Vineyards and orchards on terraces in Primorska region

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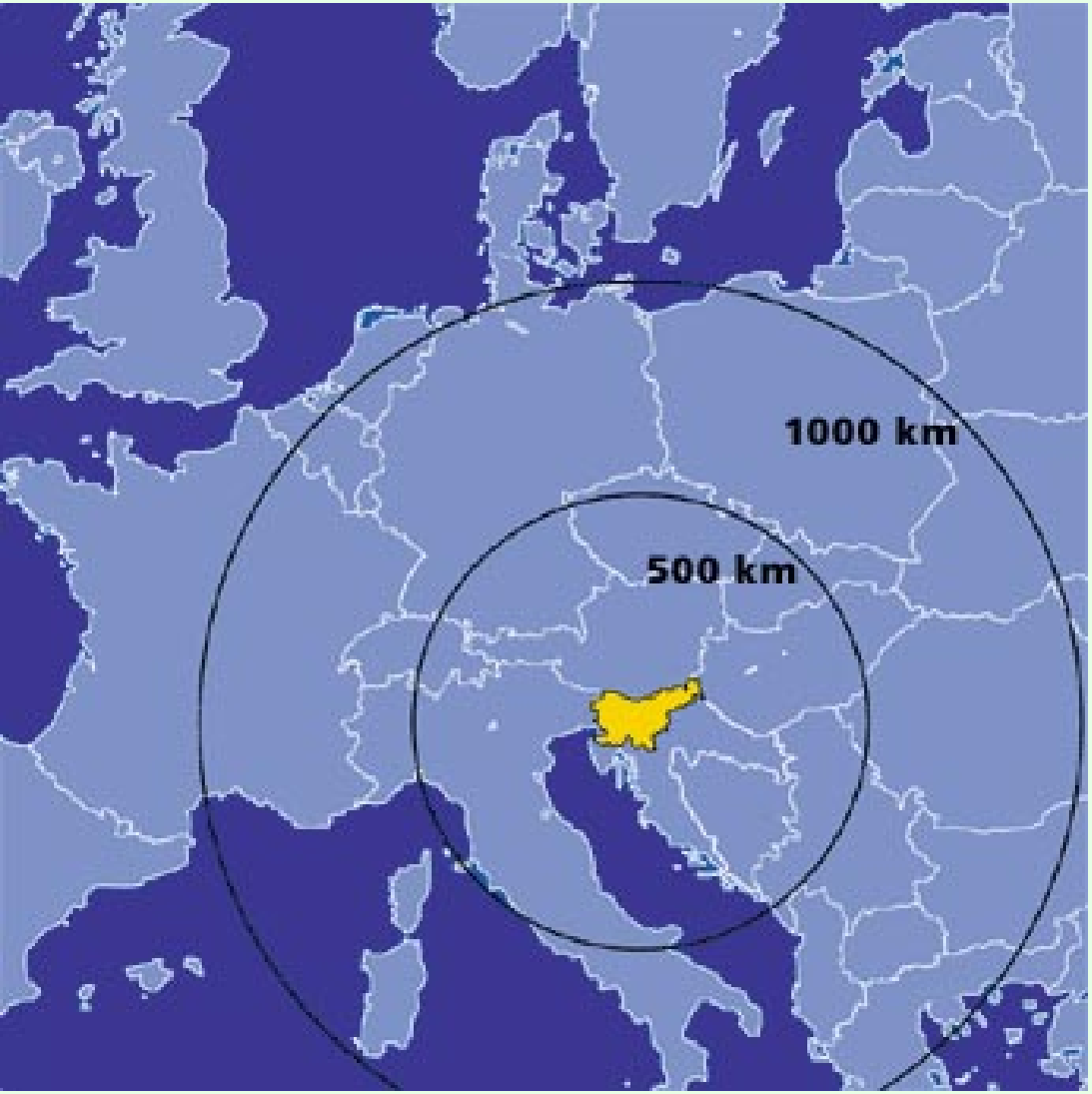
General information on Slovenian viticulture



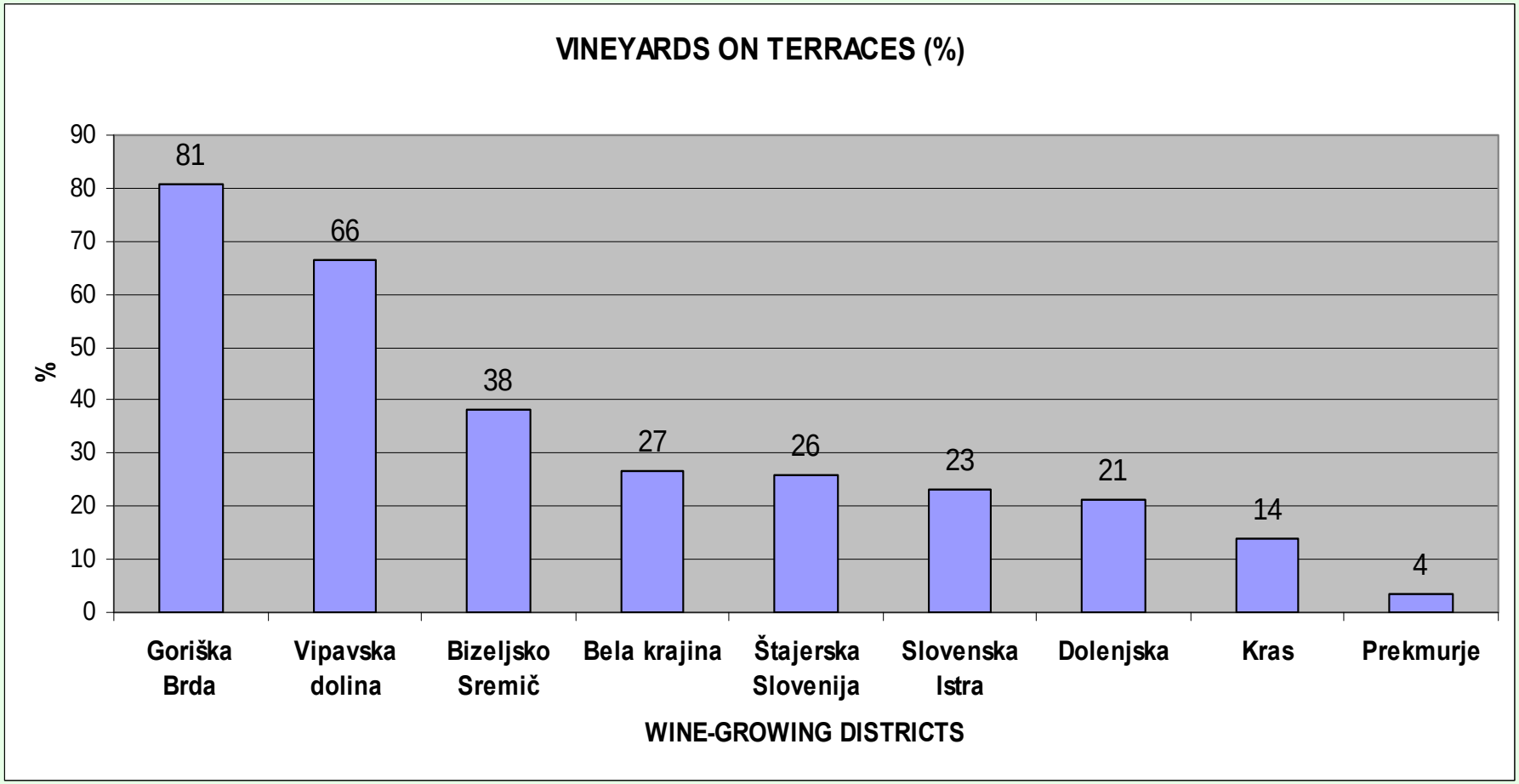
- ✓ total surface 17.200 ha;
- ✓ 35 % of farms in Slovenia have vineyards;
- ✓ the share of wine-growing in total agricultural output is 8,4%;
- ✓ average year yield of wine 1 million hl;

Characteristics of Slovene viticulture

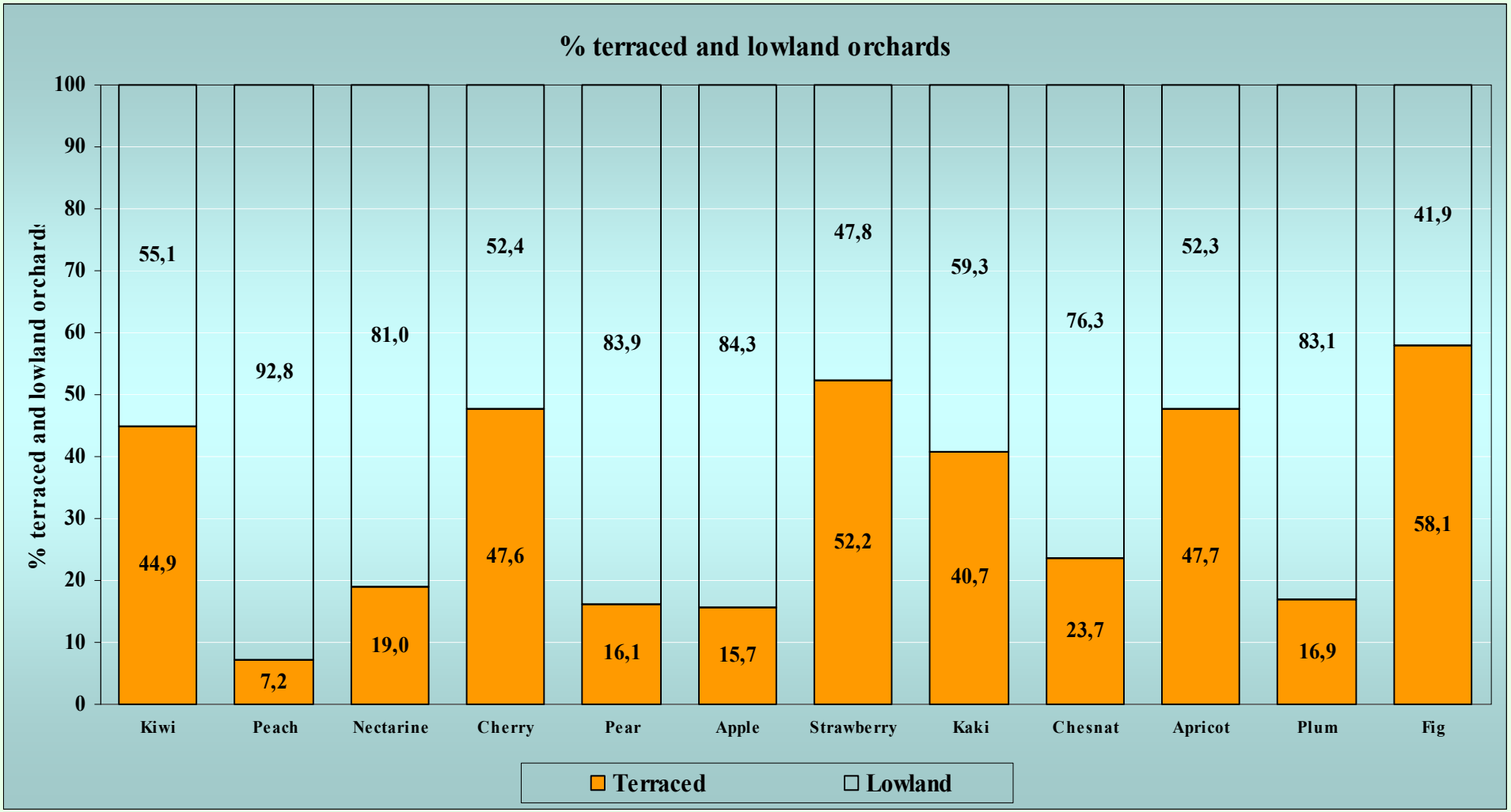
- small parcels of agricultural land; on average each farm only cultivates 0.6 ha of vineyard
- 1.4 % of wine-growers cultivate more than 5 ha of vineyards;
- 88.6 % of wine-growers cultivate less than 1 ha of vineyard;
- a great part of steep hillside viticulture - rightly defined as heroic viticulture
- more than 20 % of vineyards on inclination over 30 %

Wine growing regions of Slovenia

The share of terraced vineyards in wine growing districts in Slovenia

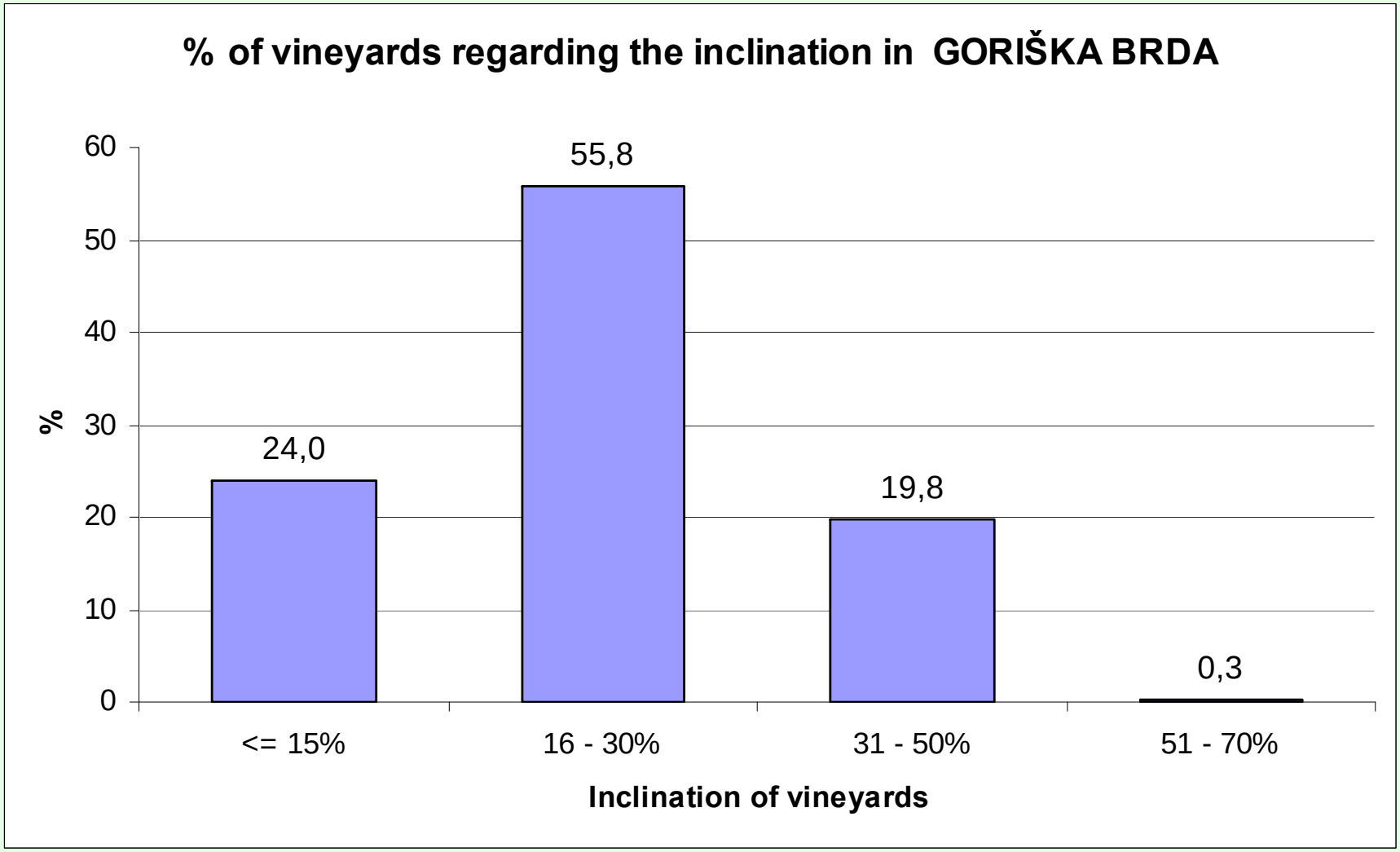


The share of terraced orchards in Slovenia



The surface of all vineyards, terraced vineyards and lowland vineyards in Primorska and its districts and the share of vineyards on terraces

Wine growing district	All vineyards (ha)	Terraced vineyards (ha)	Lowland vineyards (ha)	The share of terraced vineyards - %
GORIŠKA BRDA	1.963	1.582	382	81
VIPAVSKA DOLINA	2.573	1.705	867	66
KRAS	650	89	561	14
SLOVENSKA ISTRA	1.648	383	1.266	23
PRIMORSKA	**6.835**	**3.759**	**3.076**	**55**


% of vineyards regarding the inclination in GORIŠKA BRDA
60
50
40
30
20
10
0
%
24,0
55,8
19,8
0,3
<= 15%
16 - 30%
31 - 50%
51 - 70%
Inclination of vineyards

Vipava valley - a typical wine-growing landscape in Slovenia

The reasons for the construction of terraces

1. great part of steep hills and lack of fertile soil in lowland
2. high level of year precipitation,
3. heavy falls of rain and on the other side drought and lack of rain in summer time.

Wine growing region	Year precipitation (mm)	Precipitation in growing season (mm)	Precipitation in growing season (%)
Goriška brda	1600	984	61,4
Vipavska dolina	1507	910	60,4
Kras	1573	938	59,7
Slovenska Istra	1058	683	65,0
average	1434	879	61,6

Indirect reasons

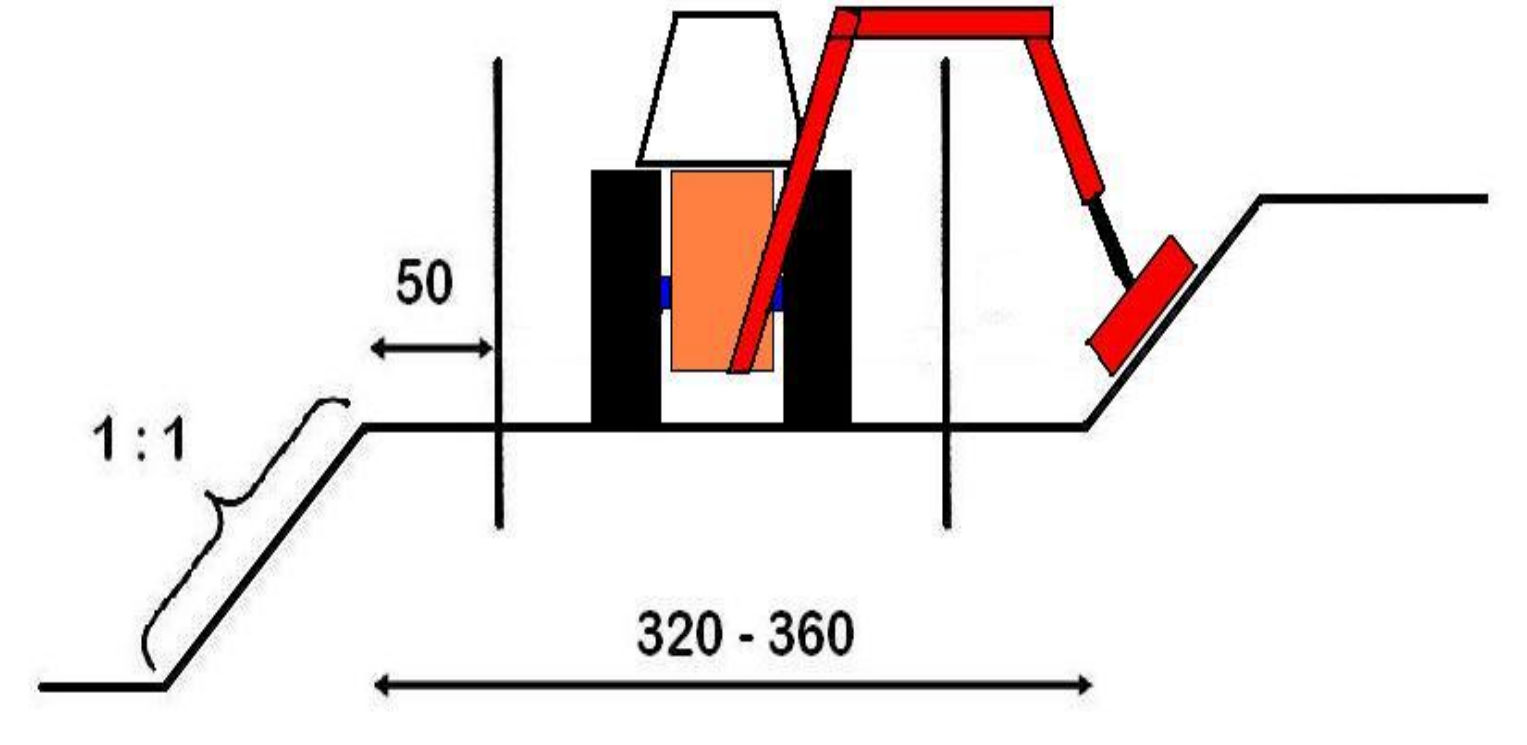
- protecting the soil from erosion and landslides – the major concern for the winegrovers
- accumulation of water in summer time, because there is no irrigation systems on terraces
- excellent sun exposure, optimum photosynthesis
- general application of different mechanisation
- terraced vineyards and orchards represent an interesting and perfect pattern in landscape and they symbolise a typical cultural landscape of Primorska

Old fashioned terraces

Reconstruction of terraces with modern techniques

- choosing the growing system and vine or fruit varieties
- choosing the proper distances between rows and within rows of planting,
- choosing the terrace width, adapted to the growing system, variety and planting distances and to the mechanical equipment
- measuring of terrain inclination, slope

- deciding on how the slopes of the terraces will be maintained and what kind of agricultural tractor and mechanisation will be used

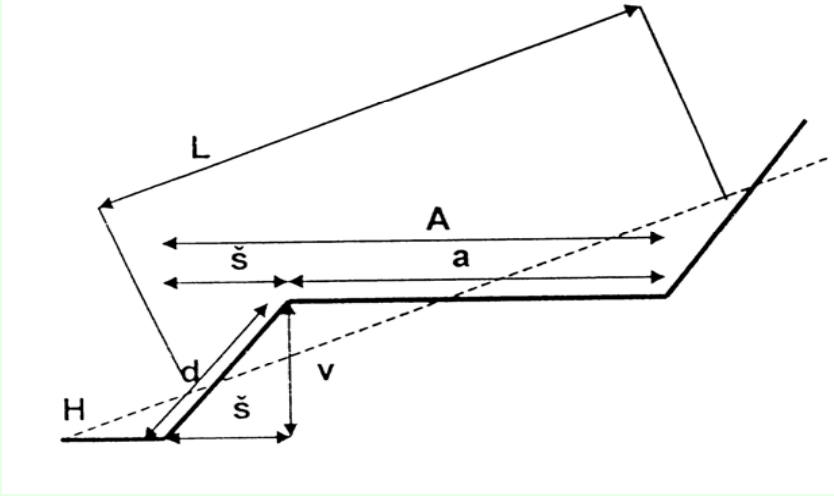


- choosing the inclination, the height and the width of the terrace slope - in our climate conditions and for flysch light soil is proposed the ratio between height and width of the slope 1:1

- constructing one-row terraces on inclination above 35 %, double-row terraces on inclination betveen 20 – 35% and double-row terraces allowing the transit on the inner side of the terrace

- construction of roads and connections for safety work with mechanisation – the width 4 - 5 m, the inclination 20-22%
- construction of drainage if necessary and controlling of the surface water

Tables for calculate the parameters of terraces in dependence of inclination



INCLINATION	ONE ROW TERRACE a = 2,30 m	TWO ROW TERRACE a = 3,50 m	EXTENDED TWO ROW TERRACE a = 5,00 m
15%	A=2,70 m d = 0,57 m v = 0,41 m	A = 4,12 m d = 0,87 m v = 0,62 m	A = 5,88 m d = 1,24 m v = 0,88 m
30%	A=3,30 m d = 1,40 m v = 1,00 m	A=5,00 m d = 2,12 m v = 1,50 m	A=7,14 m d = 3,00 m v = 2,14 m
50%	A=4,60 m d = 3,25 m v = 2,30 m	A=7,00 m d = 4,95 m v = 3,50 m	A=10,00 m d = 7,00 m v = 5,00 m

Conclusion

With our recomandations and technological advises to farmers they can:

- reduce the production costs
- reduce the amount of manual working hours
- cultivate their terraces with safety and with all mechanisation.

The construction of terraces in accordance with this recomandations made the steep slope viticulture and the viticulture on terraces more sustainable.

Thank you for your attention !