

Cosmo Oil Co. Ltd., Tokyo, JAPAN

# Field experiments with Pentakeep V in Slovakia 2006

grape-vine, tomatoe, green pepper  
water melon, hop, winter wheat

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**Slovak Agricultural University in Nitra**

## Material and methods

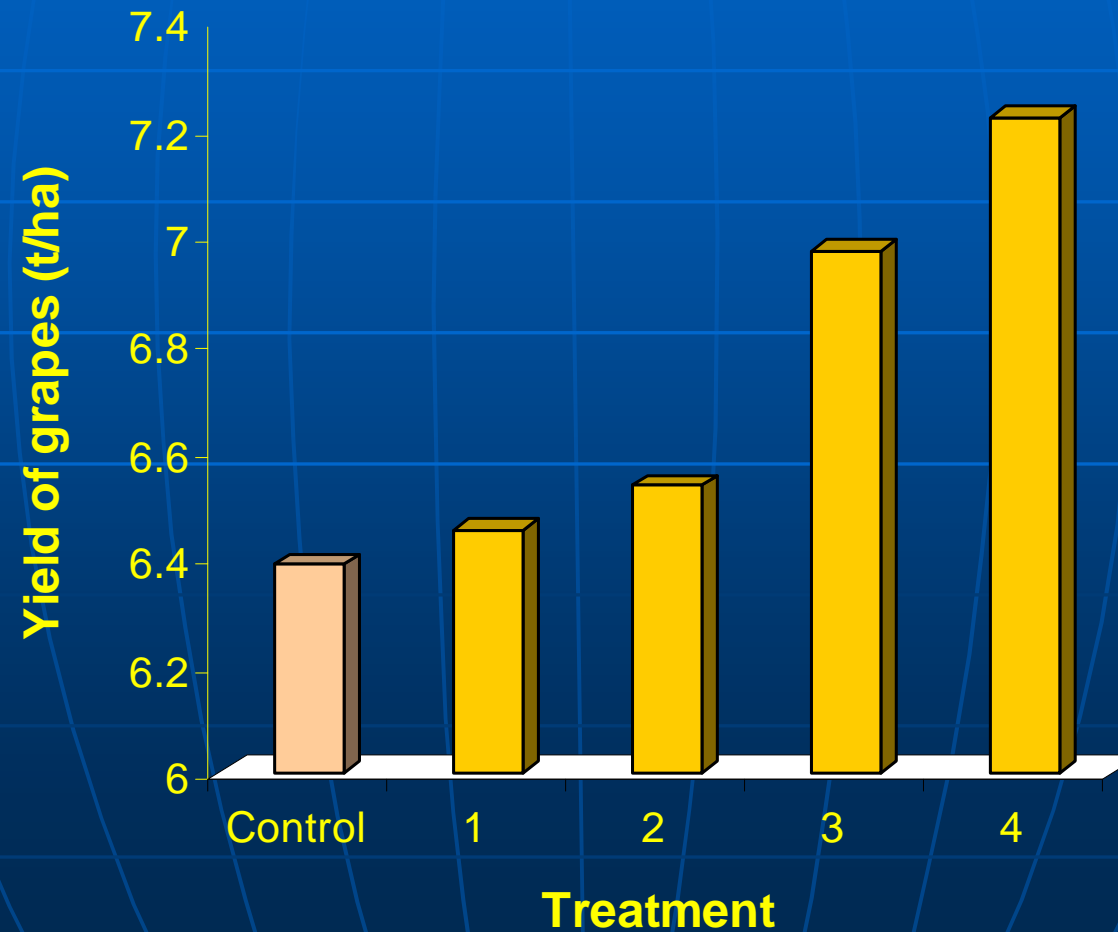
### Treatments with Pentakeep V

<b>Treatment</b>	<b>Conc. (%)</b>	<b>Rate (l.ha<sup>-1</sup>)</b>	<b>Dose of water (l.ha<sup>-1</sup>)</b>	<b>Rate of solution (l.ha<sup>-1</sup>)</b>	<b>Dilution ratio</b>
Control	-	-	-	-	-
1	0.02	0.1	499.9	500	1:5000
2	0.05	0.25	499.75	500	1:2000
3	0.1	0.5	499.5	500	1:1000
4	0.02	0.5	2499.5	2500	1:5000

## Results

# Grape-vine (*Vitis vinifera*)

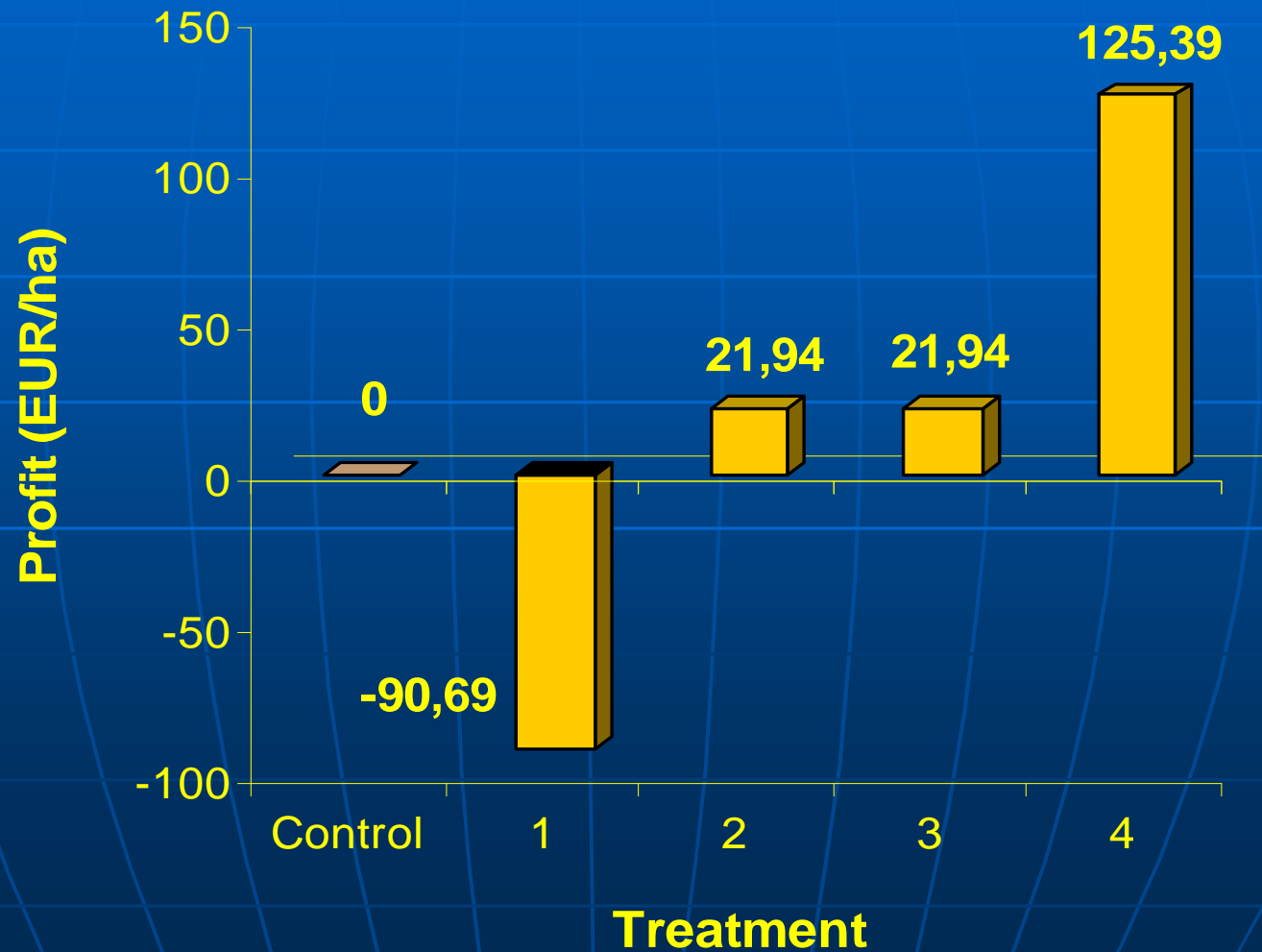
## Yield and relative yield of grapes



## Results

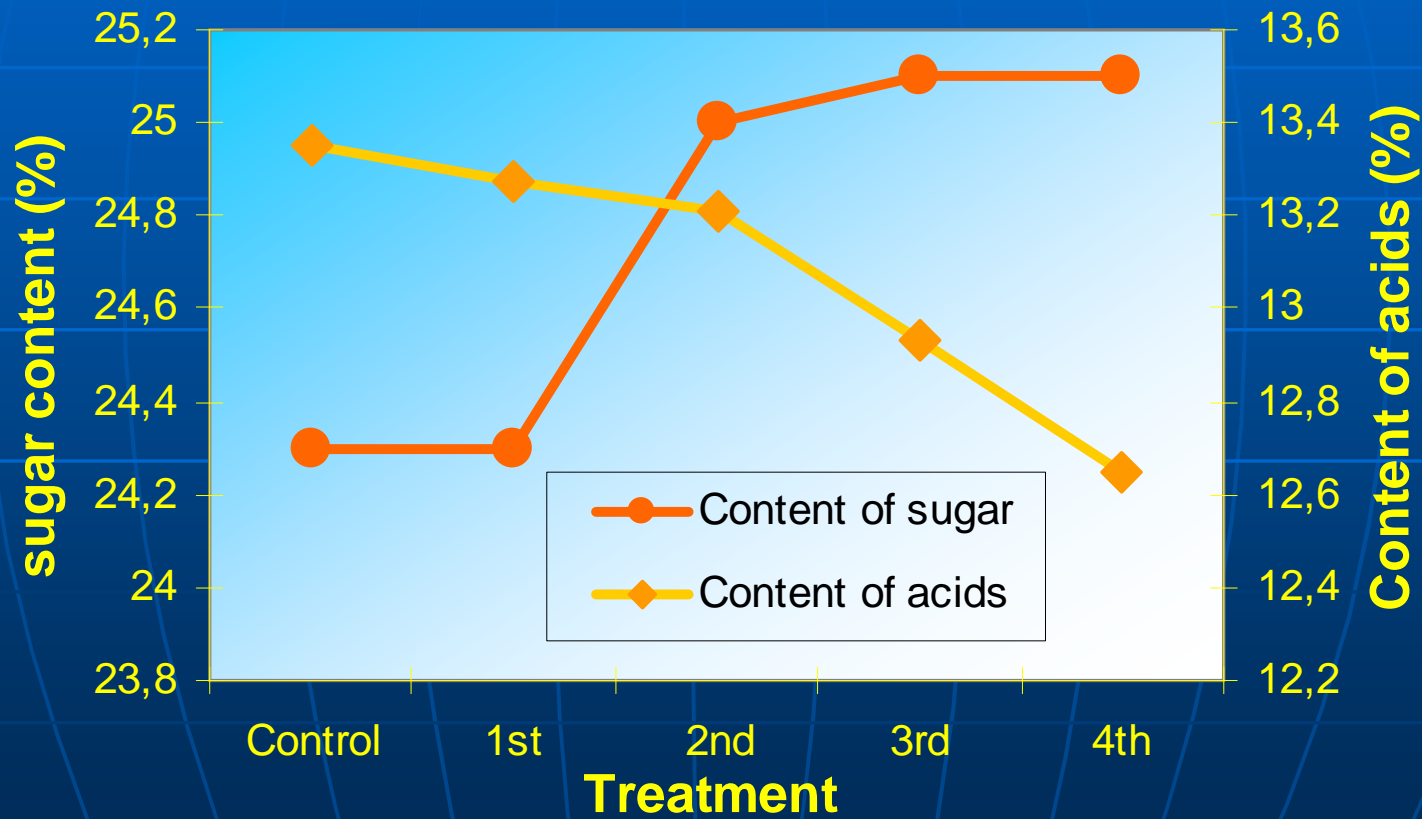
# Grape-vine (*Vitis vinifera*)

## Economical evaluation of grapevine yields, var. Chardonnay



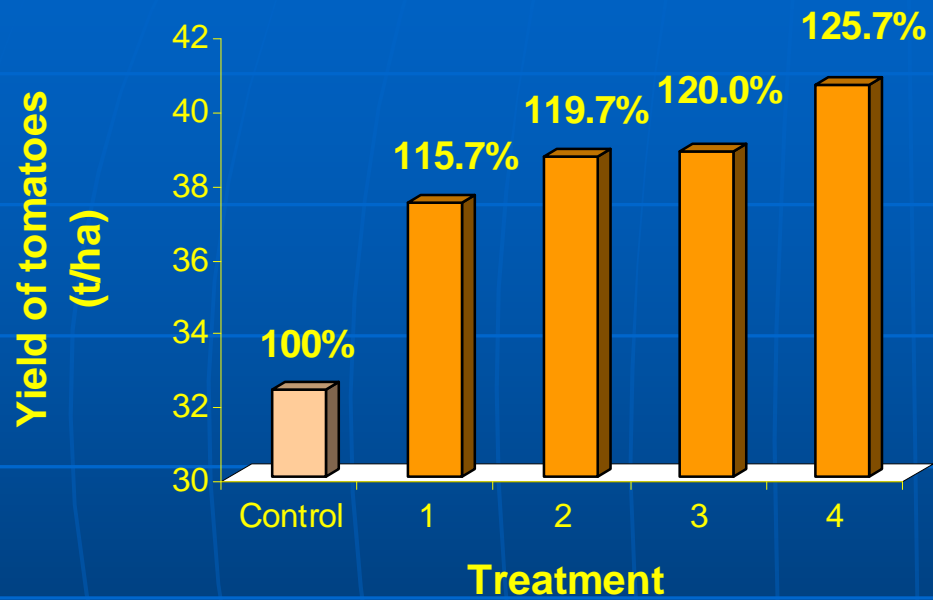
# Results

## Impact of Pentakeep V on content of sugar and content of acids in berries of grapes

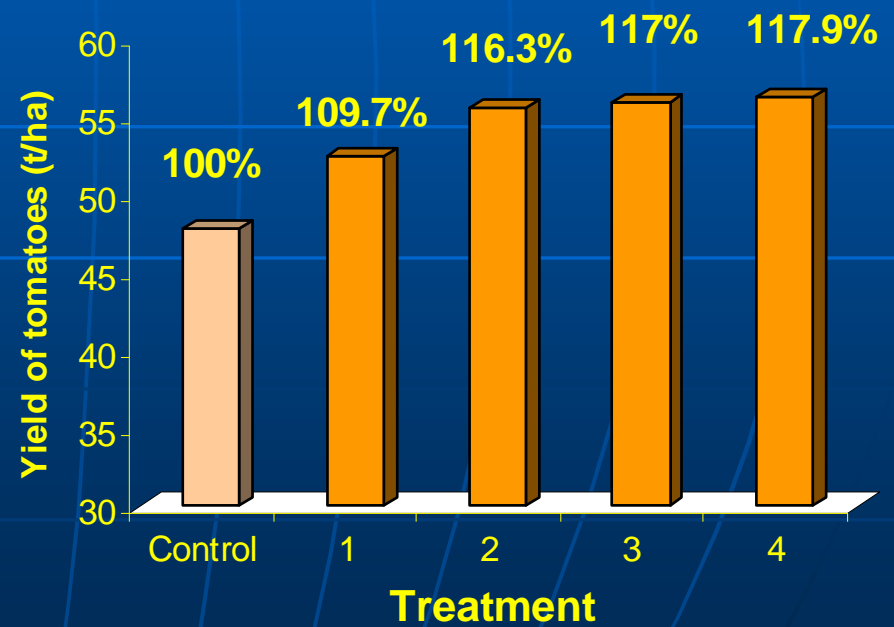


# Results

## Tomato (*Lycopersicon esculentum*)



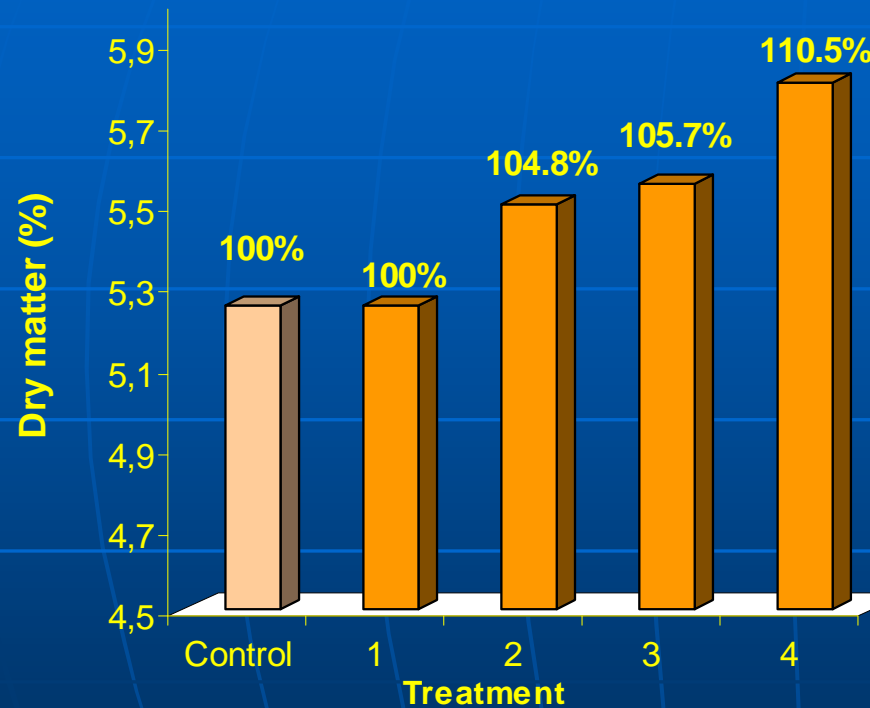
Yield of tomato fruits, variety Solerosso



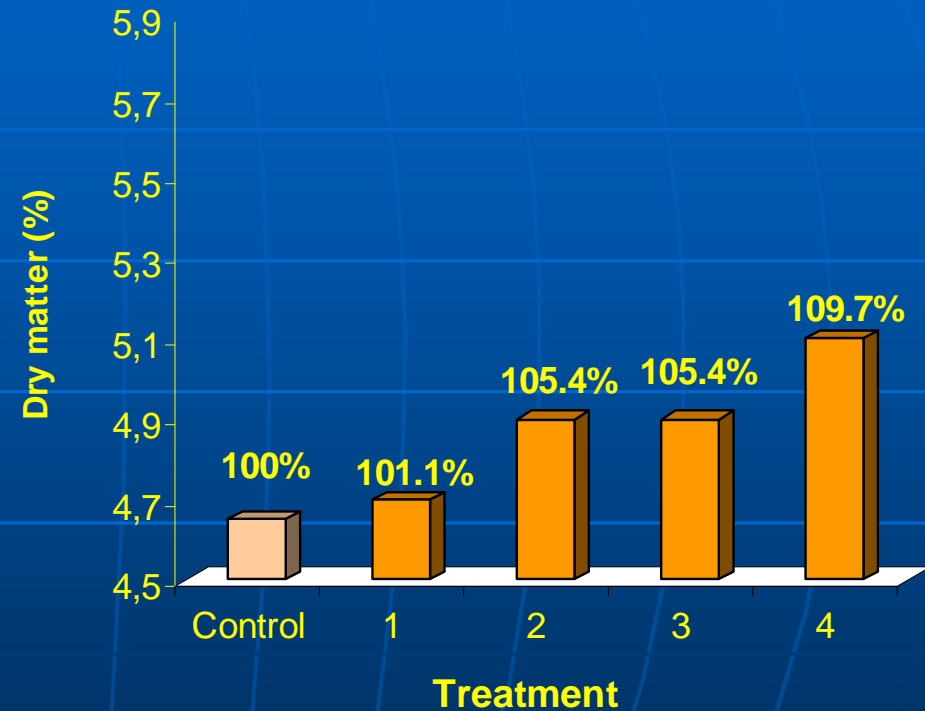
Yield of tomato fruits, variety JET

# Results

## Tomato (*Lycopersicon esculentum*)



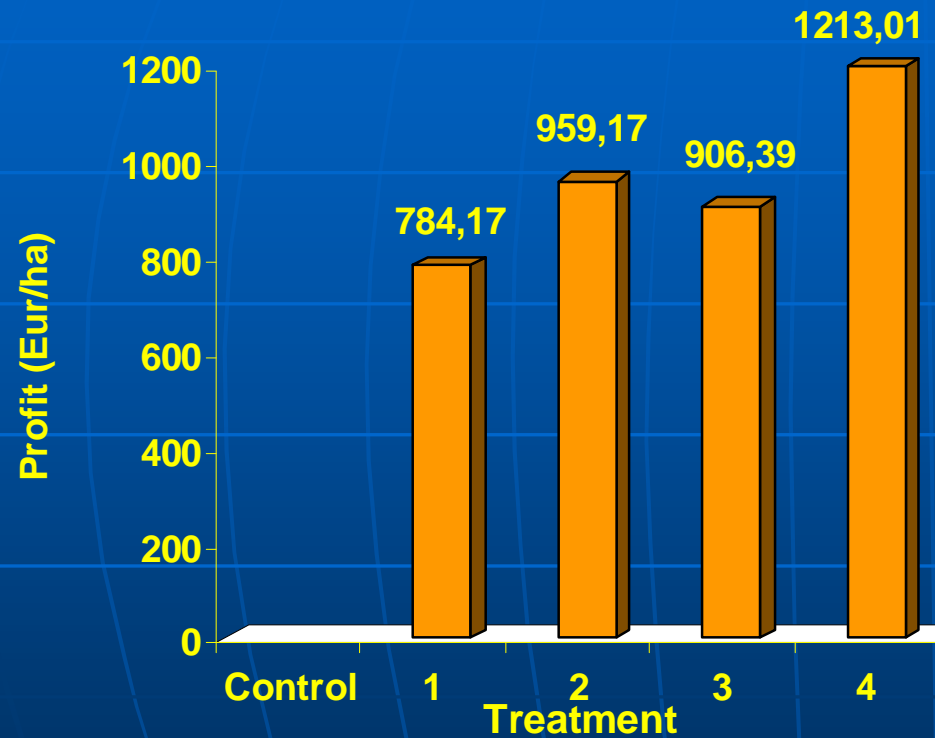
Content of refractometric dry matter  
variety Solerosso



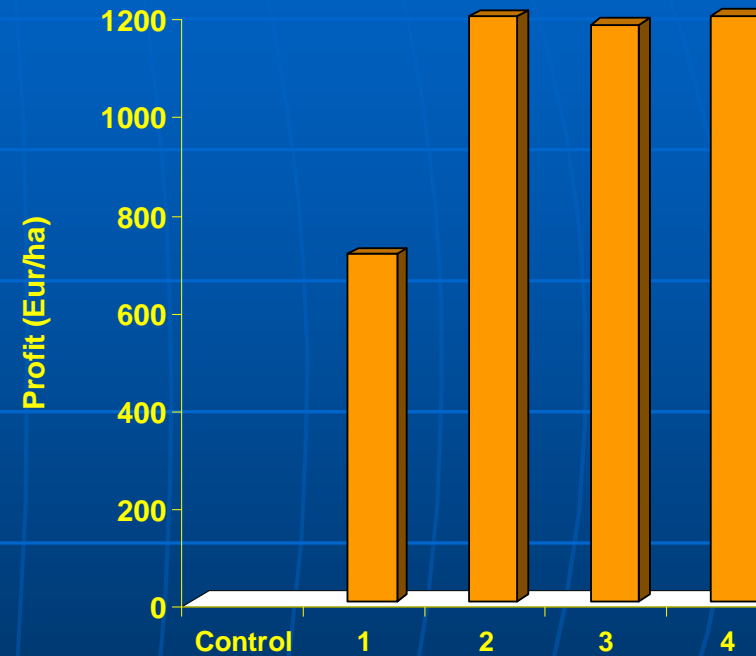
Content of refractometric dry matter  
variety JET

# Results

## Tomato (*Lycopersicum esculentum*)



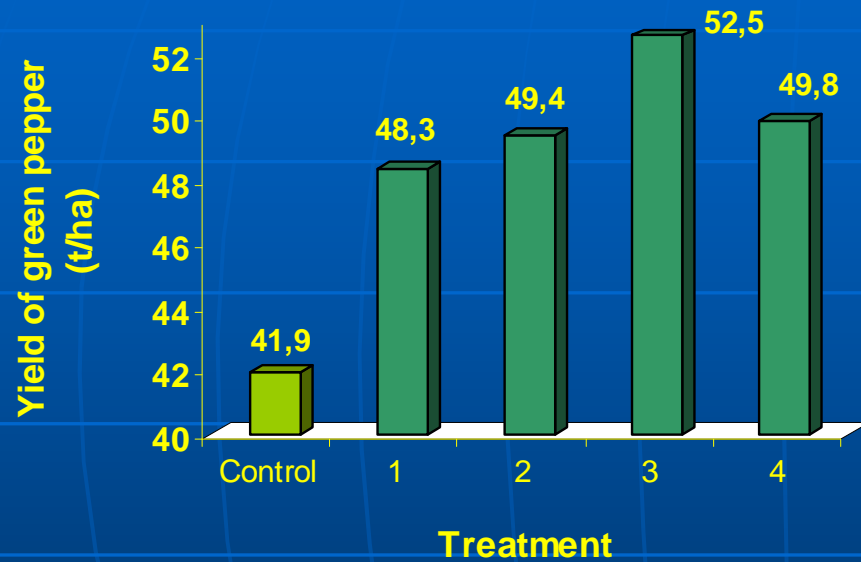
Economical evaluation of tomato yields, variety Solerosso



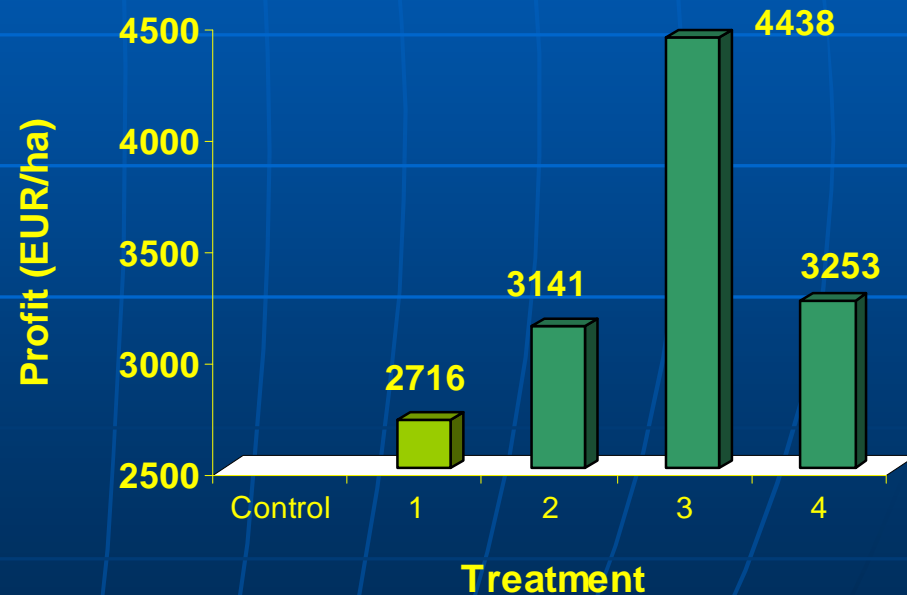
Economical evaluation of tomato yields, variety JET

# Results

## Green pepper (*Capsicum annuum*)



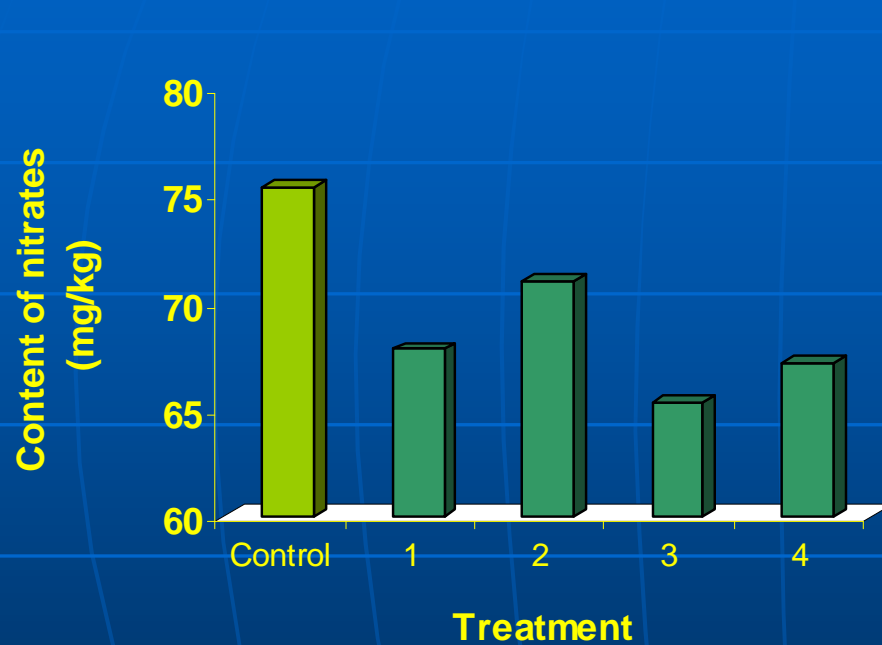
Yield of green pepper fruits (t.ha<sup>-1</sup>)



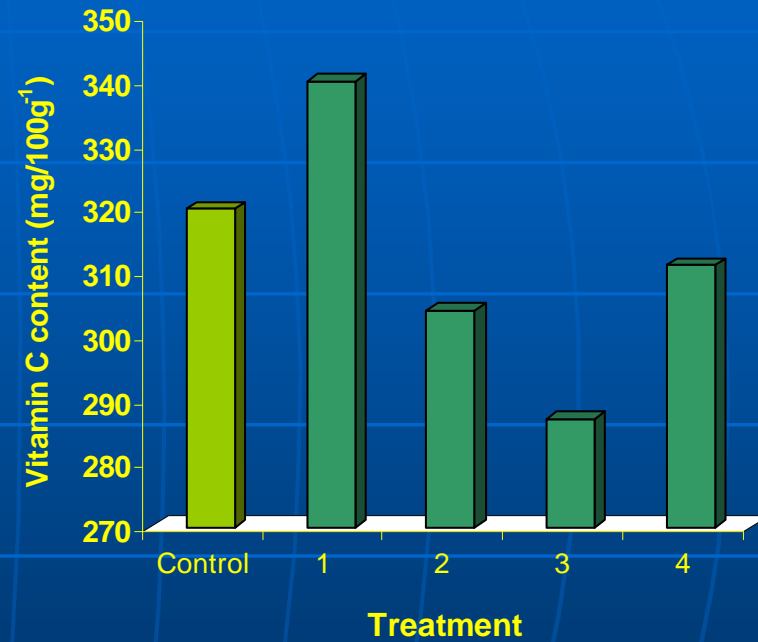
Economical evaluation of green pepper yield

# Results

## Green pepper (*Capsicum annuum*)



Content of nitrates in green pepper fruits ( $\text{mg.kg}^{-1}$  of fresh matter)



Content of vitamin C in green pepper fruits ( $\text{mg.100g}^{-1}$  of fresh matter)

## Results

### Green pepper (*Capsicum annuum*)

Portion of  $\text{NO}_3^- \text{N}$  of total N in green pepper fruits

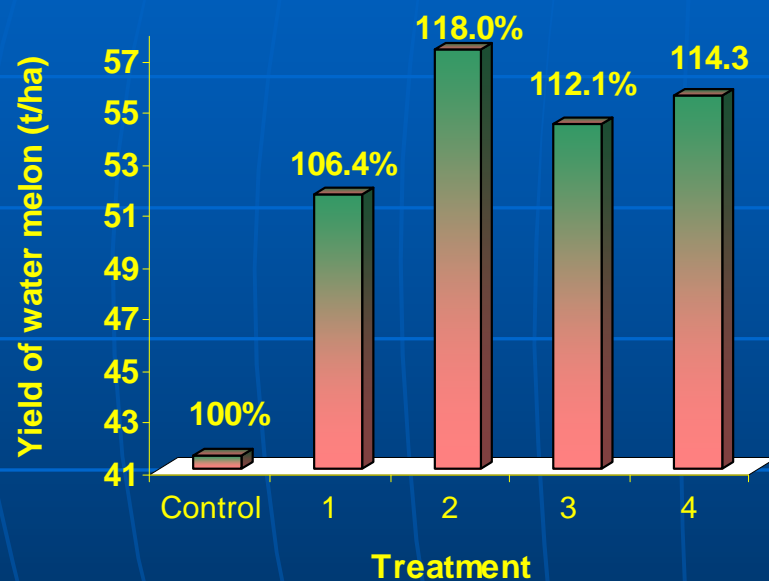
Treatments	Portion $\text{NO}_3^- \text{N}/\text{N}_{\text{tot}}$ (%)	
	%	Relatively (%)
C	5.57	100
1	4.61	82.8
2	4.82	86.5
3	4.53	81.3
4	4.38	78.6

Ratio of vitamin C content to nitrate content in green pepper fruits

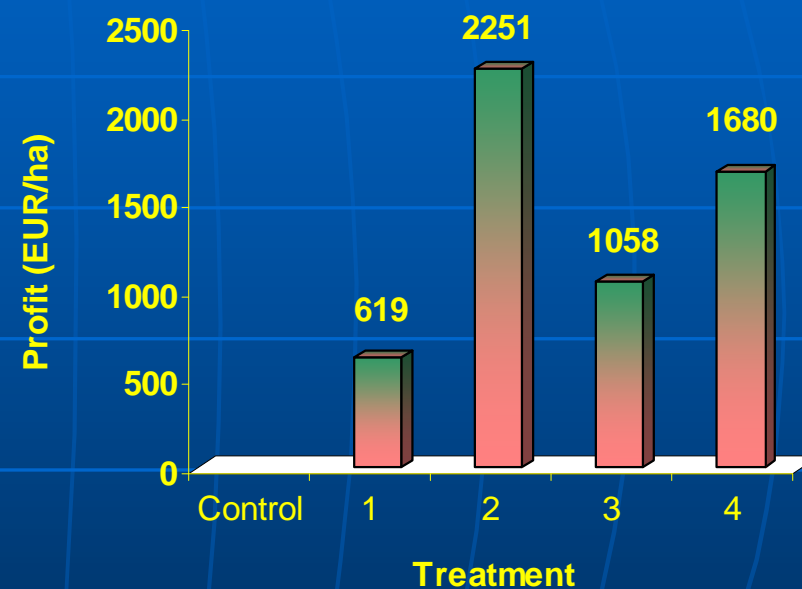
Treatments	Ratio of vit. C to nitrates	Relatively (%)
C	9.6	100
1	11.3	117.7
2	9.7	101.0
3	9.9	103.1
4	10.4	108.3

# Results

## Water melon (*Cucumis melo*)



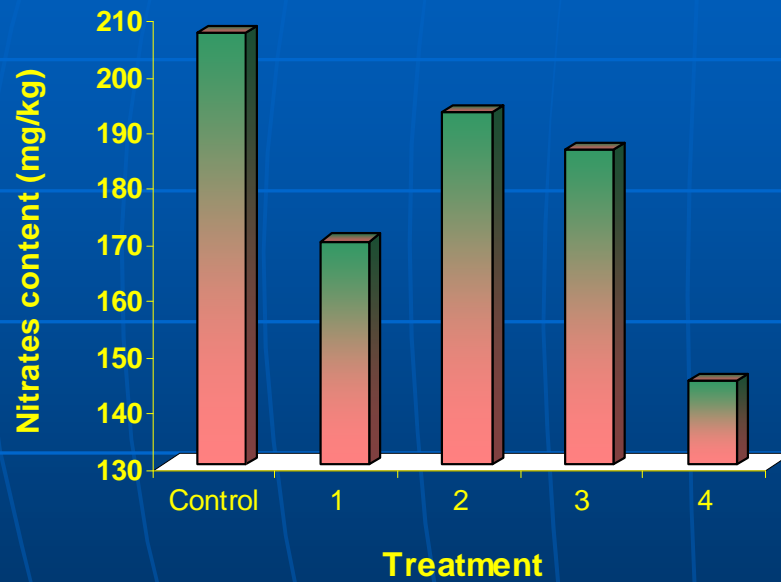
Yield of melon fruits (t.ha<sup>-1</sup>)



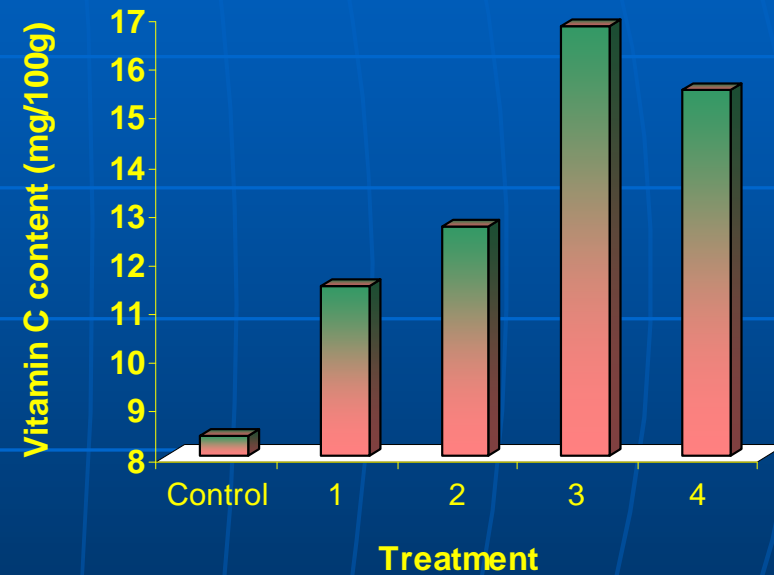
Economical evaluation of melon fruits yield

# Results

## Water melon (*Cucumis melo*)



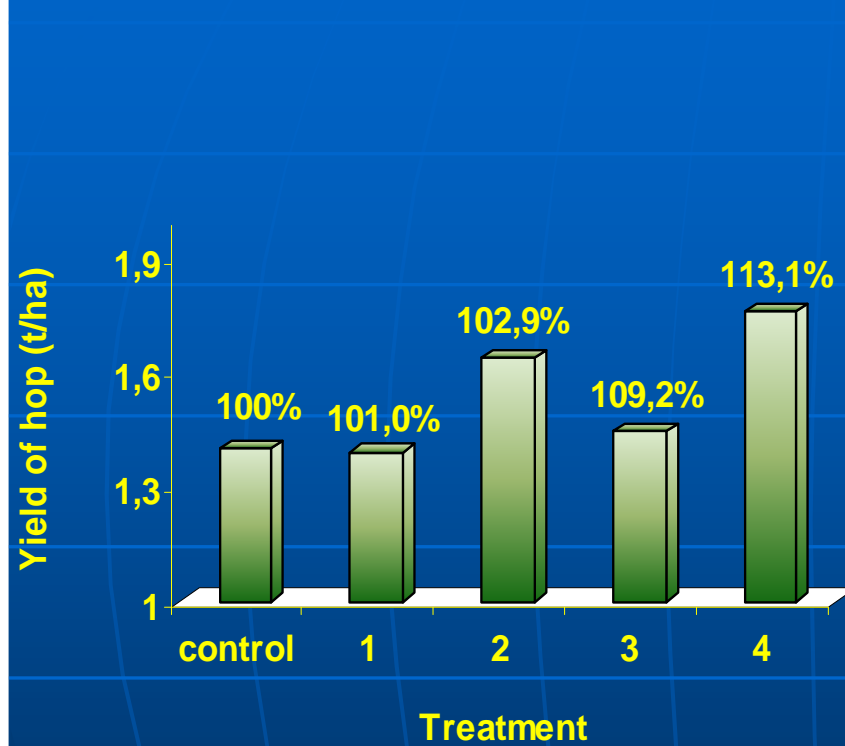
Content of nitrates in melons  
(mg.kg<sup>-1</sup> of fresh matter)



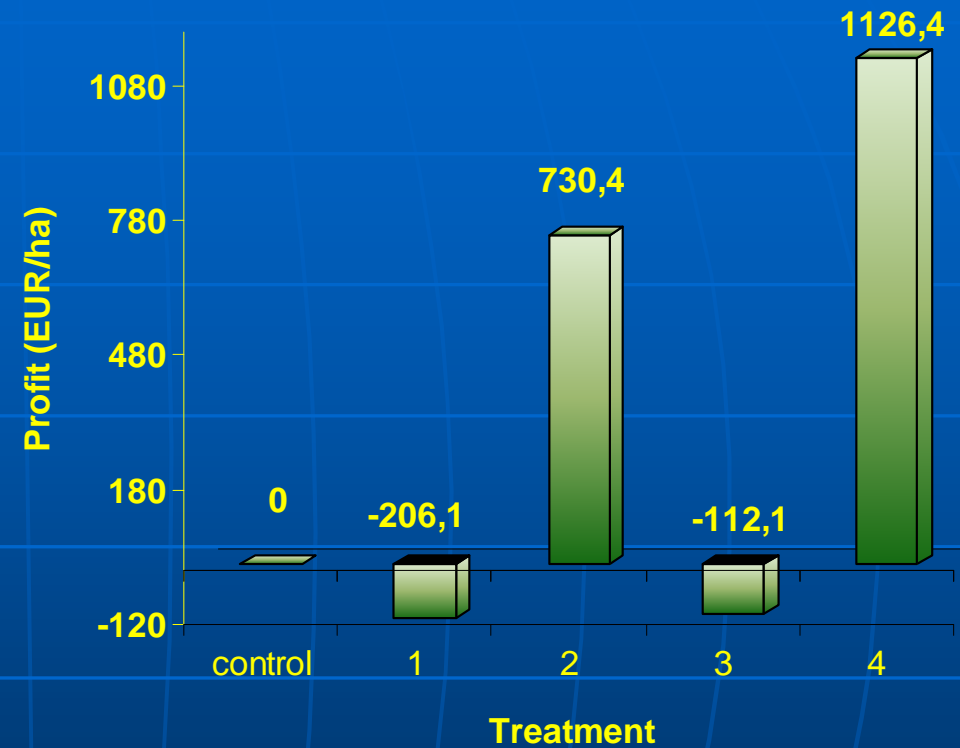
Content of vitamin C in melons  
(mg.100g<sup>-1</sup> of fresh matter)

# Results

## Hop (*Humulus lupulus*)



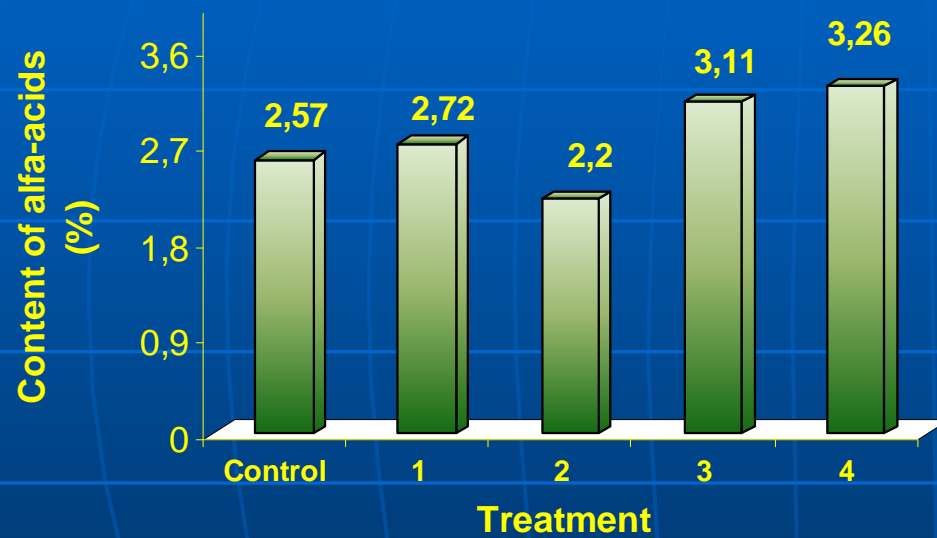
Yield of hop fruits (t.ha<sup>-1</sup>)



Economical evaluation of hop yield

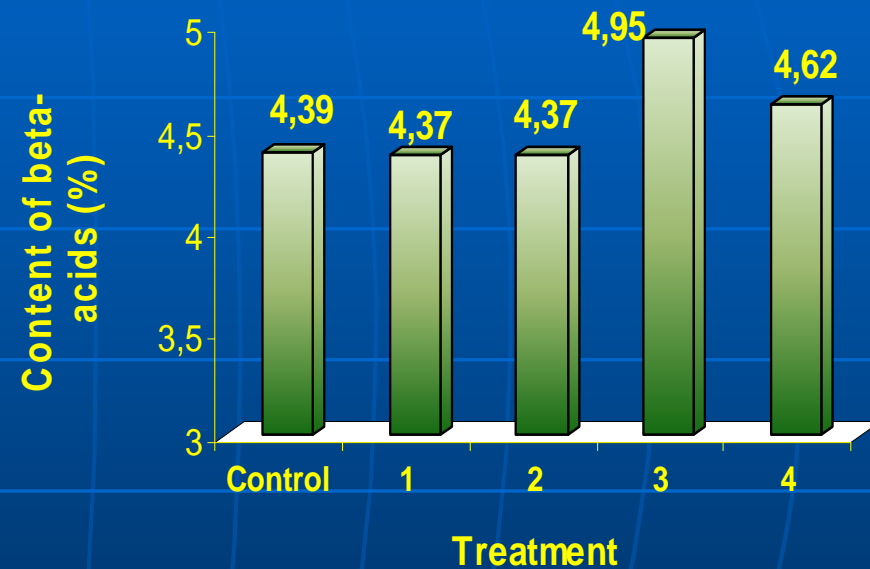
# Results

## Hop (*Humulus lupulus*)



Content of alfa-acids (%)

optimum: **3.2-4.0**



Content of beta-acids (%)

optimum: **4.5-7.0**

# Results

## Hop (*Humulus lupulus*)

Content of total polyphenols and xanthohumol in DM of hop cones

Treatments	Total polyphenols		Xanthohumol	
	%	Rel. %	%	Rel. %
C	5.27	100	0.34	100
1	4.77	90.5	0.37	108.8
2	5.77	109.5	0.33	97.1
3	4.45	84.4	0.39	114.7
4	5.13	97.3	0.34	100.0

Required standards: 4-5 %

0.4-0.6 %

# Results

## Hop (*Humulus lupulus*)

Portion of the most important hop oils (myrcene, humulene, pharnesene, caryophyllene) from the total content of hop oils

Treatments	Myrcene		Humulene		Pharnesene		Caryophyllene	
	%	Rel. %	%	Rel. %	%	Rel. %	%	Rel. %
C	34.7	100	20.5	100	16.4	100	6.2	100
1	47.7	137.5	18.0	87.8	17.7	107.9	5.5	88.7
2	40.9	117.9	16.8	82.0	15.0	91.5	6.3	101.6
3	57.0	164.3	17.5	85.4	17.6	107.3	4.9	79.0
4	51.6	148.7	17.7	86.3	19.9	121.3	4.7	75.8

standards:

40-50 %

16-22 %

14-18 %

5-7 %

## Results

### Winter wheat (*Triticum aestivum*)

#### Yield of winter wheat grain (t.ha<sup>-1</sup>)

Treatments	Yield of grain (t.ha <sup>-1</sup> )	Relatively	
		Treat. „1“ = 100 %	Treat. „2“ = 100 %
1 - control	6.70	100	-
2 - NPKS	7.39	<b>110.3</b>	100
3 - NPKS + 1 x Pent.	7.68	<b>114.6</b>	<b>103.9</b>
4 - NPKS + 2 x Pent.	7.75	<b>115.7</b>	<b>104.9</b>
5 - NPKS + 3 x Pent.	7.88	<b>117.6</b>	<b>106.6</b>
6 - 1 x Pentakeep	6.86	102.4	-
7 - 2 x Pentakeep	6.92	103.3	-
8 - 3 x Pentakeep	7.05	105.2	-

# Results

## Winter wheat (*Triticum aestivum*)

Influence of Pentakeep V on the content of crude protein, wet gluten, portion of the first class grain and volume weight of winter wheat grain

Treatments	Crude protein (%)	Wet gluten (%)	Portion of the first class grain (%)	Volume weight of grain (g.l <sup>-1</sup> )
1 - control	11.88	21.7	<b>93.9</b>	778.0
2 - NPKS	12.12	24.8	90.8	<b>788.0</b>
3 - NPKS + 1 x Pent.	<b>12.46</b>	<b>26.5</b>	89.5	781.2
4 - NPKS + 2 x Pent.	<b>12.46</b>	<b>26.2</b>	91.2	780.0
5 - NPKS + 3 x Pent.	<b>12.46</b>	<b>26.2</b>	91.8	784.0
6 - 1 x Pentakeep	10.48	23.8	92.2	770.8
7 - 2 x Pentakeep	11.00	23.9	91.7	772.0
8 - 3 x Pentakeep	11.78	25.0	91.9	778.8

# Conclusion

Treatment	The best result	%
<b>Control</b>	42	12
1-0.1 I/500I	47	13.5
2-0.25I/500I	60	17.2
3-0.5I/500I	76	21.7
4-0.5I/2500I	124	35.5
<b>1-4</b>	<b>307</b>	<b>88.0</b>
Total number of characteristics	<b>349</b>	<b>100</b>

# Conclusion

Increment of profit to control (average of 5 crops)

Treatment	Increment of profit to control	
	Euro.ha <sup>-1</sup>	%
Control	-	-
1-0.1 l/500l	766	100
2-0.25l/500l	1398	183
3-0.5l/500l	1262	165
4-0.5l/2500l	1480	193