Under-over ground Biomass characteristic of perennial Species (*Eremostachys laciniata*) in northwest Iran (Till area of shabestar)

Hamideh Shadkami[1]*, Ghassem Habibi bibalani[2]

1. M.Sc. On Plant Systematic-Ecology, Department of Plant biology, Marand Branch, Islamic Azad University, Marand, Iran
2. Department of Agriculture, Shabestar Branch, Islamic Azad University, Shabestar, Iran
h_shadkamie@yahoo.com

ABSTRACT: Studies on assessment biomass variation in selected populations of *Eremostachys laciniata* were in northwest Iran (Till area of shabestar). Research aimed to investigate how root and shoot biomass production varies across a range of bulk densities and soil strengths. The research also sought to determine whether there is a threshold bulk density and/or soil strength that limit biomass production of roots and or shoots for perennial grasses. Root and shoot in these species were sampled in one stage from Mar to Aug. roots of plants stable soils on slope and provide resistance against the forces that improve slope instability. We studied: *Eremostachys laciniata* to determine its characteristics. Data were collected with random sampling in this aria with 1m2 in 64 quadrate plots. Mean, Max and Min over ground biomass of this plant is 0.66, 7.33, 3.27 g^{-2}, respectively.
[Hamideh Shadkami, Ghassem Habibi bibalani. **Under-over ground Biomass characteristic of perennial Species (*Eremostachys laciniata*) in northwest Iran (Till area of shabestar).** *Rep Opinion* 2014;6(7):55-58]. (ISSN: 1553-9873). http://www.sciencepub.net/report. 8

Key words: *Eremostachys laciniata,* soil, under-over ground biomass and rangeland.

1. Introduction

Eremostachys, an important genus of family Labiatae, is distributed in the mountains of tropical Asia, Talesh, Torcamenshan and Pacestan. About 15 species of *Eremostachys* occur in Iran Region of which 4 species are reported from northwest Iran. Among these, *Eremostachys laciniata* (L.) Bunge is an erect annual herb (Mozaffarian, 1987). The variables that were measured included shoot biomass (clipped and dried), root biomass (washed and dried), soil strength) and rooting depth (split core). Assessment biomass variation in selected *Eremostachys laciniata* in natural habitats is considered necessary for developing in-situ conservation strategies. Therefore the present investigation attempts to provide quantitative details of *Eremostachys laciniata* through: (i) assessment of distribution patterns and quantum of availability of target species and (ii) analysis of variations in biomass among natural populations. For example, biomass production efficiency by minimizing overlap between root systems of mixed species communities, soil water can be used more efficiently and productivity enhanced (Brown 1998, Fernandez, 2000). Grazing may also promote biodiversity; many species are dependant on ranch lands and grazing animals to maintain their habitat. Grazing can cause disorder to the natural chemical processes of the soil, while at the same time, causing erosion to soil (Schulze, 1996). The use of plant species to provide ecosystem functions may be one of the most effective tools in sustainable rangeland. However, it will be important to determine how the functions of individual plant species change in mixed plant communities and how plant functions vary in response to management practices and the environment conditions.

2. Material and Methods

Study area is about 25 kilometer of Shabestar City between 15′ 38° to 38° 17′ 30″ North width and 45° 27′ 30″ to 45° 30′ East length of prime meridian and the total space of the area is almost 310.31 km2 for studding this research, we selected 10 hectare space land covered with natural rangeland grasses (Salimi faed, 2003).

In surface sampling we must have more attention incases such as Shape, Plot size, design size and the way of writing data. So from sampling the pointed case was determined by surface plat method. Quadrate size (1m*1m) is selected as the best plot. Then sampling is done by completely accident method after determine the size of optimum plot. Dada that were related to soil observation are collected that they generally include erosion information and soil protection. All of the present plants in plots were measured separately in two parts after plant sampling (Shadkami-Til and Bibalani, 2010_a, 2010_b, 2011).

Biological spectrum studying of area showed that the more Species of type are Hemicriptophyte and Trophite. *Eremostachys laciniata* species, that grows naturally in Azerbaijan Province of Iran and commonly found in rangelands

areas, were selected this species for test in (Table1) the Scientific and Farsi name of that species with blossoming time and local position.

Fig 1. A part of Till rangeland from Shabestar district, East Azerbaijan province, Iran.

Because of an irregular interference specially in northwest of the country and changing control pasture to agricultural lands, in recent decades, *Eremostachys laciniata* Species is omitted from Range area. And its density has remarkable decrease. We use accidental sampling method for determine this species for sampling. In simple accidental sampling method we were given equal chance to each people or society (Farahvash, 2004). In this stage we survey 1m2 Surface Plat and with rate of 3.33% from total stage by noting to studying area extent and spread Species. Sampling is done from beginning of Apr to the late of the Jul. And the end of that is done the late of the May when 60% were used from above statistics method in this season. And all of the present Plants in Plats were measured separately in two parts but after Plants sampling (Shadkami and Bibalani, 2010_a, Shadkami and Bibalani, 2010_b).

Table 1. Collected and determined species with blossom time and geographic height (Ghahraman, 2002, Mozaffarian, 2007).

Dicotyledonous	Angiosperms gamopetalous
Family Species binominal name	Labiatae *Eremostachys laciniata*
Species Persian name Blossoming time Geographic height	Sonbol biyabaniye pareh barg Apr-Jun Collecting place: Hussein abad till Height 1490 m

ETHODS OF DOING RESEARCH

Table2. Calculation is done for vegetal species.

Plant binominal name	Average height (cm)	Average Root depth (cm)	Total Weight dry stem (g^{-2})	Total Weight dry root (g^{-2})
Eremostachys laciniata				
Average In unit Surface	28.25	13	2.19	2.32
Max	28.5	14	24.41	28.02
Min	28	12	10.63	9.22

RESEARCH METHOD

For recognition of Species for sampling, we used of accidental sampling method. In simple accidental sampling method each people has equal for selecting (Farahvash, 2004). In this sampling determined accidental vegetal coverage and or un-coverage in each plot. We determined Geographical direction and elevation for each plot.

Sampling is done from early May to late July and it ended late June when 60% of area coverage was in Blossoming stage. And most of the plats were used from above Statistical method in this season. And all of the present Plants in plats after

Plant sampling were measured in two parts separately. sampling from area studding Plants after sending to laboratories, Each plant was photographed to record general above- ground and below-ground morphology/architecture prior to being dissected into its component parts to determine biomass. Above-ground biomass was measured by separating the foliage, branches and stem. Each component was oven dried at 80˚c for 24 h then weighed. Below-ground biomass was determined by hosing roots clean of soil, before they were oven dried at 80˚c for 24 h then weighed. The dry weight of each plant component was recorded to the nearest 0.1gr. And statistical analyzing is done by Excel.

3. RESULTS

Results of this showed that in studding area stem height *Eremostachys laciniata* was unsteady from 28-28.5 mm, that in average it is about 28.25 mm and the Mean, Max and Min underground of Biomass in studding area 0.66, 7.33, 3.27gr/m^2, respectively. The variation in fresh weight during the maturation and senescence phase was is significant.

Result shows that in studying area *Eremostachys laciniata* Biomass over ground and underground 0.66, 0.40gr/m^2 respectively (Fig2).

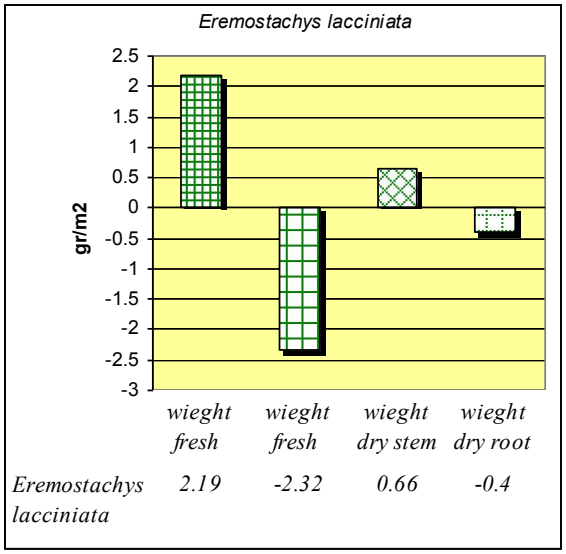

Fig 2. *Eremostachys laciniata* average Biomass over ground and under ground.

The results showed that *Eremostachys laciniata* depth is 28.25 cm and stem height is 12 cm (Fig3).

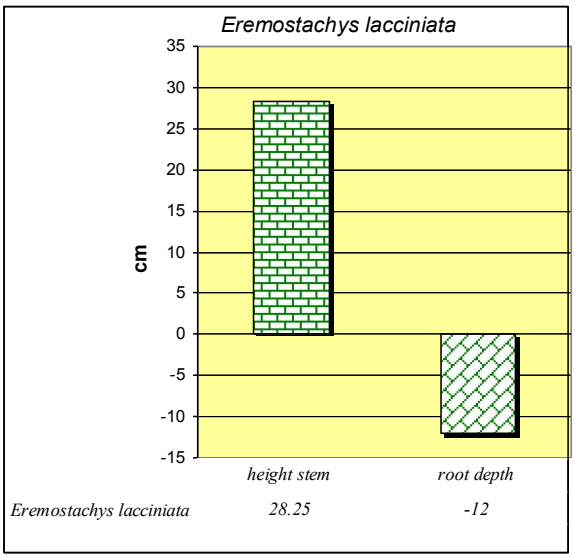

Fig 3. *Eremostachys laciniata* average root depth and stem height.

4. CONCIUSION

The objectives of this study were to determine the effects of grazing on quantity biomass perennial. Mean species richness decreased from 2009 to 2010 as annuals common after livestock grazing began to decline. Although livestock grazing can be very beneficial to the ecosystem and biodiversity through proper management techniques, it can also be damaging (Sanders, 2000, AB, 2008). Misuse of the range and lack of education can potentially lead to harmful effects. It is apparent that proper land and grazing management techniques need to be utilized to optimize forage production and livestock production, while still maintaining biodiversity and consideration of the ecosystem. The root: shoot ratios for the *Eremostachys laciniata* in this study were observed to be approximately equivalent. In some species, total dry matter production is not always associated with photosynthetic rate per unit of leaf area. Instead, it may depend on many factors including life-history characteristics, canopy structure, respiration rates, translocation and partitioning of assimilates and environmental conditions (Nasyrov 1978; Lambers 1987; Poorter et al. 1991; Poorter and Pothmann 1992; Reich 1998). The invasion of exotic annual grasses over the past one century has displaced native Till rangeland species such as native perennial grasses. Perennial grasslands dominated by purple needle grass (*Eremostachys laciniata*) have lower decomposition rates than annual grasslands, and higher levels of mulch. Perennial grasses have higher root biomass, which is distributed deeper in the soil profile. For livestock grazing, annual grasses are

preferable because of their higher productivity, nutrient turnover and forbs biomass (Fleischner, 2008). Perennial grasses are beneficial due to their more effective erosion control and ability to access more water, retaining green forage for longer periods of time. Ideally, range-land systems could benefit from a mixture of both types of grasses (Fleischner, 2008, (Schulze, 1996). By using a combination of plant species, managers has the ability to attain the most desirable suite of functions, which single species cannot provide alone. However, the effects of species combinations on ecosystem functions often cannot be predicted based on the individual effects of the component species.

Acknowledgement

The authors greatly acknowledge the scientific support from Islamic Azad University-Marand Branch to the first author for this study. The first author is studying as Ms.C Student of Plant Systematic in Marand Branch, Islamic Azad University, Marand, Iran and this paper is a part of her M.Sc. Thesis with title of **"Study on Density and biomass of rangeland plants at till area"** that have been worked in 2009.

Corresponding Author:
Hamideh Shadkami
M.Sc. On Plant Systematic-Ecology, Department of Plant biology
Marand Branch, Islamic Azad University, Marand, Iran
h_shadkamie@yahoo.com

References

1. Belsky, A.J., 1986, Does herbivory benefit plants? A review of the evidence. Am. Nat., 127(6): 870-892.
2. Boe, A., Bortnem R, Kephart KD 2000, Quantitative description of the phytomers of big bluestem. Crop Sci. 40: 737-741.
3. Farahvash, F., 2004, Ecology, Tabriz: Islamic Azad University Tabriz, Pages 104-116.
4. Facelli, J.M., and S.T.A. Pickett. 1991, Plant litter: Its dynamics and effects on plant community structure. Bot Rev., 57:2-32.
5. Fisher, F.M., J.C. Zak, G.L., Cunningham and W.G., Whitford, 1988, Water and nitrogen effects on growth and allocation patterns of creosotebush in the northern Chihuahuan Desert. Journal of Range Management, 41(5): 387-391.
6. Ghahraman, A., 2002, Folor Colored Iran, Tomes 1-24.
7. Hussain, F., and M.J., Durrani, 2007, Forage productivity of arid temperate Harboi rangeland, Kalat, Pakistan. Pak. J. Bot., 39(5): 1455-1470.
8. Johnson, Marrk, K. 1986. Estimating ratios of live and dead plant material in clipped plots. J. of Range Manag. 39(1): 90-91.
9. Murphy, S. and David D., Briske. 1992, Regulation of tillering by apical dominance: chronology, interpretive value, and current perspectives. J. of Range Mang. 45(5): 419-429.
10. Mozaffarian, V., 2007, a Dicionary of Iranian, Latin, English, Persian. Tehran, Farhang Moaser, Page 485.
11. Rodriguez, MV, Bertiller, M.B, Sain, CL., 2007, Spatial patterns and chemical characteristics of root biomass in ecosystems of the Patagonian Monte disturbed by grazing, J. Arid Environ., 70: 137-151.
12. Richards, J.H., Caldwell, M.M., 1985, soluble carbohydrates, concurrent photosynthesis and efficiency in regrowth following defoliation: a field study with Agropyron species. J. Appl. Eco., 22: 907-920.
13. Saleem, A, Sarwat, N., 2009, Irshad, M, and Franklin, J., Effect of diverse ecological conditions on biomassproduction of Themeda triandra (Kangaroo grass) at various growth stages ,African Journal of Biotechnology Vol. 8 (7), pp. 1233-1237.
14. Salimi faed, A., 2003, Looki to History and Geographical Shabestar, Tasuj, Sufiyan, Tehran Sibe Sorkh.Pages 234-244.
15. Shadkami, H., and Habibi, GH. 2010a, over ground Biomass characterics of Genera single Species Iran (Cnicus Benedictus) in northwest Iran (Till area of Shabestar), International Journal of Academic Research, and 2(6) 698-701.
16. Shadkami, H., and Habibi, GH. 2010b, Over ground Biomass characterics of Genera single Species Iran ((Teucruim polium) in northwest Iran (Till area of Shabestar), International Journal of Academic Research, 2(6) 110-113.
17. Shadkami-Til, H, Bibalani, GH. 2011, Under-over ground Biomass characterics of perennial Species (Thymus Fallax) in northwest Iran (Till area of shabestar), International Journal of Academic Research, 2(6) 1096-1100.
18. Snyder, K.A, Williams, D.G., 2003. Defoliation alters water uptake by deep and shallow roots of Prosopis velutina (Velvet mesquite). Functional Eco. 17: 363–374.
19. Zone, A., 2009, Seasonal Variation Current Season and Dead Biomass of Chrysopogon aucheri (Boiss) Stapf. And Cymbopogon jwarancusa (Jones) Schult. In Highland Balochistan, Pakistan, Pak. J. Bot., 41(2): 519-527.

8/6/2013