RESEARCHES REGARDING SOME MORPHOLOGICAL HARACTERS OF PRODUCTION IN DIFFERENT PHENOPHASES AT *TRIFOLIUM ALEXANDRINUM* L.

CERCETĂRI PRIVIND UNELE CARACTERE MORFOLOGICE DE PRODUCȚIE, ÎN DIFERITE FENOFAZE LA *TRIFOLIUM ALEXANDRINUM* L.

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Abstract: *The production capacity of berseem clover is different taking into account the harvest phenophase and it is conditioned by different production elements like: number of tillers, bush height and leaf surface. In this paper, we propose to observe the influence of different production characters, on berseem clover, in different harvest phenophases. The results obtained have shown that the bush weight realizes the biggest production in 69 phenophase, leaf surface having the biggest influence on bush weight, namely 56 % of its weight.*

Rezumat : *Capacitatea de producție a trifoiului de alexandria este diferită în funcție de fenofaza de recoltare şi este condiționată de diferite elemente de producție, cum ar fi: numărul de lăstari, înălțimea tufei şi suprafața foliară. În această lucrare, ne propunem să observăm influența diferitelor caractere de producție, asupra trifoiului de Alexandria, în diferite fenofaze de recoltare. Rezultatele obținute au arătat că greutatea tufei realizează cea mai mare producție în fenofaza 69, influența cea mai mare asupra greutății tufei având-o suprafața foliară, de 56 % din greutatea acesteia.*

Key words*: trifolium alexandrinum, phenophases, production characters, bush weight*
Cuvinte cheie*: trifoi de alexandria, fenofaze, caractere de producție, greutatea tufei*

INTRODUCTION

Trifolium alexandrinum is a forage plant met only in cultivated form, sometimes it is met in natural form in Egypt and neighbouring countries (OPROI CRISTINA, 2005).

Trifolium alexandrinum is adapted to a Mediterranean climate with light winters and without excessive drought during summer. It has a good productive potential and can be turned to advantage in manner ways: green fodder, hay, silo, pasture, green manure (HATHOUT M.K., 1996).

It gives high quality forage with a content of crude protein of 20-30 % from dry substance, which in general is of 10-17 t/ha, taking into account the breed and culture conditions. There have not been reported bloats at the animals that eat this clover in fresh green mass form (KNIGHT, W.E., 1985, REYNOLDS M.O., 1994, BOSWALL P., 2004,).

It is a species of annual clover that can be cultivated in pure culture and in mixture with other species susch as: leguminous (alfalfa, *Trifolium incarnatum*, white clover, tare), annual ryegrass and cereals: oat, wheat, barley (G.W. EVERS, 2006, ROSS S.M., et al., 2004).

MATERIAL AND METHOD

Experiences have been realised at the Didactic Station of Banat's University of Agricultural Sciences and Veterinary Medicine Timisoara.

In the paper we present the variant analyses for multiple regression on the main morphologic characters of production, obtained in 3 different phenophases (51 – Inflorescence emerged from sheath, 61 – beginning of flowering, 69 – full flowering), from 2007

experimental year. This permitted to realise some conclusions on production capacity on plant, but also to adapt *Trifolium alexandrinum* at actual culture conditions from West Plane.

Year 2007, in vegetation period, was characterised by high temperatures, over the average of multi-annual temperatures, with a few precipitations, which led to different results comparative to specialty bibliography.

We used Gorby breed as biologic material. During the vegetation period quantitative determinations have been performed (bush weight) and biometric measurements also (plant height, number of tillers, leaf surface), on the main production characters at cultivated species. These determinations have been realised in 3 different phenophases (Inflorescence emerged from sheath – 51, beginning of flowering – 61, full flowering – 69), according to BBCH code (UWE MEIER 2001).

The interpretation has been realised according to multiple regression variant analysis (CIULCA, 2006).

RESULTS AND DISCUSSIONS

For a more clear prominence of main production characters on plant in different phenophases, in this paper we have studied production morphologic characters at *Trifolium alexandrinum*, in 3 different phenophases.

From tabel 1, one can observe that sowing was realised on March 15, 51 phenophase (Inflorescence emerged from sheath), was realised on May 4, phenophase 61 (floral buds apparition), was realised on May 13 and 69 phenophase (complete flowering) was realised on June 5.

Table 1.

Phenological observations at *Trifolium alexandrinum* (year 2007)

Observations	Specification
	Trifolium alexandrinum
Sowing date	15 March
Rise date	03 April
First pear of leafs	10 April
First tiller apparition	19 May
Inflorescence emerged from sheath	04 May
Floral tillers apparition	13 May
Complete flowering	05 June

From the multiple regression variant analysis (table 2) in phenophase 51, at Trifolium alexandrinum species, it can be observed that the number of tillers has a positive influence on the realisation of plant weight (95.3 %). In a small measure, the leaf surface also contributes to the weight of the plant (3.30 %) and plant height has a less important influence (1.40 %).

Table. 2

Multiple regression variance analysis at *Trifolium alexandrinum* species

Variability source	SP	GL	S^2	Test F
Regression	16863.3	3	5621.1	4.25
Tillers number (xi)	16071.4 (95.30%)	1	16071.4	12.15**
Height pi. (xa)	236.1 (1.40%)	1	236.1	0.18
Leaf surface (xs)	555.8 (3.30%)	1	555.8	0.42
Other sources	7936.7	6	1322.8	
Sum	24800	9		

$y=368.96 + 52.32x1 -0.38x2 -1.89x3 \quad R^2 = 0.6799$

Table 2 presents the multiple regression variance analysis for phenophase 61and can be observed that number of tillers has a positive distinct significant influence at realising plant's weight (81.38 %). Plant height (18.61) and leaf surface (0.01) have a more reduced influence in increasing plant's weight.

The number of tillers has less influence on the plant's weight in phenophase 61 than in phenophase 51.

Table. 3

Multiple regression variance analysis at *Trifolium alexandrinum* species.

Variability source	SP	GL	S^2	Test F
Regression	19117.7	3	6372.57	4.98*
Tillers number (xi)	15558.8(81.38%)	1	15558.8	12.15**
Height pi. (xa)	3558.8 (18.61%)	1	3558.8	2.78
Leafs surface (xs)	0.10 (0.01%)	1	0.1	0.01
Other sources	7682.3	6	1280.38	
Sum	26800	9		

$y=468.04 + 40.63x1-4.17x2 +0.01x3 \quad R^2 = 0.7133$

In phenophase 69, from multiple regression variance analysis (table 3) it can be observed that the number of tillers (39.65%) and leaf surface (56.34%) have a positive influence in realising the plant's weight.

Plant height (4.01%) has a reduced influence in increasing the weight of the plant, which means that plants in this phenophase do not grow in height and only leaf growth takes place.

In this phenophase it can be observed that leaf surface has the biggest influence on production per plant, because plants stopped growing.

Table 4

Multiple regression variance analysis at *Trifolium alexandrinum* species.

Variability source	SP	GL	S^2	Test F
Regression	39544.0	3	13181.33	5.00*
Tillers number (xi)	15681.6(39.65%)	1	15681.6	5.94*
Height pi. (xa)	1586.8 (4.01%)	1	1586.8	0.6
Leafs surface (xs)	22275.6 (56.34%)	1	22275.6	8.45**
Other sources	15816	6	2636	
Sum	55360	9		

$y=558.89 + 17.25x1+2.52x2 -2.38x3 \quad R^2 = 0.8144$

CONCLUSIONS

From comparative studies of different phenophases, we noticed the following:

- The biggest plant weight of all 3 phenophases studied was recorded in phenophase 69 (complete flowering), as it is normal
- In phenophase 51, the biggest influence on production per plant was presented by the number of tillers (95.30%), this having a positive significant distinct influence in realising the weight of the plant
- In phenophase 61, the biggest influence on production per plant was presented by the number of tillers (81.38%) also, this having a positive significant distinct influence in realising the weight of the plant.
- In phenophase 69, the biggest influence on production per plant was presented by leaf surface (56.34%), this having a positive significant distinct influence on realising the weight of the plant, this phenophase being the maximum period of growth.

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