

The behaviour of some wine grapes varieties under some different technological sequences cultivated in Buzias - Silagiu viticultural center

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Abstract

Researches were made in order to establish the influence of some different technological models upon wine grapes varieties behavior in Buzias-Silagiu viticultural centre conditions.

Experimental plots were represented by different fruit loadings which are disposed on different length elements, different technological soil maintenance systems (black field, soil maintenance using herbicides, permanent grassing, plants cultivation as green fertilizers) and works, and different in green operations.

In case of all varieties technological factors influence was obvious, having in most of the cases statistical cover.

1. Introduction

Culture technologies are applied differently taking into consideration biological peculiarities and technological requirements of the cultivated variety, taking into consideration in the same time the ecological resources of each area and technical and financial possibilities of each viticultural exploitation.

Culture technologies should take account by the biological concept which is more and more present in viticulture in order to reduce at minimum the noxious impact upon soil and environment.

In culture technologies framework soil maintenance systems, in green works and operations and cutting systems are technological sequences with major impact upon quantitative and qualitative yield.

2. Materials and methods

Researches were made during 2007 year in Buzias-Silagiu viticultural center and were focused on different technological sequences influence upon quantitative and qualitative yield in case of: Riesling Italian, Sauvignon Blanc, Mustoasa de Maderat, Cabernet Sauvignon, Merlot and Pinot Noir varieties.

Experimental plots consist of different soil maintenance systems (black field, soil maintenance using herbicidation, plants cultivation for green fertilizers, permanent grassing), different fruit loadings distributed on short or long elements, different in green works and operations.

Observations and determinations were made on varieties and experimental plots concerning quantitative and qualitative grapes yield.

Plantations were researches were made are in total ripeness period. Planting distances are 2,2 m between rows and 1 m between trunks/row.

3. Results and discussions

Results concerning soil maintenance systems influence upon yield and its quality are presented in Table 1 and Table 2.

Quantitative yield was significantly influenced by soil maintenance systems. Absolutely in case of all varieties the highest yields were obtained in case of soil maintenance system using plants cultivation as green fertilisers. Registered differences between this variant and control (black field) had statistical cover in case of all varieties.

Soil maintenance system using herbicidation compared with the control, lead to the obtaining of some superior yield without being assured statistically speaking, excepting Merlot variety.

Permanent grassing in case of some relative droughty years lead to the obtaining of some yield slightly inferior to control, without having statistical insurance

By all means permanent grassing remains a maintenance variant which requires lower maintenance costs and reduces the noxious impact upon soil.

Soil maintenance system influence upon yield quality was less obvious. From this point of view the control (black field) lead to the obtaining of the highest sugars content in case of all studied varieties. The lowest sugar content was registered in case of the plots where green fertilizers were applied.

Table 1. Soil maintenance systems influence upon grapes yield in 2007

Variety	Soil maintenance systems				Average	Difference to the control			Significance		
	Black field (Control)	Herbicide	Green fertilizers	Permanent grassing		Herbicide	Green fertilizers	Permanent grassing	Herbicide	Green fertilizers	Permanent grassing
Riesling italian	10925	11135	11625	10876	11140,25	+210	+700	-49	-	**	-
Sauvignon blanc	9754	9956	10025	9720	9863,75	+202	+271	-34	-	*	-
Mustoasa de Maderat	13225	13280	13875	13002	13345,5	+55	+650	-223	-	***	-
Cabernet Sauvignon	8120	8215	8520	7925	8195	+95	+400	-195	-	*	-
Merlot	8921	9324	9517	8758	9130	+403	+596	-163	**	**	-
Pinot noir	7110	7305	7530	6970	7228,75	+195	+420	-140	-	*	-

Riesling italian	DL 5% = 282,1	DL 1% = 465,1	DL 0,1% = 732,3
Sauvignon blanc	DL 5% = 278,3	DL 1% = 437,5	DL 0,1% = 643,1
Mustoasă de Măderat	DL 5% = 246,2	DL 1% = 411,6	DL 0,1% = 627,3
Cabernet Sauvignon	DL 5% = 273,4	DL 1% = 531,2	DL 0,1% = 928,1
Merlot	DL 5% = 298,2	DL 1% = 397,5	DL 0,1% = 608,9
Pinot Noir	DL 5% = 284,2	DL 1% = 598,3	DL 0,1% = 972,1

Table 2. Soil maintenance systems influence upon yield quality in 2007

Soil maintenance systems	Variety	Sugar (g/l)	Acidity (g/l H ₂ SO ₄)	Glucosidimetric index	Difference to the control (sugar g/l)	Significance
Black field (Control)	Riesling italian	194	4,8	40,41	-	-
	Sauvignon blanc	198	4,3	46,04	-	-
	Mustoasa de Maderat	177	5,8	30,51	-	-
	Cabernet Sauvignon	197	4,3	45,81	-	-
	Merlot	195	4,4	44,31	-	-
	Pinot noir	205	4,1	50	-	-
Herbicide	Riesling italian	192	5,1	37,64	-2	-
	Sauvignon blanc	195	4,5	43,33	-3	-
	Mustoasa de Maderat	175	5,9	29,66	-2	-
	Cabernet Sauvignon	192	4,6	41,73	-5	-
	Merlot	192	4,5	42,66	-3	-
	Pinot noir	203	4,2	48,33	-2	-
Green fertilizers	Riesling italian	186	5,6	33,21	-8	0
	Sauvignon blanc	192	4,7	40,85	-6	0
	Mustoasa de Maderat	167	6,9	24,20	-10	0
	Cabernet Sauvignon	190	4,7	40,42	-7	0
	Merlot	190	4,8	39,58	-5	-
	Pinot noir	194	4,6	42,17	-11	0
Permanent grassing	Riesling italian	190	5,2	36,53	-4	0
	Sauvignon blanc	192	4,7	40,85	-6	0
	Mustoasa de Maderat	172	6,4	26,87	-5	-
	Cabernet Sauvignon	191	4,6	41,52	-6	-
	Merlot	190	4,8	39,58	-5	-
	Pinot noir	196	4,7	41,70	-9	0

Riesling italian	DL 5% = 6,02	DL 1% = 9,26	DL 0,1% = 16,31
Sauvignon blanc	DL 5% = 5,72	DL 1% = 8,93	DL 0,1% = 15,21
Mustoasa de Maderat	DL 5% = 7,11	DL 1% = 11,4	DL 0,1% = 18,7
Cabernet Sauvignon	DL 5% = 6,12	DL 1% = 9,78	DL 0,1% = 17,2
Merlot	DL 5% = 6,15	DL 1% = 10,41	DL 0,1% = 17,7
Pinot noir	DL 5% = 7,89	DL 1% = 11,6	DL 0,1% = 19,2

Table 3. Different cuttings influence upon yield in 2007

Variety	Indicator	Fruit loadings (eye/vine)					
		20 eyes		30 eyes		40 eyes	
		on short elements	on long elements (control)	on short elements	on long elements	on short elements	on short elements
Riesling italian	Yield (kg/ha)	9340	9715	11125	11350	10920	11275
	Difference to the control	-375	-	+1410	+1635	+1205	+1560
	Significance	-	-	**	**	**	**
Sauvignon blanc	Yield (kg/ha)	8215	8748	9930	10725	10165	10530
	Difference to the control	-533	-	+1182	+1977	+1417	+1782
	Significance	-	-	*	**	**	**
Mustoasa de Maderat	Yield (kg/ha)	8216	9175	11230	13385	12160	14082
	Difference to the control	-959	-	+2055	+4210	+2985	+4907
	Significance	0	-	**	***	***	***
Cabernet Sauvignon	Yield (kg/ha)	6275	7510	7120	8375	7325	8115
	Difference to the control	-1235	-	-390	+865	-185	+605
	Significance	000	-	0	**	-	**
Merlot	Yield (kg/ha)	7210	8325	8176	9310	8340	9280
	Difference to the control	-1115	-	-149	+985	+15	+955
	Significance	00	-	-	**	-	**
Pinot noir	Yield (kg/ha)	6675	6935	7345	7525	7210	7450
	Difference to the control	-260	-	+410	+590	+275	+515
	Significance	-	-	*	**	-	*

Riesling italian
Sauvignon blanc
Mustoasă de Măderat
Cabernet Sauvignon
Merlot
Pinot noir

DL 5% =625,3
DL 5% = 713,4
DL 5% =915,3
DL 5% = 387,6
DL 5% =412,6
DL 5% =369,2

DL 1% = 1153,5
DL 1% =1336
DL 1% =1575,2
DL 1% = 598,2
DL 1% = 715,8
DL 1% =537,2

DL 0,1% =1975,6
DL 0,1% =2105,8
DL 0,1% =2736,1
DL 0,1% =1025,3
DL 0,1% =1293,6
DL 0,1% =975,3

In table 3 are presented results concerning different cuttings influence upon yield. Qualitatively speaking varieties echelons according to their genetic potential, being still influenced a lot by the fruitiness charge let on vine after cutting. In Mustoasa de Maderat case, a vigorous variety, with a high productivity, maximum yield was obtained in case of the plot where 40 eyes/ vines were let being distributed on cords (14082 kg/ha).

Yields decreased as far as on the vine the number of eyes was smaller, the registered differences to the control having a very distinctive significance. In case of this variety was registered the highest difference between short cutting system and long cutting system.

In other varieties case, the highest yields were registered in 30 eyes/vine case distributed on long elements. Charges smaller or higher than 30 eyes/vine lead to the obtaining of some inferior yields.

In case of the less vigorous varieties as Riesling Italian and Pinot noir yield differences between tap cut variants and cord cut variants were small, when necessary, these varieties lend themselves to short cutting, fact which imply less workforce.

Varieties which have high vigour as Mustoasa de Maderat, Cabernet Sauvignon and Merlot registered high differences between tap cut variants and cord cut variants, short cut in case of these varieties being less indicated.

In table 4 are presented in green works and operations influence upon yield and its quality, in case of all studied varieties.

Although in green operations have a more visible effect in case of table grapes varieties, they have influenced yield and its quality in case of all wine varieties from our experiment.

The highest yields were obtained in case of the plots where sprig weeding and top removal were made.

Absolute all experimental plots obtained superior yields to the control, in which's case any in green operation was made.

The smallest yield increases to the control were registered in case of sprig top removal.

In green operations had an important influence upon sugar content also, in case of all variants in which's case in green operations were made, registered sugar content outruns the control.

As concerns yield quality the plot in which sprigs were top removed gave superior results to the plot where sprigs' weeding was applied.

Table 4. "In green" works and operations influence upon yield and grapes quality in 2007

Variety	Yield (kg/ha)					Sugar content (g/l)				
	Without in green works (control)	Sprig weeding out	Sprig top removal	Weeding +Top removal	Average	Without in green works (control)	Sprig weeding out	Sprig top removal	Weeding +Top removal	Average
Riesling italian	10875	11320	11025	11415	11158,75	182	188	192	196	189,5
Sauvignon blanc	9715	10515	10350	10835	10353,75	186	192	196	199	193,25
Mustoasa de Maderat	12920	13525	13380	13715	13385	168	170	176	180	173,5
Cabernet Sauvignon	7586	7912	7713	8275	7871,5	189	190	193	198	192,5
Merlot	8325	8975	8617	9275	8798	183	188	193	197	190,25
Pinot noir	6526	7230	6972	7575	7075,75	196	198	197	204	198,75

4.Conclusions

In case of different ecological resources conditions cannot be elaborated technological models universal valid, technologies must be adapted to concrete pedoclimatic conditions and to cultivated variety.

Soil maintenance systems have a huge influence concerning yield and impact upon environment.

In Buzias-Silagiu area conditions soil maintenance systems using plants cultivation as green fertilizers and permanent grassing are representing viable alternatives in order to replace black field. That's way, fuel consumption is reduced, soil features are ameliorated and environment pollution became smaller.

Practiced cutting plots dignified the positive influence of long elements upon yield.

In case of Riesling Italian and Pinot noir varieties, short cut plots registered close values to long cut plots, resulting viable cutting variants, more economic.

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