointed, the color is dark green, the length is 10-12 centimeters, and the width is 12-14 centimeters. The fruit is dark green, smooth, cylindrical,

average length 12-13 cm, width 4.6-5.4 cm, weight 120-140 grams. Its length is 14-15 cm, width is 5.0-7.0 cm, and weight is 250-400 g. The dry matter content in the fruits of the marketable cucumber is 5.3%, the sugar content is 2.5%, and the content of vitamin "C" - 9.1 milligrams /%. The taste of the fruit is high, it is about 4.5 points. The fruit is suitable for perspiration, eating salted and wrapping in bottles. This variety is more resistant to leprosy and heat than other local varieties. The average yield is 216.8 c / ha.

Figure 23. **Ashgabat cucumber variety**

Diyar variety. ACITRO from the World Vegetable Center (Taiwan) 08TWFC C-17, 34x37 (Reia x Nowruz) was created as a result of a series of unique selections of the Agricultural Research and Production Center. This is an early ripe variety, the seeds of which germinate 43-45 days after mass germination.

The fruit is dark green, smooth, cylindrical, medium length, 12-13 cm, 4.4 cm wide, weight 140-150 grams. The main branch of a cucumber is 120-140 cm long, the number of side branches is 5-6. The leaves are large, rounded, dark green in color, 10-12 centimeters long and 13-14 centimeters wide. The seeds of cucumbers are large, the stone is brown with small stripes and a mesh. It is 14-16 centimeters long and 6-7 centimeters wide. Dry cucumber contains 5.1% dry matter, 2.57% sugar and 9.4 mg /% vitamin C. Fruit taste is high, 4.6-4.9 points. The average yield is 235 centners per hectare. The fruit is suitable for perspiration, eating salted and wrapping in bottles. Diyar

varieties are more resistant to pollination, drought and heat than other local varieties.

Figure 24. **Diyar cucumbers**

Agro technics for growing cucumbers

Sloping cucumber is one of the crops that require air, high humidity, light, soil fertility. Our soil and climatic conditions allow us to grow cucumbers in the open field for three years during the year. Late planting is recommended (July).

Sowing cucumbers gives good results at a stable air temperature above 15 ° C. The air temperature exceeds 35ºC, which negatively affects the flowers that make up the cucumber and causes the flowers to fall off. Cucumbers require high humidity of air and soil during flowering and fruiting, for good growth it should be 85-90% moisture and 80-90% soil moisture.

The cucumber produces high and stable yields when sown in areas free of cereals, alfalfa, tomatoes, cabbage, peanuts and legumes. Cucumber gives good results when grown in high clay soils. When choosing cucumbers, one should take into account the mechanical composition of the soil, the level of salinity, the cleanliness of the weeds, the level of groundwater and crops of previous years.

Cucumber is one of the most demanding crops, especially for organic fertilizers. Therefore, in front of the main herd in November

and December, 40-50 tons of rotting object, 500 kilograms of superphosphate fertilizers per hectare and a seeder with a depth of 27-30 centimeters per hectare are applied on cucumber fields. The lands are leveled between March 1 and 15. Pre-planting planning is one of the most important measures. The quality of agro technical measures carried out with a high-level lay out, that is, processing, sowing, watering, row spacing, ensures good quality. The cost is less when the water is stored in a well-leveled area. Then they carry out pre-sowing work, landscaping, harrowing, sowing, and watering. Before sowing, moisture content of 700 m3 / ha is maintained on the plots. Sowing is best done in the southern regions in April.

In the southern regions of the country, it is recommended to plant cucumbers from March 25 to April 15 (early), from June 15 to July 15 (late). In the northern regions, sowing is recommended from April 5-20 (early) and from June 20 to July 1 (late). If the cucumber is to be grown earlier, the seedlings are grown in food pots in greenhouses and taken out into the open when they produce 3-4 true leaves. Before sowing, the seeds to be sown are treated with chemicals to protect them from various diseases and insects and to speed up germination. When it is processing seeds, 1 kg of cucumber seeds are mixed with 4-5 grams of Zineb powder. When planting cucumbers on an area of 5-10 hectares, sowing is carried out with seeders. When sowing in a small area, sowing is done manually. When it is sown with mechanisms, 5-6 kg of seeds are consumed per hectare, and with manual sowing - 2-3 kg. Seeds are sown in rows 90 x 25-30 to a depth of 3-4 centimeters at the edges, rows are 180 centimeters wide.

For quick and habitual germination of seeds, after sowing, 600-700 meters of sulfuric water are watered per hectare. If the planted cucumber rarely sprouts, it is re-planted in these areas by hand. Thus, in order to obtain a high and stable yield of cucumber, the presence of 37-45 thousand root plants per hectare is considered normal density. Cucumber is a moisture-loving and fast-growing crop, especially during flowering and harvesting periods, it requires a lot of water. Every 6-7 days before the flowering period of the cucumber, 600-700 cubic meters of water per hectare are applied. During flowering, harvesting, water is given every 3-4 days. For the entire period of cucumber cultivation, depending on soil and climatic conditions, they are watered 17-18 times at the rate of 600.700 m^3 thousand cubic meters per hectare. After watering, irrigation ditches, aisles, are

processed, softened and completely cleared of weeds until the plants are harvested by hand so that the fruits do not rot in the weeds.

With periodic processing, weeds are mechanically destroyed, and the base of the plant softens, its roots improve air exchange and reduce the evaporation of moisture from the soil.

Cucumbers are fed 2 times during the growing season with organic and mineral fertilizers. For the first time 3-5 true leaves are formed, 150 kg of carbamate, 150 kg of superphosphate, 60 kg of potassium chloride, 150 kg of ammonium nitrate, 150 kg of superphosphate per second, 150 kg of superphosphate per hectare, 450 -500 kg each time feeding manure are given mixed. Fertilizers are applied to varieties sown by cultivators.

Timely harvesting of cucumbers is one of the most important agro technical measures. If you do not collect the fruits of a cucumber in a timely manner, its fruits will quickly turn yellow, the quality of the presentation decreases, which leads to a decrease in its yield. Therefore, it is recommended to pick the cucumber no later than 2-3 days later. It is watered after each harvest.

Fetus of Cucumber

When sowing, it is important to use selective seeds in order to obtain a high yield of the cucumber.

Cucumbers are a cross-pollinated crop. Therefore, when planting a cucumber on the seeds of its variety, it should be planted at a distance of at least 1000 meters from each other. The agricultural technology of growing seed cucumbers is not much different from the cultivation of edible cucumbers. However, since it takes at least 4 months for the seeds to ripen, the spring sowing period is used for this. The first surface of the cucumber harvest is harvested 1-2 times from the sky, after which the dried fruits are left in the seeds. If the previous crop is not harvested, it can produce poor quality seeds.

For seed germination, 4-6 healthy embryos are left at each root. Varieties are sorted 3-4 times during the growing season. Harvesting of the variety is carried out during the period when the seed of the cucumber is isolated, when it begins to bloom, and when it bears fruit in large quantities. In the process of cleansing, diseased, non-varietal seeds and fruits are removed.

Seeds of green cucumbers, left for germination, ripen in 40-50 days. Therefore, water must be kept every 4-5 days until the cucumber seeds are fully ripe. Signs of ripening of seed embryos of cucumbers are yellowing, darkening of color, depending on the variety. Fully ripe yellowed cucumbers are selected for breeding.

The harvested seeds are delivered to special areas where the cucumber seeds are harvested and stored for 3 to 4 days to soften. The cucumber seeds are then passed through mills and seeders. The resulting seeds are poured into wooden buckets or concrete fermentation pits and stored for 12-15 hours. Thus, the juices from the outside of the seeds are quickly washed off. The seeds are then washed twice in washing machines or by hand. The washed seeds are dried in the shade. Then completely cleaned seeds are sent to special seed laboratories to determine the purity, germination, weight of 1000 seeds and other quality indicators. Clean seeds, tested and suitable for sowing, are packed in bags and stored in suitable seed storage facilities.

Figure 25. **Productivity of cucumber fetus**

The main pests and diseases of cucumber

Vegetable aphid. (Aphis frangulae Glov.) - dark green, black, 1.25–2.1 mm long, a common pest in cucumbers. The larvae are yellow-green. The melon aphid lives in a group (colony) under leaves, in plants, flowers, branches, sucks and feeds on plant sap. The leaves curl, the flowers fall off, the plant continues to grow, and the yield decreases. The plant often dries up. It produces 14-20 generations per year.

Tobacco lice (Thrips tabaci Lind.) it is pale, brown, up to 0.9 mm long. The female lays up to 100 whitish eggs. After 3-6 days, the larvae hatching from the egg feed on the sap of the plant. The plant continues to grow, the yield decreases.

The spider mite (Tetranychus urticae Koch.) It is a green, yellow, orange or red body strain. The female lays up to 100 round whitish eggs on the underside of the leaves. After 4-6 days, the larvae hatch and suck out the sap of the plant. As a result, the plant remains away from growth, and white spots form on the leaves, which dry out.

It gives 20 generations per year indoors and 5 generations per year outdoors.

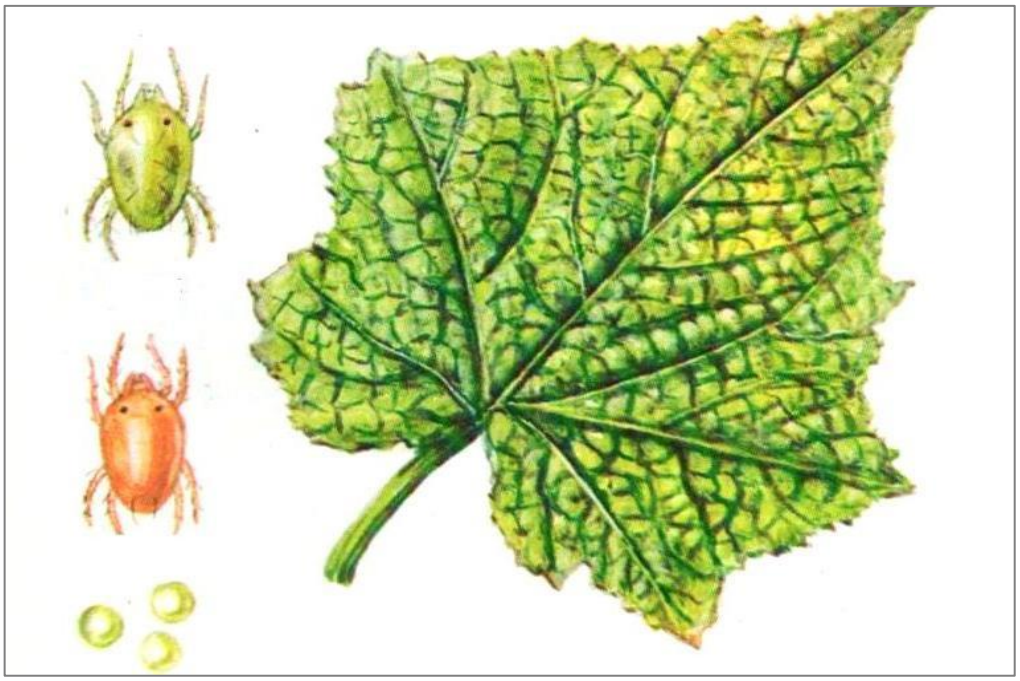

Figure 26. **A spider mite (1), her egg-laying pest (2), her egg (3) and her damaged leaf (4)**

Cucumber brown spot disease was created *by Sporodesmium mucosum Sacc* fungi. The disease mainly affects the fruit of the cucumber, while the leaves and stems are rarely affected. In the affected areas, a diseased fetus first appears, and then it grows, wounds form, young fruits rot. Brown oily substances are released from the wounds.

On diseased leaves and stems, brown spots appear on the stems, and then ulcers of various sizes form on them. The diseased plant does not grow, it often dries up. It is the source of the disease and serves as the remains of the diseased plant.

Cucumber mosaic disease is caused by the Virus-1 virus. On the leaves of a diseased plant, different colors are formed: light green, dark green, yellowish green, and the leaves curl. The fruits develop mosaic colors that swell and take on an irregular shape. The plant blooms and dries up. Weeds are the source of the disease, and insects (lice, aphids, pests) spread the disease everywhere.

Cucumber blue mosaic disease is caused by the Virus-2 virus. One generation of this virus (virus-2.2) causes green mosaic, and another generation (virus-2A) causes white mosaic disease. The symptoms of the disease are best shown in the growth of plants. In the green mosaic, white streaks appear on young leaves, small wrinkles and cracks appear. The leaves become swollen from the wind, take on an abnormal shape, and the plant does not grow.

The leaves of a cucumber affected by white mosaic turn white (chlorosis), yellow or white rings, and star-shaped spots appear on young leaves. Sick fruits turn yellow, harden, various cavities are formed.

Viral diseases are spread through seeds, which can be stored for a long time in soil and weeds in plant debris and can infect healthy plants. It is spread by insects, air.

Akdushme disease of cucumber was created by Erysiphe cichoracearum DC, Leveillula taurica Arn., Sphaerotheca fungal Poll. On top of the leaves of a diseased cucumber, white, yellowish, yellow spots appear which then increase and cover the entire surface of the leaf. Diseased leaves turn yellow and dry. Diseases are stored in plant debris and soil.

Cucumbers disease was created by Ascochyta ascochitosis. Fungal and damage leaves, stems and fruits. The leaves are formed by numerous light gray spots with small black dots. Diseases are being

tested. Factors such as sudden changes in temperature, density and high humidity contribute to the onset of the disease. The source of the disease is soil residues and seeds of diseased plants.

Figure 27. **Cucumber with ascochitis**

Control measures. The cucumbers should be turned over in the affected areas. Plant residues should be removed from the sown area and cleaned. Disease-resistant varieties and hybrids should be planted. The recommended insecticides and fungicides should be used depending on the type of pests and diseases encountered.

CULTIVATION OF CABBAGE

Cabbage (Brassica capitate Lizg.) It belongs to the genus Crucifers (Crucifera L.). The origin of the genus is considered to be the coast of Europe, the Mediterranean Sea. Cabbage is an important crop and occupies one of the main places among vegetables in human food. It is distinguished by its nutritional properties, high yield, and resistance to low temperatures, long-term freshness storage and the possibility of long-distance delivery. Compared to other vegetables, cabbage is rich in nutrients that contain carbohydrates, minerals, potassium, phosphorus and vitamin C. The lactic acid in salted cabbage improves the functioning of the human digestive system.

In our country, such varieties of cabbage are grown as white cabbage, Savoy, Brussels sprouts, collard, kohlrabi and cauliflower, and cauliflower.

Figure 28. **Cabbage field**

Biology of cabbage

Cabbage is a biennial plant. Its seeds are prepared for growing in the first year of life. In the second year, a root is planted and seeds are collected, germinating 4-5 days after sowing and germinating in 3-

4 days at a temperature of 18-20 ^{0} C. The optimum temperature for yellowing of the head is 15-17 ^{0} C. for a long time; it interferes with the growth of cabbage and reduces its yield. Cabbage is an anti-pollinator plant. The pollen in its flower cells is pollinated by insects, especially bees, and cannot be well-pollinated by the wind. Depending on the weather, cabbage takes 3 days to bloom and 15 to 20 days for a bouquet to bloom. It takes 25-60 days for the cabbage to bloom completely.

This plant loves light. During the growing season it needs light. If at this time there is little light, the stem of the seedling is thin and grows long. Its leaves are small and have a small, weak head.

Cabbage loves moisture as it grows. His seedlings require a lot of water during planting, rooting. To obtain a higher yield of cabbage, soil moisture should be at least 80%.

It is in demand for fertilizers, organic and mineral fertilizers. Cabbage likes dung. Therefore, it is widely used in this culture.

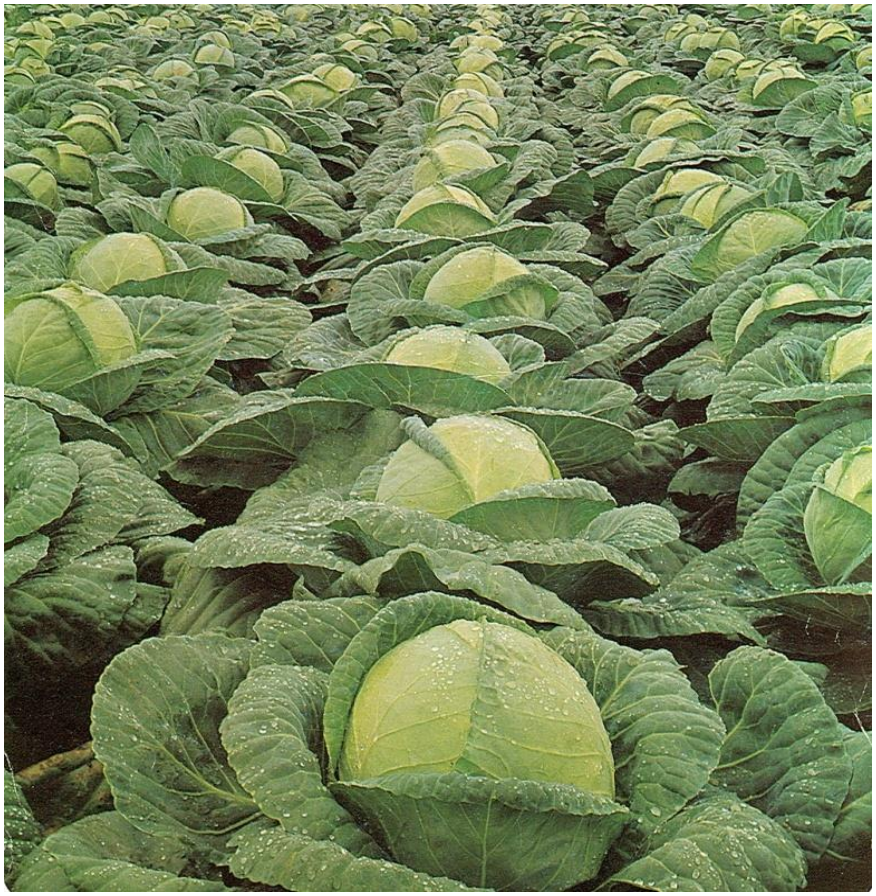

Figure 29. **Cabbage harvest**

Characteristics of cabbage varieties

Currently, cabbage has been planted in the country's farms since June 1, varieties Bagyr, Ashgabat, and hybrids have been brought from the Netherlands.

June - 1 Variety. It is an early ripening variety that takes 95-110 days from mass germination to maturity. Heads of cabbage are round, weighing 1.0 and 1.5 kilograms each. The fruit contains 7.6% dry matter and 4.2% sugar. Early cabbage is eaten fresh. Productivity is 240-270 centners per hectare.

Figure 30. **Cabbage variety June-1**

Ashgabat variety. This variety, created in our country, is a ripening variety that takes 118-120 days from mass germination to harvest. The leaves of cabbage are large, 40-45 centimeters high, the head of cabbage is flatter than round, the color is white, of medium density. Its average weight is 2.5-3.5 kilograms. The dry matter content of the fruits is 7.8%, the sugar content is 3.4%, and the vitamin C content is 35 milligrams /%. Productivity is 250-300 centners per hectare.

Figure 31. **Ashgabat cabbage variety**

Bagir variety. Late-ripening variety, moderate fruit density, 10% dry matter content, 5% sugar, sweet taste. In summer, autumn and winter, it is eaten fresh and eaten. Late cabbage is suitable for pickling. Average yield is 300 cents per hectare.

It is also possible to grow cabbage varieties Slave 1305, Gribov-147, Abs heron, adapted to the local soil and climatic conditions of our country.

Figure 32. **Cabbage variety Bagir**

In addition, in recent years, high-yielding hybrid cabbage varieties imported from the Netherlands have begun to be planted in our country. Hybrid Gloria Star F1 - 377.6 centners, ripens 2 days earlier; The Ringtone F1 hybrid reaches 363.8 quintals, 1 day earlier, while the Jet odor F1 hybrid reaches 358.7 quintals, which is 16 days earlier than the comparable standard. The use of these hybrids of white cabbage will further enhance the quality of food abundance in our country.

Agro techniques for growing cabbage

In our soil and climatic conditions, seedlings of cabbage varieties are grown in a greenhouse and then planted in the open field. A clean place is selected for sharpening. Pre-sowing waters are carried out there. Upon arrival per hectare, 20-30 tons of organic and 500 kg of superphosphate, 100 kg of potassium chloride fertilizers are poured and plowed to a depth of 27-30 centimeters. Then the areas are leveled, divided by 70 cm.

In the early stages of growing seedlings in a greenhouse, seeds are sown in the southern regions from December 15 to January 1, and in the northern ones from December 25 to January 5. Seeding rate of seeds is 0.5-0.6 kg / ha.

Seeds are sown in the southern regions from May 10 to 20, in the northern ones from May 5 to 15.

In the greenhouse, the seedlings are suitable for watering through pipes. This allows the furrow to maintain the consistency of the manure, the seeds germinate and grow normally.

During the growing season, seedlings are watered every 3-4 days, fed with 20-30 grams of nitrogen, 25-30 grams of superphosphate, 10-15 grams of potassium per 1 m2 of land. After 45 days, the seedlings are ready for planting in the fields.

Early planting of seedlings in the southern regions is from February 15 to March 5, and in the northern ones from February 25 to March 15. Late planting of seedlings is expected in the southern regions from July 1-15, in the northern regions from July 15 to August 01. Before planting cabbage seedlings in open ground, they are planted to a depth of 70 cm and kept in moist water. Once the ground is laid, cabbage seedlings with 4-5 leaves are planted in one row by hand at a distance of 35-40 centimeters. Sowing line is 70x35 40

centimeters. Then there are 41-35 thousand plants per hectare. It is also possible to plant a seedling with a special seeder.

After sowing cabbage, 600 m3 of water is collected per hectare. When developing 700-19 m3, water is watered 18-19 times.

In the process of cabbage growth, their rows are treated 3-4 times with mechanisms and 2-3 times are fed with mineral fertilizers. For the first time they are fed, giving 200 kg of carbamate and 150 kg of superphosphate per hectare 10-12 days after a sharp planting.

The second time they give 150 kg of ammonium nitrate, 100 kg of superphosphate and 50 kg of potassium chloride as the cabbage leaves begin to grow. For the third time, the cabbage is fed with 200 kg of ammonium nitrate.

The early varieties of cabbage are grown for human consumption, while the later varieties are grown for seeds and food.

When harvested, the crop is harvested at a temperature of about 4 ° C until it gets cold in the fall.

Figure 33. **Cabbage harvest**

Fetus of cabbage

Cabbage sown for fetus is regularly revised during the growing season.

Sick or insect-damaged cabbage roots are removed. When the crop is fully ripe, the crop is examined by the breeding officer and

healthy dense heads (roots) suitable for seed are selected, and the rest of the cabbage is used for food.

There are different ways to store cabbage seeds. But one of the main conditions is to prevent spoilage, swelling and diseases with all storage methods.

Where cabbage is stored for the winter, its leaves are cut 2-3 centimeters long and left with twigs. For storage, seeds of healthy cabbage are selected, of normal size and of various varieties.

In the conditions of Turkmenistan, cabbage seeds can be stored in a hole dug in the ground. The pit is dug by hand or using a mechanism, it should be 5-10 meters long, 1-1.5 meters wide and 1 meter deep. The distance between the pits should be 3-4 meters, and the extracted sand should be located so that they do not interfere with each other. The holes need to be dug in a few days for the work to be successful.

A simple, inexpensive hole to drip near the seed cabbage planting site, but do not drip in a low-lying area as it may be flooded.

Control measures of major pests, diseases and cabbage

Cabbage aphid (Brevicoryne brassicae L.) is a very common cabbage sucking pest. Its body, 1.7-2.3 mm in size, is covered with a light dusty substance and is found in both winged and wingless forms. The eggs of this pest are oblong, dark glossy in color and up to 0.5 mm long. In autumn, its female lays eggs under leaves and weeds, and in spring they emerge from wingless larvae, feed on cabbage juice and give birth to live larvae (an average of 40). Then their wings appear and spread, causing great harm to the crop. One generation is formed in 10-14 days, giving 16-18 generations per year.

Cabbage aphid lives in a group in the leaves, flowers, seeds of cabbage and sucks out its juice. Affected cabbage does not grow, the yield decreases, the germination of formed seeds or seeds are not formed.

The white cabbage butterfly (Pieris brassicae L.) belongs to the daytime flying butterflies and can reach a wingspan of up to 60 millimeters. The front of the wings is black, while the rest of the wings are white. The female butterfly lays eggs in a row on the underside of the cabbage leaves. After 6-7 days, the larvae from the

egg completely eat up the cabbage leaves. Gives 3-4 generations a year.

Cabbage scoop *(MamestrabrassicaeL.*). It refers to butterflies that fly at night. It reaches 50 millimeters in size and turns pale gray when it spreads its wings. The female lays the butterfly's egg in bundles (in total, she lays an average of 600-700 eggs). After 5-12 days, the larvae feed by piercing the leaves, which pass into the head of cabbage and contaminate it with their feces.

Blackfoot cabbage disease was created by *Olpidiumbrassicae, Wor., Rizictonia Aderholdii Col., Pythium Baryanum He* fungi. The roots of the plant turn black, rot, dry out. Factors contributing to the onset of the disease include density, high humidity, and low air circulation. Fungi are mainly found in soil.

Kila disease was created by *Plazmodiophora brassicae Wor* fungi. Tumors of different sizes form on the roots of diseased cabbage, the roots dry out, and the lower layers of the leaves begin to dry out. The disease can occur during the entire growth period of the cabbage, and if it occurs early in the growth phase, the cabbage dries completely. If this occurs during head formation, an uneven head is formed.

Figure 34. **Cabbage with kila disease**

Cabbage black spot disease was created by (*Alternaria) Alternaria brassicae Sacc., A. oleracea Mild* fungi. On the leaves and stems of diseased cabbage, black elongated spots appear, and then these areas are torn. Diseases are transmitted to healthy plants through seeds and plant debris in the soil.

Yalan ak dushme was created by *Perenospora brassicae Gaum.* creates fungi. White spots appear on the leaves of diseased cabbage, under which substances (fungal spores) are formed, as if flour had sprinkled. The spots grow gradually; the leaves turn yellow and dry. Pathogens are found in seeds and plant debris.

Control measures. It is necessary to carry out crop rotation in areas where the disease has arisen. Plant residues should be removed from the sown area and cleaned. Disease-resistant varieties and hybrids should be planted. The recommended insecticides and fungicides should be used depending on the type of pests and diseases encountered.

CULTIVATION OF CARROTS

Carrots (*Daucus carota L.)* belong to the umbrella family. The origin is considered to be the Mediterranean coast. Carrots are a valuable vegetable crop that produces a lot of fruits. Among vegetables, carrots rank first in terms of their economic importance. Carrots contain vitamins A, B1, B2, C and potassium, phosphorus, iron, which are highly sweet and digestible. Therefore, it is widely used in the food industry.

Biology of carrots

Carrots are a two-year crop, the first year is the year of rooting, and the second year is the year of flowering stems, flowers and seeds. Among edible root crops, carrots occupy one of the first places in terms of their economic importance.

The root system is rectangular and can extend to a depth of 60 cm and a width of 25-30 cm. Carrots play an important role in metabolism and increase the efficiency of intake. Carrot seeds germinate slowly. It begins to germinate at an air temperature above 4 ^{0} C. The optimum temperature for germination of carrot seeds is 16-14 ^{0} C. It grows well at moderate temperatures in the range of 18-30 ^{0} C. During the growing season, when the weather is very hot and there is a lack of moisture, carrot roots stop growing and their appearance and taste deteriorate. There must be enough moisture in the soil for the carrots to take root quickly. Seed carrots bloom 45-50 days after planting and seeds germinate after 120-125 days.

Carrots love rotten organic fertilizers, which affect not only the quantity of the crop, but also its quality. But it doesn't require a lot of natural nutrient abundance.

Due to the high content of essential oils in the seeds, in humid conditions the seeds swell and germinate slowly. The germination rate of harvested seeds is low (70-80%), they can maintain their control. The mass of 1000 seeds is 1.1-1.5 grams.

Characteristics of carrot varieties

Currently Gyzyl mizan-228, Gchki Surhy, Sary mizan- 304 varieties of carrots are grown in our country.

Variety Gyzyl mizan- 228. This variety has been brought to all provinces of our country. It ripens in 110-120 days. There are many leaves, the base is thick, and the tip is pointed. The color of the carrots is orange-red, the base is purple or dark green. The fruits of this variety are smooth, with small buds, juicy and tasty. Root vegetables contain 17% dry matter, 9% sugar, 9.15 milligrams /% carotene. The average weight of the base is 100-150 grams. It has a productivity of 200-300 centners per hectare.

Figure 35. **Red Mirzoy carrot variety**

The advantages of this carrot are the high content of carotene in the fruit, the small size of the core, the ability to adapt to local conditions and long-term storage.

Gichki Surhy is a late-ripening variety; the leaves are erect and spreading.

The root of the vegetable is smooth, knotty, the lateral buds are small, pinkish-orange in color, the core is small, contains 16.86% dry matter, 8.38% sugar, 10.38 mg /% carotene.

Figure 36. ***Gichki Surhy*** **variety of carrot**

Sary mizan- 304 ripens in an intermediate period, 90-100 days. The leaves of this carrot are ripe, multi-leaved. The root crop is pale, smooth in color, yellow in color.

The fruit is juicy, fragile, sweet, tastes less than that of red carrots. In terms of yield, carrots rank first among all cultivated varieties.

Figure 37. **Sary mizan-304 variety of carrots**

Agricultural technology for growing carrots

Carrots are best planted after cabbage, tomatoes, peas, cucumbers and wheat. It should not be replanted for 4-5 years after planting, and with regular planting there is a risk of disease.

The sowing period for cultivation in the southern zones is from 15 February to 1 March, and in the north from 5 to 15 July.

When summer carrots are planted , the preparation of planting sites begins in June. Pour 40-50 tons of rotten manure per hectare, 500 kg of superphosphate and 50 kg of potassium chloride fertilizers and plow 27-30 centimeters of straw. Carrot seeds ripen slowly and germinate late. Therefore, the soil on which you plan to plant carrots must be soft and in a good moist condition.

Carrots are sown with a double row planter. 8 kilograms of seeds are consumed per hectare buried to a depth of 1.5-2 centimeters. In good conditions, after sowing, the seeds germinate within 10-15 days. The first isolation is done after the carrot seeds have germinated and produced the first true leaf. Then the distance between the plants is reduced to 0.5-1.0 centimeters.

When carrots are planted in summer, water is kept per hectare as follows.

1) seedbed water before planting - 800 cubic meters.

2) watering for germination - 700 m^3.

3) Water for growth 12-14 x 800 = 9600 cubic meters.

Fertilizing carrots with mineral fertilizers in the spring: for the first time, 5-6 leaves give 100 kg of carbamate, 150 kg of superphosphate, 50 kg of potassium chloride. The second time the root crop begins to grow - 150 kg of ammonium nitrate and 150 kg of superphosphate.

Fertilizing carrots with mineral fertilizers in summer: during the growing season, carrots are fed 2 times. The second time they give 100 kg of urea and 150 kg of superphosphate per hectare, when the base of the carrots begins to peel off. During the growing season, rows of carrots are treated 3-4 times with cultivators, and the corresponding herbicides are sprayed before shoots of carrots or after shoots of 2-3 true leaves against the emerging weeds. Carrots are harvested in November, before the onset of cold weather.

Fetus of carrot

After harvesting, before starting to store the seeds, carrot roots are selected, and only healthy, large, medium, healthy roots of this variety, 90–120 g in size, are selected. Unripe, small, injured, diseased or frozen roots are removed.

Selected carrots can be stored in pits or warehouses. The pit in which the seeds are stored is usually 80 centimeters wide, 1 meter deep and 5 meters long. For ventilation of the pit, air ducts 10-15 centimeters wide are installed in both places.

In the pits, carrot roots are planted in one direction. Each row is covered with sand or earth. Leaving 10 centimeters to the edge of the pit, the surface of the pit is covered with sand 50-60 centimeters thick, raising the middle so that rainwater does not fall. It is important to ensure that rain and snow do not fall into the pit. It is also effective to store carrots in a 60 cm thick warehouse covered with sand. In the warehouse, carrots are well stored at an air temperature in the stone of $0 + 2.0\ ^{0}$ C.

Storage carrots seeds are controlled and rotted.

The planting rate of carrots per hectare is 4.5-7.0 tons. With a loss of 1.5-2.0 tons, a reserve should be maintained.

Carrots are planted with 2 shoots in each nest, i.e. planted in a square hole at a distance of 60x60 or 70x70 centimeters. With inter-row planting, 1 plant is left every 25-30 cm. Seed carrots are planted by hand to a depth of 15 to 20 cm, the ground is pressed on the sides and compacted.

Carrots are a cold-resistant crop that can withstand temperatures up to -150C in the soil, therefore, after the autumn harvest, it is recommended to plant it in the southern zone in the order indicated above.

Seed carrots are processed 3-4 times during the growing season, fed 2 times with mineral fertilizers and transplanted 2-3 times. The first time feeding is carried out before flowering for good growth, when it begins to germinate, and the second time for good germination.

The first feeding is given 200 kg of ammonium nitrate per hectare, 150 kg of superphosphate, 50 kg of potassium chloride, the second time 150 kg of superphosphate per hectare, 100 kg of urea.

The seeds are pollinated during the flowering period of carrots, especially with the help of insects, flies and to some extent with the help of the wind.

Food carrots are easily dusted with food carrots. Therefore, edible carrots and fodder carrots, when sown on seeds, should be planted at a distance of at least 2 km.

If the wild carrot grows about 300 meters from the seed carrot, they must be removed before flowering. Vegetables belonging to the umbrella family, such as carrots, do not compete with parsley, celery and parsnips. They can be planted in the same area as seed carrots. However, during harvest, it is important to make sure that their branches do not merge with the carrots.

Carrots bloom 45-65 days after planting in open ground. When it starts to bloom, it grows 1 meter in height.

Carrots have small bisexual flowers. But sometimes it also has purely male flowers, mother flowers, or pure flowers. First, the main branch of the main carrot flower begins to open. The floral edge of the umbrella opens slowly at first, then the middle. It takes 15 days for the main middle branch of carrots to bloom, 25-30 days for one root to bloom completely and 60-65 days for the entire field to bloom.

Figure 38. **Ripe harvest of carrots**

Figure 39. **Harvested carrot crop**

When the air is cool and the humidity is high, the flowering period of the carrots is extended. When the air is hot, dry and slightly humid, its flowering accelerates. After planting, carrot seeds ripen in 120-150 days, depending on the weather.

During the growing season, seed carrots are watered up to 12-15 times, 700 m^3 meters per hectare. Carrots ripen in mid-July. Its seeds do not ripen at the same time, so ripe seeds should be collected.

Harvested in the morning before the sun warms up, and placed in special warehouses (threshing floor). You need to arrange them so that the seeds are fully ripe and dry.

Then, after 10-12 days, the carrot seeds are processed by crushing machines or combines. Broken seed is cleaned on the "Super-Petco's" apparatus.

The main pests and diseases of carrots

The carrot fly (*Psila rosae L.)* is a pest with a black body, a shiny yellow head and a length of 4-5 millimeters. Its larvae are yellow, shiny, 6-7 millimeters long, eat carrots, causing them to rot and damage. Its female lays 1-2 white eggs on the root collar of

carrots, from which larvae emerge in 6-12 days. The larvae turn into pupae in the soil and fly like flies for 30-40 days.

Alternaria (black rot) is created by *Alternaria tenuis Nees* fungi. The leaves of the diseased plant turn black and dry out. In its fruits, it appears when the symptoms of the disease persist, that is, dry dark wounds are formed, and in the presence of moisture, it acquires a greenish color. Fruits rot in a coarse form.

Phomo disease of carrots is created by *Phoma libanotis Sacc* fungi. Green, brown spots appear on the leaves of diseased carrots. Then the disease passes on to its fruits, and when stored in a warehouse, dark brown spots form and rot. It is the source of the disease and serves the seeds and plant debris obtained from the diseased plant.

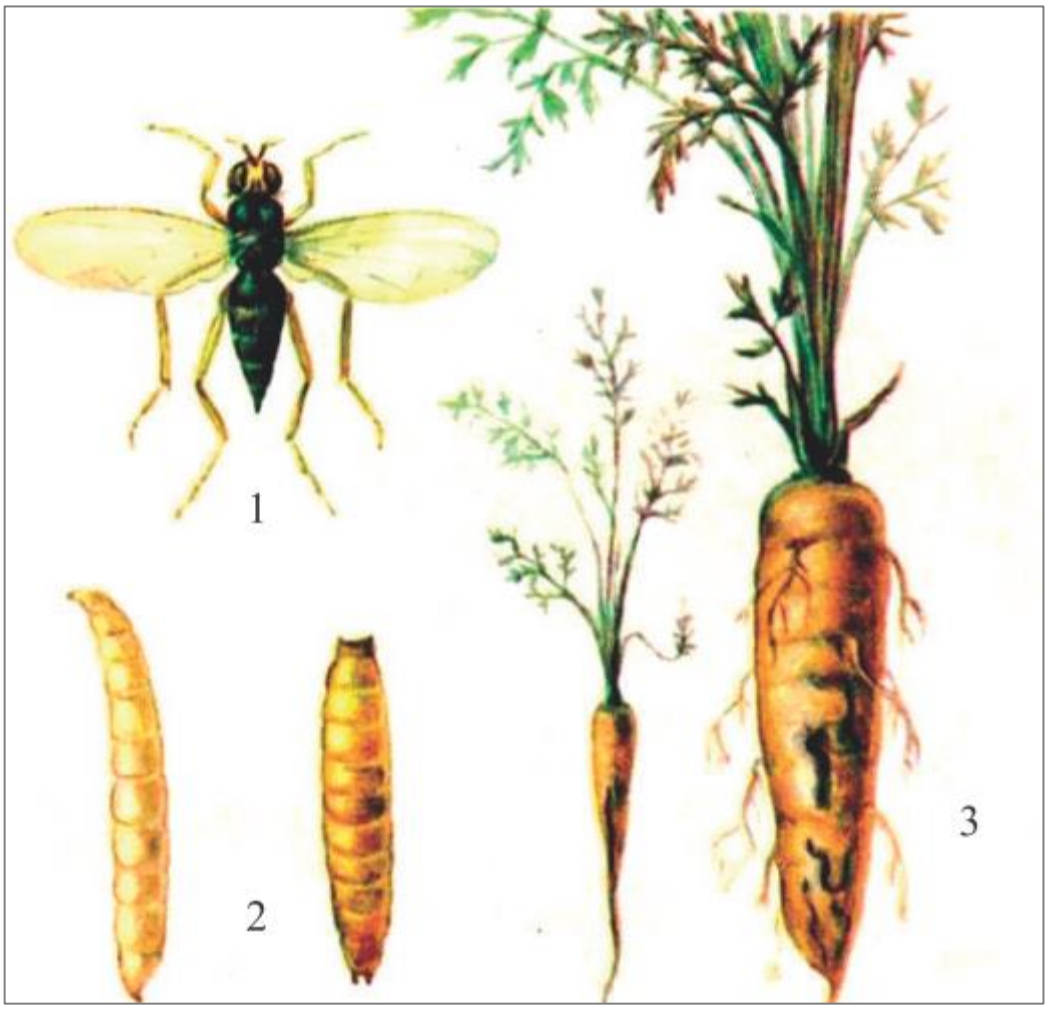

Figure 40. **Carrot fly**
Big insect (1), its larvae and damaged carrots

Carrot bacteriosis disease is created by *Hanthomonas carotae Dows* fungi. Yellow spots appear first on the lower and then on the upper leaves of diseased carrots. The spots then darken; turn brown, and the surrounding area turns yellow. The diseased leaves dry up. The source of the disease is seeds obtained from a diseased plant, serving plant residues.

Sclerotinia (white rot) is created by *Sclerotinia Libertiana Fuck* fungi and mainly carrots. The diseased fetus softens; white deadly substances (fungal spores) are formed around it. It is a source of disease and maintains soil and plant debris.

Control measures. It is necessary to carry out a crop rotation of carrots in the affected areas. Crop residues should be removed and cleared from the field. Disease-resistant varieties and hybrids should be planted. The recommended insecticides and fungicides should be used depending on the type of pests and diseases encountered.

Figure 41. **Carrot sclerotinia**

CULTIVATION OF FOOD BEET

In our country, there are 2 types of beets: the Musur variety and the Bordeaux-237 variety. The agricultural technology for growing beets is similar to the agricultural technology for growing carrots.

Egyptian variety. This is one of the earliest varieties. Seeds ripen 90-100 days after germination.

The root vegetable is round and flat, the flesh is dark red and has a high sweetness. Its roots are durable and can be stored for 4-8 months at 4-50 ° C and 90-95% humidity.

Bahar-237 variety. This is one of the varieties that grow in between. After germination, the crops ripen in 110-120 days, the yield is 200-250 c / ha.

The root vegetable is round and the inside of the fruit is dark red. The root contains 14% dry matter, 8.5% sugar and 0.86% fiber.

Agro techniques of cultivation of food beets

In spring, beet sowing in our country is carried out from February 15 to March 1 in the southern districts of Ahal, Balkan, Mary and Lebap regions and from March 1 to 15 in the northern districts of Dashoguz and Lebap regions. Summer sowing season of beets is for the southern regions of the country from 15 to 25 July, and in the northern - from 5 to 15 July.

Beet planting line: one line and two rows are planted in a 70 x 10 cm line, 10-12 kg of seeds are consumed per hectare.

When planting beets, 500 kg of superphosphate, 50 kg of potassium chloride and 20-30 tons of rotten manure per hectare should be applied. Top dressing of beets during the growing season with mineral fertilizers for the first time during mass germination and with the formation of 2-3 leaves, 100 kg of carbamate, 150 kg of superphosphate, 50 kg of potassium chloride, 50 kg of potassium chloride per hectare;

After planting, the beets need to be watered at a rate of 700 cubic meters per hectare. The cultivation water must be treated 12-15 times at 700 cubic meters per hectare. Water for final growth is supplied in 15–20 days before harvest.

Figure 42. **Bahar-237 beet variety**

Figure 43. **Picked harvest of food beet**

Table 1

Rules and terms for conducting agro technical tomato activities

No	Agrotechnical measures	Norms	The timing	
			In Akhal, Balkan, Mary regions and southern districts of Lebap region.	**In the northern district of Dashoguz and Lebap regions.**
1	*2*	*3*	*4*	*5*
1	Weed cleaning	With recommended herbicides	01-20.10	01.10.10
2	Watering before plowing	600 m³ / ha	20-25.10	-
3	Weed control measures	Recommended herbicides by rule	25-30.10	01-10.10
4	Fertilization before plowing	superphosphate t- 300 kg/ha, potassium chloride-50 kg/ha, rotten manure 30-40 t/ga	01-20.11	10-30.11
5	Plowing	30-32 cm deep	01-30.11	10-30.11
6	Trimming	Transverse section	01-15.03	15-30.03
7	Presowing treatment: chisel + rake + harrow in a complex	In light soil 12-14cm, 16-18 sm	05-20.03	20-30.03
8	Formation of sowing beds	Row spacing 180 cm	01-05.04	01-10.04
9	Humidifying waters	600-700 m³/ha	01-10.04	05-15.04

Continue of table 1

1	*2*	*3*	*4*	*5*
10	Planting seedlings	Planting by hand, 37 thousand plants ha, 90x35-40 according to the drawing	10-15.04	15-20.04
11	Growing water	600 m³ / ha	After the end of sowing	
12	Loosening the soil of plant roots	hands with a hoe 2-3 times	05-20.05	15.05-30.06
13	Control measures against diseases and insects	As a rule, recommended fungicides and insecticides	When pests and diseases appear or disease is prevented	
14	Watering for growth	600-700 m³/ha, give water only 18-20 times every 4-5 days	05.05-15.09	10.05-01.09
15	Weed cleaning	Manually 2-3 times	10.05-05.07	20.05-15.07
16	Inter-row processing and the first time to fertilize additionally with mineral fertilizers	Urea-150kg/ga, superphosphate-100kg/ga, 50 kg / ga potassium chloride and rotten manure 500-600 kg / ga	01-25.05	01-10.06
17	Fertilize for the second time additionally with mineral fertilizers	Ammonium nitrate -150 kg/ga, superphosphate - 150 kg/ga, rotten manure 500-600 kg/ga	01-10.06	15-25.06
18	Harvesting	Manually every 5-6 days	01.06-10.10	10.07-01.10

Note: Recommended agronomic measures and timing may vary in climatic conditions.

Table 2

Rules and terms for carrying out agro technical measures for the cultivation of sweet peppers, eggplant

No.	Agrotechnical measures	Norms	The timing	
			In Akhal, Balkan, Mary regions and southern districts of Lebap region.	In the northern districts of Dashoguz and Lebap regions.
1	*2*	*3*	*4*	*5*
1	Clearing weed areas	Manually	01-20.10	01.10.10
2	Watering before plowing	600 m³ / ha	20-25.10	-
3	Weed control measures	Recommended herbicides by rule	25-30.10	10-20.10
4	Fertilization before plowing	superphosphate - 300 kg / ga, potassium chloride-50 kg / ha, rotten manure 30-40 t / ha	01-20.11	10-30.11
5	Plowing	30-32 cm deep	01-30.11	10-30.11
6	Trimming	Transverse section	01-15.03	15-30.03
7	Presowing treatment: chisel + rake + harrow in a complex	In light soil 12-14 cm, in medium to heavy soil 16-18 cm	05-20.03	20.03-10.04
8	Formation of sowing beds	Row spacing 70; 90 cm	01-05.04	01-10.04

Continue of table 2

1	*2*	*3*	*4*	*5*
9	Moisture charging irrigation	600-700 m³ / ha	05-15.04	10-20.04
10	Planting seedlings	Planting by hand seedlings (70x30; 90x20 according to drawing 47.6; 55.0 thousand plants, eggplant (70x40; 90x30 according to drawing 35; 37 thousand plants	10-25.04	15-25.04
11	Watering for growth	600 m³ / ha	After the end of sowing	
12	Loosening the soil of plant roots	hands with a hoe 2-3 times	05-20.05	15.05-30.06
13	Control measures against diseases and insects	Recommended Fungicides and Insecticides	When pests and diseases appear or disease is prevented	
14	Watering for growth	600 m³ / ga, water 15-18 times every 4-5 days	05.05-15.09	10.05-01.09
15	Weed cleaning	Manually 2-3 times	10.05-05.07	20.05-15.07
16	Inter-row processing and fertilize for the first time with additional mineral fertilizers when it germinates well	urea-150kg/ga, superphosphate100kg/ga, 50 kg/ha potassium chloride and rotten manure 600 kg/ha	15-25.05	01-10.06

Continue of table 2

1	*2*	*3*	*4*	*5*
17	To fertilize for the second time additionally with mineral fertilizers during mass flowering	Ammonium nitrate -150 kg / ha, superphosphate - 150 kg / ha, Rotten manure 600 kg / ha	01-10.06	15-25.06
18	Harvesting	by hand, eggplant every 5-6 days sweet pepper every 3-4 days	20.06-10.10	20.06-01.10

Note: Recommended agronomic measures and timing may vary in climatic conditions

Table 3

Rules and terms for carrying out agrotechnical measures for growing cucumbers in spring

No.	Agrotechnical measures	Norms	The timing	
			In Akhal, Balkan, Mary regions and southern districts of Lebap region.	**In the northern districts of Dashoguz and Lebap regions.**
1	*2*	*3*	*4*	*5*
1	Clearing weed areas	Manually	10-20.10	01-10.10
2	Watering before plowing	600m³ / ha	20-25.10	-
3	Weed control measures	Recommended herbicides by rule	If necessary	
4	Fertilization before plowing	Superphosphate -500 kg / ha, Rotten manure - 40-50 t / ha	01-20.11	10-30.11
5	Plowing	27-30 cm deep	01-30.11	10-30.11
6	Trimming	Transverse section	01-15.03	15-30.03
7	Presowing treatment: chisel + rake + harrow in a complex	14-16 cm deep	05-20.03	20.03-30.03
8	Formation of sowing beds	Row spacing 180 cm	20-30.03	25-30.03
9	Moisture charging irrigation	700 m³ / ha	20.03-10.04	01-15.04
10	Sowing	Mechanisms for 1 ha 5-6 kg, 90x25-30 as per drawing	03.25-15.04	05-20.04

Continue of table 3

1	*2*	*3*	*4*	*5*
11	Watering for growth	600-700 m³/ha	After sowing	
12	Inter-row processing and the first time to fertilize additionally with mineral fertilizers	Carbamide-150 kg/ha, superphosphate-150 k/ha, potassium chloride-60 kg/ha and manure 500 kg/ha	25.04-05.05	01-20.05
13	Weeding the plants	Manually 37-45 thousand bases/ha	05-15.05	15-25.05
14	Loosening the soil of plant roots	Mechanism. By hand, with a hoe	05-20.06	15.05-30.06
15	Measures against diseases and insects	Recommended Fungicides and Insecticides	When pests and diseases appear or disease is prevented	
16	Irrigation water	600-700m³/ga kada bilen, jemi 17-18 gezek	Watering during harvest every 4-5 days	
17	Fertilize for the 2nd time with mineral fertilizers	Ammonium nitrate 150 kg/ha, superphosphate 150 kg/ha, 500 kg/ha rotten manure	20.05-05.06	10-20.06
18	Harvesting	Manually	Harvesting every 2-3 days when the crop is ripe	

Note: Recommended agronomic measures and timing may vary in climatic conditions

Table 4

Rules and terms for carrying out agro technical measures for growing cucumbers in summer

No.	Agrotechnical measures	Norms	The timing	
			In Akhal, Balkan, Mary regions and southern districts of Lebap region.	In the northern districts of Dashoguz and Lebap region.
1	*2*	*3*	*4*	*5*
2	Watering before plowing	600 m³/g	20-25.10	15-25.10
3	Weed control measures	Recommended herbicides by rule	If necessary	
4	Fertilization before plowing	superphosphate t-500 kg/ha, rotten manure 40-50 t / ha	01-20.11	10-30.11
5	Plowing	30-32 cm deep	01-30.11	10-30.11
6	Trimming	Transverse section	15-20.05	10-20.05
7	Presowing treatment: chisel + rake + harrow in a complex	14-16 cm deep	20-30.05	20-30.05
8	Formation of sowing beds	row spacing 180 cm	01.06-05.07	01-10.06
9	Moisture charging irrigation	700 m³ / ha	10.06-10.07	10-20.06
10	Sowing	Sowing machines, 1 ha 5-6 kg	15.06-15.07	20.06-01.07
11	Watering for growth	600m³ / ga	After sowing	

Continue of table 4

1	*2*	*3*	*4*	*5*
12	Inter-row processing and the first time to fertilize additionally with mineral fertilizers	carbamide-150 kg / ha, superphosphate-150 kg / ha , potassium chloride-60 kg / ha and manure 500 kg / ha	10.07-15.07	10-15.07
13	Weeding the plants	Manually 37-45 thousand bases / ha	25.07-05.08	10-15.07
14	Loosening the soil of plant roots	By hand with a hoe, by a mechanism	15-20.08	15-20.07
1	*2*	*3*	*4*	*5*
15	Control measures against insects and plants	Recommended Fungicides and Insecticides	When pests and diseases appear or disease is prevented	
16	Watering for growth	600-700m³ / ha normal, only 17-18 times watered	Watering every 4-5 days	
17	Fertilize for the 2nd time with mineral fertilizers	Ammonium nitrate 150 kg / ha, superphosphate 150 kg / ha, 500 kg / ha rotten manure	20.07-05.08	01-15.08
18	Harvesting	Manually	Harvesting every 2-3 days when the crop is ripe	

Note: Recommended agronomic measures and timing may vary in climatic conditions

Table 5

Rules and terms for conducting agrotechnical measures for growing cabbage in spring

No.	Agrotechnical measures	Norms	The timing	
			In Akhal, Balkan, Mary regions and southern districts of Lebap region.	In the northern districts of Dashoguz and Lebap region.
1	*2*	*3*	*4*	*5*
1	Clearing plant areas	Manually	10-20.10	01-20.11
2	Weed control measures	Recommended herbicides by rule	10-20.10	01.-15.10.
3	Watering before plowing if necessary	600-700 ³ / ha	15-25.10	20-25.10
4	Fertilization before plowing	superphosphate-500 kg / ha, potassium chloride-100 kg / ha, manure 20-30 t / ha	20-30.11	10-30.11
5	Plowing	27-30 cm deep	25.11	15.11.-25.12
6	Trimming	Transverse section	20-30.01	30.03-10.04
7	Chisel, rake harrowing	Along and across 16-18 cm	25-30.01	10-20.04
8	Weed control measures	Recommended herbicides by rule	If necessary	

Continue of table 5

1	*2*	*3*	*4*	*5*
9	Sowing seeds for seedlings in greenhouses	For growing 1 ga needed seedlings 0.5-0.6 kg	15.12-01.01	25.12-05.01
10	Transplanting seedlings into pots	When 3-4 leaves are formed	01-05.02	20.02-10.03
11	Formation of sowing beds	At a distance of 70 cm	05-10.02	20.02-10.03
12	Moisturizing watering	600-700 m³ / ha	05-10.02	15-25.02
13	Planting seedlings in an open space	manually 70x35-40 according to the drawing 1 ha 41-35 thousand plants	15.02-05.03	02.25-15.03
14	Watering for growth	600 m³ / ha	After sowing	
15	Watering for growth	600-700 m³ / ha according to the rule 18-19 times (hasyla duryança her 10 günden, hasyla duranda her 6-7 günden we hasyly doly ýetişýänçä her 15-16 günden	01.03-10.06	03.25-10.07
16	Inter-row cultivation, loosening of the soil of plant roots	3 times, 10-12 deep	15.03-15.06	05.04-15.07
17	Weed cleaning	manually 2 times	15.04-20.06	25.04-20.07

Continue of table 5

1	*2*	*3*	*4*	*5*
18	1st time fertilize with mineral fertilizers	Urea-200 kg/ha, superphosphate-150 kg/ha	15-25.03	05-15.04
19	2nd time fertilize with mineral fertilizers	Ammonium nitrate-150 kg/ha, superphosphate-100 kg/ha, potassium chloride-50 kg/ha	05-15.04	25.04-05.05
20	Fertilize for the 3rd time with mineral fertilizers	Ammonium nitrate-200 kg/ha	10-20.05	15-25.05
21	Control measures against diseases and insects	Recommended Fungicides and Insecticides	If necessary	
22	Harvesting	Manually assembled in 3 stages	20-25.06	20-25.07

Note: Recommended agronomic measures and timing may vary in climatic conditions.

Table 6

Rules and terms for carrying out agrotechnical measures for growing cabbage in summer

No.	Agrotechnical measures	Norms	The timing	
			In Akhal, Balkan, Mary regions and southern districts of Lebap region.	In the northern districts of Dashoguz and Lebap region.
1	*2*	*3*	*4*	*5*
1	Clearing plant areas	Manually	10-20.10	01-20.10
2	Weed control measures	Recommended herbicides by rule	10-20.10	01-15.10
3	Watering before plowing if necessary	600-700 m³ / ha	15-25.10	20-25.10
4	Fertilization before plowing	superphosphate-500 kg/ga, potassium chloride-100 kg/ga, manure 20-30 t/ha	01-20.11	25-30.10
5	Plowing	27-30 cm deep	20-30.11	15-30.11
6	Trimming	transverse	25-30.01	01-10.05
7	Chisel, rake harrowing	Along and bottom rivers 16-18cm	25-30.01	05.25-15.06
8	Weed control measures	Recommended herbicides by rule	If necessary	

Continue of table 6

1	*2*	*3*	*4*	*5*
9	Sowing seeds for seedlings in greenhouses	1 ha ýeterlik şitil ýetişdirmek üçin 0.5-0.6 kg	10-20.05	05-15.15
10	Transplanting seedlings into pots	Formation of 3-4 leaves	05-10.06	01-10.06
11	Formation of sowing beds	70 cm deep	20-25.06	20-30.06
12	Moisture charging irrigation	600-700 m³ / ha	25-30.06	01-10.07
13	Planting seedlings in an open space	Manually 1 ha 41-35 thousand plants	01-15.07	15.07-01.08
14	Watering for growth	600 m³ / ga	After sowing	
15	Watering for growth	600-700 m³ / ga kada bilen 18-19 gezek(hasyla duryança her 10 günden, hasyla duranda her 6-7 günden we hasyly doly ýetişýänçä her 15-16 günden	20.07-01.11	20.07-01.11
16	Hatarara bejergi geçirmek, düýplerini gumlamak	3 times, 10-12 cm deep	25.07-10.11	25.07-10.11
17	Weed cleaning	2 times manually		
18	1st time fertilize with mineral fertilizers	Urea-200 kg / ha, superphosphate-150 kg / ha	07.25-10.08	25-10.07

Continue of table 6

1	*2*	*3*	*4*	*5*
19	2nd time fertilize with mineral fertilizers	Ammonium nitrate-150 kg / ha, superphosphate - 100 kg / ha, potassium chloride -50 kg / ha	20-30.08	15-25.08
20	Fertilize for the 3rd time with mineral fertilizers	Ammonium nitrate -200 kg / ha	15-25.09	10-20.09
21	Pest and disease control measures	Recommended Fungicides and Insecticides	If necessary	
22	Harvesting	Collection by hand in 3 steps.	15-20.11	10-20.11

Note: Recommended agronomic measures and timing may vary in climatic conditions.

Table 7

Rules and terms for carrying out agro technical cultivation measures in spring period of Mookie

No.	Agrotechnical measures	Norms	The timing	
			In Akhal, Balkan, Mary regions and southern districts of Lebap region.	In the northern districts of Dashoguz and Lebap region.
1	*2*	*3*	*4*	*5*
1	Clearing plant areas	Manually	10-20.10	01-10.10
2	Weed control measures	Recommended herbicides by rule	10-20.10	01-10.10
3	Watering before plowing if necessary	700-800 m^3/ga	15-25.10	10-20.10
4	Fertilization before plowing	superphosphate-500 kg/ga, potassium chloride-50 kg/ga, rotten manure 20-30 t/ha	01-20.11	15-25.11
5	Plowing	27-30 cm deep	20.11-30.11	15.11-25.12
6	Trimming	Transverse	20-30.01	10-15.01
7	Chisel, rake harrowing	Along and across 16-18cm	20-30.01	10-15.01
8	Formation of sowing beds	At a distance of 70 cm	01-10.02	15-20.01
9	Moisture charging irrigation	600-700 m^3/ga	05-10.02	20-25.02

Continue of table 7

1	*2*	*3*	*4*	*5*
10	Carrying sowing	Ekijiler bilen gerşiň üstünde 2-3 setir, 8 kg / ga	15.02-01.03	01-15.03
11	Watering for growth	600-700 m^3 / ga	After sowing	
12	Pest and disease control measures	Recommended Fungicides and Insecticides	When pests and diseases appear or disease is prevented	
13	Watering for growth	700-800 m^3 / ga, doly gögeрýänçä her 4-5 günden, gögerenden soň 8-10 günden, hasyla duranda 12-15 gezek	15.03-10.06	01.04-10.05
14	Inter-row processing and fertilize for the 1st time with mineral fertilizers	urea-100 kg / ga, superphosphate t-150 kg / ga, potassium chloride-50 kg / ga	10-20.04	15-25.04
15	Fertilize for the 2nd time additionally with mineral fertilizers	Ammonium nitrate-150 kg / ga, superphosphate-150 kg / ga	15-25.05	10-20.05
16	Harvesting	Collected by hand	20-25.06	20-30.06

Note: Recommended agronomic measures and timing may vary in climatic conditions

Table 8

Rules and terms for carrying out agrotechnical measures for growing carrots in summer

No.	Agrotechnical activities	Norms	The timing	
			In Akhal, Balkan, Mary regions and southern districts of Lebap region.	In the northern districts of Dashoguz and Lebap region.
1	*2*	*3*	*4*	*5*
1	Clearing plant areas	With the help of mechanisms	15-20.06	10-20.06
2	Weed control measures	Recommended herbicides by rule	If necessary	
3	Watering before plowing	700-800 m^3/ha	20-25.06	15-25.06
4	Fertilization before plowing	superphosphate-500 kg/ga, potassium chloride-50 kg/ga, rotten manure 40-50 t/ga	20-25.06	15-30.06
5	Plowing	27-30 cm deep	25-30.06	15-30.06
6	Trimming	transverse	25-30.06	15-30.06
7	Chisel, rake harrowing	Along and across 16-18 cm	25-30.06	25.30.06
8	Formation of sowing beds	At a distance of 70 cm	01-10.07	05-10.07
9	Moisture-charging irrigation after sowing	800 m^3/ha	05-16.07	05-10.07

Continue of table 8

1	*2*	*3*	*4*	*5*
10	Sowing	With the help of seeders 2-3 rows, 8 kg/ha	15-25.07	05-15.07
11	Watering for growth	700 m^3 / ha	After sowing	
12	Pest and disease control measures	Recommended Fungicides and Insecticides	If necessary	
13	Watering for growth	800 m^3 / ha according to the rule, before seed growth every 4-5 days, after seed growth 8-10 days, for harvest 12-15 days, only 12-14 times	01.08-25.10	01.08-20.10
14	Inter-row processing and the first time to fertilize additionally with mineral fertilizers	Ammonium nitrate-200 kg / ha, superphosphate-150 kg / ha, potassium chloride-50 kg / ha	20-25.08	
15	2nd fertilize additionally with mineral fertilizers	urea-100 kg / ha, superphosphate-150 kg / ha	05-10.09	01-10.09
16	Harvesting	Collect with the help of mechanisms, collect manually packing in bags	10-20.11	15-30.10

Note: Recommended agronomic measures and timing may vary in climatic conditions

Table 9

Rules and terms for carrying out agrotechnical measures for growing sugar beets in spring

T/b	Agrotechnical measures	Norms	The timing	
			In Akhal, Balkan, Mary regions and southern districts of Lebap region.	**In the northern districts of Dashoguz and Lebap region.**
1	*2*	*3*	*4*	*5*
1	Clearing plant areas	Educational	10-20.10	01-10.10
2	Weed control measures	Recommended herbicides by rule	10-20.10	01-10.10
3	Watering before plowing	700-800 m^3/ha	15-25.10	10-20.10
4	Fertilization before plowing	superphosphate-500 kg/ha, potassium chloride-50 kg/ha, rotten manure 20-30 t/ha	01-20.11	15-25.11
5	Plowing	27-30 sm çuňlukda	20.11-30.11	15.11-25.12
6	Trimming	Transverse	20-30.01	10-15.01
7	Chisel, rake harrowing	Up and down 16-18 cm	20-30.01	10-15.01
8	Formation of sowing beds	At a distance of 70 cm	01-10.02	15-20.01
9	Moisture charging irrigation	600-700 m^3/ga	05-10.02	20-25.02
10	Sowing	Seed drills for 1-2 rows, 10-12 kg/ha	15.02-01.03	01-15.03
11	Watering for growth	700 m^3/ha	After sowing	

Continue of table 9

1	*2*	*3*	*4*	*5*
12	Disease and pest control measures	Recommended Fungicides and Insecticides	When pests and diseases appear or disease is prevented	
13	Watering for growth	700 m^3/ha, until fully grown in 4-5 days, after growth 8-10 days, 13-16 times	20.03-10.06	15.04-05.06
14	Inter-row processing and the first time to fertilize additionally with mineral fertilizers	urea-100 kg/ha, superphosphate 150 kg/ha, potassium chloride-50 kg/ha	10-20.05	15-25.04
15	2nd fertilize additionally with mineral fertilizers	Ammonium nitrate-200 kg/ha, superphosphate-150 kg/ha	15-25.04	10-20.05
16	Harvesting	Collection by mechanisms	20-25.06	20-30.06

Note: Recommended agronomic measures and timing may vary in climatic conditions

Table 10

Rules and terms for carrying out agrotechnical measures for growing sugar beets in summer

No.	Agrotechnical measures	Norms	The timing	
			In Akhal, Balkan, Mary regions and southern districts of Lebap region.	In the northern districts of Dashoguz and Lebap region.
1	*2*	*3*	*4*	*5*
1	Clearing plant areas	With the help of mechanisms	15-20.06	10-20.06
2	Weed control measures	Recommended herbicides	If necessary	
3	Watering before plowing	700-800 m^3 / ga	20-25.06	15-25.06
4	Fertilization before plowing	superphosphate-500 kg/ha, potassium chloride-50 kg/ha, rotten manure 20-30 t/ha	20-25.06	15-30.06
5	Plowing	27-30 cm deep	25-30.06	15-30.06
6	Trimming	transverse	25-30.06	15-30.06
7	Chisel, rake harrowing	Up and down 16-18 cm	25-30.06	25.30.06
8	Weed control measures	Recommended herbicides	If necessary	
9	Formation of sowing beds	At a distance of 70cm	01-10.07	05-10.07
10	Moisture charging irrigation	600-700 m^3 / ha	05-16.07	05-10.07
11	Sowing	Using seeders in the beds 1-2 rows, 10-12 kg/ha	15-25.07	05-15.07

Continue of table 10

1	*2*	*3*	*4*	*5*
12	Watering for growth	700 m^3/ha	After watering	
13	Disease and pest control measures	Recommended Fungicides and Insecticides	If necessary	
14	Watering for growth	700 m^3/ha according to the rule until the seed germinates 4-5 days, after growth 8-10 days 12-15 times	15.08-25.10	10.09-20.10
15	Inter-row processing and the first time to fertilize additionally with mineral fertilizers	Ammonium nitrate-200 kg/ha, superphosphate-150 kg/ha, Potassium chloride-50 kg/ha	20-25.08	
16	2nd fertilize additionally with mineral fertilizers	urea t-100 kg/ha, superphosphate-150 kg/ha	05-10.09	01-10.09
17	Harvesting	Collect with the help of mechanisms, collect manually packing in bags	10-20.11	15-30.10

Note: Recommended agronomic measures and timing may vary in climatic conditions

CONTENT

CULTIVATION OF CABBAGE

CULTIVATION OF CARROTS

CULTIVATION OF FOOD BEET

MINISTRY OF AGRICULTURE AND ENVIRONMENTAL PROTECTION OF TURKMENISTAN

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