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**ECOSYSTEM APPROACH OF NATURAL PASTURES
IN THEIR SEASONAL USE IN ZHAMBYL REGION**

Abstract. In the conditions of vertical zoning of soils for the first time in Kazakhstan, comprehensive research on the causes of degradation of pastures and the development of methods of their recovery in a specific project area. The purpose of the work is to study and give a scientific substantiation of the causes of pasture degradation, the possibility of their restoration, improving the productivity of natural lands by moderate grass grazing and increasing the live weight gain of grazing animals in seasonal areas. In this regard, the development of a new form of livestock farming, that is, the transfer of livestock to distant plots and the use of these plots according to the seasons of the year with moderate grass grazing, in order to reduce pasture degradation, is a promising area of agricultural research and reflects the needs of the country's livestock industry. As a result of researches on the basis of geobotanical researches, the farms of economy were divided into seasons of their use, with allocation of plant associations, conducted in order to estimate the yield of natural herbage in zones and seasons of the year and determined live weight gain of animals over the grazing period. Application of seasonal pastures provides more weight gain studied animals in comparison with animals that grazing in one place and is unsystematic. The implementation of the results created the conditions for the restoration of degraded pastures with an increase in the growth and development of vegetation cover up to 15-18% and an increase in livestock production through rational grazing up to 12%.

Key words: pastures, natural herbage, natural areas, soil moisture, yields, animals, degradation, pasture mass.

Introduction. The fact is that the pasture resources in Kazakhstan are used unevenly. Out of 188 million ha, only 78.7 million ha have been used. Among them, 59.5 million ha were irrigated, of which 52.2 million ha were economically beneficial. The average yield of green mass don't exceed 0.8 t/ha [1]. Due to the irrational use of forage lands, 48 million ha pastures became the subject to degradation processes. The processes of pastures degradation has existed for a long time. Since the mid-1950s natural grassland ecosystem has been in excessive mode of intensive grazing because of large numbers of cattle. Since the mid-1990s, some changes have occurred in the agricultural economy, which positively affected the ecological state of agricultural landscapes [2]. Due to the number of grazed cattle decreased, the anthropogenic load on the soil and vegetation cover also has decreased. But there is still a problem of uneven, local grazing of farm animals.

Nowadays, the area around the open water sources is heavily congested. In Kazakhstan, as a country with a dry climate, there are two ways to water pastures. The first way is to use the open sources (streams, springs, rivers, lakes). However, according to the Kazakh Research Institute of water management [3], natural water sources can only ensure 30-32 million ha of pastures (1/5 of the entire territory of pastures). The second way is to transport groundwater to the surface by engineering structures close to the settlement. Currently, most of the livestock is concentrated in the possession of private owners, who graze animals no further than 5 km from these sources and habitation, due to economic factor. They cannot take cattle to distant pastures because of the high cost to hire a shepherd for small livestock. In addition [4], pasture infrastructure is destroyed on remote pastures, so there is no house, communication and other vital conditions. So, as modern settlements consist of tens, and sometimes hundreds of residents [5], daily

grazing of such large number from year to year on the same place leads to degradation of pastures necessarily.

The development of new rational system of animal breeding, the transfer of cattle on the distance pastures and use these pastures in seasons with moderate grazing to reduce pasture degradation, is a promising direction of agricultural research, and reflects the requests of the livestock industry of Kazakhstan. Regulation of the use of pastures is especially important in Zhambyl region, where the total area of agricultural land is more than 4.5 million ha, of which pasturelands occupy 65% - 2.9 million ha. There are more than 5 thousand agricultural formations in the region that have pastures but no livestock. At the same time, the population of the region, which owns the majority of livestock, has no pasture. It causes overgrazing around settlements [6]. The state bodies are actively working to regulate this problem, and scientific research in this direction is very important.

Material and methods. The research was carried out in 2015-2017 on the lands of the peasant farm “Batyр”. Pasturelands of the farm consist of five independent sites, which are located on three geographical zones: foothill-steppe (950 ha), foothill dry steppe (1370 ha) and foothill semi desert (1880 ha). The total area of these distant pastures is 4.200 ha. The works performed are as follows:

- determination of soil moisture reserves – 4 points, by drilling up to 0.5 m. Soil samples were taken by soil drill on 4 fixed sites, layer by layer 10 cm by thermostatic-weight method for seasons of the year: spring, summer and autumn in triple repetition; - selection of soil samples on 4 fixed sites, layer by layer 10 cm to a depth of 50 cm, for agrochemical analysis; determination of the volume mass of soil on 4 fixed sites, layer by layer 10 cm to a depth of 50 cm in triple repetition [7]; - plant height was determined before taking into account the yield of green mass by measuring 25 plants of each species; accounting of green mass yield of natural pastures was carried out on specific plant outlines for the grazing period in 10 m². The Botanical composition was taken into account by analysis of a trial sheaf weighing 1 kg at natural humidity in 2 - fold repetition [8-10]; - chemical composition of the fodder according to seasons was defined in the Institute’s laboratory (“Kazakh Scientific Research Institute of Animal Breeding and Forage Production”) by common methods; - live weight gain of animals was carried out by weighing of the selected animals in the control and experimental groups (10 animals in each group) [11].

Results. Pasture lands of the studied area are located in 3 zones in the conditions of vertical zonality, which distinguishes them by soils and vegetation cover. The pasture lands of “Batyр” farm consists of 5 distant sites placed in the far distance, and 1 control site, placed near the village (figure).



Foothill semi-desert zone (control) Foothill semi-desert zone (spring pasture)



Foothill dry steppe zone (summer pasture) Foothill steppe zone (autumn pasture)

Pasture lands of “Batyр” farm

The site 1 is located in the foothill semi desert zone (ordinary grey soil) with the coordinate system N 43 27 17.8; E 074 55 46.2. Botanical study of the site has allowed identifying 3 independent plant associations: *Ceratocarpus-Artemisia*, *Artemisia-ephemeral* and *Ephemeral-Artemisia*.

The site 2 and 3 are located in the foothill dry steppe zone (light chestnut soil) with coordinates N 43 28 58.8; E 074 50 43.8. Biological diversity of plants is demonstrated by following 4 associations: *Festuca-variiherbetum*, *Festuca-Artemisia-variiherbetum*, *Stipa-Poa-Artemisia* and *Artemisia-Festuca*.

The site 4 and 5 are located in the foothill steppe zone (dark chestnut soil) with coordinates N 43 19 46.4; E 075 01 02.2. Botanical composition presented by 6 associations: *Onobrychis-Bromopsis-Festuca*, *Festuca-Poa-Carex*, *Gramineae-Erysimum*, *Onobrychis-Festuca-Poa-Bromopsis*, *Bromopsis-Alyssum-Secale* and *Bromopsis-Festuca-Onobrychis*. The site 6 is located in the foothill semi desert zone in the coordinate system N 42 27 34.5; E 074 53 26.7. As a control variant, the pasture site belongs to the village's territory with unsystematic and all-year free grazing mode.

In 2015, on the control site, the projective cover by grass was between 30-35%. In the distant spring pasture, this indicator was at the level of 50-55%, in summer and autumn pastures - 70-80%. At the end of studies (2017), on the distant sites the projective cover increased by 8-10% due to the appearance of young shoots of growing plants, while in the control sites this indicator remained almost unchanged. During the work, on selected botanical associations in all geographical areas there were carried out different studies, starting with the measuring of soil moisture, including the determination of pasture mass and ending with the weighing of live weight of animals because of the grazing.

The research we carried out, concerning the determination of the total moisture reserve in the soil, showed that all the types of pastures in the spring time had a sufficient level of humidity suitable for the initial growth of grasses. So, in 2015, in spring, the total soil moisture content in the upper 0-30 cm layer in the control variant with year-round use was 20.3 mm, in the foothill-semi-desert zone - 25.7 mm, in the foothill-steppe zone - 39.5 mm and in the foothill-steppe zone - 50.4 mm. In the half-meter layer of soil, these indicators were respectively: 42.7; 47.6; 71.5 and 90.1 mm. The results obtained in determining the total reserves of moisture in the soil show that the best conditions for the accumulation of moisture in the spring period are created in the foothill-steppe zone. Here, the content of total moisture in the 0-30 cm soil layer is 30.1 mm higher than in the control variant of the experiment. In summer, the amount of soil moisture is somewhat reduced due to its use by plants for its growth and development. In this regard, the total moisture content in the soil in the 0-30 cm layer with unsystematic grazing was 17.1 mm, in the spring use area - 20.7 mm, in the summer use area - 27.4 mm and in the autumn section use - 21.9 mm. In the half-meter layer of soil, these figures were, respectively, 32.4; 37.3; 51.8 and 40.2 mm. By the fall, the soil moisture content throughout the soil profile continues to decrease and in the 0-50 cm soil layer on the control variant is 21.3 mm, the semi-desert zone is 24.2 mm, the foothill-dry steppe zone is 32.1 mm and the foothill-steppe zone - 35.5 mm.

At the end of the research (2017) in spring, the total soil moisture content in the upper layer of 0-30 cm was: in the control variant with unsystematic grazing - 44.8 mm, in the foothill-semi-desert zone - 50.8 mm, in the foothill the dry steppe zone is 52.1 mm and in the foothill steppe zone is 75.3 mm. In the half-meter layer of soil, these indicators were respectively: 76.5; 89.1; 86.9 and 123.8 mm. In the summer, this figure decreases slightly and amounts to 14.2 mm in unsystematic grazing, in the semi-desert it was at the level of 17.2 mm, in the steppe and steppe zones - to 19.3 to 27.6 mm. In the 0-50 cm layer, these figures were respectively: 29.2; 33.1; 37.5 and 47.4 mm. By the autumn, the soil moisture content in the control variant with unsystematic grazing in the 0-30 cm layer was 10.6 mm, the semi-desert zone - 12.7 mm, the foothill-dry steppe zone - 15.2 mm, in the foothill-steppe zone - 19.5 mm. In the half-meter layer of soil, these figures were respectively: 20.5; 24.5; 28.9 and 36.5 mm.

The observation showed that the all-year pasture had a slightly lower level of the soil moisture during the moisture-accumulating period, than the pastures of spring, summer and autumn use. It should be noted that such minimal content of soil moisture in the treatment is linked with the fact that here the plant cover of the soil surface is very weak, and it is less than 50%, whereas in seasonal areas it is higher and ranges from 70 to 90%. In this context, in the foothill semi-desert zone with ordinary grey-brownish soil (control) the moisture accumulated in winter and early spring periods is used not only for the growth and development of the grass, but most of it is spent on physical evaporation from the soil surface. In addition, the total moisture content in the soil is greater in the foothill-steppe zone with *Poa-Onobrychis-Festuca-Carex-Alyssum* associations, compared with other variants of experience, which is logical. This is due to

the fact that in the piedmont-steppe zone more precipitation falls due to the proximity of the mountains, and they are located at an altitude of 1350 meters above sea level, snow comes off the surface of pastures in mid-April. In addition, they are located on a dark chestnut soil; in the spring, the wetting of the soil along the moisture profile is more than 100 cm.

As a result of studies found that on distant-pasture sites where it was applied seasonal use, indexes of volume mass of the soil are slightly lower in comparison with control option of experience at an unsystematic pasture. Thus, indicators of volume weight in 2015 year (the beginning of researches) in a half-meter layer of earth on the site of spring use – 1.34 g/cm³, summer – 1.26 g/cm³ and autumn use – 1.24 g/cm³, at the end of researches (in 2017) they decreased, and made respectively – 1.33; 1.23 and 1.21 g/cm³. On control option of experience indexes of volume weight, on the contrary, increased by 0.01 cm³ (in 2015 – 1.36 g/cm³ and 2017 of – 1.37 g/cm³).

Researches of chemical properties of the soil show that the maintenance of the common humus and nutritious elements - the common nitrogen and the relative frame phosphorus in the soil low, except for the relative frame potassium irrespective of types of pastures. However it should be noted what in comparison with the beginning (2015) of an experiment, at the end of researches (2017) on seasonal sites indexes of fertility of the soil improved a little, because of carrying out the normalized pasture of animals where extent of scouring of natural herbage made no more than 70%.

In 2015, on the control version of the experiment, the projective soil cover by the grass stand was between 30-35%. In the distant pastures, that is, in the spring pasture, this indicator was at the level of 50-55%, in the summer - 60-65% and in the autumn - 70-80%. At the end of studies (2017), on the distant sites, the projective soil cover by plants increased by 8-10%, due to the appearance of young shoots of growing plants, while in the control sites this indicator remained almost unchanged, remained at the same level.

In order to identify feed capacity of the used pastures, we have recorded yields of pasture herbage in the selected plant associations according to seasons (table 1).

Table 1 – Yield of pasture grass in the conditions of vertical zoning of the soil (average for the period of 2015-2017)

Natural area	Season using	Plant associations	Seasons of the year, c/ha		
			spring	summer	autumn
Foothill semi-desert	Control – all-year round use	Artemisia	7.9	4.1	3.9
	I area – spring use (spring pasture)	Ceratocarpus -Artemisia	13.7	7.1	8.3
		Artemisia-ephemerae	13.5	7.2	8.1
Foothill dry steppe	Area II – summer use (summer pasture)	Ephemerae -Artemisia	15.5	8.4	9.4
		Festuca-varietherbetum	17.8	19.6	12.1
		Festuca-Artemisia- varietherbetum	18.8	19.7	13.6
		Stipa-Poa-Artemisia	16.4	17.6	11.7
Foothill steppe	Area III – autumn use (autumn pasture)	Artemisia-Festuca	16.0	17.3	10.7
		Onobrychis-Bromopsis-Festuca	40.8	38.3	25.9
		Festuca-Poa-Carex	26.9	27.9	21.6
		Gramineae-Erysimum	37.1	37.9	24.3
		Onobrychis-Festuca-Poa-Bromopsis	33.5	34.9	23.2
		Bromopsis-Alyssum-Secale	30.1	31.4	20.2
		Bromopsis-Festuca-Onobrychis	32.1	33.2	21.4

Studying the yield of green mass of natural grass stands on average for three years showed that the maximum yield of pasture mass at the site of spring use in the piedmont-semi-desert zone provided the Ephemerae –Artemisia type of pastures, where it was 15.5 c/ha in spring, in summer - 8.4 c/ha and in autumn - 9.4 c/ha. In the area of summer use in the foothill-dry steppe zone, the highest yield of pasture mass was noted in the Festuca-Artemisia- varietherbetum type of pasture, where it was 18.8 c/ha in the spring, 19.7 c/ha in the summer and 13.6 in the autumn. In the foothill-steppe zone, in the area of autumn

use, the yield of pasture mass is higher on the vegetation contour consisting of *Onobrychis-Bromopsis-Festuca* vegetation, where it was 40.8 c/ha in the spring, 38.3 c c/ha in the summer and 25.9 c/ha autumn. At the same time, in the distant pastures the peak of the yield falls on the summer periods. In the control variant of the experiment with year-round use the lowest yield of pasture mass was obtained. Here, with *Artemisia* type of pasture, the yield of grasses was in the spring - 7.9 c/ha, in the summer - 4.1 c/ha and in the autumn - 3.9 c/ha.

Determination of pasture mass yields in the project area according to the seasons of the year showed that the maximum yield of the pasture mass at the site of spring use is provided by the *Ephemerae - Artemisia* type, at the site of summer use - *Festuca-Artemisia- variierherbetum* and on the site of autumn use - *Onobrychis-Bromopsis-Festuca* type. At the same time, in the distant pastures the peak of the yield falls on the summer periods.

The study of the chemical composition of plants in connection with the purpose (period of use) for an average of three years showed that in the foothill semi desert zone the crude protein content was 8.1% in spring. In the foothill dry steppe zone protein amounted 7.9, and in summer, and in the foothill steppe zone it was 6.9% in autumn. In general, in all areas, the content of crude protein decreased during the growing season because of biological characteristics of herbs.

In the control variant of the experiment, the content of crude protein always was at the lowest level – from 7.4% in spring to 5.6% in autumn. The obtained data showed that the content of crude protein in grass decreased from spring to autumn in the studied areas, except for the semi desert zone. The decrease in crude protein is observed only until to august, and in September, there is an increase due to the rapid development of *Artemisia*.

While the protein content decreased from spring to fall, the fiber content increased in all variants. It reached the maximum value in September when grasses finished their development and became thicker. For example, in the spring period, the content of fiber in herbage from pastures in foothill semi desert was 26.4%, but at the end of vegetation period, these indicators raised to 29.1%. In the control variant of the experiment, the amount of fiber was the lowest again - 25.8% in spring, 27.3% in summer, and 28.7% in autumn.

The fiber is a mandatory component of forage for ruminants. It provides active microbiological processes in the rumen, neutralizes some toxic substances entering the body, and affects the fat content in milk. However, too much fiber reduces the nutritional value of plant food. In excess, it is difficult to digest and reduces the digestibility of other nutrients [12].

For conducting an economic assessment of seasonal use of pastures there were selected two groups (experimental and control) of animals-analogues, including three age groups - ram-makers, ewes of the third year, and lambs of the current year of birth (table 2).

Table 2 – The dynamics of the live weight of animals in the seasonal pastures, kg/head

Year	Season	The live weight of animals, kg/head					
		Tupping rams (n=10)		Ewes (n=10)		The lambs of this tear of birth (n=10)	
		experimental group	control group	experimental group	control group	experimental group	control group
2015	Spring	83.520±1.64	81.690±1.53	51.120±1.26	49.840±1.25	17.940±2.21	16.970±2.18
	Autumn	85.300±1.47	82.120±1.46	58.450±0.75	54.700±0.81	36.300±0.58	27.400±2.72
2016	Spring	81.340±0.67	81.410±0.72	48.320±0.83	49.100±1.03	14.80±2.46	14.600±2.60
	Autumn	86.370±0.60	83.740±0.81	59.100±0.67	55.000±0.39	38.800±0.72	31.950±1.12
2017	Spring	79.300±0.64	80.100±0.73	49.200±2.05	49.800±1.44	15.800±1.99	15.400±1.93
	Autumn	87.700±1.25	83.400±1.24	63.300±1.23	56.100±2.02	43.000±1.98	32.800±2.01
Average for 2015- 2017	Spring	83.380	81.060	49.550	49.580	16.180	15.650
	Autumn	86.450	83.080	60.280	52.260	39.360	30.720

The breed of sheep was the Kazakh fine-wool sheep [13]. Assessment was conducted twice a year – in spring and in autumn. The difference in starting indicators of animals' live weight (every year before the start of grazing) on average for three years did not exceed 1.5 kg. The control group was in the foothill-semi-desert zone on the lands of the settlement “Kenen” and grazed in a free manner, all year round in one place. Experimental group were grazing under the scheme, that is, on seasonal pastures. Thus, from the obtained data it can be seen that a higher gain of live weight was obtained in the experimental group of animals where seasonal grazing was used on the pasture. Seasonal grazing for an average of three years of research at the end of the grazing period provided a gain in live weight of tugging rums at – 3.370 kg/head, in ewes on 8.020 kg/head and lambs of the current year of birth on 8.640 kg more than the control groups of animals that grazed haphazardly on the control pasture.

It should be noted that during the pasture period, the increase in live weight of animals in the experimental group in 2017 is higher than in previous years of the study. So if the increase in live weight in the experimental group in 2015 in tugging rams was 3.180 kg/head, in ewes – 3.750 kg/head and lambs of the current year of birth – 8.900 kg/head, in 2016 – 2.630; 4.100 and 6.850 kg/head, in 2017, these indicators amounted to 4.30; 7.200 and 10.200 kilograms per head, respectively, compared with the control groups of animals. The increase in live weight gain in experimental groups of animals is due to the fact that in 2017, when grazing animals on seasonal sites, an intra-seasonal pasture turnover was used, in which virtually reduced three times unproductive (idle) movement of animals in search of food in the grazing area, is also sharply reduced trampling vegetation, and in addition completely eliminates the degradation of pasture area.

In addition, the experimental data show that during the pasture period the highest increase in live weight was provided by lambs of the current year of birth. On average, for three years of research during the grazing period, the increase in live weight of lambs of the current year of birth from spring to autumn was in the experimental group – 23.180 kg/head, and in the control group – 15.070 kilograms per head. Such high rates of live weight gain of lambs during the pasture period is mainly due to the increase in muscle mass. It should be noted that during the pasture period, the smallest increase in live weight of animals was noted in sheep-producers, which is natural, since they were additionally fed with concentrated feed in the winter months and they were well-fed in the spring, they also ran out of muscle growth.

In carrying out the calculation of economic efficiency were accepted only basic expenses for maintenance and grazing of pasture period. Comparing the slaughter weight of sheep in two different groups of animals showed that in the experimental group it was more than in the control group. Considering that the slaughter weight of animals is 50%, we received the following data: in experimental group, slaughter weight of ram-makers amounted to 41.540 kg/head, ewes to 26.130 kg/head and lambs to 15.360 kg/head, while in the control group it was 43.225 kg/head, 30.140 kg/head, 19.680 kg/head, accordingly. Thus, the net profit in the sale of meat from the experimental group for sheep producers amounted: 5.4 dollars per head of ram-maker, 12.9 dollars per head ewe of and 15.0 dollars per head of lambs.

Conclusion. Thus, the use of seasonal pastures provides more live weight gain of the studied animals compared to the animals that graze in one place with a free grazing.

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ЖАМБЫЛ ОБЛЫСЫНДА ТАБИҒИ ЖАЙЫЛЫМДАРДЫ МАУСЫМДЫҚ ПАЙДАЛАНУ КЕЗІНДЕҒІ ЭКОЖҮЙЕЛІК ТӘСІЛ

Аннотация. Қазақстанда агроөнеркәсіптік кешеннің басты бағыттарының бірі жайылымдық табиғат байлығын пайдалану болып табылады. Онда табиғи жайылымдық-нішендік жерлердің көпжылдар бойы өнімділігін сақтау және арттыру, ұтымды пайдалану басты міндеттерге жатады. Еліміздің аумағының 60% аса көлеміп алып жатқан жайылымдар малдың барлық түрлері үшін жемшөп көзі рөліп атқарады және экологиялық катаклизмдер жолына кедергі болады (шанды дауыл, климаттың өзгеру факторлары және т.б.).

Республикада жайылымның қазіргі жағдайы бір жағынан жайылымдық азықтың сапасы мен өнімділігінің барынша нашарлауы және екінші жағынан – пайдаланатын аумақта мал басының шектен тыс шоғырлануымен сипатталады. Сол себепті суландырылған жайылымдарды шамадан артық қарқынды пайдалану, әсіресе ауылмаңы мен құдықтың айналасындағы телімдердің жүктемесін және қарапайым жайылым айналымын сақтамай қолдану белең алды, бұл экологиялық тепе-теңдікті бұзып, мал азығы қорының азаюына және жайылымның тозуына, жел эрозиясының туындауына, мал жемейтін арамшөптердің көбеюіне әкеліп соқтырды.

Қазақстанда топырақтың вертикальдық аймақтық жағдайында алғаш рет нақты жобалық аумақта жайылымдардың тозу деңгейін азайту және оларды қалпына келтіру бойынша зерттеулер жүргізілді. Жұмыстың мақсаты – жайылымның тозу себептеріне ғылыми негіздеме беріп, оны қалпына келтіру, табиғи жайылымның өнімділігін шөп шүйгінін малға орташа мөлшерде жегізіп, маусымдық телімдерде жайылатын малдардың тірі салмағын арттыру мүмкіндіктерін зерттеу. Зерттеу нысаны – топырақтың вертикальдық аймақтық жағдайында таубөктерлік-шөлейт, таубөктерлік-қуаң дала және таубөктерлік-дала аймақтарында орналасқан «Батыр» шаруа қожалығының табиғи жайылымдары және осы аймақта жайылатын малдар болды. Осыған байланысты мал шаруашылығын жүргізудің жаңа формасын жасау, яғни жайылымның тозуын төмендету мақсатында малды шалғай телімдерге ауыстыру және оларды жыл мерзімдеріне қарай пайдалану аграрлық зерттеулердің келешекті бағыты болып табылады және республиканың мал шаруашылығы саласының сұраныстарын сипаттайды. Геоботаникалық зерттеулер негізінде шаруашылықтың аумағы өсімдіктер қауымдастықтарын оқшаулай отырып, оларды пайдалану маусымдарына бөлінді. Жыл мезгілдері бойынша табиғи шөптердің шығымдылығын есепке алу жүргізілді және жайылымдық кезеңде малдардың тірі салмағының өсімі анықталды.

Жүргізілген жұмыстарды іске асыру кезінде тозған жайылымдарды қалпына келтіру үшін өсімдік жабынының өсімі және өсуі 15-18%-ға дейін жағдай жасалды және тиімді мал жаю жолымен мал өнімін 12%-ға дейін арттыруға мүмкіндік берді. Жүйесіз бағу тәсіліне қарағанда, жайылымды маусымдық пайдалануды қолдану, зерттеудегі малдардың тірілей салмағының анағұрлым көбірек өсуін қамтамасыз ететіні анықталды.

Жұмыстың тәжірибелік маңыздылығы жайылымның деградациясын шектеу, келесі кезекте оны тоқтату, шамадан тыс мал жаюдан жоғалған азықтық биоалуантүрлілікті қалпына келтіру, жайылым кезеңінде жайылатын малдарды азықпен тұрақты қамтамасыз ету, мал өнімі шығымын арттыру болып табылады. Құрастырылған сызба бойынша шалғайдағы жайылымды қолдану аграрлық қалыптастыру кезінде жайылым жерлерді тиімді және өнімді пайдалануға мүмкіндік береді. Бұдан басқа шалғайдағы жайылымда маусымішілік жайылым айналымы бойынша өңделген карта-сызбасы толығымен жайылымның тозуын жоюына мүмкіндік туғызады.

Түйін сөздер: жайылымдар, табиғи шөптер, табиғи аймақтар, топырақтың ылғалдылығы, өнімділігі, жануарлар, тозу, жайылымдық массасы.

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ЭКОСИСТЕМНЫЙ ПОДХОД ЕСТЕСТВЕННЫХ ПАСТБИЩ ПРИ ИХ СЕЗОННОМ ИСПОЛЬЗОВАНИИ ЖАМБЫЛСКОЙ ОБЛАСТИ

Аннотация. В Казахстане одним из важнейших направлений агропромышленного комплекса является пастбищное природопользование. При этом приоритетной задачей являются рациональное использование, повышение урожайности и сохранение продуктивного долголетия естественных кормовых угодий. Занимая более 60% всей территории страны, пастбища выполняют роль источника полноценных кормов для всех видов скота и барьера на пути экологических катаклизмов (пыльные бури, факторы изменения климата и т.д.).

Современное состояние пастбищ в республике характеризуется, с одной стороны, прогрессирующим ухудшением продуктивности и качества пастбищных кормов, а с другой – предельной концентрацией поголовья сельскохозяйственных животных на используемой территории. По этой причине увеличилось чрезмерное интенсивное использование обводненных пастбищ, особенно приколодезных и приаульных массивов, без соблюдения нагрузки и элементарного пастбищеоборота, которое постепенно нарушило экологическое равновесие, что привело не только к снижению кормозапасов, но и деградации угодий, появлению ветровой эрозии и зарастанию сорной и непоедаемой растительностью.

В условиях вертикальной зональности почв впервые в Казахстане комплексно проведены исследования по изучению причин деградации пастбищ и разработка приемов их восстановления на конкретной проектной территории. Цель работы – изучить и дать научное обоснование причин деградации пастбищ, возможности их восстановления, улучшения продуктивности естественных угодий путем умеренного стравливания

травостоя и повышения прироста живой массы выпасаемых животных на сезонных участках. Объектом исследования явились пастбищные земли крестьянского хозяйства «Батыр», расположенного в условиях вертикальной зональности, находящиеся в предгорно-степной, предгорно-сухостепной и предгорно-полупустынных зонах и животные, выпасаемые на этой территории. В связи с этим, разработка новой формы ведения животноводства, то есть перевод скота на отгонные участки и использование этих участков по сезонам года с умеренным стравливания травостоя с целью снижения деградации пастбищ является перспективным направлением аграрных исследований и отражает запросы животноводческой отрасли республики. В результате исследований на основании геоботанических исследований, территория хозяйства были разделены на сезоны их использования (весна-лето-осень), с выделением растительных ассоциаций, проведен учет урожайности естественных травостоев по зонам и сезонам года и определен прирост живой массы животных за пастбищный период. Применение сезонных пастбищ обеспечивает больше прироста живой массы изучаемых животных по сравнению с животными, которые выпасаются в одном месте и бессистемно.

Реализация результатов создала условия для восстановления деградированных пастбищ с увеличением роста и развития растительного покрова до 15-18% и повышение животноводческой продукции путем рационального выпаса до 12%.

Практическая значимость работы заключалась в локализации и последующем прекращении деградации пастбищ, восстановлении потерянного перевыпасом кормового биоразнообразия, устойчивого обеспечения выпасаемых животных кормом в течение пастбищного периода, увеличении выхода животноводческой продукции. Использование отгонных пастбищ по разработанной схеме позволит агроформированиям более рационально и продуктивно эксплуатировать пастбищные земли. Кроме того, разработанная карта-схема внутрисезонных пастбищеоборотов на сезонных участках позволит полностью исключить деградацию пастбищ.

Ключевые слова: пастбища, естественный травостой, природные зоны, влажность почвы, урожайность, животные, деградация, пастбищная масса.

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