

# THE AGROBIOLOGICAL AND TECHNOLOGICAL VALUE FOR GELU TABLE GRAPEVINE VARIETY IN VINEYARD AREA OF IASI

## VALOAREA AGROBIOLOGICĂ ȘI TEHNOLOGICĂ A SOIULUI PENTRU STRUGURI DE MASĂ GELU, ÎN CONDIȚIILE PODGORIEI IAȘI

**ROTARU Liliana, MUSTEA M., IRIMIA L., PETREA Gabriela**  
University of Agricultural Sciences and Veterinary Medicine of Iași, Romania

**Abstract.** *In the zone of the North-East of Romania, characterizes by the restrictive climatic conditions (the winters cold and be torrid for it and drynesses), the type of vines for the grapes of table have the less favorability, being cultivates especially the Chasselas type of vine gilds. For at the time the units of research wine in Romania centered their research of improvement of vine for obtain new genotypes which have the best adaptability with the these restrictive factors and the shorter growing period. The table grape variety Gelu, constitute one of the most valuable Romanian creation. It was obtain at SCDVV Iasi by Gh. Calistru and Doina Damian (1998) in follow Coarnă neagră seeds radiated with X rays. In this paper, the authors present the behaviour of table grape Gelu in area ecoclimatic condition of Copou vineyard, where it constitute one of most valuable variety, which allows obtain greats and best quality productions in NE of Moldavia area.*

**Key words:** Gelu, grapevine variety, Iași, fertility, productivity.

**Rezumat.** *Zona de nord est a României este caracterizată prin condiții climatice restrictive (ierni geroase, veri călduroase și secetoase) pentru cultura soiurilor de viță de vie pentru struguri de masă, de aceea aici se cultivă mai ales soiurile de tipul Chasselas. Tocmai de aceea, unitățile de cercetare vitivinicolă din România și-au îndreptata atenția către obținerea de noi genotipuri care să fie mult mai bine adaptate la aceste condiții restrictive și care să prezinte perioadă scurtă de vegetație. Soiul de viță de vie Gelu este una din aceste creații. el a fost obținut la SCDVV Iasi de către Gh. Calistru și Doina Damian (1998) din semințe de Coarnă neagră iradiate cu raze X. În această lucrare sunt prezentate valoarea agrbiologică și tehnologică a soiului Gelu, care asigură obținerea unei producții de struguri pentru struguri de masă de calitate foarte bună în condițiile zonei de NE a Moldovei.*

**Cuvinte cheie:** Gelu, struguri de masă, Iași, fertilitate, productivitate.

### INTRODUCTION

The variety of Gelu consumption grapes is one of the most valuable Romanian creations. It was obtained at SCDVV Iași following Coarnă neagră seeds radiated with X rays. It has widely spread in other vineyards, where it proved its special quality (Damian D. and al., 2006).

In Romania this variety has been recently introduced in most vineyards whose production objective is to obtain varieties of consumption grapes. This

paper is meant to outline the behavior of the Gelu grape variety in the ecoclimatic conditions of the Copou Iasi Viticultural Center, one of the most valuable varieties, which enables the obtaining of extensive and high quality productions in the North-Eastern zone of Moldavia, the area of the Copou viticultural center, together with other important creations obtained at SCDVV Iasi, such as the Aromat de Iași and Paula varieties (Rotaru L. and al., 2002).

## **MATERIAL AND METHOD**

The study was performed in the Copou viticultural center, at ampelographic collection of University of Agricultural Sciences and Veterinary Medicine of Iași, in a experimental plantation with the Gelu variety, grafted on the mother plant Berlandieri x Riparia Selection Oppenheim-4. On the plantation, the vines are directed on semitall stems, bilateral cord, with cutting in crop chains (taps 2 eyes + cord 5-6 eyes), with the attribution of a cutting load of 40-45 eyes per vine.

The observations and calculi were performed in the period 2007-2009 and focused on: the resistance of the variety to frost, the development of the vegetation phenophases, grape fertility and productivity, resistance to diseases and damages, quantity and quality of the grapes production.

## **RESULTS AND DISCUSSIONS**

The Iasi vineyard meets many of the habitat conditions for vine, in relation to the support factors (litho-morpho-pedologic), as well as to the external ones (bioclimatic). The main climatic indexes: the duration of the vegetation period 170-180 days, the annual average temperature, 11.3 degrees Celsius in 2007, 11,5 degrees Celsius in 2008 and 11.7 degrees Celsius in 2009, the global thermal situation 3700-3800<sup>0</sup>C, the active thermal situation 3200-3350<sup>0</sup>C, the useful thermal situation 1400-1500<sup>0</sup>C, the real insolation 1400-1500 hours, the sum of annual rains 500-550 mm; in 2007 - 2009 the vegetation periods were of only 296-312 mm. In the study years, the absolute minimum value -25.1 C, was registered in the month of December of 2007, and the maximum value reached 42.3°C in August 2009 .

Consequently, in this vineyard one can grow vine varieties with a medium vegetation period, with moderate requests in relation to temperature and humidity, good resistance to frost, except for the years with climatic accidents (Cotea D.V. and al., 2000).

Gelu grapevine variety is resulting from seeds resulted from free pollination from the type of vine Coarnă neagră irradiated with x-rays. Obtained with the SCDVV Iași, Gh. Calistru and Doina Damian authors, approved in 1998. Type of vine of II-e epoch (1 -15 August), which presents the large adult sheet (17-18 cm), glabrous, pentalobe, of color dark green to the slightly corrugated limb, completed. The side sines are U-shaped with the slightly superimposed lobes, and the petiolar sine in the shape of quadrant. The grapes of intermediate size, cylindro-conical, uniaxial, bi or are triailés, semi-compact. The grain of intermediate size towards large, elliptic, with the film of color blue-purple, is

covered with bloom. Pulp is without color, semi-crunching with frank savour, agreeably harmonious (Rotaru L. and al., 2008).

*The losses of buds during the winter.* In the years with a normal thermal regime the Gelu variety (figure 1) registers losses of the main buds, the losses of buds exceed 24.9% and the application of compensation cutting is necessary in order to obtain a normal production of grapes.

In the years when the minimum absolute temperatures decrease under the resistance limit of the variety (2007), the losses of buds exceed 24.9%, thus requiring compensation cutting in order to obtain a normal production of grapes.

*The development of the vegetation phenophases* (table 1). Function of the climatic conditions of the year, it has been noticed that the Gelu variety enters in vegetation in the second half of April, being protected from the danger of late spring frost (15 April), and the blossoming occurs in the first decade of the month of June. The ripening of the grapes takes place at the end of July, when the grapes reach maturity, in the second decade of the month of August, according to the second epoch.



**Fig. 1.** Gelu grapevine variety

The vegetation period ends with the ripeness of the twigs and the fall of the leaves, phenophases that are strongly conditioned by the climatic regime of the area of the Iasi vineyard; for the Gelu variety, these phases take place after October 15, with the appearance of the first autumn frost.

Table 1

**The development of the vegetation phenophases  
at Gelu grapevine variety in the Iași vineyard  
(years 2007-2009)**

Years	Budding	Flowering	Ripeness of the grapes	Maturation of the grapes	Falls of the sheets
2007	24.04	5.06	31.07	18.08	20.10
2008	22.04	4.06	28.07	17.08	23.10
2009	20.04	1.06	26.07	15.08	25.10

*The fertility and productivity of the grapevine variety* (table 2). The Gelu variety is characterised by medium fertility and increased productivity, due to the size of the grapes.

The percentage of fertile twigs varies between 60% and 70%. The values of the fertility quotas were: c.f.a 1,00-1,05, c.f.r. 0,64-0,69, which indicates the fact that a single inflorescence forms on a twig, in average, and consequently, the application of the green rate setting operation is not necessary.

The productivity of this variety is very high, due to the weight of the grapes, which is of approximately 400 g. The values of the productivity indexes were: i.p.a. 427,45-513,45, i.p.r. 282,20-312,96.

Table 2

**The fertility and productivity of the  
Gelu grapevine variety in the Iași vineyard  
(years 2007-2009)**

Years	The percentage of fertile twigs	C.f.a.	C.f.r.	The average weight of the grape (g)	i.p.a.	i.p.r
2007	60	1,05	0,64	400	513,45	312,96
2008	63	1,04	0,65	388	403,52	252,20
2009	65	1,03	0,68	415	427,45	282,20
<i>Average</i>	<i>62,5</i>	<i>1,04</i>	<i>0,67</i>	<i>401</i>	<i>448,24</i>	<i>282,45</i>

*Resistance to diseases and damages* (table 3). The appreciation of the level of resistance was performed according to the O.I.V. norms, with the help of descriptors. We analyzed the behavior of the variety in relation to biotic and abiotic factors. It was observed that the Gelu variety presents a good level of resistance to the grey rot of the grapes, medium tolerance to manna and mildew. Under the aspect of tolerance to damages, the Gelu variety has medium tolerance to the attack of grape moths and sensitivity to spiders, especially to the red spider. It has medium resistance to drought and is a little more sensitive to frost.

Table 3

**Resistance to diseases at the  
Gelu grapevine variety in the Iași vineyard  
(years 2007-2009)**

Years	Resistance of manna		Resistance of mildew		Resistance of grey rot	
	levels	grapes	levels	grapes	levels	grapes
2006	5	4	5	6	3	4
2007	6	5	5	5	3	4
2009	4	5	4	6	2	3

*Quantity and quality of grapes production* (table 4). The Gelu variety has a very increased productivity capacity, of over 20t/ha, and with a percentage of 83% of merchandise production; the quantity of traded grapes was of about 16-17t/ha.

Table 4

**Quantity and quality of grapes production  
at the Gelu grapevine variety in the Iași vineyard  
(years 2007-2009)**

Years	The average weight of the grape (g)	Weight of a 100 berries (g)	Production		Percent of the merchandise production	Sugar accumulations (g/l)	Total acidity (g/l H <sub>2</sub> SO <sub>4</sub> )	Glucoacidimetric index
			kg/stock	t/ha				
2007	400	385	5,1	19,3	84	170	4,0	42,50
2008	388	368	6,2	23,0	82	160	4,8	33,33
2009	415	400	5,0	18,8	86	165	4,5	36,66
<i>Average</i>	<i>401</i>	<i>384,3</i>	<i>5,4</i>	<i>20,3</i>	<i>84</i>	<i>165</i>	<i>4,4</i>	<i>37,49</i>

From the analysis of the table it results that the Victoria grape has very big grapes, this feature being less influenced by the climatic conditions of the year and by the agrotechnical level applied at the plantation.

From a qualitative perspective, the Victoria variety has sugar accumulations within the specific limits of consumption grapes 165-170 g/l, with total acidity of the must, balanced with 4,3 g/l H<sub>2</sub>SO<sub>4</sub>, so that the value of the glucoacidimetric index approaches the optimum value of 37,49.

## CONCLUSIONS

1. In the ecoclimatic conditions of the Iasi vineyard, the Gelu variety can be cultivated with good results, since it reacts very well under the temporal aspect, and registers large and high quality productions.

2. The introduction of the Gelu variety in the category of consumption grapes of the Iasi vineyard brings diversity to the grapes variety and enables the consumption of these varieties for a longer period of time.

3. Due to medium resistance to frost and drought, when setting up new plantations one must give special attention to the growing surface and exclude those lands with high frequency of climatic accidents or with long periods of drought during the summer.

## ACKNOWLEDGMENTS

*This study was financed by the National Center of Program Management, EUREPGAP project, no. 52-113/15.09.2008*

## REFERENCES

1. **Cotea D.V., Barbu N., Grigorescu C., Cotea V.V.**, 2000 – *Podgoriile și vinurile României*. Ed. Academiei Române, București.
2. **Damian Doina, Savin C., Vasile Ancuța, Zaldea Gabi**, 2006 - *Valoarea agrobiologică și tehnologică a unor soiuri noi și clone create la SCDVV Iași*. Lucr. Științif. USAMV Iași, seria Hortic., vol. 1 (49).
3. **Rotaru Liliana, Țârdea C., Mustea M.**, 2002 – *Comportarea soiurilor noi pentru struguri de masă, create la SCH Cluj-Napoca, în condițiile ecoclimatice ale podgoriei Iași*. Lucr. Științif. USAMV Iași, seria Hortic., vol. 1 (45).
4. **Rotaru Liliana, Mustea M., Zamfir C., Cotea V.V., Vasile Ancuța**, 2008 - *New vinifera creations for table grapes in the restrictive conditions of culture in the North-Eastern area of Romania*. XXXI<sup>th</sup> – World Congress of Vine and Wine OIV, Verona, 15-20 June.