CORRELATIONS BETWEEN THE MAIN PRODUCTION CHARACTERS IN VARIETY SPRINT OF *LOLIUM MULTIFLORUM*

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Abstract: *How the existing meadows may not cover the feed necessary all year, people are obligated to cultivate fodder also. Some of these plants are grown for grain, while others are grown for hay or green mass (MARGINEANU T., 1980, MARIAN F. et all 2010). Lolium multiflorum is a culture trying to expand into production due to production capacity, but also presents the disadvantage of lack of uniformity production on scythe (MARIAN F. et all 2009). The adaptability of a cultivar is generally defined as the genetic feature which enables the plant to give yields that are both high and stable in different environmental conditions. The result of the interaction between the cultivar and the environment is expressed in the adaptability and yield stability of that specific cultivar. (SAVATTI 2004). This paper aims at finding the dependence between the main production characters in variety SPRINT of Lolium multiflorum. The research was carried out in the experimental fields belonging to the Discipline Culture of grasslands and fodder plants from the Didactical Station of USAMVB Timisoara, the experience being placed on a cambic chernosem weakly gleyed soil, with salinisation in depth. In order to reach this goal, we studied variety Sprint in 2011 trying to find the influence of tiller number, tiller height and foliar surface on the weight of the plant. The experience is placed in accordance with the randomized blocks method, in three repetitions, a parcel surface is 15 m^2. Sowing was made on October 12th 2010, with a 12.5 cm distance between rows. The results of our research show that regarding the main production characters of variety Sprint of Lolium multiflorum, performed above, we can conclude that there is a positive linear correlation between plant weight and the number of shoots per plant. There is also positive linear correlation between plant height and the length of the main shoot. There were underlined also the linear dependence between the above main production characters.*

Key words: *Sprint, Lolium multiflorum, production characteristics*

INTRODUCTION

How the existing meadows may not cover the feed necessary all year, people are obligated to cultivate fodder also. Some of these plants are grown for grain, while others are grown for hay or green mass (MARGINEANU T., 1980, MARIAN F. et all, 2010).

Thus, it is recommended the use of complex mixtures for extensive culture systems, of simple mixtures for intensive culture systems and of monocultures for very intensive systems.

Lolium multiflorum is a culture trying to expand into production due to production capacity, but also presents the disadvantage of lack of uniformity production on scythe (MARIAN F. et all, 2009).

The adaptability of a cultivar is generally defined as the genetic feature which enables the plant to give yields that are both high and stable in different environmental conditions. The result of the interaction between the cultivar and the environment is expressed in the adaptability and yield stability of that specific cultivar (SAVATTI, 2004).

MATERIAL AND METHODS

The aim of this paper is to find the dependence between the main production

characteristics of variety Sprint of *Lolium multiflorum*

The research was carried out in the experimental fields belonging to the Discipline Culture of grasslands and fodder plants from the Didactical Station of USAMVB Timisoara, the experience being placed on a cambic chernosem weakly gleyed soil, with salinisation in depth.

This study was made in 2011.

The biological material studied is represented by foreign varieties of *Lolium multiflorum*, namely Sprint.

The experience is placed in accordance with the randomized blocks method, in three repetitions, a parcel surface is 15 m^2. Sowing was made on October 12th 2010, with a 12.5 cm distance between rows.

In order to help the statistical interpretation, we chose the following abbreviations:

- NrLa – number of shoots per plant,
- NrFr - number leaves per plant
- H - plant height,
- G - plant weight,
- SFLP - foliar surface of the main shoot.
- LLP – length of the main shoot

This paper analyses the dependence of the main morphological characters (harvested in phenophase 61, in accordance with BBCH) for variety Sprint of *Lolium multiflorum*. We studied them in order to assess their potential under the conditions at Timişoara

RESULTS AND DISCUSSION

The matrix of the linear correlation coefficients between the characteristics studied is presented in Table 1.

We can notice a significant positive linear correlation between the plant weight and the number of shoots per plant (coefficient of linear correlation 0.89); the plant height and the length of the main shoot (coefficient of linear correlations 0,73).

Thus, for variety Sprint of *multiflorum*, an increasing of the number of shoots per plant determine an increasing of the plant weigth, and an increasing of the length of the main shoot of the plant determine an increasing of the plant height.

Table 1

The matrix of the coefficients of linear correlation between the characteristics under study

	G	H	NrFr	NrLa	LLP	SFLP
G	1,000000	-0,069149	-0,046725	0,894431	-0,221297	-0,022517
H	-0,069149	1,000000	0,077300	0,062903	0,738947	0,390558
NrFr	-0,046725	0,077300	1,000000	0,122444	0,363414	0,393859
NrLa	0,894431	0,062903	0,122444	1,000000	-0,217141	0,081826
LLP	-0,221297	0,738947	0,363414	-0,217141	1,000000	0,379244
SFLP	-0,022517	0,390558	0,393859	0,081826	0,379244	1,000000

The linear correlations between the main production characters are presented intuitively in Figure 1.

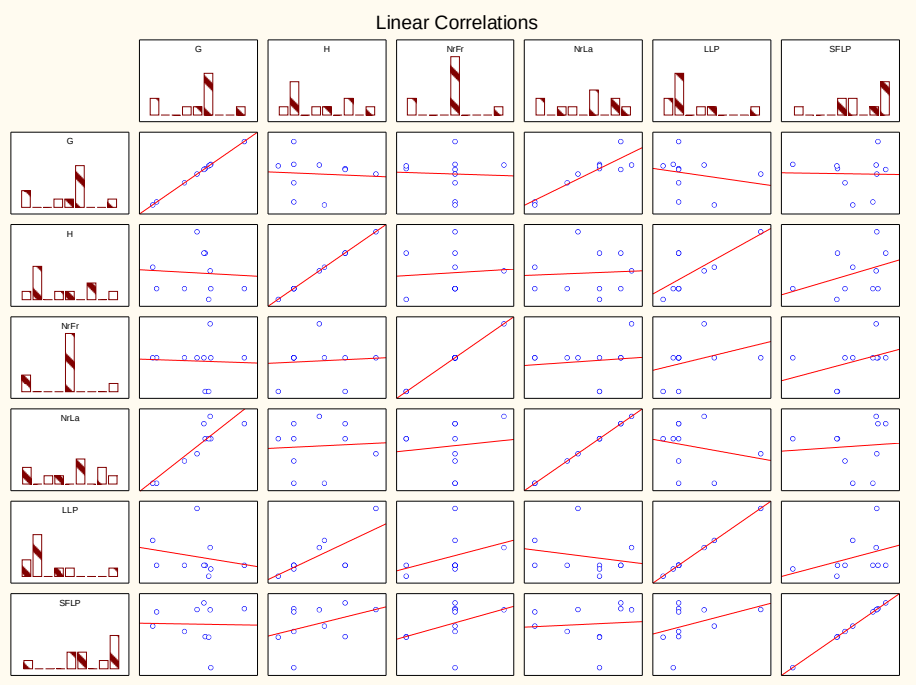

Figure 1. The graph of linear correlation between the main production characters of variety Sprint

Based on the linear correlations, we established functional dependence between pairs of the variables that are well correlated: G - plant weight and NrLa – number of shoots per plant; H - plant height and LLP – length of the main shoot

We performed a linear regression analysis of the plant weight against the number of shoots per plant (see Table 2). We found that the variation proportion of the number of tillers per plant was statistically significant for a value of p below 0.05 (confidence interval 95%). Analysis of variance for the linear regression coefficients is presented in Table 2.

Table 2.

ANOVA for the linear regression coefficients of plant weight against the number of shoot per plant

Univariate Tests of Significance for G					
	SS	Degr. of - Freedom	MS	F	p
Intercept	125,7	1	125,7	0,01340	0,910698
NrLa	300289,0	1	300289,0	32,00131	0,000478
Error	75069,2	8	9383,6		

The regression equation y = ax+b was used to describe the dependence of the **plant weight on the number of shoots per plant** (see Figure 2). Thus, **plant weight** was expressed

on the **the number ofof shoots** by equation:

G = -10 + 57,13*NrLa

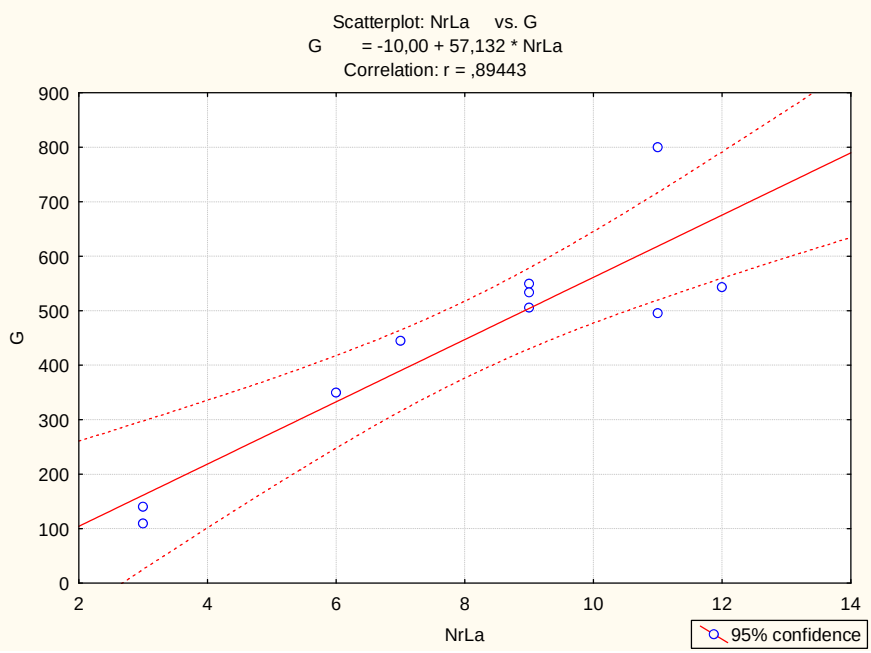

Figure 2. Linear dependence of plant weight on the number of shoots per plant

The coefficient of linear correlations and the determination coefficient are 0,89 and 0,8 respectively. The confidence intervals (95%) for regression coefficients were (-209,256; 189,252) and (33,842; 80,4206).

We performed also a linear regression analysis of plant height against the length of the main shoot (see Table 3). Thus we established that the variation proportion of the lentght of the main shoot was statistically significant for a value of p below 0.05 (confidence interval 95%). Analysis of variance for the linear regression coefficients is presented in Table 3.

Table 3.

ANOVA for the linear regression coefficients of plant height on the length of the main shoot

Univariate Tests of Significance for H					
	SS	Degr. of - Freedom	MS	F	p
Intercept	13,9317	1	13,9317	0,738615	0,415114
LLP	181,5048	1	181,5048	9,622829	0,014620
Error	150,8952	8	18,8619		

The regression equation y = ax+b was used in order to express in the best way the dependence between **plant height on the length of the main shoot** (see Figure 3). Thus, **plant height** was expressed in relation to **the length of the main shoot by** the equation:

H = 18,34 + 0.80170*LLP

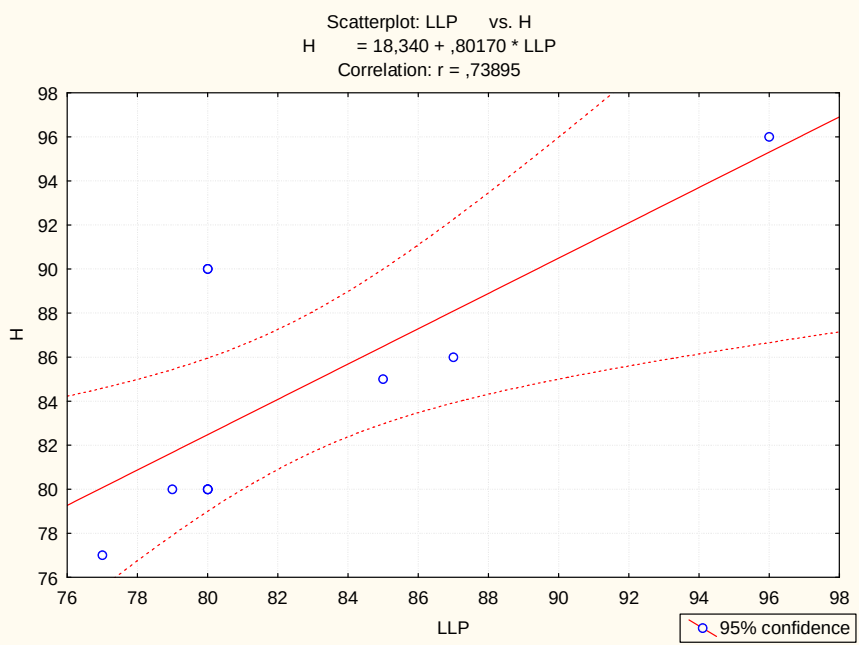

Figure 3. Linear dependence of plant height on the length of the main shoot

The correlation coefficients and the determination coefficient are 0,73 and 0,54 respectively. The confidence intervals (95%) for the regression coefficients were (-30,8696; 67,54944) and (0,2057; 1,39766).

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CONCLUSSIONS

After the analysis regarding the main production characters of variety **Sprint** of *Lolium multiflorum*, performed above, we can conclude that there is a positive linear correlation between plant weight and the number of shoots per plant. There is also positive linear correlation between plant height and the length of the main shoot. There were underlined also the linear dependence between the above main production characters.

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