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THE AGRICULTURAL CHARACTERISTICS OF 132 HECTARE LAND AREA IN SOIL BALANCE OF ASTGHASHEN VILLAGE OF ASKERAN REGION

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Zoning of land is of vital importance for its economic assessment and establishment of a reliable tax rate.The purpose of our work was to study the area of 132 hectares of brown, clay sand medium capacity soil of Artsakh highland belt which is located in the soil balance of Astghashen village of Askeran region for the purpose of zoning and giving the agricultural characteristics of the studied area. As a result it has been found that the relief of the land area is roughly wavy which gradually turns mountainous from south to the north.The soil is very poor with both humus and nutrients necessary for plants (NP), it is infected with different types of weeds, plant diseases and pests, farming is maintained mainly under dry conditions, rotation is not applied with its corresponding stages as a result of which crop yield and livestock productivity in rural farms continue to stay low.

***Key words*:** land zoning, agrochemical characteristics, weediness, plant and animal diseases

Introduction

The studied area is located in the western part of Askeran region, 20 km far from Stepanakert and 12 km far from the regional center Askeran.

As it is common to the Republic of Artsakh, the territory of Astghashen is mountainous. The great variations in the relief and the slopes determine the diversity of climate, water, soil cover, wildlife, natural landscape and land zoning.

Reliefs are characterized by wide mid mountain concavities which have mainly tectonic erosion origin. In the middle elevation zone of the range where the studied plot is located, flat areas are typically located which have stepy appearance. Among the typical forms of relief are the lake alluvial, proluvial and delluvilial sedimentary mid mountainous concavities.

Due to the contradictions of the relief, the climate is distinguished by its diversity. Meteorological elements characterizing the area are mainly dependent on the geographical location of the area, the total circulation of the atmosphere, the penetrating air masses, the nearby Caspian Sea, the altitude of the sea, the support of the mountain range and other factors. Taking into account the change in air temperature, moisture and other elements in the region we have temperate warm and dry climatic zone with typical warm summers and mild winters. In January the average temperature is $+1^0$ C and in July the average is $23,8^0$ C (Fig.1). Absolute minimum can reach to -25^0 C and the absolute maximum can be 40^0 C.

The annual long term average precipitation is 497 mm, the maximum is in May, 94 mm, the minimum is in December – January as 15 mm. Polar days are 2200-2300 hours. This zone is noted by less clouds (34-37days) (Fig. 2).

The clear days of summer are more. We get much warmth and light from sun. The winter is mild. We rarely have snow cover. The wind direction mainly is towards the mountain valleys. The average speed of wind is small in the studied area and doesn't exceed 1,5-3,0 m/sec. In winter it comprises 3,4 - 4 m/sec and in summer it is 1,5 – 2 m/sec. In the mentioned climatic conditions dry resistant crops are dominant and also bush frigid plants are growing. The lands being formed under such vegetation are classified as forest brown, mountain light brown, brown and dark brown soils based on the results of the studies conducted by the Armenian "State Soil Construction Project" Institute. The mechanical composition of the soil varies from the clay medium to the clay rocks, the

content of humus is 3.0- 3.5% carbonate or without clay, the reaction of the soil solvent is weak alkaline.

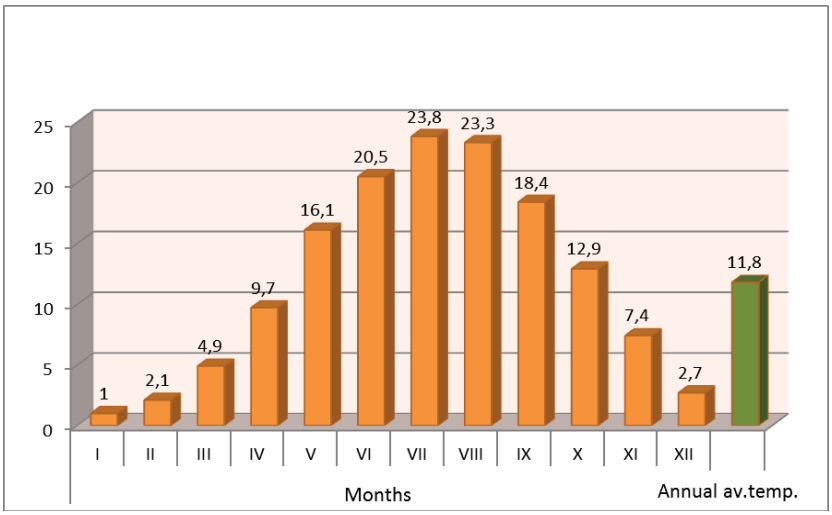

Figure 1. Average monthly and annual air temperature (°C) according to the data by Sujinka hydrometeorology station

The risk factors for climatic conditions include frostbite, hailstorm and drought which are recurring periodically. Dry tropical dusty wind emerges into the region in spring and summer months from Middle Asia causing significant fluctuations in the weather especially drought. Often these hot winds have a negative impact on vegetation. The northern air masses bring spring and autumn frosts that also negatively affect the agriculture [1,2,3].

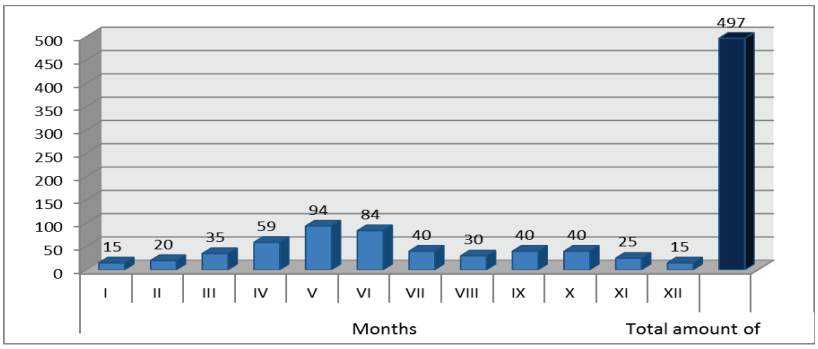

Figure 2. Average rates of monthly and annual precipitaions (mm)according to the data by Sujinka hydrometeorology station

Conflict setting

In this zone the first of the most important factors in the life of plants are the water and nutrients. In the case of balanced use of organic and raw fertilizers under irrigation high yields of field, crop and perennial plants are expected. However, both the moisture and the nutrients in the condition of drought are in direct dependence not only on climatic conditions but also on land relief which is one of the key factors of the land formation process and has great impact on the formation of its fertility. Besides the vital factors of life, weeds, pests and diseases which are spread in the fields and gardens have significant impact on crop yields and quality indicators of the products [4].

According to the data of German statistics, if the diseases and pests of crops get 5-10.2% of the grain harvest, only weeds take up to 15% of that harvest every year [4]. The purpose of the research is to carry out geodesic surveys reflecting the relief elements of 131 hectares of land balance in Astghashen village in Askeran region, to give the agro-chemical characteristic of that area through

chemical researches which is the basis for the development and investment of scientifically justified fertilization system.

The geodesic survey of 131 hectare land was done by 1:1000 scale the coordinates of the point in the middle of the land in Arm WGS system Y=8648497,118, X=4423654,597, H=731,330, the decline of axis 0,5 m, height system Baltic 1977. To give the agrochemical description of the soil the area was divided into 10 hectare sections from south to north from each of which 40 samples were taken. These 40 samples were mixed with each other and as a result 13 average samples were obtained which were subjected to chemical study.

The research on the varieties of crop and weed diseases and pests and their distribution has been carried out based on our long-term work experience in the given region and also on the data in the professional literature and in scientific research [4].

Taking into account the fact that the second important branch of agriculture in this zone is considered livestock breeding, we have identified the causes of low livestock production, the varieties of illnesses preventing the development of livestock based on surveys, statistical rates and scientific literature and we have also found out that it is impossible to imagine the further development of livestock without preventive struggle against them and scientific treatment of these diseases.

Research results

The research showed that the primary area of the survey was 131 hectares. 132 hectares were actually surveyed. The area of the investigation is at an altitude of 705,81 meters above sea level (the lowest point is 671,38 meters, the maximum is 751,51 meters).

Relief is a wavy area that turns into mountainous in the northern part. The total length of the boundaries of the territory is 9,27 km, from which 2,5 km stretches along Stepanakert - Drmbon highway. The maximum length of the area is 2,7 km to the south from the east, the largest from the east to the west is 0,67 km and the narrowest place is 0,44 km.

The results of the agrochemical analysis of 132 hectares of land, according to the samples given in Table 1, show that the mechanical composition of the soil clay sand heavy and medium, PH is weak alkaline (7,03-7,3), CaCO3 is absent, the content of water solvent salts varies between 0,025 and 0,043%.

Table 1

The results of agrochemical analyses of 132 hectare land area according to soil samples

Name of soil sample	Humus %	PH	$CaCO_3$	Water solvent salts content %	Water survey, mg/eq in 100 soil %		The available nutrients in plants, mg 100 g soils		
					Ca^{2+}	Mg^{2+}	N	P_2O_5	K_2O
132-1	5,06	7,03	no	0,034	0,5	0,16	2,54	1,33	37,6
132-2	3,78	7,7	no	0,038	0,4	0,33	1,9	1,10	40,61
132-3	2,53	7,4	no	0,033	0,51	0,17	1,27	1,00	33,84
132-4	5,07	7,4	no	0,03	0,3	0,15	2,55	1,44	34,96
132-5	3,80	7,2	no	0,025	0,29	0,16	1,91	1,11	33,83
132-6	2,54	7,2	no	0,029	0,49	0,32	1,28	0,78	41,36
132-7	2,51	7,5	no	0,043	0,41	0,33	1,26	1,43	38,35
132-8	3,76	7,7	no	0,042	0,39	0,17	1,89	1,22	42,86
132-9	5,04	7,4	no	0,028	0,31	0,17	2,53	1,09	34,22
132-10	5,09	7,2	no	0,022	0,4	0,50	2,56	1,08	34,21
132-11	3,82	7,3	no	0,031	0,5	0,15	1,92	1,12	34,59
132-12	3,78	7,0	no	0,032	0,41	0,83	1,9	1,01	40,6
132-13	2,56	7,3	no	0,038	0,7	0,32	1,29	1,23	34,97

The diagrams in Fig. 3, 4 and 5 show that the plot formed in the conditions of wavy relief has various chemical composition.

According to the diagram of Fig. 3, the nitrogen available to plants varies from 1,26 to 2,56 mg in 100 g soil, P_2O_5 from 0,87-1,44mg, K_2O from 38,83 -42,86 or 132 hectare in average contains 1,9 mg nitrogen in 100 g soil, 1,15 mg P_2O_5 and 38,345 mg of 1 K_2O in 100 g soil. Meanwhile, according to the limiting numbers adopted in the RA, the soil is considered weak in nitrogen when the nitrogen in the 100 g soil is 8 mg, medium soils 8-12 mg and in strong soils 12 mg or more. According to Mashingin, the soils are considered weak in phosphorus when phosphorus is available in 100 grams of soil up to 3 mg in medium, 3-6 mg and 6 mg or more in strong soils [5].

According to the classification adopted in Armenia soils are considered to be weak in calcium when available calcium comprises 18 mg in 100 g, if 18-36 mg, then the soil is considered to be medium supported and in case of 36 and more it is considered to be well supported.

Based on the above mentioned measures, we can say that 132 hectares of land are considered to be poor in nitrogen and phosphorus dynamic compounds and rich in potassium. Therefore, a special place should be given to the application of nitro-phosphorous and organic fertilizers for any crop in any crop rotation for any fertilization system and the use of potassium fertilizers only under certain crops (potatoes, flax, rootstocks) which are fertilized by potassium.

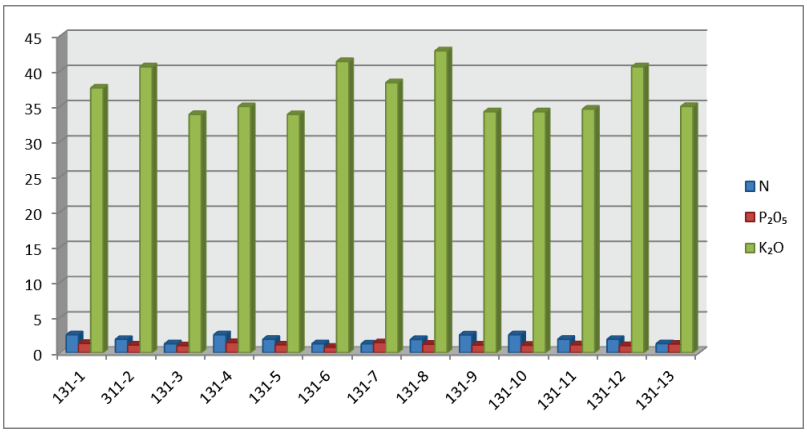

Figure 3. The nutrients of plant (mg) in 100 g of land

The data on the contents of Ca^{2+} and MG $^{2+}$ ions are brought in diagram in Fig. 4 and show that in 132 hectare area the content of Ca^{2+} ion fluctuates between 0,29 – 0,70 mg/ equiv. in 100g soil %, and Mg^{+2} ion is 0,15-0,83 mg/ equiv. 100g % limits or the average for 132 hec Ca $^{2+}$ ions was 0,43 mg/ equiv. 100 g % and Mg^{+2} ion was 0,28 mg/ equiv. 100g % which is positive from the point of view soil aggregate stability.

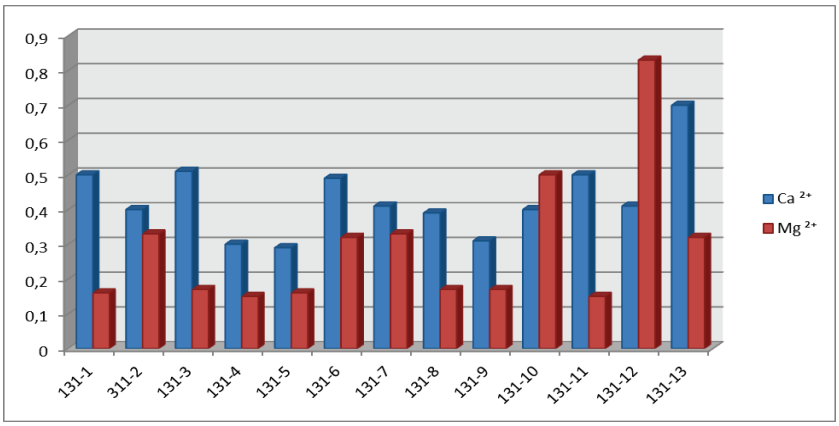

Figure 4. Water survey in mg/eq 100g soil (%)

The content of humus in the soil is shown in Fig. 5.

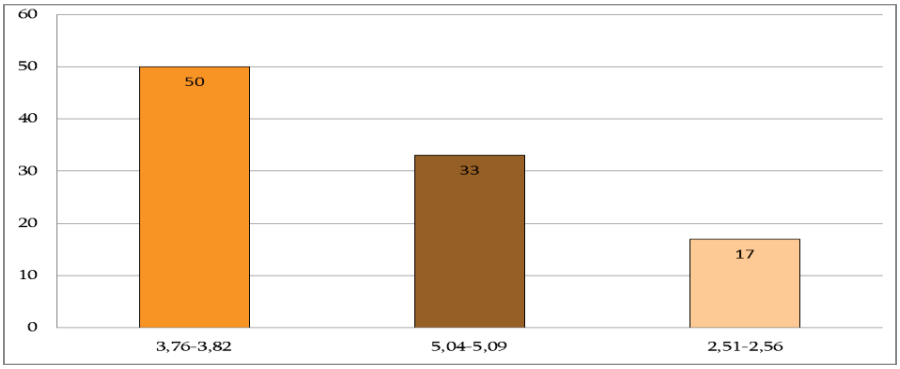

Figure 5. The content of humus in soil samples (%)

As can be seen from the diagram, the content of humus varies within the range from 2,5 to 5,09%. In 17% of the total area of the land, the content of humus varies between 2,51-2-26%, in 33% - 5,04-5,09% and in 50% - 3,76-3,82 %: This is the result of a wavy hill in the condition of which the formed soil is spotted with fertile soil.

Research on the species composition and prevalence of weed in vegetable crop diseases and pests has revealed that many weed species, which are root parasites, are highly harmful to tobacco, sunflower and cabbage. Stem parasites are spread from various types of weed mint which are parasitic on alfalfa, potato, cigarettes, currants, raspberries, beetroots, fruit trees and shrubs. Non-parasitic weeds are subdivided into the annuals and perennials. Among annuals wild oats, goosefoot, joint weed, false carrot, amaranth, palm grass, purslane, bitter thorn, garbage plant, boomrape etc. and from perennials we have banewort, plantain, dock, dandelion, sage-brush, field gem, lesser bindweed, couch grass, weed sorghum etc. are common here.

Among the common diseases threatening the cereals in the region are cereal smut, stone smut, rusts, flour powder, mycosphaerella, corn smut, corn rust.

Phyto furosis is one of the common diseases of potato which is expressed on the leaves and blisters. In the region cereals are damaging by the beetle, grain turtle, cereal aphids, Hensen flies, Swedish flies, corn butterflies, corn moths, beetle worms, locusts, grigs, field mice etc.

Potatoes are damaged by colorado beetle, worms, ordinary mole cricket and so on. The most common vegetable diseases are black legs, fruit peak rotting, cereal smut, stone smut, rusts, flour powder, mycosphaerella, corn smut, corn rust and among viral and phytoplasmic diseases mosaics, stolburs etc. are common.

The vegetable crops in the region are largely damaged by the ordinary mole cricket, Colorado Beetle, soil moths, cabbage white butterfly and aphids.

The study showed that mange of pomes, moniliose, erysiphaceae, black cancer, drupe moniliose, gummosis, porosity, leaf curliness etc. are among the common diseases that threaten fertility in the region.

Among the fruit pests are totrix moths, flower moths, aphids, moths, billbags etc.

In the region surveyed grapes are infected with mildium and oidium and pests are mainly grape moths.

Organization of feedstock base in creating conditions for the proper breeding of the livestock is one of the most urgent issues. The creation of a warehouse for natural herbs is particularly important which, besides being the most important resource for the organization of fodder is also of utmost importance for the overall biodiversity. Despite the fact that the total number of animals has declined considerably over the last 20-25 years in new economic conditions, however, in case of irregular and improper use and the lack of necessary care and improvement measures this resource has been endangered, leading to a sharp rise of degradation, decrease of the rate of spatial growth of the plants

and level of fertility, leveling of stony and foliage. The yield in the pastures is only 25-35 c/ha of green mass and in the grasslands which are at the foot of northern slopes, the yield fluctuates within the limits of dry grass 9-12 c/ha. The number of livestock in pastures varies between 95-100 conditional headings. One conventional head gets 3.7-3.5 hectares of pastures, which, even under such low reproduction, are sufficient to provide high levels of productivity. However, livestock productivity indicators in the region remain low, due to inefficient use of natural habitat and lack of adequate quantities and quality of nutrition for the feeding rack.

The breed of cattle here is the Caucasian gray which has lost its tough tribal qualities as a result of many years of irregular, mixed crossing and gives low yielding (800-900l) of milk. The main breed of sheep is the Karabakh breed, which, under conditions of inadequate feeding and poor behavior often does not express its breed potential. Although pig breed is forbidden by law openly, the region continues its unacceptable process.

Parasitic, infectious and non infectious diseases also hinder the development of livestock breeding.

The diseases registered in the region by 2018 are common to both Artsakh and the Republic of Armenia.

The region registered heamitosis diseases like fascioliasis, dichrocyeliosis, birds prosthogonimus, Monieziosis, pigs finoze, echinococcus, sheep gid, sheep dictycaulosis, ascariasis of pigs, birds heterocigosis, among protozoan diseases piroplasmosis and theileriosis of cattle.

Infectious diseases registered in the region include brucellosis, gastric tuberculosis, pasteurosis, anthrax, diarrhea, bradzot, tuberculosis, bird plague, pig bladder, African pig plaque, rabies etc.

Among the non infectious diseases registered are sharp edema of the cutter, cramps, dyspepsia and clogging.

Conclusions and suggestions

Thus, considering the fact of decline of the fertility of the arable lands in the region and the phyto sanitary state of the fields, we suggest the following in agriculture:

a) Replacement of the traditional land-based desertification system with a new system of minimal cultivation as the depth of soil cultivation, the intensification of the bedrock and the increase in the number of operations in the conditions of traditional farming contribute to the occurrence of such negative phenomena such as destruction of soil aggregates, acceleration of decomposition rates, dust removal of the treated layer, loss of moisture, acceleration of erosion, increase in labor and material costs etc.

The proposed minimal processing system, whose main and decisive linkage is the development of the soil without the need to rely on the principle of reducing the depth of processing and decreasing the number of operations which is free from the above mentioned negative phenomena.

Reducing the depth of soil core processing will reduce the intensity of humus decomposition thus preventing its inefficient loss and the risk of land acquisition. Excluding the rear will create favorable conditions for land air living and non air living bacteria that play a major role in land acquisition. Reduction of the number of operations and their speed, conditioned by wide and high productivity of ploughshare and needle rakes will allow to perform technological operations in the best agro technical times, which will contribute to moisture retention in the soil and rapid destruction of weed plants. This is especially important for preserving the moisture remaining in the soil that has not been used by the predecessor which will allow the fallow seeds to grow in even the driest years.

b) Implementation of the efforts of minimum development will fail if it is not secured or insufficiently provided by any of these links (crop rotation, fertilization, struggle against weed pests and diseases, machines, seeding).

Effective structure of rotation, scientifically justified crop rotation is a necessary condition for high cultivation of crops in the rotation scheme. The use of perennial papilionaceous herbs is a

powerful and irreplaceable agro technical measure especially in this area which simultaneously solves a number of problems, improves the agro-physical characteristics of the bedrock, reduces costs for fertilization and plant protection chemicals and prevention of the erosion process. Including the perennial herbs in the sowing process will also be a stimulus for the development of livestock breeding and increase of productivity as there is no plant with the content amount of proteins, carotene, other vitamins and minerals among field crops which exceeds alfalfa and sainfoin. Therefore, we recommend applying the following scheme of rotation in this dry zone:

1 grain+ sainfoin
2 sainfoin for grass for one year
3 sainfoin for grass for two years
4 grain
5 grain

and in irrigated conditions

1 1.grain + alfalfa
2 alfalfa for grass for one year
3 alfalfa for grass for two years
4 vegetables and gardening
5 corn (maize)

The fertilizing chain carries significant changes on the minimum cultivation arena being done periodically. The relation of NPK changes, the ways of inserting mineral and organic fertilizers into the soil, leaving the straw in the filed get more specific weight as a source of nutrients, the green fertilizing becomes more common and wide spread. Taking into account the miserable amount of mobile nutrients in the soil it is necessary to add 120 kg/he N 90 kg/he $P_2 O_5$ as affecting substance.

While fighting against diseases, pests and weeds it should be taken into account that in the dry conditions of the region in all crop fields among risky weeds wild oats, filament, sweet clover and lesser bindweed and in irrigated areas weed sorghum, wheat grass, amaranth and palm grass are spread over. Field crops diseases are cereal smut, stone smut, tomato and potato phyto furios, pome mange, drupe porous mottled, leaf curliness and grape mildium and oidium.

From pests are field mice, ground beetle, worms, Colorado beetle, mole cricket, fruit eaters of grape and tree plants against which it is necessary to take preventive and damaging measures (agro technical, biological and chemical).

2. We suggest the following in the field of animal breeding:

a) Technical improvement of natural pastures, organization of pasture behavior of the cattle in turn, creation of a stable feed base for the fodder region giving priority to the structure of accumulating animal feed from tough feed such as alfalfa or sainfoin, from juicy feed we have feeding rootstocks and senage. Ensure that all types of animals are fed in dense feed 20-30% of the feed rate and the feeding is no less than 5 months.

b) In order to improve the existing cattle breeding to gradually supplement the herd with the high quality sorts of the young bred in Askeran pedigree station.

c) For the purpose of improving the effectiveness of anti-epidemic measures proper livestock breeding and numbering are used.

d) Apply preventive (pasture grazing, pets etc) measures and appropriate treatment against the risky infectious diseases (African pig plaque) registered in recent years in the region.

3, Promote the formation and development of farms with optimal production capacities to provide a dynamic growth of agricultural production.

Farmers having 50 hectares of arable land and own agricultural machinery will be engaged parallelly with effective production of livestock.

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ԱՍԿԵՐԱՆԻ ՇՐՋԱՆԻ ԱՍՏՂԱՇԵՆ ՀԱՄԱՅՆՔԻ ՀՈՂԱՅԻՆ ՀԱՇՎԵԿՇՌՈՒՄ ԳՏՆՎՈՂ 132 ՀԵԿՏԱՐ ՏԱՐԱԾՔԻ ԳՅՈՒՂԱՏՆՏԵՍԱԿԱՆ ԲՆՈՒԹԱԳԻՐԸ

Ս.Բ.Գալստյան, Ս.Կ.Երիցյան , Հ.Ա.Օհանյան, Վ.Լ.Արզումանյան
Շուշիի տեխնոլոգիական համալսարան

Հողերի գոտիավորումը կարևոր նշանակություն ունի դրանց բոնիտման տնտեսական գնահատման և արժանահավատ հարկաչափ սահմանելու համար:

Մեր հետազոտության նպատակն է եղել Արցախի նախալեռնային գոտու շագանակագույն կավավազային, միջին հզորության 132 հա ընդհանուր տարածք զբաղեցնող հողամասում, որը գտնվում է Ասկերանի շրջանի Աստղաշեն համայնքի հողային հաշվեկշռում, գոտիավորման նպատակով տալ ուսումնասիրվող տարածքի գյուղատնտեսական բնութագիրը: Արդյունքում պարզվել է, որ հողամասի ռելիեֆը բարդ ալիքավոր է, որը հարավից հյուսիս աստիճանաբար դառնում է լեռնային: Հողը, ինչպես հումոսի, այնպես էլ բույսին անհրաժեշտ շարժուն սննդատարերի (N P) պարունակությամբ խիստ աղքատ է, վարակված տարբեր տեսակի մոլախոտերով, բույսերի հիվանդություններով և վնասատուներով, երկրագործությունը վարվում է

հիմնականում անջրդի պայմաններում, չեն կիրառվում ցանքաշրջանառություններ իրենց համապատասխան օղակներով, որի պատճառով մշակաբույսերի բերքատվությունը և անասունների մթերատվությունը գյուղացիական տնտեսություններում շարունակում է մնալ ցածր:

Բանալի բառեր. Հողի գոտիավորում, ագրոքիմիական բնութագիր, մոլախոտվածություն, բույսերի և կենդանիների հրիվանդություններ:

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СЕЛЬСКОХОЗЯЙСТВЕННАЯ ХАРАКТЕРИСТИКА УЧАСТКА ПЛОЩАДЬЮ 132 ГА, НАХОДЯЩЕГОСЯ НА ЗЕМЕЛЬНОМ БАЛАНСЕ ОБЩИНЫ АСТХАШЕН АСКЕРАНСКОГО РАЙОНА

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Зонирование земель имеет важное значение для их бонитировки, экономической оценки и установления надлежащей меры налога.

Цель нашего исследования - дать сельскохозяйственную характеристику земельного участка в предгорной зоне Арцаха общей площадью 132 га с коричнево-глинистой среднемощной почвой, находящегося на земельном балансе общины Астхашен Аскеранского района, с целью зонирования.

В результате исследования выяснилось, что рельеф местности сложный волнистый и с юга на север постепенно становится горным. Почва бедна содержанием гумуса, перегноя и питательных веществ, необходимых растению, заражена различными видами сорняков, вредителями и болезнями растений; земледелие ведется в неполивных условиях, не применяется севооборот с его главными звеньями, в результате чего урожайность возделываемых культур и продуктивность скота в фермерских хозяйствах продолжают оставаться низкими.

Ключевые слова: зонирование земель, агрохимическая характеристика, сорняки, болезни растений и животных

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