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THE INFLUENCE OF DEVELOPMENT LEVEL OF VINES ON THE BIOMETRIC INDICES OF CARDINAL VARIETY

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Abstract

The grape quality is determined by the development of vines. Homogeneity of plant development depends on the quality of planting material and agrotechnics used. In our study on vineyards, the vines were classified in three groups - the small, medium and large vines. The vines within each group were studied weak, medium and strong shoots, setting a specific correlation.

Key words: *biometric indices, Cardinal variety, influence.*

INTRODUCTION

Viticulture is and will remain one of the basic branches of economy of the Republic of Moldova. Today the scientists are working to select the varieties and clones resistant to various adverse factors, high productivity and quality. Moldova has favorable conditions for growing grapes, but winters in recent years have lower minimum temperatures influencing productivity and quality. Therefore, recommended to protect the vines of table grapes' varieties and clones with soil even in the South of Moldova, especially varieties with early bud break, for example, the table grape variety Cardinal.

The grapes' resistance to frost and winter conditions is a multilateral particularities of the vines, because gradually formed long before installing the low temperatures. This complex of characteristics and agronomic measures are determining the longevity of vineyard plantation and the development level of vines. The vines of the Cardinal variety are characterized with average growth vigor. Level vine growth is determined mostly by the homogeneity and quality planting material.

The vigor of varieties is given with in a length and diameter of the shoots. In the experience, we studied both data diameter as well as length.

MATERIALS AND METHODS

The vineyards which we studied are located in Copceac village, Stefan Voda district, in a South-East part of Republic of Moldova, in 2011-2012 years.

The vines of vineyards were classified into three categories: small grow vigor, medium grow vigor and large grow vigor and the shoots were classified into the same three categories.

The observations and analyzes were performed according to current guidelines (Mănescu, Creola, ş.a., 1989; Perstniov, N, ş.a., 2000).

Results were processed by the method of correlation and regression analysis:

- small grow vigor vines (y_1, y_2, y_3, y_4), medium grow vigor vines (y_9, y_{10}, y_{11}, y_{12}), large grow vigor vines (y_{17}, y_{18}, y_{19}, y_{20}), general data (y_{25}, y_{26}, y_{27}, y_{28});
- small grow vigor shoots (y_1, y_9, y_{17}, y_{25}), medium grow vigor shoots (y_2, y_{10}, y_{18}, y_{26}), large grow vigor shoots (y_3, y_{11}, y_{19}, y_{27}), general data (y_4, y_{12}, y_{19}, y_{28}).

RESULTS AND DISCUSSIONS

Cardinal-is an early table grape variety. The grapes are large, cylindrical-conical shape. The berry density is different. The berries are very large, spherical or oval, red-violet, covered with obscure bloom. The peel is thick, but edible. The berries begin to ripening in late I-II decade of august. Productivity is high. The grapes have a high transportability.

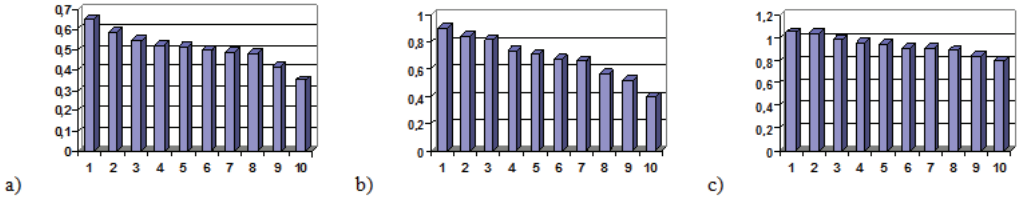


Figure 1. The diameter of internodes of shoots with small grow vigour
(a-small vigour shoots, b-medium vigour shoots, c-large vigour shoots)

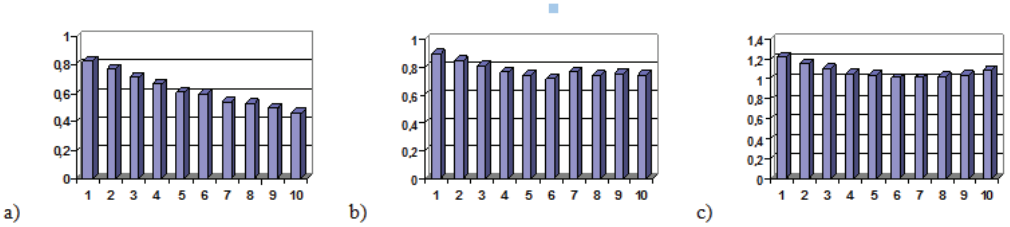


Figure 2. The diameter of internodes of shoots with medium grow vigour
(a-small vigour shoots, b-medium vigour shoots, c-large vigour shoots)

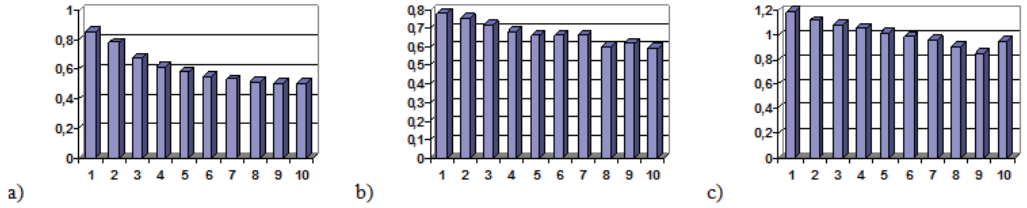


Figure 3. The diameter of internodes of shoots with large grow vigour
(a-small vigour shoots, b-medium vigour shoots, c-large vigour shoots)

The data from figure 1 showed that the diameters of internodes of small grow vigor was between 0,35 to 0,65 cm for small shoots, from 0,40 to 0,94 cm for medium shoots and from 0,79 to 1,05 cm.

The data from figure 2 showed that the diameters of internodes of medium grow vigour was between 0,46 to 0,83 cm for small shoots, from 0,74 to 0,89 cm for medium shoots and from 1,09 to 1,22 cm.

The data from figure 3 showed that the diameters of internodes of large grow vigor was between 0,51 to 0,85 cm for small shoots, from 0,59 to 0,78 cm for medium shoots and from 0,94 to 1,20cm.

The data from figure 4 showed that the length of internodes of small grow vigor was between 1,60 (1^{st} internodes) to 4,10 cm (8^{th} internodes) for small shoots, from 3,85 (1^{st} internodes) to 7,25 cm (4^{th} internodes) for medium shoots and from 2,63 (1^{st} internodes) to 7,90 cm (5^{th} internodes).

The data from figure 5 showed that the length of internodes of medium grow vigor was between 2,30 (1^{st} internodes) to 7,27 cm (5^{th} internodes) for small shoots, from 3,13 (1^{st} internodes) to 9,80 cm (8^{th} internodes) for medium shoots and from 3,84 (1^{st} internodes) to 11,74 cm (5^{th} internodes).

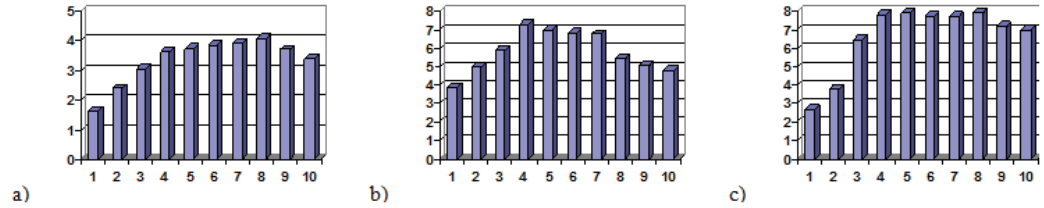


Figure 4. The length of internodes of shoots with small grow vigour (a-small vigour shoots, b-medium vigour shoots, c-large vigour shoots)

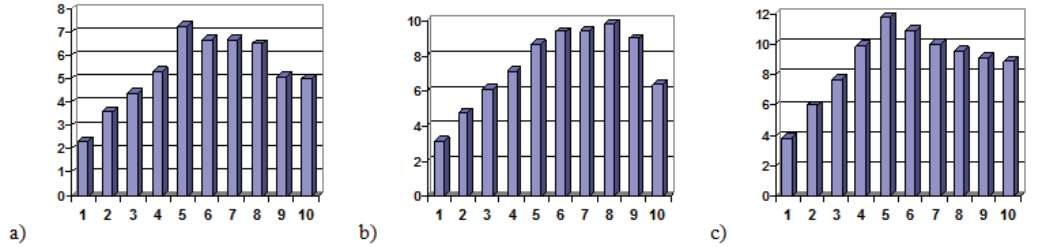


Figure 5. The length of internodes of shoots with medium grow vigour (a-small vigour shoots, b-medium vigour shoots, c-large vigour shoots)

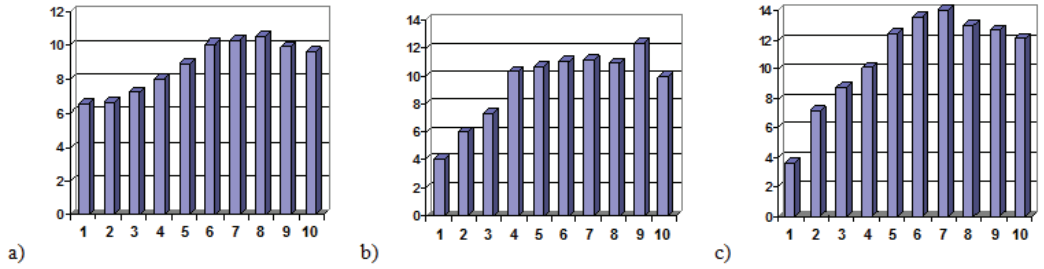


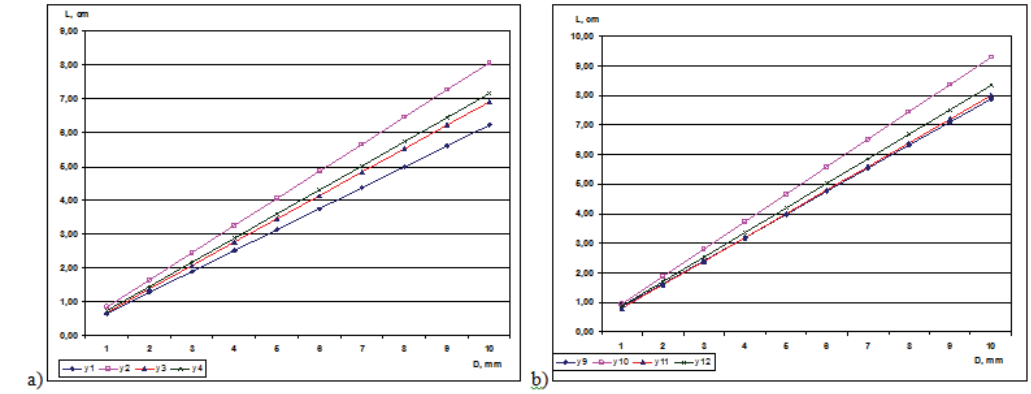
Figure 6. The length of internodes of shoots with large grow vigour (a-small vigour shoots, b-medium vigour shoots, c-large vigour shoots)

The data from figure 6 showed that the length of internodes of large grow vigor was between 6,53 (1st internodes) to 10,50 cm (8th internodes) for small shoots, from 4,10 (1st internodes) to 12,40 cm (9th internodes) for medium shoots and from 3,64 (1st internodes) to 14,00 cm (7th internodes).

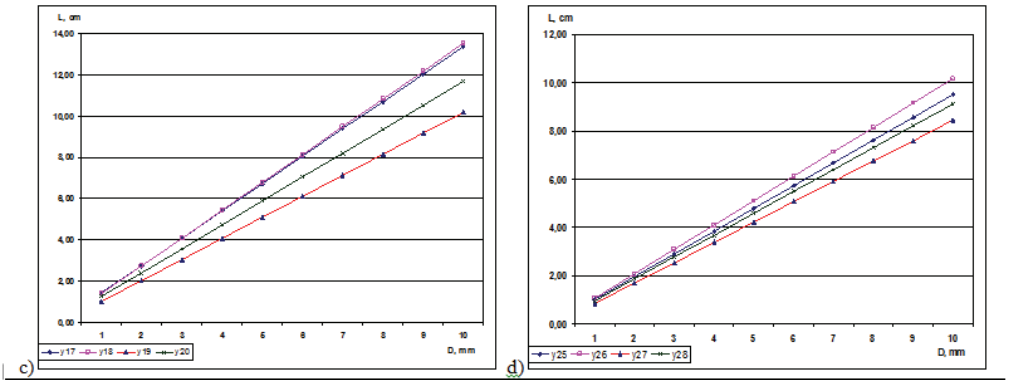
The data from figure 7 showed the correlation between the length and diameters of internodes for each group of shoots and grow vigor of vines. For small vines we obtained the next equation of regression y_4=0,02761+0,7134x, correlation coefficient r=0,46, coefficient of determination d_{yx}=0,2116 (figure 7a). For medium vines we obtained the next equation of regression y_{12}=0,03575+0,8317x, correlation coefficient r=0,28, coefficient of determination d_{yx}=0,0784 (figure 7b). For large vines we obtained the next equation of regression y_{20}=0,09795+1,1592x, correlation coefficient r=-0,08, coefficient of determination d_{yx}=0,0064 (figure 7c). For all vines (the general data), we obtained the next equation of regression y_{28}=0,05181+0,9067x, correlation coefficient r=0,21, coefficient of determination d_{yx}=0,0441 (figure 7d).

The general data of all vines for small vigor shoots showed the next equation of regression y_{25}=0,05324+0,9454x, correlation coefficient r=-0,07, coefficient of determination d_{yx}=0,0049 (figure 7d). For medium vigor shoots showed the next equation of regression y_{26}=0,04636+1,0117x, correlation coefficient r=-0,32, coefficient of determination

d_{yx}=0,1024 (figure 7d). For high vigor shoots showed the next equation of regression y_{27}=0,02148+0,8435x, correlation coefficient r=-0,37, coefficient of determination d_{yx}=0,1369 (figure 7d).



y_1=0,03853+0,6186x	r=-0,69+-0,26	d_{yx}=0,4761	y_9=0,06944+0,7819x	r=-0,68+-0,26	d_{yx}=0,4624
y_2=0,04423+0,8024x	r=-0,01+-0,35	d_{yx}=0,0001	y_{10}=0,02371+0,928x	r=-0,88+-0,17	d_{yx}=0,7744
y_3=0,01789+0,6913x	r=-0,69+-0,26	d_{yx}=0,4761	y_{11}=0,01651+0,7994x	r=-0,95+-0,11	d_{yx}=0,9025
y_4=0,02761+0,7134x	r=0,46+-0,17	d_{yx}=0,2116	y_{12}=0,03575+0,8317x	r=0,28+-0,18	d_{yx}=0,0784



y_{17}=0,10386+1,327x	r=-0,93+-0,13	d_{yx}=0,8649	y_{25}=0,05324+0,9454x	r=-0,07+-0,19	d_{yx}=0,0049
y_{18}=0,04482+1,3498x	r=-0,85+-0,19	d_{yx}=0,7225	y_{26}=0,04636+1,0117x	r=-0,32+-0,18	d_{yx}=0,1024
y_{19}=0,03991+1,0205x	r=-0,88+-0,17	d_{yx}=0,7744	y_{27}=0,02148+0,8435x	r=-0,37+-0,18	d_{yx}=0,1369
y_{20}=0,09795+1,1592x	r=-0,08+-0,19	d_{yx}=0,0064	y_{28}=0,05181+0,9067x	r=0,21+-0,1	d_{yx}=0,0441

Figure 7. Results of correlation and regression analysis between length and diameters of internodes of shoots

CONCLUSIONS

The correlation between the length and diameters of internodes for small, medium and large grow vigor of vines showed the insignificant weak correlation between these indicators. This is due to the biology of variety, quality of planting material and climatic conditions.

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