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GROWING POTATOES USING VARIOUS MODIFICATION METHODS AFFECTS CHANGES IN THE PHYSICAL PROPERTIES OF THE SOIL

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Abstract: In the article, in the conditions of long-irrigated light gray soils of Surkhandarya region, the mid-ripening potato varieties "Sante" and "Yaroqli-2010" have two reproductive seed nodules, two cultivation methods, two row widths and three maintenance measures. In the scheme of 90x15 cm, an additional device is installed on the "Amak" tiller-cultivator or KRN-2,8A cultivator, 1st time 18 cm, 2nd time 23 cm deep, leaving a protective zone of 8-10 cm and softening and furrowing, the highest grade (25.3- 32.7 t/ha) and seed yield (13.4-17.9 t/ha) and 2.4-5.4 mln. per hectare. soums of net income and 11.8-21.5% additional profitability level increased, in the conditions of Surkhandarya region, a convenient planting method of growing potato varieties as double-cropped and double-cropped crops, as well as the effect of different methods of inter-row processing on soil physical properties in the care of potatoes information on.

Key words: Light-colored gray soils of Surkhandarya region that have been irrigated since ancient times, "Sante" and "Armed-2010" potato varieties, different inter-row cultivation, changes in soil physical properties.

Introduction: potato cultivation is rapidly developing in world agriculture, 19-20 million are grown in 150 countries. per hectare, 350-381 mln. tons of gross crops are being produced. The average productivity is 17-18 tons per hectare. In the leading potato-producing countries (Holland, Germany, Poland, Belgium, Belarus, Russia) in the cultivation of this crop, determining the effective measures of planting and care that create favorable conditions for plant growth and development, the varieties suitable for specific soil-climatic conditions, which allow the formation of a stable high-quality fairy-tale crop selection, creation and application of modern technologies are being researched.

In the countries that grow potatoes in the world, it is important to create new promising varieties of this crop suitable for different soil and climatic conditions, to develop and improve agro-technologies for growing them in different periods and methods, and to evaluate the effect of potato on the increase in productivity in different row intervals and maintenance measures. Researches on the effective use of agricultural lands, continuous supply of food products to the population, regular increase of potato productivity are of great importance.

According to the decree of the President of the Republic of Uzbekistan No. PF-5853 of October 23, 2019 "On approval of the strategy of the development of agriculture of the Republic of Uzbekistan for 2020-2030", continuous development of agricultural production, further strengthening of the country's food security, production of environmentally friendly products, Priority tasks such as introduction of modern

resource-efficient agro-technologies in the expansion of agriculture have been defined. In solving these priority tasks, effective use of land and water resources in irrigated agriculture, growing potatoes in different ways is of great importance in growing high and quality crops from agricultural crops.

In the experiments of N.N. Balashev, the yield of potatoes on unfertilized land in a plot of 70x50 cm was 141 t/ha, and when fertilized it was 311 t/ha, planting 70x30 169 and 317 ts/ha productivity was achieved when it was implemented in cm scheme (N.N. Balashev, 1986).

He noted that the best shape of the feeding area is the configuration of rows and squares where the distance between the bushes in the rows is the same.

According to A. Hamzaev, M. Artikovlarni, the width of the row spacing in the field experiment: 70, 75 and 90 cm; In standard 70x20 cm, 75x25 and 90x20 cm potato varieties Sante, Romano and Hamkor - 1150 were compared. According to the results of the experiment, planting between rows at 75 and 90 cm, compared to planting at 70 cm, the peak germination of plants occurs 2-3 days earlier, and the flowering and flowering phases occur 3-5 days earlier.) was found to be formed by plants (A. Hamzaev, M. Ortiqov, 2007).

L. G. Bobrov [31; p. 76] states that when the tubers are planted more densely, the level of damage during harvesting is low (L.G. Bobrov, 2009).

N.S. Batsanov [29; p. 376] believes that as a result of denser planting of tubers, plants quickly break through the rows and grow, create a comfortable microclimate around the potato root system, and prevent the soil from overheating. Under these conditions, potato tubers are well formed and its seed quality is improved (N.S. Batsanov, 1970).

T. E. Ostonakulov [21; 188 p.], the yield of potato tubers planted in a 90x20 cm scheme is 16.5-23.0 tons higher than those planted in a 75x25 cm scheme, the marketability level is 20-23%, and the average weight of the tubers is 4-9 g more. , it was noted that infection with various viral diseases was less than 0.7-0.5% (T.E. Ostonakulov, 2018).

According to the information given above, it can be concluded that potato planting systems, feeding standards and irrigation procedures have been studied, but no scientific research has been conducted in the meadow gray soils of Surkhandarya region.

MATERIALS AND METHODS

Conducting field and production experiments, planting, crop care, harvest, calculation and analysis are universally accepted by the Ministry of Agriculture and Water Management (2016), the All-Russian Institute of Plant Science (1984, 1986), the All-Russian Research Institute of Potato Farming (1967, 1989), Research Institute of Vegetables, Rice Crops and Potatoes (1978), carried out based on the method and recommendations of the State Commission for Testing New Varieties of Agricultural Crops of the Republic of Uzbekistan (1974). The statistical analysis of the results obtained in the field experiments was calculated by the method of B.A. Dospekhov using Microsoft Excel.

RESULTS AND DISCUSSION

After planting with different row spacings (70x20 and 90x15 cm schemes) and applying various maintenance measures (during the growing season of potato varieties), a soil sample was taken from the driving layer of the experimental plot and its physical properties were studied.

The volume mass (g/cm³) in the soil 0-10 and 10-20 cm tillage layer according to the options during the growing periods of the potato varieties before planting the seed tubers of the medium-quick potato varieties Sante and Yaroqli-2010 and after planting in 70x20 and 90x15 cm schemes and applying various care measures at) change was studied. In field conditions, soil volume mass was determined by taking undisturbed soil samples from the 0-10 and 10-20 cm driving layers using a cylinder.

When the studied potato varieties were planted in a 90x15 cm scheme in an experimental plot, and when different maintenance measures were applied, before planting and during the development periods (from tillering to leaf yellowing) compared to the control option, the volume mass was 0.02-0.03 and 0.02-0.03 and 0.02-0.03 and 0.02-0.03 It was found that it decreased to 0.02-0.01 g/cm³. The above regularity was also noted when planting in a 70x20 cm scheme and various care measures were studied for the Yaroqli-2010 potato variety.

However, when planting in a 70x20 cm scheme and studying the medium-fast Sante variety of potatoes in various care measures, the volume mass of the soil according to the development phases

increased to 1.33-1.34 or 0.01-0.02 g/cm³ in the 0-20 cm layer compared to the control variant. was determined.

The above pattern was also observed when potato varieties were tested as a two-crop crop, and compared to the control option, the volume and mass of the seed tubers of the potato varieties before planting and in the development phases in the plowing layers of soil 0-10 and 10-20 cm were 0.03-0.02 and 0.02-0, 01 g/cm³ was found to decrease.

The maximum decrease in soil volume mass in the 0-10 and 10-20 cm layers was observed in the experimental plot of potato varieties tested as a two-crop crop in a 90x15 cm scheme with the installation of an additional device to the "Uncle" tiller-cultivator or KRN-2.8A cultivator. 1st time 18 cm, 2nd time 23 cm deep, leaving a protective zone of 8-10 cm, it was recorded when softening and furrowing measures were applied, compared to the control option, it was planted according to varieties, and during the growing season, the soil volume mass was 0.01-0.02 g/cm³, compared to the one planted in the 70x20 cm scheme. and it was found that the volume mass of the soil decreased by 0.02-0.03 g/cm³.

Variation of porosity in the soil layer of 0-10 and 10-20 cm with the experimental plot, potatoes in the 90x15 cm scheme using the "Amak" tiller-cultivator or by installing an additional device to the KRN-2.8A cultivator 1st time 18 cm, 2nd time 23 cm deep 8-10 It was observed when softening and furrowing was carried out leaving a protection zone of cm. Porosity in the 0-10 and 10-20 cm driving layer was 52.7-53.4 or 1.0-1.1% and 52.7-53.4 or 1.0-1.1% and 52, It was found to be 0-52.7 or 0.4% higher.

This pattern was also noted when the studied varieties of medium-quick potatoes Sante and Yaroqli-2010 were planted in a 70x20 cm scheme. Compared to the control option, the porosity in the soil 0-10 and 10-20 cm tillage layers was 52.3-52.7 or 0.7-1.0% and increased by 51.6-52.3 or 0.6-0.3%.

The studied potato cultivars were planted in a 90x15 cm scheme in the experimental field compared to those planted in a 70x20 cm scheme when different care measures were applied. It was found that the porosity increases by 52.7-53.4 or 0.4-0.7 and 52.0-52.7 or 0.4% in the driving layer of 0-10 and 10-20 cm during the growth period.

When the potato varieties studied as a double crop were planted in a 70x20 cm plot with different maintenance measures, the porosity in the 0-10 and 10-20 cm tillage layer was 51.8-52.5 or 0.7-1.1 and 51. It was found to increase by 4-52.2 or 0.7-0.8%.

Planting was carried out in a scheme of 90x15 cm, and when different maintenance measures were applied in options 2-3, the porosity of potato varieties tested as a two-crop crop was observed to increase in the 0-20 cm driving layer of the experimental soil. 53.6 or 0.4-0.7 and 52.2-52.9 or 0.4-1.1% higher, these indicators are higher in 0-10 growth periods by varieties when planted in a 90x15 cm scheme than when planted in a 70x20 cm scheme and in the 10-20 cm layer, the porosity was 53.3-53.6 or 0.8-1.1 and 52.9 or 0.7% higher.

In contrast to the cultivation of potatoes in a 70x20 cm scheme as a double and double crop, using an "Amak" tiller-cultivator or by installing an additional device to the KRN-2.8A cultivator, the first time is 18 cm, the second time is 23 cm deep, leaving a protective zone of 8-10 cm. it was found that soil physical properties, i.e., soil volume mass and porosity, can be improved when loosening and furrowing measures are applied. Therefore, we recommend the widespread use of this wide row planting (90x15 cm scheme) and maintenance measures in potato cultivation.

CONCLUSIONS

90 cm between rows, planting in a 90x15 cm pattern and installing an additional device on the "Amak" tiller-cultivator or KRN-2,8A cultivator, 1st time 18 cm, 2nd time 23 cm deep, leaving a protective zone of 8-10 cm, softening and furrowing 3.3-5.4 million per hectare in potato varieties tested as a fairy crop, and 2.4-3.4 million per hectare as a two-crop crop. soum provided additional net income and profitability of 15.5-21.5 and 11.8-16.7%, respectively. In order to obtain a stable, high (25.3-32.7 t/ha) product and cheap seed yield from potato as a double-crop and double-crop crop in the conditions of long-irrigated light gray soils of Surkhandarya region;

- to plant medium-quick potato varieties Yaroqli-2010, Aladin, Arizona, Condor, Sante in a scheme of 90x15 cm with 90 cm between rows (70 cm in a scheme of 70x20 cm in years of water shortage);
- maintenance, it is recommended to soften and furrow by installing an additional device to the "Amak" tiller-cultivator or KRN-2.8A cultivator, leaving a protective zone of 8-10 cm at a depth of 18 cm, 2

time, 23 cm.

LIST OF REFERENCES:

1. "Metodika polevykh opytov s khlopchatnikom (1981)
2. Metodika agrokhimicheskikh issledovaniy (1977),
3. Methods of conducting field experiments. - Tashkent, 2007. - B.147.
4. Khlevnoy B.F., Zaikin D.V., Zamotaev A.I., Pakhomova S.S., Volovik A.S., Pisarev B.A., Pshechenkov K.A., Rubtsov V.T., Korshunov A.V., Starovoitov V.I. Agronomicheskaya tetrad. Vozdelyvanie potatoes po intensive technology. - M.: Rosselkhozizdat. 1986. - S.96.
5. Balashev N.N. Semenovodstva kartofelya na yuge USSR. - M.: Selkhozizdat. 1963. - P.86-95.
6. Balashev N.N. Vozdelyvanie ovoshchi i potato. - M.: 1980. - S. 3-192.
7. Balashev N.N., Zeman G.O. Vegetable growing.- T.: Teacher. 1981 (1977). - B.408.
8. Batsanov N.S. Potato. - M.: Colossus. 1970. - S.376.
9. Bobrov L.G. Potato production in Kazakhstan. Alma - Father. Hot. 2009. - S.76.
10. Astanakulov T.E. Technology of vzdelyvaniya, selection and breeding of potatoes in Zarafshanskoj valley. - T.: Labor. 2018 (1991). - S.188.
11. Khlevnoy B.F., Zaikin D.V., Zamotaev A.I., Pakhomova S.S., Volovik A.S., Pisarev B.A., Pshechenkov K.A., Rubtsov V.T., Korshunov A.V., Starovoytov V.I. Agronomicheskaya tetrad. Vozdelyvanie potatoes po intensive technology. - M.: Rosselkhozizdat. 1986. - S.96.
12. According to B.F. Khlevnoy and others, it is noted that 52 thousand buds are required for one hectare if there are 5 sprouted eyes on average. If the weight of tubers is 60 grams, this is 31.2 ts/ha (B.F. Khlevnoy et al., 1986).
13. According to N.N. Balashev, in his data, it was noted that their biological characteristics and growth conditions are also taken into account when determining the optimal plant thickness in potato cultivation (N.N. Balashev, 1963).
14. Hamzaev A.Kh., Artykov M. Effect of row spacing on yield and quality of potato varieties. Scientific collection of Sam QXI. Samarkand. 2007. – B.22.