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TECHNOLOGY OF MOTHER-IN-LAW ONION PRODUCTION BASED ON THE SUMMARY OF EFFICIENT TEMPERATURES

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ABSTRACT:

In this study, the efficient and high-efficiency use of crop areas in the current climatic conditions, as well as the dependence of the ripening of vegetable crops on the sum of effective temperatures due to differences in temperature, soil and air humidity in different latitudes. Theoretical research based on the sum of effective temperatures of vegetable cultivation and new technologies of their cultivation are described on the basis of the results and conclusions of experiments conducted, especially in the onion crop.

Introduction. Changes in the ecological balance and related climate change in recent decades have also had an impact on agriculture. The ripening period of the crop obtained from seeds sown in the ground is delayed due to rapid changes in temperature. The yield and productivity of agricultural crops depend on many factors, such as climatic temperature, water resources (air composition, growing season, ...), and the rational use of these factors is the basis of the economy of the republic. Therefore, in agriculture, changes in the duration of growth phases of different plants and the rapid development of plants, the study of the impact of crops on water needs, in particular the reduction of required irrigation days, the increase in

the sum of effective temperature potential should lead to shorter crop growth. .

Changes in external climatic and atmospheric parameters in turn affect soil biological properties. Soil temperature range from 10 ° C to 28 ° C affects soil respiration by increasing the activity of extraction enzymes that break down polymer organic matter in soils. Soil bioactivity is observed. Increasing soil temperature increases microbial activity and increasing the decomposition of organic matter in the soil Increases the rate of mineralization of soil nitrogen through soluble substrates and other microbial respiration rates.

T.Y. In the work of Prakova et al., They studied the fact that treatment with senicants accelerates the growth and maturation of grain crops when the temperature is higher than the sum of the effective temperatures.

Experiments were carried out for three years on the example of onions to study whether the sum of similar effective temperatures would be appropriate for vegetables and to determine the ripening time of the valley climate conditions, rapid changes in temperature.

It is known that ordinary onion is the most widely grown of the onion crops and is one of the most lucrative vegetable crops.

Especially in the cultivation of onions have been grown from seeds and onions. Onions are of special importance for the human body. Until now, it was known that the cultivation of onions in our country is planted in three periods. We have proposed a new technology of onion cultivation, which allows planting in the fourth term and early ripening.

During the planting period, the onion crop planted in early spring is grown more than the crop grown at other times. Therefore, during the period of its growth, the applied technological processes will be different.

Specialists of the Department of Physics and Chemistry of the Andijan branch of the Tashkent State Agrarian University and specialists of the Mirzo Urugchi Elite farm have taken responsibility for proposing the introduction of early ripening onion farming on farms of the Republic.

Over the past 6 years, as a result of research conducted by scientists of the branch and farmers, the method of planting onions and planting onions has been improved.

As a result of these experiments, onions ripened earlier than in the southern part of the country, Surkhandarya region. The main problem in the cultivation of early onions from onions is the emergence of seeds during the ripening of onions. As a result of germination, the nucleus is formed, resulting in deterioration of product quality. In order to improve the quality of products by eliminating onion germination and to achieve early ripening in the Fergana Valley, ie in the second (or third decade) of April, the university and Mirza Urugchi Elite farm jointly selected several onion varieties by phenological and biometric monitoring. by the method of creating a new technology of cultivation of onions, which reduced the amount of new very early ripening high-yielding stalks from 90-95% to 5-10%.

To grow onions from a mother bulb, you first need to grow bulbs. To do this, the soil is plowed and leveled, and 250 kg of phosphorus and 100 kg of potassium fertilizers are applied, and 60 or 70 cm of furrows are obtained, depending on the slope of the soil. In early spring, ie in early February, 6-7

kg of onion seeds per 1 hectare are sown on an area of 10 hundred square meters, and the seeds are buried with soil 1-2 cm thick. It is then watered in order to produce seeds depending on the air temperature and the amount of precipitation. Once fed in the norm of 200 kg with nitrogen fertilizer. Depending on the conditions, it is once weeded and once treated with a fungicide against diseases. By the end of May, when the bulbs reach the size of 1–3 cm, that is, cherries, all agronomic measures are stopped, that is, watering is stopped. As a result, the plant withers. After that, the bulbs are collected and stored in a cool place in special net bags covered with 10–15 kg, or spread out to a thickness of 15–20 cm. With such storage, the bulbs go through a period of dormancy (wounding) until September. In the first or second decade of September, the bulbs are pre-dug, leveled and planted in rows of 60 or 70 cm, 3 rows of 60 cm, 4 rows of 70 cm, 5-6 cm between nests (like garlic). It should be borne in mind that during the preparation of the soil should be applied 300 kg / ha of phosphorus, 10 kg / ha of potassium fertilizers. After that, the field is well irrigated (at the rate of 700-800 cubic meters per hectare). The plant is fed with nitrogen fertilizer at the rate of 200 kg / ha after good grip, ie when it reaches a height of 10-15 cm. Given the onset of winter, all agro-technical measures will be postponed to spring next year.

In early spring, ie in late February to early March, depending on the conditions, it is lightly weeded once and fed with nitrogen fertilizer at the rate of 200–250 kg. Depending on the weather precipitation, watered 2–3 times. Thus, during the implementation of agro-technical measures in the climatic conditions of the Fergana Valley in the first and second decade of April onions are technically ripe.

One of the biggest problems in growing onions is the deterioration of product quality as a result of seed production. In the M-55-79 early ripening variety and cultivation technology that we offer, the process of onion pruning is very important compared to other varieties.

RESEARCH METHODS AND MATERIALS

In agrometeorology, the sum of temperatures is an important quantity that characterizes the thermal characteristics of the study area. The sum of temperatures was introduced in 1734 by Reomyur as a quantity that characterizes the demand of plants for heat. For the first time GT Solyaninov used a quantity called the sum of active temperatures. The sum of the average daily temperatures above 10 degrees Celsius is called the sum of the active temperatures. It was found by M.I. Budiko that there is a close correlation between the sum of active temperatures and the annual radiation balance. A quantity called the sum of effective temperatures is used to express the heat demand of plants. The sum of the effective temperatures is the sum of the average daily temperatures above the minimum temperature that the plant under consideration will grow biologically. For example, when calculating the sum of effective temperatures above 10 degrees Celsius, the total temperature that is 10 degrees above the average daily temperature is set. The biological minimum temperature of plant development varies for different plants.

For example: spring wheat - 5 degrees, corn - 12 degrees, cotton - 13 degrees

cotton for southern lands - 15 degrees.

At temperatures above this temperature the plant grows well. The concept of the effect of air temperature on plants is widely used to characterize the demand of plants for temperature, and the temperature of each plant must not exceed a certain limit to pass a certain developmental phase, this limit is called the biological minimum. A degree that exceeds the biological minimum is called the effective temperature. The biological minimum was 5 degrees for cereals, 12 degrees for corn, and 13 degrees for cotton. For southern varieties of cotton, the biological minimum is even 15 degrees. The effective daily temperature is determined by the following formula:

$$t_{эфф} = \bar{t} - t_{б}$$

Here $t_{эфф}$. Daily (effective) effective temperature, $\bar{t}$- average daily temperature, $t_{б}$- biological minimum.

The sum of the effective daily temperatures for a given period is determined by summing the effective daily temperatures for that period. The sum of such effective temperatures can be calculated for a decade, a month, a plant's development phase, or the entire growing season.

Table 1 shows the sum of the effective temperatures required for the local variety of maize from planting to different phases.

Table 1

T/r	Phases of development	the sum of the effective temperatures ($t_{б}$=10 degree)
1	From sowing to germination	80
2	From sowing to pruning	750
3	From sowing to the maturation of milk	1200
4	From planting to wax ripening	1460

Table 2 summarizes the effective temperatures required for the entire growing season of some plants.

Table 2

T/R	Type of plants	The required effective temperature for the entire growing season ($t_{б}$=10 degree)
1	Spring wheat	1300
2	Maize	1500-2000
3	Potatoes	900-1000
4	Beets	1200-1500
5	Cotton	1700-2000

The sum of the effective temperatures is the result of the influence of various factors.

may change. For example: planting time is one such factor. If planting is carried out at the most optimal time, the plant will reach the desired temperature sum in the shortest possible time and will ripen faster.

After a portion of the effective temperature has been given, the remaining portion can be given later using the onion re-greening property. Therefore, this technology is used in onions. The third advantage of this technology is that onions are able to receive energy even during the spring, which we call the latent energy. It can be hypothesized that the accumulated latent energy should have a positive effect on the immunity of the onion.

Onion varieties differ from each other in a number of morphological features and biological characteristics.

Hence, it is well known and popular that the product ripens as a result of obtaining the sum of temperatures. The method of growing onions from onions is based on the same logic, that is, from ancient times our ancestors were experts in planting onions in the fall and early spring. But a serious drawback of this method was that because onions are a biennial plant, bulbs planted in the ground in the fall would bloom in early spring, producing 90-95 percent of the buds instead of bearing fruit. Even if the stalks were removed, a core layer was formed in the middle of the bulb (inside the fruit), which had a serious negative impact on product quality. In order to overcome this shortcoming and select a variety with a very low percentage of flower production from onions to onions, a group of scientists from the Andijan branch of the Tashkent State Agrarian University and specialists of the Mirza Urugchi Elite farm specializing in vegetable growing in Andijan district created many local and foreign fairy tales. onion varieties were planted and the M-5579 variety, which recorded the best results, was isolated by individual selection method. Conditional M-5579 onion variety is very early, and when planted from onions, it serves as an important factor in the production of quality products, with no more than 10-15% of flower buds in the spring next year. As a result of many years of experiments, agro-techniques for the cultivation of M-5579 cultivar by the onion method have also been developed.

Sow from seed and grow beans

Activity 1: Growing bulbs from seed:

In the first event, 0.36 hectares of land were allocated at the Mirza Urugchi Elite farm in Andijan district and 110 kg of superphosphate and 50 kg of potassium mineral fertilizers were sown.

On March 10, 2017, 36 kg of seeds of M-5579 and “Oqdur” onion varieties were sown. Agrotechnical measures were carried out in a timely and quality manner (Figure 1). As a result, on March 21, 2018, the seeds sprouted. During the growing season, a total of 350 kg / ha of nitrogen fertilizer (AFU) was applied 3 times. Watered 6 times. Flour was sprayed 2 times against dew disease, 1 time against thrips insecticide, 1 time against manual weeding and 1 time against herbicide. Agrotechnical measures are given in Table 3.

Table 3

№	Name of activities performed	05.03.2017
1	Ammophos mineral fertilizer 220kg / ha	05.03.2017
2	Potassium mineral fertilizer 90kg / ha	05.03.2017
3	Irrigation - 1	11.03.2017
4	Irrigation - 2	15.03.2017
5	Nitrogen fertilizer (AFU) was applied - 50 kg / ha	10.04.2017
6	Irrigation - 3	10.04.2017
7	Fungicide Polysulfide preparation 10l / ha	15.04.2017
8	Fungicide Impact 0.5l / ha	21.04.2017
9	Irrigation - 4	24.04.2017
10	Nitrogen fertilizer (AFU) - 100 kg / ha	20.05.2017
11	Manual switching	20.05.2017
12	Herbicide (Zelek 1l / ha, Goal 1l / ha)	24.05.2017

13	Nitrogen fertilizer (AFU) was applied - 50 kg / ha	27.05.2017
14	Insecticide (carat 0.5 kg / ha)	28.05.2017
15	Irrigation - 5	28.05.2017
16	Irrigation - 6	14.06.2017
17	The harvest was harvested	03.07.2017

On 03.07.2017 onions were harvested when they reached the size of 1-3 cm, cherries. Bulbs were placed in 10–12 kg net bags and placed in a dormant period (Yarovization period) until planting in cool places.

Also, this year in the farm "Ozod Iqboljon eri" in Asaka district planted onion seeds M-5579 on the area of 0.10 ha and onion seeds on the area of 0.02 ha. All agro-technical measures were carried out according to the plan.

In the house of Khalikov Nabijon, a resident of 62 houses, Qoritopi mahalla, Asaka district, onion seeds of M-5579 variety were planted on an area of 0.10 ha, and the bulbs were grown in cool places for the period of hardening.

Activity 2 Growing early onion products from onion bulbs: On October 10, 2017, Mirza Urugchi Elite farm planted and irrigated 5-7 cm thick bulbs in 4 rows of 70 cm by 70 cm on 2.0 ha.

Onions bloomed en masse on October 18th. 29.10. In 2017, 150 kg / ha of sulphate ammonium mineral fertilizer was sown and irrigated. Due to the arrival of winter, agro-technical activities in 2017 were suspended.

On March 25, 2018, urea mineral fertilizer at the rate of 100 kg / ha was sown and irrigated. On April 1, 2018, the drug Polysulfide was sprayed against the disease and thrips. On April 10, 2018, it was manually weeded. On April 1, 2018, the fields were cultivated in order to deepen them. The plant was watered on 20.04.2018 due to demand for water. On 30.04.2018, due to the technical ripening of onions, the crop was harvested. Table 4 shows the activities carried out at the Mirza Urugchi Elite farm.

Table 4

№	**Name of the event performed**	**Date**
1	Onions were planted	10.10.2017
2	Irrigation-1	12.10.2017
3	Sprouted (blue)	18.10.2017
4	Nitrogen fertilizer was given (ammonium sulfate) - 150 kg / .	29.10.2017
5	Irrigation -2	30.10.2017
6	Nitrogen fertilizer was applied (urea) - 100 kg / ha	25.03.2018

7	Irrigation -3	26.03.2018
8	Fungicide (tramish) 10 l / ha	1.04.2018
9	Crossing in the ashes	10.04.2018
10	Cultivation	12.04.2018
11	Irrigation -4	20.04.2018
12	The harvest was harvested	30.04.2018

In the end, the yield was 500 ts / ha in "Mirza urugchi elite" f / x.

Also on the farms "Ozod ikbol zamini" (Fig. 2) and "Shukhratbek the Great Future" (Fig. 3) on the basis of this technology under the supervision of the authors of the article carried out the cultivation of onion bulbs and earlier onion products.

On October 12, 2017, 4 rows of 7 cm thick bulbs were planted and watered on the same day. The carried out agrotechnical measures are given in Table 5.

Table 5.

№	**Name of the event performed**	**Data**
1	Onions were planted	10.10.2017
2	Irrigation -1	12.10.2017
3	Sprouted (blue)	20.10.2017
4	Nitrogen fertilizer (AFU) - 150 kg / ha	30.10.2017
5	Irrigation -2	02.11.2017
6	Manual switching	18.03.2018
7	Nitrogen fertilizer was applied (urea) - 100 kg / ha	27.03.2018
8	Irrigation -3	29.03.2018
9	Fungicide (tramish) 10 l / ha	04.04.2018
10	Irrigation -4	11.04.2018
11	NPK suspension was sprayed	15.04.2018

At the end of the growing season on the farm "Ozod Iqbol Zamini" was 600 ts / ha.

On September 20, 2017, “Shukhratbek Great Future” f / x was planted in rows of 7 cm thick bulbs between the seedlings in 4 rows on a

2.0 ha plot of 70 cm in the ground and watered on the same day. The carried out agrotechnical measures are given in Table 6.

Table 6.

№	**Name of the event performed**	**Data**
1	Onions were planted	20.09.2017
2	Irrigation -1	21.09.2017
3	Sprouted (blue)	01.10.2017
4	Herbicide (Zelek	16.10.2017
5	Nitrogen fertilizer (AFU) was given - 150 kg / gya	26.10.2017
6	Irrigation -2	27. 10.2017
7	Manual switching	15.03.2018
8	Nitrogen fertilizer was applied (urea) - 100 kg / ha	25.03.2018
9	Potassium mineral fertilizer 90 kg / ha	25. 03.2018
10	Irrigation – 3	27.03.2018
11	Fungicide (polysulfide preparation) 10 l / ha	07.04.2018
12	Cultivation	10.04.2018
13	Irrigation – 4	17.04.2018
14	NPK suspension was sprayed	20.04.2018
15	The harvest was harvested	30.04.2018

At the end of the growing season, the yield of Shukhratbek's Great Future was 600 quintals per hectare.

On October 10, at the Andijan Scientific Experimental Station, 0.5 hectares of land were plowed, and the next day, on October 11, irrigation was carried out. On October 17, the onions sprouted en masse. On October 25, 150 kilograms of nitrate was applied per hectare, and on October 30, irrigation was carried out.

The following agro-technical works were carried out in the spring after winter:

In the first ten days of March, 150 kg of ammonium nitrate was irrigated, and in the first ten days of April, 100 kg of nitrate.

In April 2018, due to lower temperatures, fully ripe onions were dug up on May 1-3 and yielded an average of 450 quintals per hectare (Zakhkash once again proved that the yield of onions on the ground is less).

On October 25, 2017, the Andijan branch of the Tashkent State Agrarian University planted 4 rows of onions on a test plot of 70 cm and the spacing

of seedlings was 7 cm (onions were planted in 3 rows on the ground). On May 1-3, 2018, onions were harvested — an average of 500 quintals.

RESEARCH RESULTS AND THEIR DISCUSSION

Summarizing from Tables 7, 8, 9, we conducted field experiments on the optimal timing of planting onions in the experimental field of the Andijan branch of TSAU with 3 options 4 repetitions. According to the results obtained, the seedlings planted in 3 variants, ie on 25 October, showed good results in terms of yield and yield quality (low flower yield).

Table 7. According to the project work program, biometric measurements were made in order to record the growth of onion plants in the fall and to determine the sum of useful temperatures (effective temperature) in the experiment.

Table 7

№	Farmer's name	31.10.2017			19.11.2017			19.12.2017		
		Os. height see	The number of stems is one	Effective Temperatures sum	Os. height see	The number of stems	Effective Temperatures sum	Os. height see	The number of stems	Effective Temperatures sum
1	“The great future of Shuhratbek” f / x 20.09.2017	10	2	338,4	17	4,4	490,9	19,3	5,4	513,7
2	“Mirza seed elite” f / x 10.10.2017	5,6	1,5	215,2	9	3	367,7	11,5	3,2	390,5
3	"It simply came to our notice then	6,0	2,0	202,2	8.5	2,8	354,7 *1*	11,2	3,0	377,5

Table 8. According to the project work program, biometric measurements were made in order to record the growth of onion plants in the experiment in the spring and to determine the sum of useful temperatures (effective temperature).

Table 8

№	Name of farmers	15.03.2018			05.04.2018			25.04.2018		
		Os. height see	The number of stems	Effective Temperatures sum	Os. height see	The number of stems	Effective Temperatures sum	Os. height see	The number of stems	Effective Temperatures sum
1	“The great future of Shukhratbek” f / x 20.09.2017	22.1	6	673,0	26.2	6,5	902,3	29,3	7,4	1163,5

2	“Mirza urugchi elite” f / x 10.10.2017	16,6	4	549,7	23.5	6	779,0	26,5	7,0	1040,2
3	“Ozod ikbol zamini” f / x 10.10.2017	15.6	4.4	536,7	22.8	6.3	766,0	26,1	7,2	1027,2

According to the results of research conducted in 2017 - 2018,
Among the onions planted on November 25, 2017, onions planted yielded good yields (average 50 t / ha). The sum of the effective temperatures was. Apparently, in this technology, onions can be cooked as soon as they reach an effective temperature. This is because onions planted in the spring stop growing when the temperature rises on hot summer days. This in turn leads to an upper extremity error in obtaining the average daily temperature. In the technology we have seen, the development of onions occurs at temperatures below the beginning to the end, which in turn leads to a reduction in the error in obtaining the average daily temperature.
Onions known from the literature have a sum of effective (effective) temperatures. Hence, the sum of the effective temperatures in the technology we propose is reduced to. This can allow the onion planting area to rest for at least a month (during sunny times) or plant another crop and ripen earlier.

The sum of the effective temperatures obtained at the farm "Mirza Urugchi Elite" on March 10, 2017 before the seeds were sown bulbs (1-3 cm):

,,,
In event 1, the total from seed to bulb growth. achieved effective temperature collection.

The sum of the effective temperatures collected from the bulbs obtained in the 1st event to the winter of onions planted on October 25, 2017 in the branch Experimental Farm: October – 74.4, November – 163,33 , Total - $237,7℃$.

From the bulbs obtained in the 1st event, the sum of the effective temperatures collected by the onion planted on October 25, 2017 before ripening in the spring on the branch Experimental Farm: February – 57.4 , March – 325.5 , April – 341.1 , Total in Spring – 724.0
Onions planted on the experimental farm are:

$$1796,2℃ + 237,7℃ + 724℃ = 2757,9℃.$$

Onions planted on an experimental farm $2757,9℃$. cooked to an effective temperature.
The sum of effective temperatures for the 2017–2018 season for onions at the Branch Experimental Farm $2757,9℃$, "The great future of Shukhratbek" $2834,9℃$
"Mirza Seed Elite" $2822,1℃$ formed.

The following conclusion from the results of research and suggestions are reasonable:

1. We recommend to determine the sum of effective temperatures of all fruits, vegetables and melons and newly created varieties grown in the country, but not having a set of effective (effective) temperatures.
2. After a portion of the effective temperature has been given, the remaining portion can be given later using the onion re-greening property. Therefore, this technology is used in onions. The third advantage of this technology is that onions are able to receive energy during the spring, which we call latent energy. It can be hypothesized that the accumulated latent energy should have a positive effect on the immunity of onions.
3. The effect of air temperature on plants To characterize the demand of plants for temperature and for each plant to pass a certain stage of development, a certain temperature must not be below a certain limit, this limit is called the biological minimum. We recommend that the biological minimums of all new varieties included in the State Register be determined.
4. Establish regionalization and export of all new varieties grown in our country, knowing the sum of effective temperatures and biological minimums.
5. We recommend the introduction of this technology, which has been tested in all regions of the country in the conditional onion variety "Andijan M-5579".
6. It is known that vegetables harvested in the summer will need freezers to be stored until spring. This will definitely require additional funding. The advantage of introducing this new technology is that onions planted in the fall can be stored at no cost to the motherland until spring, as they can regain their normal condition even if they are frozen in the cold of winter.
7. When onions are grown as a secondary crop, the total yield per hectare per season doubles.
8. Depending on the soil fertility of onions $800000 \div 1200000$ should be planted to a good result.

REFERENCES:

M.G. Lebedeva, A.B. Solovev, O.S. Tolstopyatova Agroklimaticheskoe rayonirovanie Belgorodskoy oblasti v usloviyax menyayushchegosya klimata // NAUChNYE VEDOMOSTI. Natural Science Series. 2015.№ 9 (206). Issue 31

V.A.Dukhovniy, G.F.Solodkiy, G.V.Stilina. USAID-PROJECT Tranboundary water management adaptation in the Amudarya basin to climate change uncertainties Report (Tashkent 2016). 2.3. Modeling crop water reguirements in the context of climate change

V.A.Dukhovniy, G.V.Stilina. USAID-PROJECT “Tranboundary water management adaptation in the Amudarya basin to climate change uncertainties” Report on position (Tashkent 2016). 3.1.2.2. Studying the positive effect of climate change in the basin through shortened period of growing plant. 3.2. Developing proposals on water management in the context of climate change. 4.4. Presenting resalts and drafting a dissemination plan

Brownmang Onwuka, Brown Mang. Effect of soil temperature on soil properties and plant growth.Advances in Plants & Agriculture Research. 2018; 8 (1) 34-37

T.Ya.Prakova, A.A. Smirnov, V.A. Gushchina, and O.N.Kukharev. Agrobiological Basis For Formation Of Crambe Abyssinica Agrocoenosis In Conditions Of Middle Volga. // RESEARCH JOURNAL OF FARMACEUTICAL, BIOLOGICAL AND CHEMICAL SCIENCES September-October 2018. RJPBCS. 9 (5). Page № 2168

Balashev N.N., Zeman G.O. "Vegetable" T., "Teacher", 1977.

Gringof I.G., Kleshchenko A.D., Osnovy selskoxozyaystvennoy metrologii I-tom Rossiya Obninsk, FGBU “VNIIGMI-MID”, 2011.

Buriev X.Ch., Zuev V.I., Qodirkhojaev O. Muxamedov M.M. "Progressive technologies of growing vegetables in the open field" T., "UzMEDIN", 2002.

Zuev V.I., Abdullaev A.G. "Biology of vegetable crops and technology of their cultivation", T., "Uzbekistan", 1997.

Rybakov A.A., Ostrouxova S.A. "Fruit of Uzbekistan" T., 1981.

Ashurmetov OA, Buriev H.Ch. “Biology and cultivation technology of melons”, T., 2000.

Rasulov A. - Storage of potatoes, vegetables and melons. T., “Labor” 1995.

Xakimov P. Karshibaev A. To'xtamishev B. Usmonov A. Xakimov G. "Agometeorology" Agricultural workers and Agronomy, plant protection and quarantine, technology of storage and primary processing of agricultural products, agricultural selection and seed production, fruit and vegetable and viticulture, biogeochemistry and soil erosion protection, agrochemistry and agrosoil science, agriculture, silkworm breeding, agriculture Methodical manual for students of management education directions 2016 y.