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IRRIGATED AGRICULTURE IN THE RIVER BASIN ERTIS PAVLODAR-TION REGION

**Anatacia**

In the river basin Ertis Pavlodar region includes almost all of its territory. The only exception is one of Bayan-aul district, which refers to the enclosed area. The total area of the territory is 106,25 thousand km2. The population of Pavlodar region pool is 715,70 thousand.

***Key words:*** soil analysis, rainfall, irrigated area, basin irrigation, the array of irrigation equipment.

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AFTERMATHION OF THE SUDAN-GRASS DEPENDING ON TERMS AND HEIGHT OF MOWING IN THE CONDITIONS OF THE EDUCATIONAL-EXPERIMENTAL STATION "AGROUNIVERSITY" OF ALMATY REGION

**Abstract**

Sudan-grass has exclusively high educational ability of escape throughout all vegetative period. Exerts impact both time of the first mowing on the general efficiency, and height of a cut of vegetative weight. The gross harvest depends on duration of growth and from that due to what escapes the harvest is formed. Aftermathionof a Sudan-grass depending on terms and height of mowing in the conditions of Almaty region is shown in this article. It is established that the greatest productivity of green mass of an aftermath of a Sudan-grass is received with a height of cut 6-8 cm - 144 c/hectare.

**Keywords:** Sudan-grass, escape education, mowing, aftermathion, productivity.

**Introduction**

The modern period development of agriculture of Kazakhstan is characterized by increase of a role of a forage production as systemically important branch of agro-industrial complex, defining a condition of livestock production and having significant effect on increase in efficiency of agriculture and crop production.

It is known that the main source replenishment resources of forages is the field forage production allowing to provide the need of livestock production for the qualitative sterns balanced on all nutrients.

In a field forage production the extensive level of maintaining, owing to the unfinished structure of sown areas, low efficiency of the arable land used for cultivation of forage crops is observed. In this regard it is necessary to increase acreage of forage crops with simultaneous increase in their productivity.

The food supply has to be created in regional aspect proceeding from the direction of economy, the planned efficiency and diets of full feeding of the cattle.

One elements of a food supply is the field forage production in which one-year forage crops have big specific weight.

In the conditions of a foothill zone of the republic the Sudan-grass yields a big crop of green material at the expense of the main hay crop and an aftermath. After mathion of a Sudan-

grass is of great importance in southeast areas of the republic as natural pastures, as a rule, in the second half of summer burn out, and the Sudanese's aftermath during this period reaches pasturable-hay cutting a maturity.

Owing to this fact, the question of an after mathion of a Sudan-grass in the studied conditions has important economic value as a source of providing animals in the second half of summer with sterns.

The research problem consisted in studying feature of an after mathion of a Sudan-grass depending on terms and height of mowing, and also to prolong the term of use her in a green look.

**Materials and methods**

The purpose of researches consisted in definition influence of the main hay crop and height of a cut on growth of a Sudan-grass in the conditions EES "Agrouniversity" of Almaty region.

Object of a research was the fodder culture, an annual bluegrass grass – a Sudan-grass, grades Odessa-25. Researches were conducted in the territory Enbekshikazakh district of Almaty region on light brown soils. Accounts and observations were made by the corresponding approved techniques.

**Results of researches**

It is known that plant of many one-year cultures including Sudanese, are capable to grow after the first hay crop and to yield in the subsequent the big crops of an aftermath which sometimes aren't inferior to the basic.

The fullest and effective use of harvests of the Sudanese is possible only on the basis of profound knowledge of features of vegetative renewal of plants after mowing. Productivity, and mainly quality and nutritiousness of green material and the Sudanese's hay received from her substantially depend on terms of her cleaning: the at younger age it is mown, the these indicators are higher.

In different phases of development stalks and leaves of the Sudanese contain unequal amount of nutrients. Field experiments on a research of influence of terms of cleaning of this culture with various height of a cut on an after mathion have been made: at the beginning of a tasseling, a full tasseling, blossoming. Mowing height by each option – 2-4, 6-8, 10-12 cm.

Throughout vegetation of a Sudan-grass conducted phonological observations and defined dynamics of growth. Celebrated dates of hay crops and growth after each hay crop; considered a bushiness, anleaf formation, defined the chemical composition.

Researches have shown that the first hay crop, at the beginning of a phase of a tasseling provides increase in escape education, at the same time influence of height tasselingon escape education of the Sudanese is established(Table 1).

Table1- Escapeeducation of a Sudan-grass (counting on 100 plants)

| Height mowing, cm | 2015 y. | | 2016 y. | | Averagefor 2 years | |
|---|---|---|---|---|---|---|
| | Total number of escapes, pieces | Grown from knot of a tillering, piece. | Total number of escapes, pieces | Grown from knot of a tillering, piece. | Total number of escapes, pieces | Grown from knot of a tillering, piece. |
| 2-4 | 350 | 241 | 410 | 307 | 380 | 274 |
| 6-8 | 670 | 495 | 720 | 633 | 695 | 564 |
| 10-12 | 480 | 297 | 530 | 360 | 505 | 420 |

The most intensive formation of escapes (aftermath) is noted when mowing the basic stalk standing at the height of 6-8 cm. Increase in height of mowing to 10-12 cm reduces total number of escapes of plants.

With increase in height of a cut the percent of the stalks which have grown from escapes with the remained growth point and also from bosoms of leaves of the first and the subsequent knots of a stalk increases. Such regularity was observed in all years. At later termsmowing of escapeeducation it is noted.

Escapes, developed from tillering knots, were more tall, than grown from elevated knots of stalks. Height of an aftermath increased with increase in the line of a cut to 8 cm, at a further raising of height of a cut advantages aren't revealed.

One of the factors determining the size of a harvest of the Sudanese is dynamics of growth of the plants mown in different terms (Table 2).

Table2-Height plants of a Sudan-grass at various terms of mowing, cm

| Terms mowing | 2015 y. | 2016 y. | Average for 2 years |
|---|---|---|---|
| Beginning tasseling | 134 | 117 | 126 |
| Full tasseling | 168 | 158 | 163 |
| Blossoming | 175 | 173 | 174 |

It should be noted that height of plants at various terms of mowing increases from early to late phases.

The main hay crop at the beginning of a tasselingwas carried usually out to the second decade of July. On an exit of green material later term of mowing – a blossoming phase is allocated.

On average in two years the most big crop is celebrated in option where the main hay crop is carried out in a phase of blossoming (Table 3).

Table 3-Influence terms mowing on productivity of a Sudan-grass, c/hectare

| Terms mowing | Date | Green mass | Hay |
|---|---|---|---|
| 2015 y. | | | |
| Beginning tasseling | 12.07 | 209 | 52,3 |
| Full tasseling | 22.07 | 220 | 55,0 |
| Blossoming | 31.07 | 271 | 67,8 |
| 2016 y. | | | |
| Beginning tasseling | 10.07 | 207 | 51,8 |
| Full tasseling | 19.07 | 218 | 54,5 |
| Blossoming | 27.07 | 274 | 68,5 |
| Average for 2 years | | | |
| Beginning tasseling | | 208 | 52,0 |
| Full tasseling | | 219 | 54,8 |
| Blossoming | | 272,5 | 68,2 |

One of the main indicators of high fodder qualities of green material is the leaf formation of plants. From literature it is known that the highest palatability plants of the Sudanese is provided due to existence in them of a part, especially valuable on nutritiousness, – gentle leaves.

Results of experiments on studying of anleaf formation of green plants are shown in table 4. Higher leaf formation of plants of the Sudanese is noted in the earliest phases of their development. During blossoming the mass of leaves in relation to the weight of all plant considerably decreased. Amount of solids in a plant in later phases due to increase of less nutritious part of plants – stalks and inflorescences.

Table 4- Leaf formation of a Sudan-grass depending on the term of cleaning, %

| Development phases | 2015 y. | 2016 y. | Average for 2 years |
|---|---|---|---|
| Beginning tasseling | 55,4 | 45,0 | 50,2 |
| Full tasseling | 53,9 | 41,0 | 47,5 |
| Blossoming | 40,6 | 33,0 | 36,8 |
| Aftermath | 50,0 | 42,0 | 46,0 |

Productivity of green mass and exit hay of the Sudan-grass from unit of area at the studied terms of cleaning were relatives though they decreased from early to late terms and depending on cut height. In two years when mowing at the beginning of a tasseling, phase productivity of green mass has averaged 352 c/hectare (for two hay crops); a full tasseling– 219 c/hectare; and phases of blossoming 272,5 c/hectare. At the last two termsmowing of an aftermath wasn't (Table 5).

Table5-Influence terms and height mowing of plants on productivity of the Sudan-grass (an average for 2 years), c/hectare

| Terms mowing (phase) | Height of a cut, cm | Green mass | | Hay exit | | | |
|---|---|---|---|---|---|---|---|
| | | main hay cutting | aftermath | for only 2 hay cutting | from the main hay cutting | from an aftermath | for only 2 hay cutting |
| Beginning tasseling | 2-4 | 204 | 141 | 345 | 52,8 | 37,7 | 90,5 |
| | 6-8 | 208 | 144 | 352 | 53,9 | 42,7 | 96,6 |
| | 10-12 | 201 | 139 | 340 | 52,0 | 41,5 | 93,5 |
| Full tasseling | 2-4 | 210 | - | 210 | 32,1 | - | 32,1 |
| | 6-8 | 219 | - | 219 | 33,5 | - | 33,5 |
| | 10-12 | 206 | - | 206 | 31,5 | - | 31,5 |
| Blossoming | 2-4 | 250 | - | 250 | 38,2 | - | 38,2 |
| | 6-8 | 272,5 | - | 272,5 | 41,7 | - | 41,7 |
| | 10-12 | 264 | - | 264 | 40,4 | - | 40,4 |

From data of table 6 it is visible that if at a cut at the height of 2-4 cm at 10 plants has grown 38 stalks, then at a cut of the main herbage on 6-8 cm – 69,5 stalks, and in option with a cut for 10-12 cm 51 stalks have grown.

By us it is established that at low cuts growth of an aftermath goes quite slowly, in process of their increase growth and development of plants accelerate. From data of table 18 it is visible that the greatest productivity of green material of an aftermath is received with a height of cut of 6-8 cm of 144 c/hectare.

Table6-Influence height of a cut on escape education and bushiness the Sudan-grass

| Height of a cut, cm | Has grown stalks in an aftermath, piece | Bushiness aftermath |
|---|---|---|
| 2015 y. | | |
| 2-4 | 35 | 3,5 |
| 6-8 | 67 | 6,7 |
| 10-12 | 48 | 4,8 |
| 2016 y. | | |
| 2-4 | 41 | 4,1 |
| 6-8 | 72 | 7,2 |
| 10-12 | 53 | 6,3 |
| Average for 2015 – 2016 yy. | | |
| 2-4 | 38 | 3,8 |
| 6-8 | 70 | 7,0 |
| 10-12 | 51 | 6,1 |

Such in the way, height of a cut of the main herbage substantially influences productivity and terms of approach hay cutting ripeness of an aftermath.

The low cut (2-4 cm) of plants deprives of them the first interstice of the main stalks and a part of spare nutrients that has an adverse effect on growth of an aftermath.

At a cut at the height of 6-8 cm in most cases at plants of a Sudanese grass the first interstice and a reserve of the nutrients located in it remains. The plant at the same time grows rather intensively, the escapes which are earlier formed bushiness of knot, actively using nutrients, interfere with growth of escapes from the first stem knot.

With a cut height at the height of 10-12 cm plants have untouched considerable part of the second interstice which long time remains green and continues to live at the expense of the spare nutrients necessary for growth of an aftermath and this most reduces an aftermath ion.

At a low cut of the loudspeaker of growth of an aftermath is much lower, than with a height of 6-8 cm and 10-12 cm. At the same time the growing escapes grow much more slowly and have smaller height before the second hay crop.

Cut height at the level of 10-12 cm had no particular advantages before option of 6-8 cm. The fact that the plant has in necessary quantities spare nutrients used after a hay crop for formation of new escapes is the reason of it.

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## АЛМАТЫ ОБЛЫСЫ «АГРОУНИВЕРСИТЕТ» ОТШ ЖАҒДАЙЫНДА СУДАН ШӨБІНІҢ ШАБУ МЕРЗІМІ МЕН БИІКТІГІНЕБАЙЛАНЫСТЫ БАЛҒЫНШӨП ӨСУІ

***Аннотация***

Макалада көрсетілген судан шөбінің жасыл масасының ең мол өнімділігі шабу биіктігі 6-8 см болғанда-144 ц/га өнім алынған.

***Тірек сөздер:***судан шөбі, өскінпайда болуы, шабу, балғыншөп өсуі, өнімділік.

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## ОТАВНОСТЬ СУДАНСКОЙ ТРАВЫ В ЗАВИСИМОСТИ ОТ СРОКОВ И ВЫСОТЫ СКАШИВАНИЯ В УСЛОВИЯХ УОС «АГРОУНИВЕРСИТЕТ» АЛМАТИНСКОЙ ОБЛАСТИ

***Аннотация***

В статье показана отавность суданской травы в зависимости от сроков и высоты скашивания в условиях Алматинской области. Установлено, что наибольшая урожайность зеленой массы отавы суданской травы получена при высоте среза 6-8 см- 144 ц/га.

***Ключевые слова:*** суданская трава, побегообразование, скашивание, отавность, урожайность.

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## ВЛИЯНИЕ РАЗЛИЧНЫХ ВИДОВ СЕВООБОРОТА НА ПОРАЖЕННОСТЬ ВРЕДНЫМИ ОРГАНИЗМАМИ И ПРОДУКТИВНОСТЬ КАРТОФЕЛЯ НА ЮГО-ВОСТОКЕ КАЗАХСТАНА

**Аннотация**

В статье приведены результаты исследований влияния различных видов севооборота на фитосанитарное состояние полей и продуктивность картофеля в горной и предгорной зонах юго-востока Казахстана. Установлено, что 6-польный и 7-польный севообороты улучшают фитосанитарное состояние полей и обеспечивают формирование высоких урожаев картофеля (30,9-34,1 т/га и 31,1-35,2 т/га).

***Ключевые слова:*** картофель, севооборот, продуктивность, фитосанитарное состояние, вредные организмы.

**Введение**

Картофельный севооборот - наиболее простой, наиболее доступный, не требующий затрат, приемлемый для всех производителей элемент агротехнологии. Составленный на научно-обоснованной основе и строго соблюдаемый севооборот обеспечивает высокие результаты в плане сохранения плодородия почвы, улучшения фитосанитарного состояния полей, создании оптимальных условий произрастания картофельных растений и формирования высоких урожаев клубней с лучшими качественными показателями и лежкостью [1].

Влияние севооборотов на урожай картофеля, а также на почву, связано с благоприятным воздействием смены возделываемых культур на влагообеспеченность, плодородие и накоплением в ней минеральных веществ, усваиваемых растениями [2].

Мероприятия против болезней культуры, передающихся через почву, должны быть в первую очередь направлены на уменьшение исходной численности популяции патогена в почве ниже порога вредоносности. Это возможно путем внедрения экологически