At further explanation we summarize results from second grade of selection for five genotypes which seems to be the most interesting. All five have been registered at the Yugoslav commission for homologation of new cultivars.

With Traminer were compared:
NSK 77–14/17 (Kunleany x Muscat Ottonel)
SK 77–5/3 (Kunbarat x Pinot Noir)

With Italian Riesling were compared:
SK 76–3/3 (Irshai Oliver x Kunleany)
SK 77–12/6 (Kunleany x Pinot Gris)
SK 77–10/69 (Italian Riesling x Kunbarat)

Table 3. Meteorological Data for Sremski Karlovci

Records	Period	Year 1982	1983	1984	1985	1986	1982–1986	1949–1968
Mean daily air temperature °C	Annual	11.6	12.3	11.2	10.8	11.2	11.4	11.7
	4/15–10/31	17.9	18.4	17.3	17.1	18.0	17.7	17.3
Σ t °C	4/15–10/31	3592	3621	3454	3416	3597	3548	3633
Σ t° above 10 °C	4/15–10/31	1643	1715	1480	1495	1616	1590	1594
Rainfall mm	Annual	562	460	555	525	423	505	578
	4/15–10/31	358	320	315	277	266	307	353
Last frost in Spring	Date	4/23	3/14	4/29	3/14	3/3	4/3	4/11
	t °C	−0.5	−2.0	−0.4	−1.5	−0.1	–	–
First frost in Autumn	Date	11/6	10/25	11/12	11/16	12/4	10/25	10/23
	t °C	−2.0	−0.6	−1.1	−1.6	−0.5	–	–
Frostless period (days)		200	200	199	198	242	208	193
Absolute Minimum Temperature	January	−11.2	−4.5	−5.9	−17.4	−3.0	−17.4	−25.5
	February	−7.8	−8.1	−6.9	−16.4	−13.9	−16.4	−22.2
	March	−2.4	−6.5	−3.3	−2.7	−5.4	−6.3	−13.0
	December	−5.3	−4.5	−10.3	−3.3	−10.0	−11.5	−17.0

Yield and Grape Ripening Time

The lowest yield had selection SK 77–14/17 even lower than Traminer. The yield of this genotype was at the load of 6 nouds/m^2 considered as really low, although very stabile by years. This has been proved by very low values of standard error of arithmetic mean and variation coefficient (Table 4). The selection SK 77–5/3 has significantly higher yield then standard Traminer. Selections SK 76–3/3, SK 77–12/6 and SK 77–10/69 have shown higher yield compared to Italian Riesling. At the same time it has fluctuated less by years. The best results in this view has shown by SK 77–10/69.

Table 4. Grape Yield* (kg/m^2)

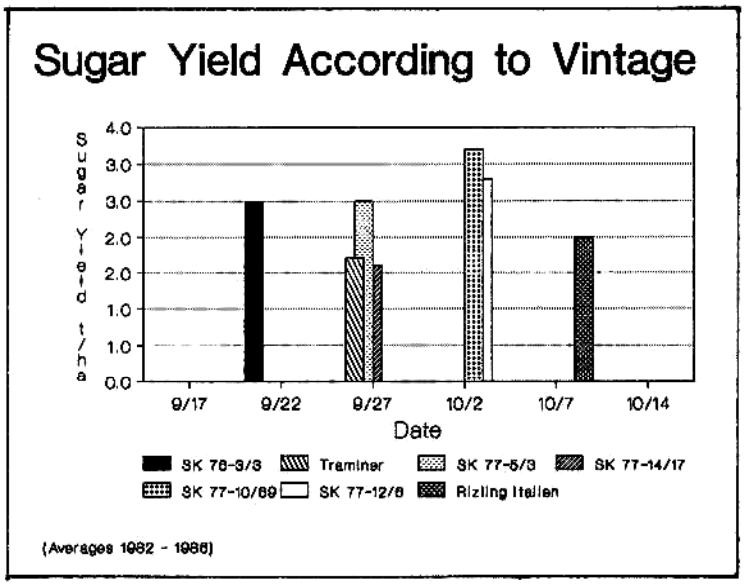
Cultivar	Year 1982	1983	1984	1985	1986	Averages X	s_X	v
Traminer	1.09	1.52	1.40	0.73	1.10	1.17	±0.17	26
SK 77–14/17	1.00	1.34	1.16	1.09	0.86	1.09	±0.10	16
SK 77–5/3	1.47	2.05	2.07	1.08	1.33	1.60	±0.25	28
SK 76–3/3	1.57	2.19	2.40	1.70	1.36	1.84	±0.24	24
SK 77–12/6	1.48	1.96	2.47	1.62	1.71	1.85	±0.22	21
SK 77–10/69	2.46	2.43	1.99	1.73	1.89	2.10	±0.18	16
Riesling It.	1.24	1.70	2.65	0.84	1.77	1.64	±0.38	41

* Locality: Sremski Karlovci
Number of vines: 36 (3x12)
Spacing: 3 x 1 M
Buds load: 6 buds/m^2; 18 buds/vine

X = mean value
s_X = standard error of mean value of P–0.05
v = coefficient of variation (%)

Graph 2 shows the average yield of sugar calculated on base of grape yield, must sugar content and 70% of must efficiency. These values are shown according to the average harvest date at five years. harvest date has been determined on the base of sugar content in grape.

Graph 2.



Selections SK 76–3/3 ripens the earliest. Compared to Traminer it ripens about a week before, while in comparison with Italian Riesling it ripens almost three weeks before.

Selections SK 77–14/17 and 77–5/3 ripen at the same time with Traminer, with fact that SK 77–5/3 has much higher sugar yield.

Selections SK 77–12/6 and SK 77–10/69 in average have been harvested a week before Italian Riesling. They have exceeded Italian Riesling in sugar yield considerably.

Grape Quality

Selections SK 77–14/17 and SK 77–5/3 like Traminer had high sugar content (Table 5). It is important as well that both selections, particularly SK 77–14/17, had higher level of acids compared to its standard. Selection SK 77–14/17 has shown high resistance to the disease Botrytis cinerea.

Table 5. Grape Quality

Cultivar		Years 1982	1983	1984	1985	1986	Averages* X	$\pm S_X$	V
Traminer	Sugar(%)	21.3	22.8	20.0	24.3	23.8	22.2	±1.0	8
	Acids(g/l)	7.7	5.1	8.4	7.2	6.4	6.9	±0.8	20
	Botritis(%)	2	–	0	13	10	6		
SK 77–14/17	Sugar(%)	21.2	22.3	19.3	23.2	22.7	21.7	±0.9	7
	Acids(g/l)	8.5	7.8	10.3	7.4	9.5	8.6	±0.7	14
	Botritis(%)	0	0	0	0	0	0		
SK 77–5/3	Sugar(%)	21.0	23.9	19.1	25.4	23.4	22.2	±1.3	11
	Acids(g/l)	8.4	6.4	8.1	7.9	7.9	7.7	±0.4	9
	Botritis(%)	1	3	0	15	2	4		
SK 77–3/3	Sugar(%)	20.1	18.6	17.2	20.9	18.6	18.9	±0.9	7
	Acids(g/l)	7.4	7.0	8.2	7.2	8.4	7.6	±0.3	8
	Botritis(%)	2	1	1	2	0	1		
SK 77–12/6	Sugar(%)	22.3	23.4	20.8	22.2	22.8	22.2	±0.6	5
	Acids(g/l)	10.8	9.3	10.2	10.4	8.2	9.8	±0.6	5
	Botritis(%)	0	0	0	1	1	0		
SK 77–10/69	Sugar(%)	20.7	22.4	21.1	21.8	23.9	21.9	±0.6	5
	Acids(g/l)	7.7	7.4	10.5	9.4	8.3	8.5	±0.7	14
	Botritis(%)	1	5	1	1	4	3		
Riesling It.	Sugar(%)	19.0	17.5	13.5	20.8	18.4	17.0	±1.5	16
	Acids(g/l)	6.9	5.9	8.6	8.1	7.3	7.5	±0.6	14
	Botritis(%)	2	3	10	13	8	7		

* X = Mean Value
S_X = Standard error of mean value on P–0.05
V = coefficient of variation (%)

All three selections which were compared to Italian Riesling had high sugar content in must through all tested years without exception. Selections SK 77–12/6 and SK 77–10/69 besides exceptionally high level of average sugar content had fairly small oscillation per years. It is also characteristic for both of these selections relatively high acid content in must. Besides that, selection SK 77–12/6 show relatively high resistance to the disease Botrytis cinerea. The others are also not very susceptible to that fungy disease.

Table 6 presents results which characterize the size of grape cluster. Selection SK 77–14/17 had the smallest, while selection SK 76–3/3 had the largest clusters. neither one of new selections does not have to much compact clusters.

Table 6. Cluster Weight (g)

Cultivar	Years 1982	1983	1984	1985	1986	Averages* X	$\pm S_X$	V
Traminer	130	138	123	125	117	127	± 5	6
SK 77–14/17	125	152	84	108	105	116	±15	23
SK 77–5/3	178	133	125	110	135	136	±13	17
SK 76–3/3	183	242	248	270	230	238	±16	12
SK 77–12/6	101	135	142	129	149	133	± 9	12
SK 77–10/69	165	221	164	149	192	180	±15	15
Rizling It.	139	130	168	113	152	147	±11	13

* X = Mean value
S_X = Standard error of mean value on P–0.05
V = coefficient of variation (%)

Wine Quality

Experimental wines have been produced by the procedure of microvinification at glass vessels, in quantity of 20 – 30 liters. Organoleptic evaluations were held by the authoritative experts using the system of 20 points (color = 2: clarity = 2: aroma = 4: taste = 12).

Wine of SK 77–14/17 selection had very fine characteristic flavor whole taste, harmonious, often with left unfermentable sugar. Similar features had also wine SK 77–5/3. Wines of both selection were evaluated with very high marks, (Table 7).

Out of three genotypes which are compared with Italian Riesling, the wine SK 76–3/3 has been evaluated approximately equal to the standard, while wines of two other selections have been evaluated significantly higher then the control.

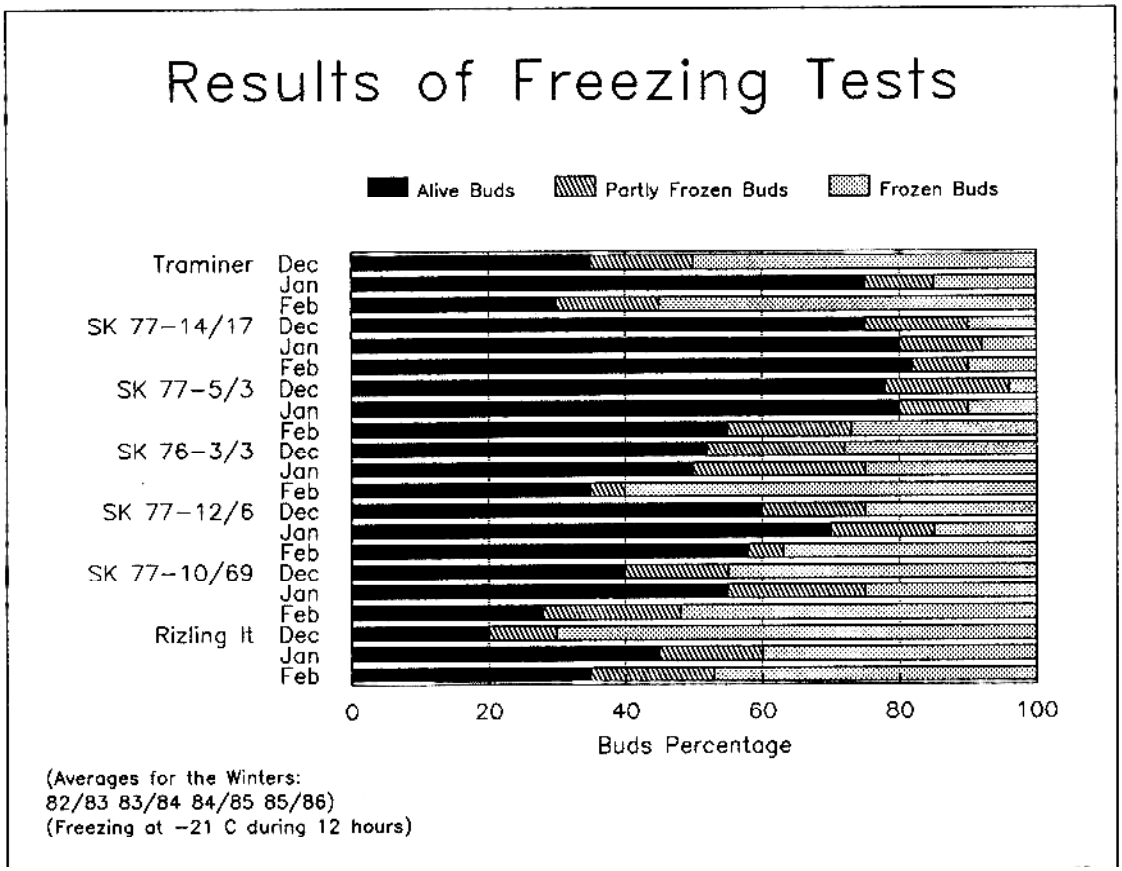
Table 7. Wine Quality (Organolepticaly Tasting)

Cultivar	Years 1982	1983	1984	1985	1986	Aver-age	Wine Flavor
Traminer	18.7	18.3	18.2	17.5	17.7	18.1	Aromatic
SK 77-14/17	17.9	19.0	17.7	18.4	18.5	18.3	Aromatic
SK 77-5/3	18.4	18.5	17.7	18.1	18.3	18.2	Aromatic
SK 76-3/3	18.0	17.9	17.9	17.8	17.3	17.8	Neutral
SK 77-12/6	18.1	18.3	18.3	18.1	18.2	18.2	Neutral
SK 77-10/69	18.3	18.2	18.1	17.7	18.0	18.1	Neutral
Rizling It.	18.3	17.8	17.5	17.5	17.5	17.7	Neutral

Resistance to Low Temperature

These tests were done by the method of exposition of a one year cane cuttings to low temperature at cold chamber. Tests were done at the beginning, mid and the end of winter. Relative resistance of genotypes has been evaluated on the base of winter buds frosted degrees, (Graph 3).

Graph 3. Results of Freezing Tests



Experimental results during four winters have shown that selections SK 77–14/17 and SK 77–5/3 are significantly higher resistance to low temperature then the cultivar Traminer. Selection SK 77–14/17 showed stabile high resistance during the whole winter.

All three selections which are compared to the Italian Riesling in the resistance have exceeded their standard.

The best was selection SK 77–12/6 which showed the best results at all periods of examination, while selections SK 76–3/3 and SK 77–10/69 showed better values only at the beginning and mid winter. At the end of winter these two cultivars did not differ essentially from their standard.

CONCLUSION

On the base of presented research it is possible to conclude that inclusion of East Asian species Vitis amurensis into the improvement of grape vine breeding is absolutely acceptable.

From the second back crossing of this species with Vitis vinifera cultivars are selected genotypes which fairly well accumulate sugar and have high cold hardiness.

As they give high quality wine, besides theoretical, they might have a practical value.

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