THE PRODUCTION OF SOME FORAGE BEET SOMACLONES

PRODUCȚIA UNOR SOMACLONE DE SFECLĂ FURAJERĂ

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Abstract: *The regenerated plants in long-term "in vitro" culture showed some modifications of agronomical traits that can be used in breeding programs of this plant. In this paper, we present the results regarding the traits evaluation of forage beet somaclones, obtained by "in vitro" regeneration and multiplication from meristem, and acclimatization in green house. All somaclones presented increased values in comparison with the control (plants cultivated in normal conditions), for root weight, leaf weight and total weight. These results point out that the "in vitro" induced variability is important and valuable.*

Rezumat: *Plantele regenerate în cultura "in vitro"de lungă durată prezintă unele modificări ale însuşirilor agronomice care pot fi utilizate în programul de ameliorare a acestei plante. În această lucrare prezentăm rezultatele privind evaluarea însuşirilor unor somaclone de sfeclă furajeră, obținute prin regenerarea şi multiplicarea "in vitro"prin cultura de meristeme şi aclimatizarea plantelor în seră. Toate somaclonele prezintă o creştere a valorilor comparativ cu martorul (cultivat în condiții normale), pentru greutatea rădăcinii, greutatea frunzelor, greutatea totală. Aceste rezultate arată că inducerea variabilității "in vitro" este valoroasă şi importantă.*

***Key words**: forage beet, somaclones, productivity*
***Cuvinte cheie:** sfecla furajeră, somaclone, productivitate*

INTRODUCTION

"In vitro" regenerated plants in a long-term meristem culture present some modifications of agronomical traits that can be used in the plant breeding programs.

MATERIALS AND METHODS

We studied four genotypes of forage beet: two diploid genotypes (Monogal and Ursus) and two tetraploid genotypes (Tetra Roşu and Tetra 181). The regenerated plants from the long-term meristem culture and acclimatized in the green house, were cultivated in field conditions five months (150 days). We studied the development of leaf system and the disease symptoms. After harvesting (after the first frost fall) we have registered the following plants traits: the total weight, the volume and size of roots, the leaf weight. The results were compared with the ones of the normal plants.

RESULTS AND DISCUSSIONS

The results are presented in the following two tables:

Table 1

The characteristics of forage beet somaclones cultivated in field (at harvesting)

Genotype	Root weight (g) x±sx	Root size (cm) x±sx	Total weight (root.+leaf.)g x±sx	Fresh leaf weight (g) x±sx
Tetra Roşu	3100 ± 483.5	35 ± 0.24	3981 ± 532.7	881 ± 73.5
Tetra 181	1800 ± 264.2	30 ± 0.31	2580 ± 368.7	781 ± 53.6
Monogal	1200 ± 196.3	32 ± 0.26	1813 ± 213.6	613 ± 41.2
Ursus	990 ± 156.9	29 ± 0.20	1580 ± 163.7	590 ± 76.4

From the results presented in table 1, we have noticed that the Tetra Roşu genotype showed superior values regarding the root weight and fresh leaf weight. The diploid genotypes presented a low values for the same traits. The values have been compared with the ones of the plants cultivated in normal conditions, representing the three-year mean. The results for the normal plants were presented in table 2.

Table 2

The characteristics of forage beet plants cultivated in normal conditions

Genotype	Root weight (g) x±sx	Root size (cm) x±sx	Total weight (root.+leaf)g x±sx	Fresh leaf weight (g) x±sx
Tetra Roşu	1126 ± 98.8	15 ±0.18	1410 ±213.7	260 ± 4.50
Tetra 181	2642 ±196.5	31 ± 1.12	2642 ± 311.6	327 ± 4.44
Monogal	990 ± 86.3	16 ± 0.21	1348 ± 186.5	250 ± 3.64
Ursus	781 ± 57.4	17 ± 0.18	890 ± 99.9	84 ± 1.76

In comparison with the traits of normal plants, we observed a considerable improvement of these traits in forage beet somaclones (Fig. 1, 2, 3, 4).

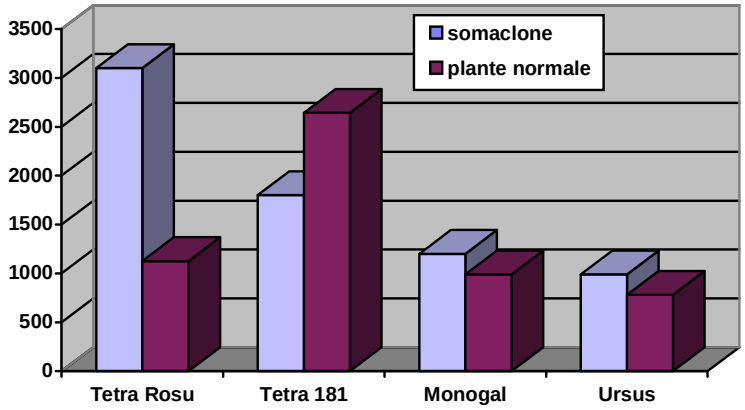

Fig. 1. The comparison of root weight in somaclones and in normal forage beet plants

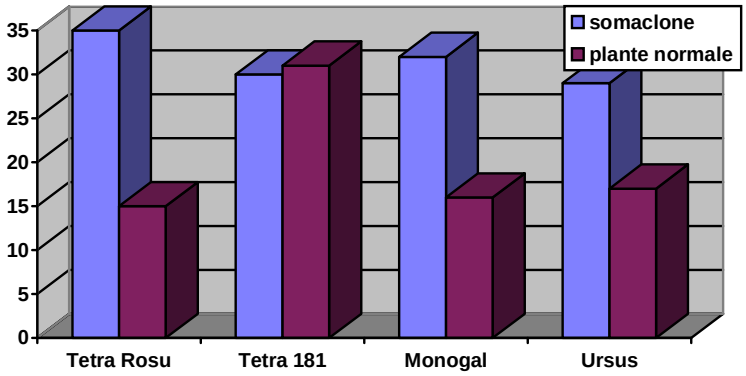

Fig.2. The comparison of root size in somaclones and in normal forage beet plants

The tetra 181 presented decreased values for root weight, size and total weight. The other genotypes presented an important increase of feature values at somaclonal level, in comparison with the normal plants. On one hand, we presume that the increase of feature values in forage beet somaclones was due to the effect of "in vitro" culture, which activated some biosynthetic processes and, on the other hand, it was due to the stimulating effect of procaine, a substance used in acclimatization period. The forage beet somaclones were healthy, free of disease symptoms.

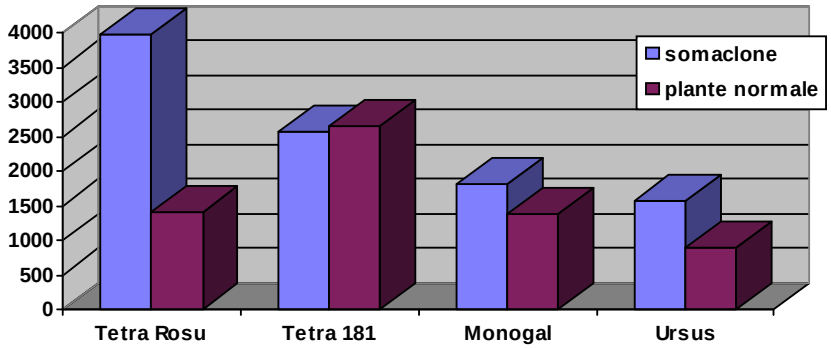

Fig. 3. The comparison of total weight in somaclones and in normal forage beet plants

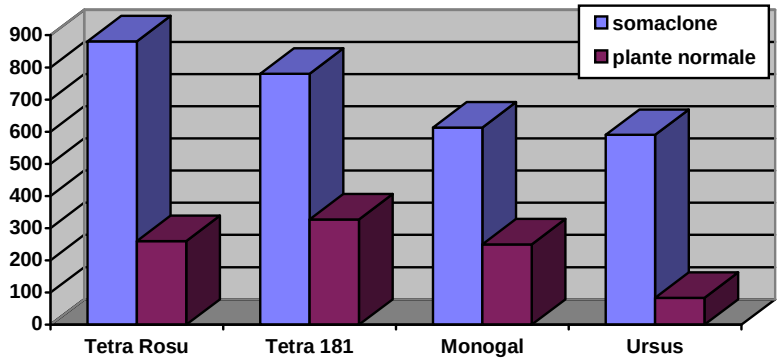

Fig. 4. The comparison of leaf weight in somaclones and in normal forage beet plants

CONCLUSIONS

The long-term "in vitro" culture can determine the appearance of some changes of the agronomic features. Some of these can be used in the plant breeding programs.

"In vitro" culture conditions preserve the genotypes resistance to diseases.

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