С.Сейфуллин атындағы Қазақ агротехникалық университетінің **Ғылым жаршысы (пәнаралық)** = **Вестник науки** Казахского агротехнического университета им. С.Сейфуллина (**междисциплинарный**). - 2019. - №1 (100). - Р.87-96

YIELD OF LENTIL (Lens culinaris) IN THE CONDITIONS OF CHERNOZEM SOIL OF AKMOLA REGION

K.M. Mussynov, Doctor of Agricultural Sciences, Professor
Z.Sh Suleimenova, Senior Lecturer
Y.A.Utelbayev PhD[1]., Senior Lecturer
B.B Bazarbayev., PhD[1]., Senior Lecturer
S.D. Sagatbek.[1], MSc, Assistant
[1]S.Seifullin Kazakh Agrotechnical University, ZhenisAvenue, 62,

Annotation

This article presents the results of 2017-2018 research on the formation of yield and economic efficiency of lentil (Lens culinaris) in chernozem soil conditions of Akmola region. The influence of different sowing dates and weather conditions on the duration of the duration of phenological phases of growth and development, and forming elements of yield structure of the crop. According to the results of field experiments, the high seed yield under the conditions of the region wasobtained on the variants with a sowing period of 20May and amounted to - 14,1 centnersper hectare, which is higher than the control variant by 2,1 centners per hectare. Calculations of economic efficiency show a high profitability of this crop, which varied by year and planting time in the range from 100,4 to 218,6%.

Keywords: lentil, growth and development, field germination, yield, economic efficiency

Introduction

Lentil is one of the most valuable leguminous crops. It is grown mainly for grain, which is one of the first places on the content of protein and other nutrients among leguminous crops.

Among the vast diversity of leguminous crops lentil occupies a special place due to its unsurpassed taste, highly human-assimilated protein, a large set of essential amino acids, vitamins and microelements [1].

Sown areas of lentils around the world are steadily increasing. Suffice it to say, that the claim on FAOSTAT data in 2010, it was grown in 52 countries. Largest regions - Lentil Manufacturers - South and West Asia, North Africa, Canada, Australia and the USA. Harvesting area amounted to 4,2 million hectares, and the gross collection – 4,6 million tons. In the production of leguminous crops, lentils occupy 4-5th place after soybeans, beans and peas. The leaders

in the production of lentils are Canada (harvest area 1.34 million hectares, gross yield 1,9 million tons), India (1,3 million hectares, 1,1 million tons), Turkey (234 thousand hectares, 345 thousand tons) [2].

In neighboring Russia, the northern border of sustainable production of lentils runs along the Moscow-Izhevsk line, and the lower one along the south of the Saratov and Samara regions. It was also widely cultivated in the Ural region, but the traditional areas of its cultivation are the regions of the Middle Volga and Nonchernozem. The revival of producer interest in this crop through the development of new approaches to the technology of its cultivation and, above all, through stable seed production is a very important issue in solving the problem - increasing the production of edible vegetable protein.

Lentil is one of the most important from an economic point of view and the most used of leguminous crops in European countries [3].

For our country, this culture has a significant export potential. In 2015 the sown area of lentils was 6453 hectares [4].

According to the research conducted in 2015-2016 years in a dark chestnut soils of Akmola region lentil yields averaged 16,6-18,9 c/ha with minimum tillage technology [5, 6].

Thus, the expediency of growing this crop is beyond doubt; it is necessary to revive its production in our Republic. It could be of the greatest interest for small collective farms or farms of Northern Kazakhstan, for whom it is difficult to compete in the production of grain crops with large agricultural enterprises.

In this regard, in 2017 and 2018 years, scientific studies were conducted on the experimental plot LLC "Kamenka and D", located in Sandyktau district of Akmola region.

The purpose of the research is to determine in the mold the sowing dates for the yield of lentil seeds in chernozem soil condi tions of the Akmola region. The tasks of the research included determining the effects of planting dates on the growth and development of lentils, on the formation of the structure of the elements of the seed harvest, as well as the calculation of the economic efficiency of sowing dates.

Materials and methods of research

Field experiments were established at the experimental plot LLC "Kamenka and D", located in Sandyktau district of Akmola region in the area of 0.9 hectares, laboratory experiments and all related analyzes were carried out at the department of "Plant Protection and Quarantine" at S. Seifullin Kazakh Agrotehnichal University. The program provided for a tab of one field experience but mainly by the method of the state strain testing of crops.

Table 1 - Scheme ofexperience

Cultivar	Options	Repetitions			
		I	II	III	IV
Vekhovskaya	May 15 (control)	1	4	7	10
	May 20	2	5	8	11
	May 25	3	6	9	12

The object of research was a variety of lentils Vekhovskaya. Sowing dates were 15; 20; 25 May. Seeding rates: 105 kg/ha. SZS seeder – 2,1, row-spacing width - 21 cm. All variants of the experiment were placed sequentially in 4 times. Plot size 6,3x120 m=756 m^2. The total area of the experimental field is more than 0, 9 ha, the accounting area of the plot is 400 m^2 (table 1).

Agrotechnics in the experiment: the predecessor is pure steam; in the spring, BIG-3 was harrowed with 4cm of soil physical maturity. Before sowing, the seeds were treated with Olymp K.S. fungicide with a consumption of working fluid of 0,5-0,6 l/t for protection of lentils from a complex of diseases transmitted by seeds and through the soil (anthracnose, root rot, molding of seeds, etc.). Sowing of seeds was carried out by the seeder- SZS 2,1.

Care of crops consists in carrying out chemical treatment of crops against harmful organisms. Measures were taken to combat the contamination of crops in the phase of 1-3 true leaves of weeds. Spraying of crops was carried out with thepreparation Fyuzilat Forte with a consumption rate of 0,75 l/ha against annual cereal weeds, and against diseases in the phase of budding with a Titul-Duo fungicide with a consumption rate of 0,25 l/ha.

The method of harvesting was determined depending on lentil ripening conditions. In 2017, in the phase of full ripeness of all baskets by direct combining and separately in 2018, conventional grain combines.

Calculations and observations:

1. Meteorological conditions are given according to the weather stations of Balkhashino located in Sandyktau district of Akmola region.

2. Phenological observations in accordance with the methodology of the state commission for varietal testing of agricultural crops. Observations are carried out from sowing to seed ripening on 4 permanent sites measuring 0,25 m^2 each plot in two non-adjacent replications. The beginning of the phase is taken as the date of occurrence in it of 10% of plants, the full phase is 75 % plants.

3. Definition of elements of the structure of the crop. Determine the density of standing plants in the spring, the density of plants before harvesting, the number of baskets per plant, the number of seeds in the ripening phase.

Field seed germination is determined by the formula (1):

$$Fg = \frac{D' \, 100}{Rs} \quad (1)$$

where: Fg - field germination in%

D - the actual density of standing plants on shoots, pieces /m^2

Rs - the rate of seeding, units/m^2

Plant density is determined twice: after germination and when harvesting by counting plants on all varieties. For this purpose, 4 platforms with an area of 0.25 m^2 were fixed on two non-adjacent replicas. Is determined by the safety of plants (S_p) by the formula (2)

$$Sp = \frac{D}{Fg} \quad (2)$$

where: Sp - the safety of plants,%

D - the actual density of standing plants before cleaning, pieces/m^2

Fg - field germination , pcs./m^2

4. The yield of lentils is determined by the method of state variety testing of agricultural crops (2002), with its reduction to standard humidity, according to the following formula (3):

$$X = \frac{\mathrm{Yx}(100 - \mathrm{M})}{100 - \mathrm{SM}} \quad (3)$$

where: X - final yield with reduction to standard moisture, c/ha;

Y - yield during harvest, kg/ha;

M–moisture of crop,%;

Sv - standard moisture for this culture,%.

Accounting of grain yield in the experiments was carried out with the entire counting area of each plot by weighing, at the same time as harvesting, samples were taken from each variant for subsequent analyzes. The grain yield was recalculated to standard 12% moisture and 100% physical cleanliness [7].

5. Economic efficiency is calculated on the basis of technological maps with the adjustment of actually performed agro-events.

6. The results obtained on yield and fat content in the seeds of safflower were processed by the SNEDECOR program [8].

Research results

Kamenka and D LLP is located in the central zone of the Akmola region. The climate is continental arid. The amount of precipitation is 250-280 mm. Vegetation period varies in the range of 110-120 days. The sharp continental climate is arid, with hot summers and cold winters. The daily and annual temperature amplitudes are very high. Spring and autumn are mild. There are many sunny days, the amount of solar heat that the earth receives in summer is almost as great as in the tropics.Cloudiness is negligible. Annual precipitation decreases from north to south, their maximum falls in July, the minimum in February. Snow cover is kept for an average of 150 days.

The main part of the territory belongs to the denudation-accumulative type of relief. These are the watershed plains of the Zhabay and Zhilandinka rivers, dissected by a younger network, with the presence of basins, lakes and depressions.

In general, the land use relief is convenient for mechanized soil treatment.

The soil cover on the farm is mainly represented by ordinary chernozem , carbonate medium and chernozem southern carbonate medium and also meadow-chernozem medium powerful soils (Table 2).

Table 2 - Agrochemical characteristics of the soil on the security of the main nutrients (according to the agrochemical service)

Soil type	Humuscontent, %	Nitrogen content (0-40cm), mg/kg	Phosphorus content (0-20 cm), mg/kg	Potassiumcontent, mg/kg
Dark chestnutsoils	3,0 – 5,1	30,80 – 49,9	11,0 – 26,4	389 - 500

Sandyktau district is located in the northwestern part of the Akmola region, with a center in Balkashino.

The sowing period of lentils in the month of May 2017 stood favorable weather, dropped 35 mm of rainfall, slightly below the average long-term rates by 2 mm, however, the average air temperature was above the long-term average rates on 0,9 ^{0}C. This contributed to the friendly emergence of lentil shoots. In June month precipitation was less of mean indicators 10 mm, especially hot proved II and III decade, also the average air temperature was above the norm for many years 0,6^{0}C. July month and characterized Referrin g slightly low temperature conditionts (of mean deviation from the norm was -1,0^{0}C). Meanwhile, the month of July was rainy (78,7 mm of rain fell), especially the rains fell in the second and third decade. During this period, lentils gained a good green mass. The month of August turned out to be dry and warm, the amount of precipitation was only an extra 1,5 mm, which is 38,5 mm lower than the average annual rate, and the average monthly air temperature is 0,9^{0}C higher. Such weather conditions contributed to the timely ripening of lentil seeds with high quality seeds. The opposite of precipitation and the accumulation of the amount of temperature was 2018.

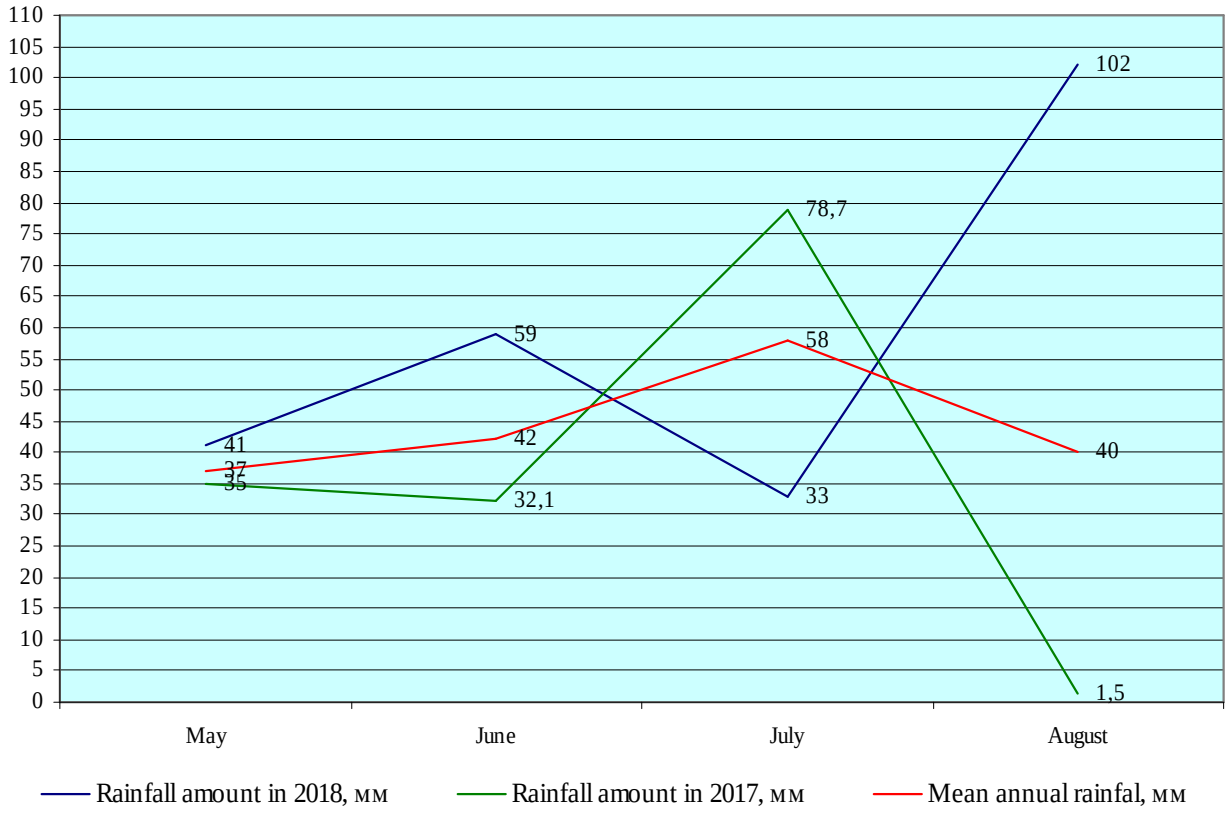

Figure 1 - Monthly average of the amount of precipitation in compared with average long-term indicators, mm

Spring 2018 was wet and protracted. In the 3 rd decade of May, 147% of precipitation fell compared to the average multiyear average. During the period of sowing and germination of field crops, average daily temperatures were 2-4°C lower than the average annual values, which caused a delay in seed germination and the emergence of seedlings. Temperatures in June were below normal. In 1-2 decades of July, elevated temperatures had a favorable effect on the growth and development of plants, but in the 3rd decade the warm weather changed to cool. In August, after a short heat in the first decade of August, the average daily air temperature was established below the mean multiyear values (by 1–3°C). The precipitation was extremely unstable. In the 3 rd decade of June 224% of precipitation from the norm. In contrast to dry July, August turned out to be rainy (Figure 2, 3).

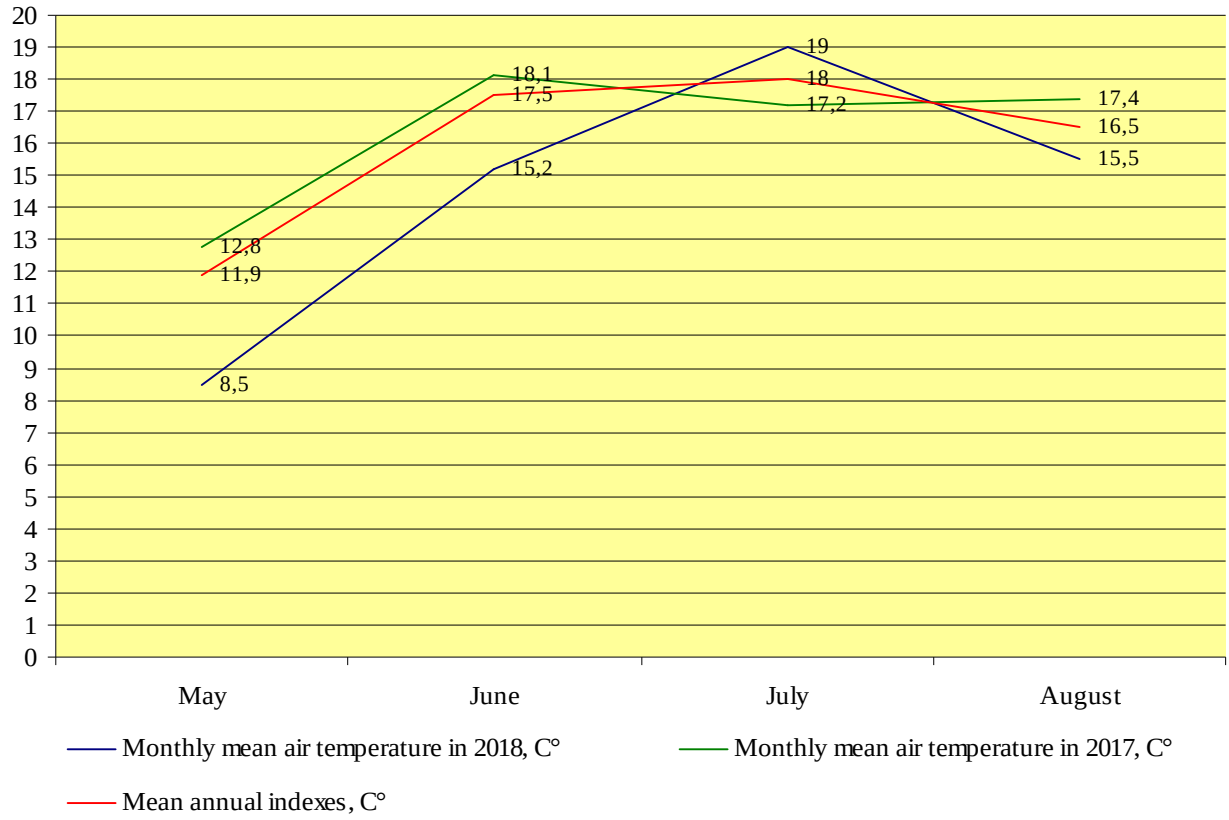

Figure 2 - Average monthly air temperature in comparison with average long-term indicators, ^{0}C

The yield of any crop, including lentils, is determined by the number of plants per unit area and the mass of a single plant or seeds obtained from this plant. Of great importance is the direction of agricultural methods to obtain the required number of plants per unit area, which in the process of growth and development ensures the optimal course of formation of the assimilation surface and biomass accumulation.

As is well known, friendly awn emergence and uniformit y of spine plant with a given density of the second stand of plants is essential for the formation I have high seed yield of field crops. Numerous studies confirm that the field of tin seeds depends on the predecessors, the processing system soil and fertilizer, sowing dates, seeding rate and seed embedment depth, methods of planting care.

The complex interaction of agrotechnical, ecological, and - meteorological and other conditions affect the e- hand floor germination. The higher the level of agricultural technology, the more thoroughly It is based on soil properties, weather conditions and the need seed quality to germination factors, the higher the field germination of seeds.

The density of the field phytocenosis is determined by many factors, the main of which are soil fertility, plant availability of moisture, light, varietal characteristics, rate and time of sowing, seed quality, field germination, plant survival from

sowing to harvest and other conditions [9].

Sowing density has a significant impact on plant height and mass, crop structure, timing of phenological phases and other biometrics. In thickened crops, the formation of generative organs slows down, significantly reduced their share in the crop.

Field germination of seeds in the years of research depended on weather conditions, as well as on the studied agricultural methods. High field germination was obtained on a variant with a sowing date of May 20 and amounted, respectively, by year - 170; 178 plants per 1 m^2, which is higher than the control variant by 11; 15 plants per 1 m^2 and indicators of the variant with a period of 25 May for 6-8 plants per 1 m^2.

The safety of plants is the number of plants remaining for harvesting as a percentage of the number of plants that have risen. In the aggregate, field germination and preservation characterize the overall survival of plants, the number of plants remaining for harvesting as a percentage of the number of germinated seeds sown. This indicator is integral and characterizes the ability of seeds to create in specific conditions high-grade plants involved in the formation of the harvest.

Higher safety of the plants was obtained on the variant with the date of sowing on May 20, where it was 162,0; 169,3 plants per 1m^2. Less received on the variant with a sowing date of May 25 and amounted, respectively, by year - 154; 160,0 plants per 1 m^2. The control variant was inferior in this indicator to the variants under study (Table 3).

Table 3 - Field germination and safety of plants

Options	Field germination				Safety of plants			
	pcs/m^2		%		pcs/m^2		%	
	2017	2018	2017	2018	2017	2018	2017	2018
May 15 (control)	159,0	163,3	79,5	81,7	147,0	151,0	92,4	92,5
May 20	170,0	178,0	85,0	89,0	162,0	169,3	95,3	95,1
May 25	164,0	170,0	82,0	85,0	154,0	160,0	93,9	94,1

Lentil is the earliest leguminous crop. Vegetation period ranges from 80 to 100 days.

In lentil plants, phases of sprouting,
branching, budding, flowering, bean formation and ripening are noted. The last phases are marked by tiers, since flowering and ripening occur sequentially from the bottom upwards along the stem. At the same time, the generative organs located on different tiers are at different stages of organogenesis.

The growth and development of lentils is largely determined by the combination of the amount of heat and moisture during the growing season, as well as the individual response of the varieties to these

conditions, due to the genotype. The abundance of precipitation and high relative humidity of the air, as well as a decrease in air temperature, led to an increase in the length of the growing season.

In the period from sowing to full germination in 2017, it tooks 7-8 days, and in 2018 it took 8-11 days, which is 1-3 days longer. This is due in the first place the prevailing weather conditions in the spring. With an increase in precipitation during the flowering-maturation period in 2018, the interphase period increased by 2-4 days.

In the dry 2017, it took 86-89 days to ripen lentils, and in 2018 it took 96-98 days, which is 9-10 days longer.

A significant difference between the studied variants of the experiment in the length of the growing season of lentils was not observed, however, in the control variant, the growing season was for years respectively - 89-98 days, which is 2 dayslonger compared to the studied variants of the experiment (Table 4).

Table 4 – Duration of interphaseperiods of lentil in the experimental plot in LLP "Kamenka and D"

Year	Options	Sowing-shoots	Shoots-branching	Branching - budding	Budding -Bloom	Flowering - Beanformation	Beanformation-ripening	Ripening - fullripeness	Sowing-fullripeness
2017	May 15 (control)	8	11	12	13	14	18	13	89
	May 20	7	11	12	13	14	17	12	86
	May 25	7	11	12	13	14	17	12	86
2018	May 15 (control)	11	12	14	14	15	19	13	98
	May 20	9	12	14	14	15	19	13	96
	May 25	8	12	14	14	15	18	13	96

Analysis of the crop structure is an important method for assessing the development of cultivated plants; it allows to establish patterns of crop formation and to trace its dependence on a variety of environmental factors, the action of chemicals or extreme weather conditions, as well as the influence of diseases, weeds, pests and others. For each variant of experience (including control) a certain number of measurements of each element of the crop structure should be obtained. The mass of 1000 seeds is a fairly stable element of productivity and varies depending on

weather conditions to a lesser extent than the number of beans and seeds per plant.

The a feature of generating yield structure elements depending on the sowing date and weather conditions was studied by us.

The number of lentil plants varied depending on the time of sowing and weather conditions from 147 to 162 pcs/m^2 in 2017 and from 151 to 169,3 pcs/m^2 in 2018. This indicator was higher in 2018, and among the sowing dates - on the variant with the sowing date - May 20. There were no significant differences between the time of sowing in terms of the number of seeds per spike and the mass of 1000 seeds, however, in comparison with 2017 in 2018, the formation of these indicators was slow due to lack of heat and was 0,7-1,7 less seeds and 5,4-6g.

Biological yield of lentils varied depending on the sowing date from 14,5 to 16,2 c/ha in 2017 and from 11,9 to 14,2 c/ha in 2018. The control variant was lower than the studied variants by 0,6–2,3 c/ha (Table 5).

Table 5 - The structure of the harvest of lentils, depending on the time of sowing

Year	Options	The number of plants piece/m^2	Number of seeds per 1 plant, pcs	Weight 1000 seeds, g	Biological yield c/ha
2017	May 15 (control)	147,0	20,0	49,3	14,5
	May 20	162,0	20,3	49,5	16,2
	May 25	154,0	20,0	49,2	15,1
SD $_{05}$					***0,35***
2018	May 15 (control)	151,0	18,3	43,3	11,9
	May 20	169,3	19,0	44,0	14,2
	May 25	160,0	19,0	43,8	13,3
SD $_{05}$					***0,44***

Numerous studies of V.S. Sheveluh, A.T. Mokronosov, N.N. Protasov, V.I. Kefel found that the productivity of agricultural crops is closely related to the growth of plants, which is an integral reflection of their internal, external factors [10].

Harvesting is a set of works at the final stage of agriculture. During the period of full ripeness of seeds of the tested varieties of leguminous crops, on August 20–21, the harvest was carried out on 12 experimental plots.

In the summer, the temperature background in the main phases of growth and development of leguminous crops was favorable, the moisture reserves in the soil were in sufficient quantities. August month

2017 was warm and dry, which contributed to the successful ripening of lentil seeds. The yield of lentils in the experiments, depending on the time of sowing, ranged from 13,4-15,1 centners per hectare in 2017 and from 10,6-13,1 centners per hectare in 2018. On average over the years of research, high yield of lentils was obtained on a variant with a sowing period of May 20, which is higher than the control variant by 2,1 centners/ha (Table 6).

Table 6 – Lentil yields depending on the sowing time, c/ha

Cultivar	Sowing date	Grain yield			Deviation from control
		2017	2018	average	
Vekhovskaya	May 15 (control)	13,4	10,6	12,0	-
	May 20	15,1	13,1	14,1	2,1
	May 25	14,0	12,0	13,0	1,0
SD_{05}					***0,31***

The economic effect is a useful result of the production activities of agricultural enterprises. It manifests itself in saving labor and material resources, increasing the volume and improving product quality, reducing losses and improving other results of labor.

At this stage of development of agriculture, the main attention should be focused on the most rational efficient use of material, labor, financial resources and natural resources. In each farm, to ensure an all-out increase in the production of high-quality products per unit area with minimal labor and funds more efficient production of a crop.

To fully meet the population's need for food, not only additional material and energy costs are required, but also measures to save them, as well as a radical revision of the principles of agriculture, the design and use of agricultural equipment. This is especially important now, when the entire national economy of the country is oriented towards a market economy.

At the present stage of development of agriculture, when the country switched to a market economy, the main attention should be focused on the most rational and efficient use of material, labor, financial and natural wealth in order to ensure a full increase in production at the lowest cost in each particular farm. Hence, the more high-quality products are produced per unit of area with the minimum expenditure of labor and funds, the more effective is the cultivation of a particular crop.

The economic efficiency of new technologies is determined by their impact on improving the final indicators of agricultural production, mainly on the increase in profits due to increased crop yields, improved product quality, reduced costs and reduced cost of production. The economic assessment of the end result of agricultural production (by increasing income or reducing the

cost of production allows you to identify and implement effective technologies and others). To achieve the goal, a calculation was made of the economic efficiency of growing lentils for seed.

In 2018, due to additional processing of crops against diseases, the total costs increased by 2310 tenge per hectare compared with 2017. This was facilitated by adverse weather conditions during the formation of beans and ripening of lentil seeds, where a recurrent outbreak of disease occurred.

According to data of calculation of economic efficiency, found that lentils reaching e t the greatest cost-effectiveness in terms of sowing on May 20. The difference between the maximum level of profitability and low (in the control variant) was 13,1-36,3% in 2017 and 26,5-47,3 % in 2018 (Table 7).

Table 7 - Economic indicators of lentil

Year	Sowingdate	Indicators					
		Sellingprice tg/c	Totalincome, Tg	Totalcosts, tg	Net income, tg	Cost priceцaseeds, tg	Profitanbility, %
2017	May 15 (control)	7100	95140	33650	61490	2511,2	182,3
	May 20	7100	107210	33650	73560	2228,5	218,6
	May 25	7100	99400	33650	65750	2403,6	195,4
2018	May 15 (control)	6800	72080	35960	36120	3392,5	100,4
	May 20	6800	89080	35960	53120	2745,0	147,7
	May 25	6800	81600	35960	45640	2996,7	126,9

Conclusion

As a result of studies in 2017-2018 years we have found that the onset of the main phenological phases of growth and development of lentils in experiments depended both on the agricultural practices as well as weather conditions. When drought conditions for the emergence of shoot Lentil needed 7-8 days, and when cool conditions with a shortage of the second heat 8-11 days. For the formation and timely maturation of seeds, the temperature regime in the period “bean formation" and "ripening". With a sufficient amount of heat, the number of seeds in one plant and the mass of 1000 seeds multiply; as a result, the biological yield increases. Economic efficiency shows a high profitability of lentil cultivation, both in dry years and in cool, wet years. All the studied sowing dates showed good

profitability, however, compared with the control variant on the variant with the sowing period of May 20, the increase in profitability was 36,3-47,3%.

References

1. Arinov K., Musynov K., Shestakova N., Serekpaev N., Apushev A. Crop Growing. Textbook - Astana, Ed .: Foliant. 2016. - p. 412 - 417.
2. "Production of Lentils by Countries". UN Food & Agriculture Organization, Statistics Division. 2013. Retrieved 24 March 2015.
3. Zotikov V.I. Promising technology for the production of lentils: guidelines / V.I. Zotikov, M.T. Golopyatov, G.A. Borzenkova , AA Janova. - Orel: GNU VNIIZBK, 2011. - 60 p.
4. State program for the development of the agro-industrial complex of the Republic of Kazakhstan for 2017-2021. February 15, 2017.
5. Mussynov K.M., Tahsin N.T., Arinov B.K., Kipshakbayeva A.A., Utelbayev Y.A., Bazarbayev B.B. Productivity and Cooking Advantages of Lentil Grades Grown Under Conditions Found in North Kazakhstan Pakistan Journal of Nutrition 16(11): 843-849, 2017.
6. Musynov K.M., Kipshakbayeva A.A., Arinov B.K., Tleulina Z.T. Formation of grain products and quality due to cultivation technology of lentils under the conditions of North Kazakhstan // Vestnik KazATU them. S.Seifullin. Special edition, Astana. 2016. -WITH. 106-109.
7. Arinov K.K., Mozhaev N.I., Shestakova N.A., Serekpaev N.A., Yskakova M.A. Crop Growing mannual. - Astana, 2004. - 280 p.
8. Program package application statistics SNEDECOR: 1-factor analysis of variance. Version 4.7, 05.07.2004.
9. Kayumov M.K. Programming the productivity of field crops // Reference . - 2nd ed., Pererab. and add. - M .: Rosagropromizdat, 1989. - 368 p.
10. Protasov N.N. Photosynthesis and growth of higher plants, their interrelation and correlations. Physiology of photosynthesis / Protsova N.N., Kefeli V.I. –M.: Science, 1982. - p. 251.

АҚМОЛА ОБЛЫСЫНЫҢ ҚАРА ТОПЫРАҚТЫ ЖАҒДАЙЫНДА ЖАСЫМЫҚТЫҢ (Lens culinaris) ӨНІМДІЛІГІ

Қ.М[1].Мұсынов, а.ш.ғ.д., профессор
З.Ш[1]., Сулейменова, аға оқытушы
Е.А.Утельбаев, PhD[1], аға оқытушы
Б.Б. Базарбаев, PhD[1], аға оқытушы
С.Д.Сагатбек ,магистр, ассистент
[1]С.Сейфуллин атындағы Қазақ агротехникалық университеті, Жеңіс

Түйін

Мақалада Ақмола облысының қара топырақты жағдайында жасымықтың (Lens culinaris) өнімділігінің және экономикалық тиімділігінің қалыптасуы бойынша 2017 - 2018 жылдар аралығында жүргізілген зерттеу жұмыстарының нәтижелері келтірілген. Әр түрлі себу мерзімдері мен ауа райы жағдайларының дақылдың өсіп-дамуының фенологиялық кезеңдерінің өту ұзақтылығына, сондай-ақ, өнімнің құрылымдық элементтерінің қалыптасуына әсері көрсетілген. Жүргізілген танаптық тәжірибенің нәтижелері бойынша аймақ жағдайында тұқымның жоғары өнімділігі 20 мамырда себілген нұсқаларда алынған (14,1 ц/га), ол бақылау нұсқасымен салыстырғанда 2,1 ц/га жоғары болған. Экономикалық тиімділікке жүргізілген есептеулер аталмыш дақылдың жоғары рентабельді (100,4 - 218,6 %) екенін айғақтайды.

Кілттік сөздер: жасымық, өсу және даму, танаптық өңгіштік, өнімділік, экономикалық тиімділік

УРОЖАЙНОСТЬ ЧЕЧЕВИЦЫ (Lens culinaris) В УСЛОВИЯХ ЧЕРНОЗЕМНЫХ ПОЧВ АКМОЛИНСКОЙ ОБЛАСТИ

К.М[1].Мусынов, д.с.х.н., профессор
З.Ш.Сулейменова, старший преподаватель
Е.А.Утельбаев ,PhD[1], старший преподаватель
Б.Б. Базарбаев, PhD[1], старший преподаватель
С.Д[1]Сагатбек., магистр, ассистент
[1]Казахский агротехнический университет им. С.Сейфуллина, проспект

Аннотация

В данной статье представлены результаты исследований 2017 - 2018 годов по формированию урожайности и экономической эффективности чечевицы (Lens culinaris) в условиях черноземных почв Акмолинской области. Показано влияние разных сроков посева и погодных условий на длительность прохождений фенологических фаз роста и развития, а также, формирование элементов структуры урожая культуры. По результатам полевых опытов высокая урожайность семян в условиях региона получена на вариантах со сроком посева 20 мая и составило - 14,1 ц/га, что выше контрольного варианта на 2,1 ц/га. Расчеты экономической эффективности показывают высокую рентабельность данной культуры, которая варировало по годам и срокам посева в пределах от 100,4 до 218,6 %.

Ключевые слова: чечевица, рост и развитие, полевая всхожесть, урожайность, экономическая эффективность