World Applied Sciences Journal 30 (8): 955-957, 2014
ISSN 1818-4952

DOI: 10.5829/idosi.wasj.2014.30.08.14106

Introduction of Sorts Calligionum in Southern Kazakhstan

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Submitted: Dec 02, 2013; **Accepted:** Feb 10, 2014; **Published:** Feb 24, 2014

Abstract: The article provides a brief characteristic of genus calligonum and defined phenological phases and economic value species.

Key words: Introduction · Genus · Family · Species · Arid zone · Calligonum

INTRODUCTION

In Kazakhstan Calligonum found 85 species, mainly in the sandy desert [1]. Most of them serves as food for livestock, many species, food, dye, medicines, honey plants [2, p.251 -254].

In a culture Calligonum valued for ease of reproduction by seeds and seedlings. Good results are obtained when grown from cuttings [3].

In the valleys and foothills of the arid zone of South Kazakhstan focused core areas of natural grassland region. According to its climatic conditions they are divided into ephemeral, wormwood -ephemeral, thistle and grass- shrub pastures that are the basis fodder Karakul and camel breeding.

However, these lands passed to the different forms of ownership are used ineffectively, sometimes carelessly. On some arrays due to excessive overload of pastures and grazing of delays developing wind erosion, depletion observed botanical composition of herbage.

In a more rational use of existing natural diversity of pastures and protection of plant resources important to expand the range of forest-pasture crops through their less common species, ecotypes and varieties. This problem is especially true for ephemeral and wormwood- ephemeral pastures where there is almost no scrub vegetation and there is a high wind activity. In this regard, since the mid 70 -ies of the last century in the arid zone of South Kazakhstan is working on the introduction of plants with a wide range of useful properties. In this respect, a great interest is the genus *Calligonum*.

MATERIALS AND METHODS

The Object of the Study Was Genus: (*Calligonum*) from *Polygonaceae* family (*Polygonaceae* Juss). Experiments for the study of genus *Calligonum* is carried out at the experimental site "Baktyolen", located on the plains of the wilderness and Physiological complex of the Institute in the area of the foothills. On the temperature conditions of these hospitals close to each other: the average annual temperature -11 -11, 50. However, the rainfall distribution is uneven: in the plains the annual rainfall in the years of studies ranged from 108 to 383 mm, in the foothill zone - from 484 to 869 mm. The main amount of precipitation falls out in winter-spring period of the year. Drought at both hospitals comes from second half of May. The soil of the experimental areal "Baktyolen" - light grey soils, loamy, are associated Sands, Saline complex-ordinary grey soils, loamy.

Their study was conducted by the following procedures. Collection and processing of herbarium material carried out by the standard technique [4]. During fieldwork conducted observation on confinement of plants to environmental conditions.

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Table 1: Characteristics of species Calligonum (experimental site "Baktyolen", 2013).

Species	Year of sowing	Height and crown projection, cm H	P	P	Number of shoots in the internodes, PCs	The length of the shoot, cm	Green mass with 1 bush, g
Calligonum Khingan	1974	127	190	210	6.8±0.6	31.1±6.6	490
Calligonum leucocladum	1987	147	180	167	6.5±0.7	25.4±3.8	540
Bunge of the Kyzyl Kum	2001 (landing on related Sands)	182	267	272	5.6±0.5	19.5±2.8	1190
Calligonum leafless *Calligonum aphyllum*							
Gurke from Dagestan	1974	142	210	191	6.2±0.7	28.0±3.6	510
Calligonum leafless	1984 (landing on related Sands)	245	304	275	7.2±0.4	22.9±2.7	2100
Calligonum aphyllum	1987	168	302	205	7.4±0.7	22.1±2.1	1010
Gurke of the Kyzyl Kum	1997	156	197	202	6.9±0.8	26.7±2.8	790
	2001	140	128	119	9.8±0.9	26.8±1.9	370
Calligonum bristly *Calligonum setosum*							
Litv. of Kyzylorda oblast	1974	167	198	205	4.4±0.4	21.8±2.8	610
Calligonum head-jellyfish	1987	288	336	316	2.4±0.2	47.3±4.9	1860
Calligonum caput-medusae	1997	256	286	311	2.4±0.3	53.3±6.3	1340
Schrenk of the Kyzyl Kum	2002	169	-	-	3.1±0.2	40.6±5.1	750
Calligonum Small berried	1987	170	269	330	2.7±0.2	39.7±3.2	980
Calligonum microcarpum	1997	124	152	198	1.8±0.2	28.0±2.1	690
Borszcz. of the Kyzyl Kum	2001	110	-	-	2.3±0.2	47.2±4.7	580
Calligonum densely setigerous *Calligonum densum* Borszcz. of							
the Kyzyl Kum	1997	115	154	142	4.2±0.4	23.3±3.0	630
Calligonum woolly	2001(landing on related Sands)	305	-	-	9.8±0.6	28.6±29	1100
Calligonum eriopodium							
Vunge of Kyzyl Kum	2002	184	-	-	5.7±0.4	34.3±3.6	430

In determining the herbariums were used the following multi-volume reports: "Flora of Kazakhstan" [5], "the plants of Kazakhstan Illustrated" [6], "Flora of the USSR". [7] Floristic list is based on the system [8]. Latin names of the plants specified on the "List of vascular plants of Kazakhstan" [9]. Yield was determined by mowing pasture areas the size of 100 x 4 m in 4 replicates. Surveys and observations were carried out in accordance with the Methodological guidance on the study collection of perennial grasses (Leningrad 1973) [10]. Methodical recommendations on the introduction of desert forage plants (Samarkand, 1986) [11]. Data processing procedure B.A. Dospehova (1973) [12].

RESULTS AND DISCUSSION

Conduct of introduction of Calligonum under different environmental conditions of southern Kazakhstan has allowed a better judge of potential, as well as to directional selection of samples. Throughout the years, the 30 samples studied.

After a comprehensive long-term study on the experimental areal "Baktyolen" was identified the most promising species, such as Calligonum Khingan (*Calligonum leucocladum* Bunge), Calligonum leafless (*Calligonum aphyllum* Gurke), Calligonum densely setigerous (*Calligonum densum* Borszcz), Calligonum ordinary (*Calligonum commune* Mattel), Calligonum Small berried (*Calligonum microcarpum* Borszcz), Calligonum head- jellyfish (*Calligonum caput-medusae* Schrenk), Calligonum legged woolly (*Calligonum eriopodium* Vunge). No less interesting is Calligonum Kyzylkum (*Calligonum kzylkumi* Pavl.) - Endemic. In the foothill zone allocated to only one species-Calligonum leafless. All these samples were collected on sandy areas and Kizilkum Moiynkum. Samples obtained from Turkmenistan, except head-jellyfish (*Calligonum caput-medusae* Schrenk), Sverdlovsk region Zhambyl region, in the Aral region of Kyzylorda withered in 1-2 year of life.

All of the selected species, regardless of their geographical and ecological origin had an early fenoritm. Vegetation mature plants begin in late March-early April with the deviation data for 7-10 days. Flowered species Calligonum 2-3 years in ages. Flowering occurs in May, fruiting-in early June. Observations revealed that in early spring appearance of these phases of development is accelerated by about 15-20 days.

A characteristic feature of biological genus Calligonum-the rapid development of the aboveground part. Depending on the weather conditions at the experimental site "Baktyolen" height bushes in the first year of life reaches 19.5-39.4 only exception was in 2002,

when the plant height Calligonum leafless (*Calligonum aphyllum* Gurke) reached an average of 81.4 cm, Calligonum small-fruited (*Calligonum microcarpum* Borszcz) - 80.4, Calligonum head - jellyfish (*Calligonum caput-medusae* Schrenk) – 83.5 and Calligonum legged woolly (*Calligonum eriopodium* Vunge) - 105.2 cm is due to the fact that in the second half of the summer were abundant rainfall. Physiologic complex plant height at Calligonum leafless (*Calligonum aphyllum* Gurke) did not exceed 11-26.0 cm Calligonum Khingan (*Calligonum leucocladum* Bunge)-28.0 cm.

Watching old-growth plants showed that all types of conditions in the experimental site "Baktyolen" grow and develop normally, fruit annually accumulate sufficient yield of green mass (table 1). As can be seen from the data table for each kind of characteristic growth and productivity. Height bushes depending on the species and age ranges from 110 to 305 cm The largest growth rates differ Calligonum leafless (*Calligonum aphyllum* Gurke), Medusa-head Calligonum, (*Calligonum caput-medusae* Schrenk), Calligonum legged woolly (*Calligonum eriopodium* Vunge). It was noted that the best development of their associated observed on sand than on sandy gray soil. So, crops Calligonum Khingan (*Calligonum leucocladum* Bunge) of Kyzyl Kum, Calligonum leafless (*Calligonum aphyllum* Gurke) from Dagestan and Calligonum bristly (*Calligonum setosum* Litv.). In Kyzylorda region in 1974 were laid on sandy light gray soils. Apparently, so these types of bushes height is comparatively lower than the bushes growing on sandy substrates. Calligonum Khingan (*Calligonum leucocladum* Bunge), Calligonum leafless (*Calligonum aphyllum* Gurke) and Calligonum legged woolly (*Calligonum eriopodium* Vunge) related to the height of the sand reached respectively 182.245 and 305 cm with age in all species of shrubs grow apart. Powerful bushes are formed in Calligonum leafless (*Calligonum aphyllum* Gurke), Medusa - head Calligonum (*Calligonum caput-medusae* Schrenk) and small-fruited Calligonum (*Calligonum microcarpum* Borszcz), which grows shoots cover the surface of the soil, thus protecting against wind erosion and have a great reclamation value.

Due to strong growth of plants and the abundance of long annual shoots these species are a major forage value. They have a lot of green from one bush from 580 to 2100 Fruiting plentiful and they are stable. In some years from one bush-Calligonum Medusa -head (*Calligonum caput-medusae* Schrenk) collected up to 1.5 kg of seed, leafless (*Calligonum aphyllum* Gurke)-1.1 kg.

In conditions of Physiological complex, as already noted grow only two types: Calligonum leafless (*Calligonum aphyllum* Gurke) and Calligonum Khingan (*Calligonum leucocladum* Bunge). Plant height in the first species does not exceed 113-134 cm 101-135 cm diameter crown, the second-78-97 cm diameter 46-48 cm crown Fruiting occurs only in Calligonum leafless (*Calligonum aphyllum* Gurke). Seed yield per bush of 28-37 Calligonum Khingan (*Calligonum leucocladum* Bunge) annual flowers, but Seed production is not mentioned even once.

A distinctive feature of the species Calligonum is their longevity. Currently on the experimental plot "Baktyolen" are planting different kinds Calligonum 39, 29, 26 and 14 years, in a physiologically complex 12 and 15 years of life. Thus, our studies indicate that successful environmental adaptation of species Calligonum.

Based on the long period of repeated mass and individual selection of promising populations created Calligonum leafless varieties (*Calligonum aphyllum* Gurke)- "Shugyla" Calligonum-head jellyfish (*Calligonum caput-medusae* Schrenk)-"Asem" Calligonum small-fruited (*Calligonum microcarpum* Borszcz)-" Kyzyl Kum -42".

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