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Cultivation of Pea Varieties Suitable For Soil and Climate Conditions of Nakhchivan Autonomous Republic

Abstract

Increasing the production and improving the quality of chickpeas plays a key role in ensuring the food security of the Autonomous Republic, as chickpeas have high nutritional value and healing properties. Therefore, today's human nutrition depends mostly on plants. In particular, legumes, which contain a high amount of protein, are the main component of human and animal food. In the article, suitability of 2 varieties of pea (*Cicer arietinum* L.) planted for research purposes to the conditions of Nakhchivan Autonomous Republic, planting technology, care rules and productivity were mentioned. At the same time, the soil and climate conditions of the pea plant, vegetation period, irrigation technology were also mentioned. Also, the results obtained from pea varieties planted for research purposes in the Nakhchivan Autonomous Republic were also mentioned.

Keywords: *chickpea, pest, control, phenological observations, quality, protein, productivity*

Introduction

The pea plant is the most widespread among the cereal-legume crops cultivated in the Nakhchivan Autonomous Republic. Chickpea belongs to the family of legumes (Fabacea) and belongs to the genus Cicer arietinum L. The yellow pea was cultivated around 7,000 years ago, B.C. In the 5000s, it began to be planted in the Middle East, especially in the regions of Iran and Iraq. This period is a period of time when peas were recognized by people as an agricultural product and began to be widely used. These regions are considered to be one of the oldest places in the cultural history of peas. At the same time, peas are an indispensable source of protein cultivated in India, America, Western Asia, North Africa, and Australia. The pea plant, which is rich in protein, sugar and trace elements, is of great importance (The farmer's annual activity calendar, 2019, p. 40).

Research

Pea is an annual herb. The color is white, yellow, pink, green. The leaves are short-stalked, compound unipinnate, without whiskers. There are 9-15 pairs of leaves on the leaf stalk. The leaves of different varieties differ in size. Depending on the variety, the plant is 30-90 cm tall. The fruit is

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swollen, 1-3.5 cm long. Each pod contains 1-2 occasionally 3 grains. Peas contain a high amount of protein (about 20-25 %), carbohydrates (40-60 %), fat (3-8 %), calcium, iron, potassium and a high amount of sodium. The main composition of peas is irreplaceable acids – methionine and tryptophan. Yellow peas are the third largest leguminous plant in the world, after green peas and beans. The amount of proteins in peas is very close to the amount of proteins in eggs. Its composition is rich in vitamins A, B1, B2, B6, C, D, PP and minerals. Peas are considered beneficial for the intestines due to the fiber they contain. The role of peas in the health of the body is great. It improves the functioning of the nervous system and normalizes sleep. It can be used in the prevention of cardiovascular diseases. Fresh chickpea juice is very beneficial for skin and hair. Peas have the ability to nourish cells and heal skin scars. It has the ability to protect the lens of the eye. Thus, the contents of peas eliminate fatigue in the crystalline membrane and improve vision (Valiyeva, 2024, p. 414).

There is a growing demand for chickpea due to its nutritional value. In the semi-arid tropics, chickpea is an important component of the diets of those individuals who cannot afford animal proteins or those who are vegetarian by choice (Singh, 1985, p. 23).

Soil requirements of the pea plant: The pea plant is not very demanding on the soil. It grows and yields well in sandy, light loamy and even saline soils. The pea plant gives the highest yield on black soil and dark chestnut soils (Amirov, 1968, p. 12).

Climatic requirements of the chickpea plant: Chickpea is a plant adapted to arid climatic conditions. In hot and dry climates, the plant can grow faster, but in cold weather, the growth process can be prolonged. Peas begin to germinate at 2-5°C. Pea tolerates weak frosts in autumn and spring relatively well, its sprouts can withstand -7°C (Yusifov, 2011, p. 134).

Water Requirement of Pea Plant: Pea plant needs moderate amount of water to get the best results. Water supply during the first 4-6 weeks is important for plant development. Later, plant roots go deeper and can catch water resources themselves (Hajiyev & Huseynov, 2009, p. 216).

Vegetation period of the pea plant: This plant is a very demanding plant, and the vegetation period lasts 70-100 days, depending on the time of sowing, cultivation conditions and variety characteristics, and 140-200 days in late-ripening varieties (Valiyeva, 2024, p. 415).

Applying fertilizers: Fertilizing the chickpea plant is important for its healthy growth and productivity. The following fertilizer types and application methods are suitable for peas:

Phosphorous fertilizer increases the yield of peas and accelerates its ripening. In addition to giving 90-100 kg of P2O5 per hectare, it significantly increases the productivity of rye and wheat, which will be planted after peas. Phosphorus and potassium fertilizers are applied to the soil at the rate of 40-60 kg per hectare before frost plowing, and in light soils, 75-120 kg (according to the effective substance) are applied at that time. It is purposeful to give nitrogen fertilizer in the amount of 40-60 kg before planting plants (Humbatov, Mammadov, & Nazaraliyeva, 2023, p. 48).

Applying granular superphosphate to the soil with seeds gives a positive result. It is recommended to give 250 kilograms of superphosphate in physical weight per hectare (Amirov & Amirov, 2011, p. 92).

Weed control: Using chemical methods, 1.5-2.0 kg of promethrin herbicide per hectare is dissolved in 300-400 liters of water, a working solution is prepared and sprayed on the field with POU, ON-400 or OBT-1A sprayers (The farmer's annual activity calendar, 2019, p. 42).

Fighting against diseases: In our country, the disease is widespread in cereal and leguminous plants, causing considerable damage to the crops. Pea diseases are as follows.

1) Alternaria-Alternaria alternata (Fr.) Keissl. It cannot cause significant damage to the pea plant, but the ability of the seeds to germinate is reduced. For the purpose of control, seeds are sprayed with TMTD (3 kg/t) a few months before sowing (Jafarov, 2024, p. 60).

2) False powdery mildew-Peronospora viciae (Berk.) Casp. A characteristic sign of the diffuse form of the disease is dwarfing of plants and a gradual change in color. For the purpose of control, when the initial symptoms of the disease appear in the seedbed, monico burgundy 4.0 kg/ha, curzat 1.8 kg/ha, iteral 0.2 kg/ha, spraying with one of the drugs ridomil gold MS 2.0 kg/ha is carried out (Jafarov, 2024, p. 61).

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3) There are 2 types of ascocytosis. A) Pale spotted ascochytosis-Ascochyta pisi Lib. It mainly infects beans and seeds, and to a lesser extent stems and leaves. B) Dark spotted ascochytosis-Ascochyta pinodes L. K. Jones. It infects all organs of the plant. For the purpose of control, seed material should be collected in time, and deep plowing should be done in autumn. Sustainable varieties should be grown. Seeds should be treated before sowing. During medication, hopper (60 g/l tebuconazole), vial (60 g/l dinicamazol-M+80 g/l thiabenazole), vitaros (198 g/l, carboxin+198 g/l thiram), TMTD (400 g/l thiram) type of modern seed fungicides provides high biological efficiency (Jafarov, 2024, p. 62).

4) Rust disease-Uromyces pisi-sativi (Pers.) Liro. During severe infection, the leaves dry up and fall off, and the pods fail to develop. For the purpose of control, deep plowing, early sowing, destruction of intermediate host plants, planting of fast-growing varieties, application of fungicides are important. The application of copper-containing fungicides (burgundy solution, copper chloride, monico burgundy, copper) in seed areas provides high biological efficiency in the fight against rust disease (Khalilova, Ismayilzadeh, & Safarova, 2016, p. 60).

5) Bacterial blight-Pseudomonas syringae pv.pisi (Sackett.) Young et al. Bacteriosis causes vascular disease of peas. For the purpose of control, the seeds should be sprayed before sowing. TMTD 400-10 l/h; tachi-garen-6 l/t; vitoros-3 l/t, etc. When the initial symptoms of the disease appear in the seed pea fields, spraying with one of the copper-containing fungicides with a contact effect (1 % burgundy solution, 0.5 % monica burgundy) is carried out (Ibanez, Rinch, & Amaro, 1998, p. 55).

Pest control: Yellow peas are susceptible to a number of pests. The main pests are:

1) Moths Aphidadae – Moths disrupt physiological processes in plants by sucking cell sap, and as a result, their development is weakened. Weevils are active carriers of viral diseases in peas (Amirov, 2015, p. 188).

2) Pea leaf fly (Liriomyza cicerina Rondani) – both larval and adult forms cause serious damage to the plant.

3) Pea greenworm (Heriothis viriplaca) – damages plants by feeding on seeds, leaves, stems and flowers.

4) Gray worms (Agrotis spp.) – feed on the stems and leaves of the plant and cause serious damage to the plant.

5) Lentil weevil (Sitona crinitus Herbst) – the main pest of lentils, this weevil also causes serious damage to the pea plant (Lev-Yadun, Gopher, & Abbo, 2000, p. 146).

These are the pest control methods. It is necessary that the seeds of the plants selected for planting meet the standards, the correct selection of the sowing time, the timely and correct care of the plants, and the correct fertilization of the plants. Against pea leaf fly Diaulinopsis arenaria, Diglypus areae, Chrysocharis longitarsus, Tetrastichus spp., against pea greenworm Telenomus sp., Trichogrammatidae sp., Campoletis chlorideae, Hyposoter Didymater; Against gray worms Apantheles ruficrus Haliday, Macrosentrus Collaris Spincla, Bracon kitcheneri, Fleanda Ruficanda, Beauvaria bassiana; Opius monilicornis can be used in biological control (Hasanova, 2024, p. 69).

Academician Hasan Aliyev, Nakhchivan Agricultural Scientific-Research Institute, scientific worker of the field of working with cereals, legumes, technical and other plants and junior researcher, according to the 5-year planning program, 2 varieties of peas (Sultan and Narmin) were planted on 0.08 ha on 14.03.2024 in the experimental area of the Sharur base station of the Institute according to the 5-year planning program.

The methodology "Collection of world genetic resources of grain bean viruses: replenishment, preservation and study (ВИР)" was used in the research.

Before planting, the field was prepared by plowing to a depth of 18-25 cm. 15 days after plowing, the cuttings were split and softened with a toothed trowel. Rows were opened 1 week before planting. After the rows were opened, they were watered and plowed. Immediately after planting, the research area was irrigated, agrotechnical measures were implemented. The first sprout was after 1 week. Flowering began 25-35 days after germination and lasted 30-40 days. During the vegetation period, the pea plant was watered 4 times, cultivated 3 times and sprayed with burgundy

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solution in order to take preventive measures against diseases. Biometric and phenological measurements were carried out during the vegetation period of the study. Peas were harvested on 23.07.2024.





The indicators of the researched pea plant are reflected in the table below.

Table
Pea yield table

S/No	The name of the variety	Area (ha)	Planting scheme	Vegetation period	Plant height (cm)	Mass of grain per plant (g)	Mass of 1000 grains (g)	Productivity (kg)
1	Sultan	0,05	30 x 15	180-200 days	20-25	10-15	343	14
2	Narmin	0,03					350	14,600

The purpose of the study is to study productive varieties in the conditions of the Autonomous Republic based on a 5-year plan-program and recommend them to farmers.

Conclusion

The technology of planting peas, maintenance rules, productivity, soil and climate conditions, vegetation period, irrigation technology were studied, and at the same time, the amount of protein in the samples of the pea plant, cooking time, water absorption capacity, moisture, etc. were studied signs have also been studied.

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