The Influence of Agricultural Techniques of Growing Chinese Legumes on its Yield

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Geliş Tarihi / Received:12.02.2023
Kabul Tarihi / Accepted: 03.03.2023

Araştırma Makalesi/Research Article
DOI: 10.5281/zenodo.7951010

Abstract

The article examines and summarizes the results of tests of domestic varieties of Chinese legumes by the method of row spacing 60 and 45 cm. The protein contained in Chinese beans is 2.5 times higher than the protein content in meat and contains completely essential amino acids. In addition, Chinese bean oil contains a large amount of phospholipids. Phospholipids serve as the main "framework" – the building material that makes up the cell membrane. Phospholipids entering the body help to constantly maintain the normal structure of the cellular structure, that is, cell membranes are constantly exchanged and updated.

Keywords: chinese beans, variety, row spacing, harvest

Chinese beans (Glycine mex) is one of the most basic protein oilseeds in world agriculture, its seeds contain from 30 to 52% protein, 20-25% fat, up to 30% carbohydrates and a full set of essential vitamins. According to this property, it ranks first in the world as a source of protein and ranks 1st in the production of fat from it.

Fat is a vital source of energy. But the use of unused fats in the human body is for overweight, and animal and vegetable fats containing saturated fatty acids leads to the accumulation of cholesterol in the blood, especially in people with limited mobility. And vegetable oils do not contain cholesterol. Chinese beans contain the largest amount of vitamin E, its accumulation in oil is 114 mg / 100 g, sunflower-67, margarine – 20, butter – 2.5 mg / 100 g. Vitamin E refers to antioxidants such as vitamin A. Chinese beans contain from 1.8 to 2.5% phospholipids (lecithin, kefalin). These structures contribute to the survival of the cell membrane and the transition to cholesterol reduction. As an emulsifier, lecithin is a very valuable raw material for food, feed, fermenev, lacoboev changes [1].

Carbohydrates contain 9-12% soluble substances, 3-9% starch, 3-6% fiber in Chinese bean grain. Chinese beans are used as industrial raw materials for the production of vitamins. Its grain (mg/100 g) contains 0.007-0.12 - vitamin-A, 0.94-1.28 - B, 0.21-0.23 – B2, 1.30-1.60 – B3, 0.39-0.91 – B6, 8.50-9.70 - C, 1.79-2.70 - E, 0.15-0.24-K, 2.20-3.40 – Contains vitamins PP and 95-160-R. In addition, Chinese beans contain more concentrations of a number of fat-soluble vitamins than whole grains, and the vitamin E content in oil is 114-215 mg/ 100 g. Important mineral elements are contained in Chinese bean grains in the following amounts: Potassium – 1607, Phosphorus – 510, Calcium – 348, Magnesium – 191, Sodium – 44, iron–12. in terms of iron content, Chinese beans are 7 times more than wheat bread and are in a form that is well absorbed by the body [2].

According to its value, Chinese bean protein is considered the best of vegetable proteins. Due to the fact that it dissolves well in water, it is well absorbed by the human body, and in terms of amino acid content it is very close to the protein of a chicken egg. China adds legumes and additional products from them to the diet of livestock and poultry, increasing the fertility of feed and

improving the quality of meat, milk, wool obtained from them. In this regard, in recent years, the trend of using Chinese pea grains in the food industry has been improving in many countries of the world [3].

The protein contained in Chinese beans is 2.5 times higher than the protein content in meat and contains completely essential amino acids. In addition, Chinese bean oil contains a large amount of phospholipids. Phospholipids serve as the main “framework” – the building material that makes up the cell membrane. Phospholipids entering the body help to constantly maintain the normal structure of the cellular structure, that is, cell membranes are constantly exchanged and updated.

A large amount of phospholipids is necessary for the brain, heart and liver, so these organs still need phospholipid molecules coming from the outside through food, since cell membrane switching occurs intensively. Another unique property of phospholipid molecules is that they remove cholesterol through the walls of blood vessels. In addition, phospholipids perform an antioxidant function for the body, that is, they play an inhibitory role in the formation of highly toxic free radicals in the body. The antioxidant function of phospholipids is directed against radicals and contributes to the prolongation of human life. Phospholipids-have an anti-cancer effect and positively contribute to prolonging the life of sick people [2-3].

The cultivation of Chinese beans is of great agrotechnical importance, because it absorbs nitrogen from the air into the soil through tuberous bacteria in its roots and enriches it with nitrogen.

According to the research results of P. P. Vavilov, G. S. Posypanov, under normal, optimal conditions, the bean-rhizobial symbiosis during the growing season fixes 280 kg/ha of nitrogen from the atmosphere [4].

This feature of legumes contributes to increasing soil fertility and improving the yield of subsequent crops, the quality of the protein contained. Legume grains are the only valuable food that goes instead of meat.

Compared with cattle meat, its protein contains 2 times more phosphoric acid and 4 times more minerals. The protein contained in Chinese beans consists mainly of water-soluble proteins (72-94%), so it is easily absorbed by the body and easily absorbed. For animal feed,

Chinese beans and their products contain 36.4% crude protein, 6.5% fat, 32.4% non-nitrogen substances, 5.24% crude fiber and 5.64% ash. 100 kg of fodder Chinese legume grass contains 51 feed sizes and 51 kg of easily digestible protein, and 1 kg of grain contains 137 feed sizes and 96 kg of easily digestible protein [5].

Recently, due to the growth of livestock in the Republic, the feed composition should be rich in protein, for which it is necessary to grow a large number of crops such as Chinese beans with a high protein content.

In addition to the fact that it is recognized as an agrotechnically good crop, it is characterized by lower costs for tillage after harvesting and the absence of weeds, as well as more economical consumption of moisture reserves in deeper soil layers than sugar beet, sunflower, alfalfa crops [6-7].

The southern, south-eastern region of Kazakhstan, according to its natural and climatic conditions, is a favorable zone for growing this crop, where 35 to 50 thousand hectares of this Chinese legume have been sown in irrigated agriculture for the last 10 years [8].

Chinese peas are divided into 4 types depending on the duration of the growing season, the size and fineness of the grain, the peculiarities of the location of the leaves, the shape of the plant: height, flatness:

1. Korean; 2-Manchurian; 3 - Chinese; 4 - Indian.

In general, we still have a Manchurian origin. The variety zoned in Zhambyl region is Eureka 357.

As the chemical examination of the soil of the experimental site shows, the maximum humus content in the 0-10 cm layer was 1.44 percent. Soil humus decreased to 0.40 percent at a depth of 50-60 cm, where plant roots spread, a similar pattern was observed with phosphorus and total nitrogen values. The salt content in the surface layer of 0-20 cm was 0.326 percent, with a decrease in soil salinity at a depth of 50-100 cm, the salt content was 0.117 percent. Among the cations, the amount of calcium prevails, which ranged from 63.4 to 67.4 percent of the amount of absorbed bases in the soil (11,818 mg – eq/100 g), and the sodium cation-2.4% of the amount of cations. The magnesium cation exceeded its permissible value (30% TSK) and accounted for 36 percent of the amount of the soil-absorbing complex.

Thus, the physico-chemical properties of the soil of the experimental site under study showed that mobile phosphorus is present in small quantities, and magnesium cation in the soil–absorbing complex in large quantities, groundwater is located at a depth of 5 to 20 m, water salinity is 0.03 - 0.05 g / l. the soil of the site is formed in combination with erosive forms of ordinary sulfur soil.

Long-term observations show that during the germination period (March-August), precipitation falls more than in the autumn and winter periods (56.2% of the annual amount). While the average long–term precipitation in this region is 309.12 mm, 21.3 percent falls in winter, 35.6 percent in spring, 20.6 percent in summer and 22.5 percent in autumn. The main feature of the climate of this land is the very variability of the amount of precipitation that falls in different years.

The soil of the experimental site is light sandy-sandy by mechanical assembly. The thickness of the humus layer of ordinary gray soil is small here-no more than 35-40 cm deep and also below nutritional value (0.15-0.60%). The carbonate content in the layer is 0-10 cm (0.06-0.26%).

In the image N1 of the soil at a depth of 30-40 cm, carbonates rise by 0.33%, and in the image N2 of the soil (at a depth of 10-20 cm), if it is 0.72%, at a depth of 20-35 cm of the layer, the carbonate decreases again (0.15%).

The reaction of the soil solution is negligible alkalinity, the soil is not brackish, in the pumped surface layer of the soil the set of salts does not exceed only 0.157 -0.20%.

According to the methodological instruction on the Agronomic program, the soils of the experimental site are recognized as moderately sufficient in terms of calcium and magnesium content (0.14-0.35 mg per 100 g of soil), moderately sufficient in terms of mobile phosphorus content (1.04-2.4 mg / 100 g of soil), belonging to ordinary light clay gray soils.

The study of the productivity of Chinese beans was conducted at the experimental production site "Besagash", located in the Zhambyl district of the Zhambyl region of the Kazakh Research Institute of Water Management.

Methodology and program of the practice

In accordance with the research program, it is planned to develop agricultural techniques for growing Chinese beans in the soil and climatic conditions of the Zhambyl region (row spacing width, growth thickness), testing of zoned and promising varieties for high yields.

The experiment was carried out according to the lower scheme:

The experimental plot on which Chinese beans are sown has a length of 10 m and a width of 60 cm, i.e. when carried out in 4 row 4 repetitions with an area of 6 m^2, the total area of the experiment is 24 m^2.

In the second variant, the total area of the experiment is 18 m^2 when performing 4 consecutive repetitions 10 m long, 45 cm wide, with a total area of 4.5 m^2. Repeatability of each option from 3 times, estimated areas of 6 and 4.5 m^2 ;

The agricultural equipment used in practice is generally accepted for this zone. During the experiment , the following control and calculation works were carried out:

Phenological observations;

- The thickness of the plant was calculated by counting one square meter after the full appearance of the sprout and before its collection; * The thickness of the plant was calculated by counting one square meter after the full appearance of the sprout and before its collection;

- The nutrient regimes of the soil were determined by mobile forms of NPK before sowing and after harvesting on soil layers 0-20 and 20-40 cm;

- Biometric distance calculation -the number and thickness of the plant, height, weight of the plant, as well as the weight of seeds (grain), absolute weight of grain, yield of seeds and stems were calculated.

Tillage. In conditions of irrigated agriculture, tillage for Chinese beans consists of watering before turning over the soil after sowing, turning over the soil to a depth of 27-30 cm and tillage before sowing grain. Deep plowing of the soil not only improves the water-physical properties of the soil and the diet of the plant, but also accelerates the development of tuberous bacteria in the roots, increasing the yield of Chinese beans.

Sowing dates. The optimal timing of sowing seeds of Chinese legumes is determined depending on the specifics of the soil and climatic conditions of each region, taking into account the degree of warming of the soil at the depth of sowing seeds, the biological specificity of the seed variety and other factors. According to the results of the experiment, the optimal sowing period for Chinese beans was determined -the third decade of April.

Methods and norms of sowing. Methods of sowing and optimal conditions of the seeding rate of Chinese beans should be precisely defined and studied for each farm, depending on the type of sowing, soil and climatic conditions and the level of agricultural technology used.

Care of crops. The care system for Chinese bean crops should be aimed at maintaining the soil in a loose, moist form and free of weeds. After sowing Chinese beans, the seed soil must be tamped and compacted with stem rollers, which will strengthen the contact of the grain with the soil and accelerate the germination of shoots. Raking of crops can be carried out when the growth of Chinese peas reaches 1-1. 5 cm in height.

Raking is useful to carry out in the horizontal direction to sowing when the main leaves of the crop appear, in dry weather, in the afternoon, when the sprout is well stored without breaking.

In the soil and climatic conditions of the Zhambyl region, a good harvest of Chinese legumes can be obtained only in conditions of irrigated agriculture. The optimal water regime should provide for soil moisture from the emergence of seedlings to the flowering phase of at least 70%, and from flowering to the phase of formation of massive pea grains-80%, and in the phase of full ripening at least 70% of the minimum water capacity. Crops sown with Chinese beans must be kept clean throughout the growing season.

Harvesting. Chinese bean grain harvesting is carried out immediately by a combine harvester when its leaves turn yellow and the grain ripens by 90-95%.

In accordance with the research program, experiments were conducted to improve agricultural techniques for growing domestic varieties of Chinese beans in order to identify and test in practice varieties with potential prospects for obtaining high yields, depending on row spacing (45 cm and 60 cm).

Conclusion

The natural and climatic conditions of the Zhambyl region allow, with the right choice of varieties and agricultural techniques for growing Chinese beans, to obtain 30-63.5 c/ ha of the crop of this crop.

The optimal sowing period for Chinese beans is the 3rd decade of April, when the optimal hydrothermal regime is established in the soil.

Since the Chinese legume crop is a late-ripening crop in the Zhambyl region, it is mandatory to cultivate the grain 2-3 times before sowing. It provides an abundant accumulation of moisture, nutrients in the fields, the destruction of weeds, the fight against harmful insects, diseases.

Out of 8 domestic varieties of Chinese beans sown in rows of 45 cm, 4 varieties yielded higher yields than the control variant. Of these, the most abundant harvest was given by the Perizat variety – 19.5 c / ha -by 144.3% more. Then in the mountainous zone of Zhambyl region it will be possible to offer varieties of Chinese beans Perizat, Vita, Almaty, Zhansaya for zoning

Out of 8 varieties of domestic Chinese beans sown with row spacing of 60 cm, compared with the control variant, only 3 varieties yielded an excess yield. Of these, the highest yield was also given by the Perizat variety – 14.3 c / ha or 140.7%, that is, 40.7% more than that of the control variety Eureka.

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