SUITABILITY OF THE NEW POLISH BLACKCURRANT CULTIVARS FOR MECHANICAL FRUIT HARVEST

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Premises for undertaking studies

- **Big economic importance (1st. place in the world in the fruits production, 30-40% of the world production of the blackcurrant),**
- **Great interest in the commercial and amateur cultivation,**
- **High nutrient and health benefits contents of fruits and good usefulness to the processing and freezing industries,**
- **Construction and production of different types of harvesters in Poland,**
- **Working out the technology of cultivation and maintaining plantations established for fruit picking by harvests,**
- **Good weather and soil conditions for blackcurrant growing in Poland.**
- **Long tradition in blackcurrant production**

AIMS OF STUDIES:

- **Assessment of the usefulness of new, Polish blackcurrant cultivars for the cultivation on commercial plantations established for fruit picking by different harvesters**

New blackcurrant cultivars released at the RIPF Skierniewice and evaluated in the experiment

The List of Cultivars and Plant Breeder's Rights (PBR) - Poland

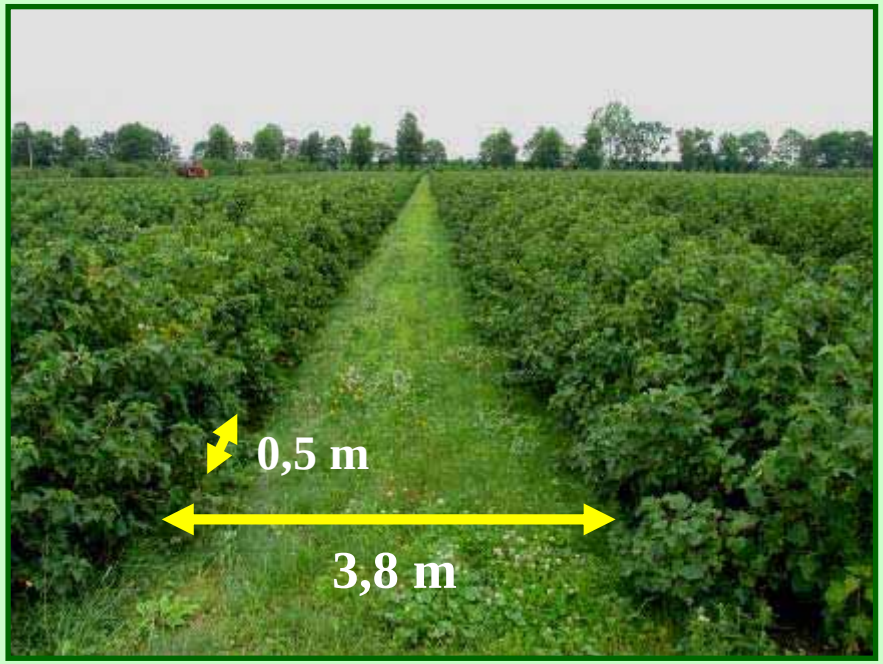
In 2000

In 2005

PBR on the territory of EU till 2030

MATERIAL and METHODS:

Studies were carried out in 2 separate experiments located on fields of the Experimental Orchard (SD) in Dabrowice near Skierniewice, Central Poland



EXPERIMENT I – established in 1998

- **Cultivars tested: 'Tiben', 'Tisel', 'Tines'**
- ***Standard cultivars: 'Titania', 'Ben Connan' 'Ben Lomond'***
- **Studies carried out in 2000 - 2006**

EXPERIMENT II – established in 2002

- **Cultivars tested: 'Tiben', 'Tisel', 'Tines', 'Ores' and 'Ruben'**
- ***Standard cultivars: 'Ojebyn' and'Titania'***
- **Studies carried out in 2005- 2007**

Both experiments were established according to the same arrangement of random blocks in 4 replications, with 50 bushes per the plot, planted in the density of 3.80 x 0.50 m (c. 5.000 plants/ha). Bushes of each cultivar grew in separate (neighboring) rows, each of the length of about 200 m.

MATERIAL and METHODS:

- Fruits were picked with two types of Polish made harvesters:

1. KPS 4b – self-propelled

2. Arek 3 – half-row

Traits were evaluated in both experiments:

1. **Date of ripening (harvesting) of fruits**
2. **Fruit yield [t/ha]**
3. **Fruit size as a weight of 100 berries [g]**
4. **Size of bushes (high x width [m^2]**
5. **Field resistance to fungal diseases: [ranking scale 1-5],**
   1 – no symptoms, 3 – medium, 5 – the highest infection
   - Powdery mildew (*Sphareoctheca mors-uvae*),
   - Leaf spot (*Drapenopezisa ribis*)
   - White pine blister rust (*Cronatrium rubicola*)
6. **Damages of shoots and plants by harvester during fruit picking**

In Experiment II, additionally were evaluated:

- **losses of the fruit yields (fruit left on bushes and dropped on the soil)**
- **effectiveness of fruit picking by the self-propelled KPS-4b harvester.**

RESULTS

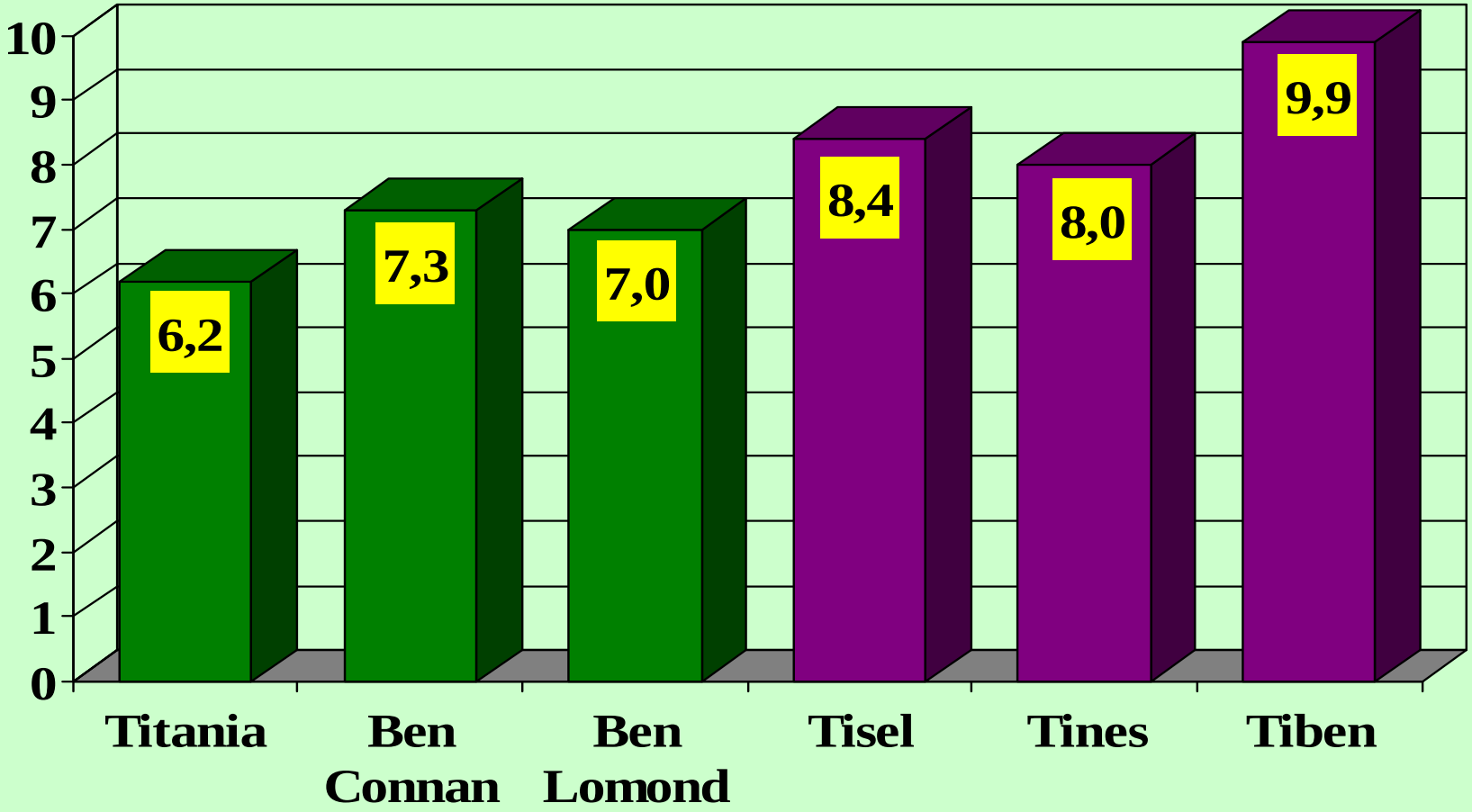
EXPERIPMENT I.

2000-2006

FRUIT YIELD [t/ha]
(Experimental Station at Dąbrowice)

EXPERIMENT I **– established in autumn 1998**

Average for 2002-2006 – harvester picking

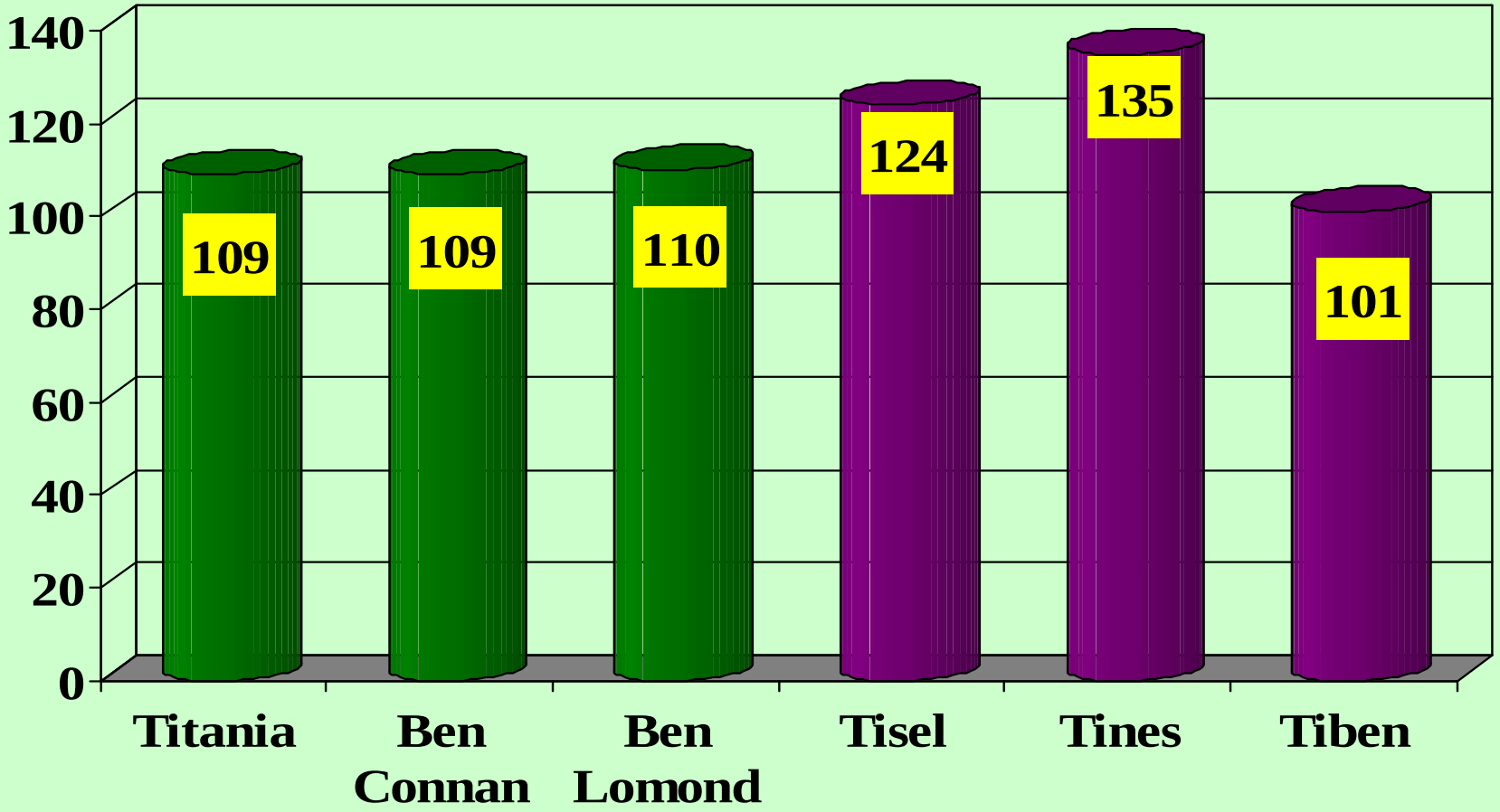


FRIUT SIZE (weight of 100 berries) [g]

EXPERIMENT I – established in autumn 1998

Experimental Station Dąbrowice

Average for 2000-2006



FIELD RESISTANCE TO FUNGAL DISEASES

EXPERIMENT I (average for 2002-2006), [ranking scale 1-5]

Cultivar	Infection by fungal diseases		
	Powdery mildew	Leaf spot	White pine blister rust
1. Titania	*1,0*	*2,3*	*1,0*
2. Ben Connan	*1,0*	*1,8*	*2,1*
3. Ben Lomond	*4,0*	*2,0*	*2,3*
4. Tisel	1.0	1,4	1,0
5. Tines	1,0	1,7	2,0
6. Tiben	1,0	2,3	1,7

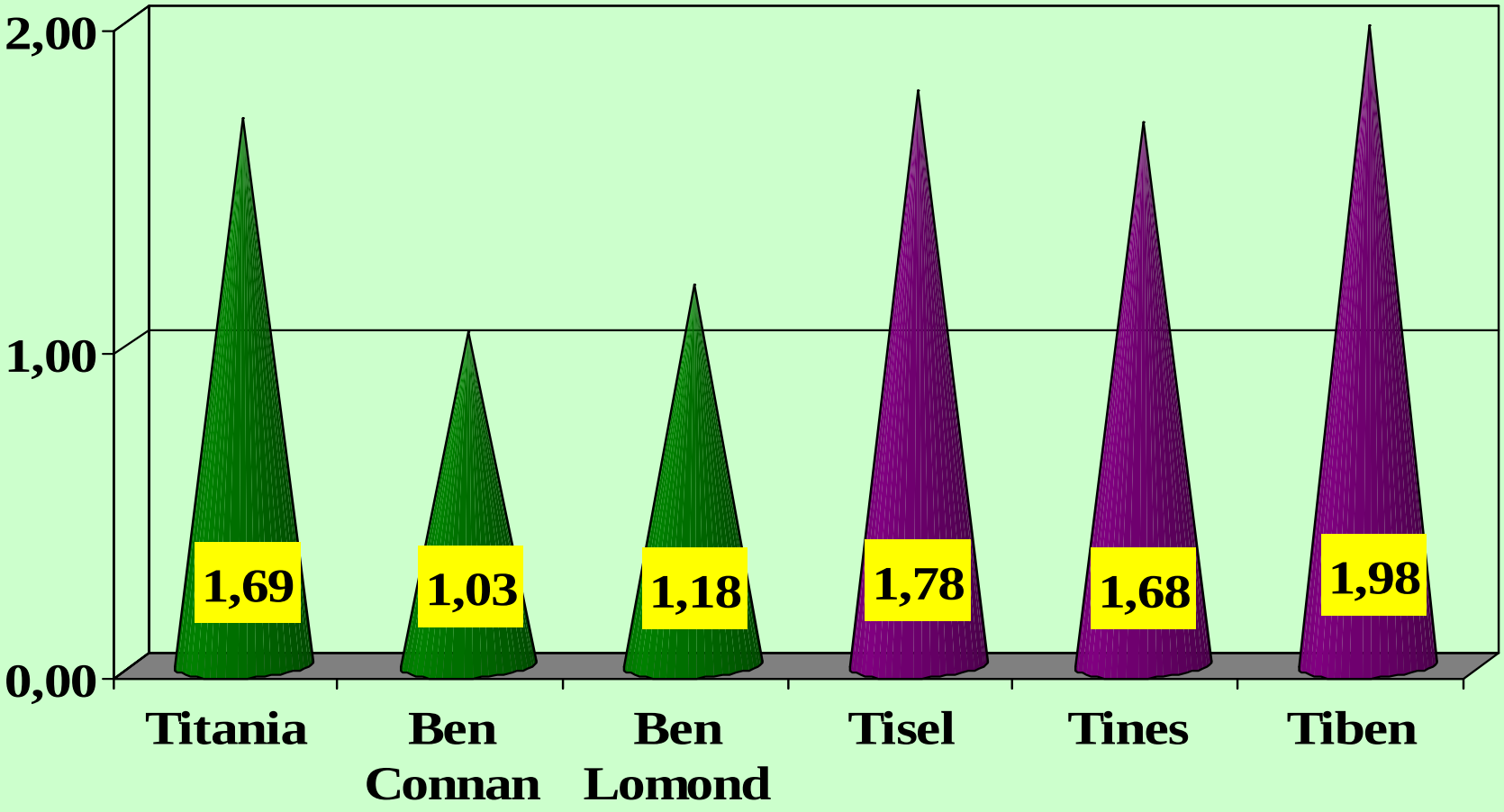
Ranking scale: 1-5, 1 – no symptoms, 3- medium, 5 – very severe symptoms

BUSH SIZE (high x width) [m²]

EXPERIMENT I – established in autumn 1998

Experimental Station Dąbrowice

Average for 2000-2006



Damages of shoots: the biggest: 'TITANIA', 'TISEL', medium: 'TIBEN', 'TINES'
the lowest: 'BEN LOMOND', 'BEN CONNAN'

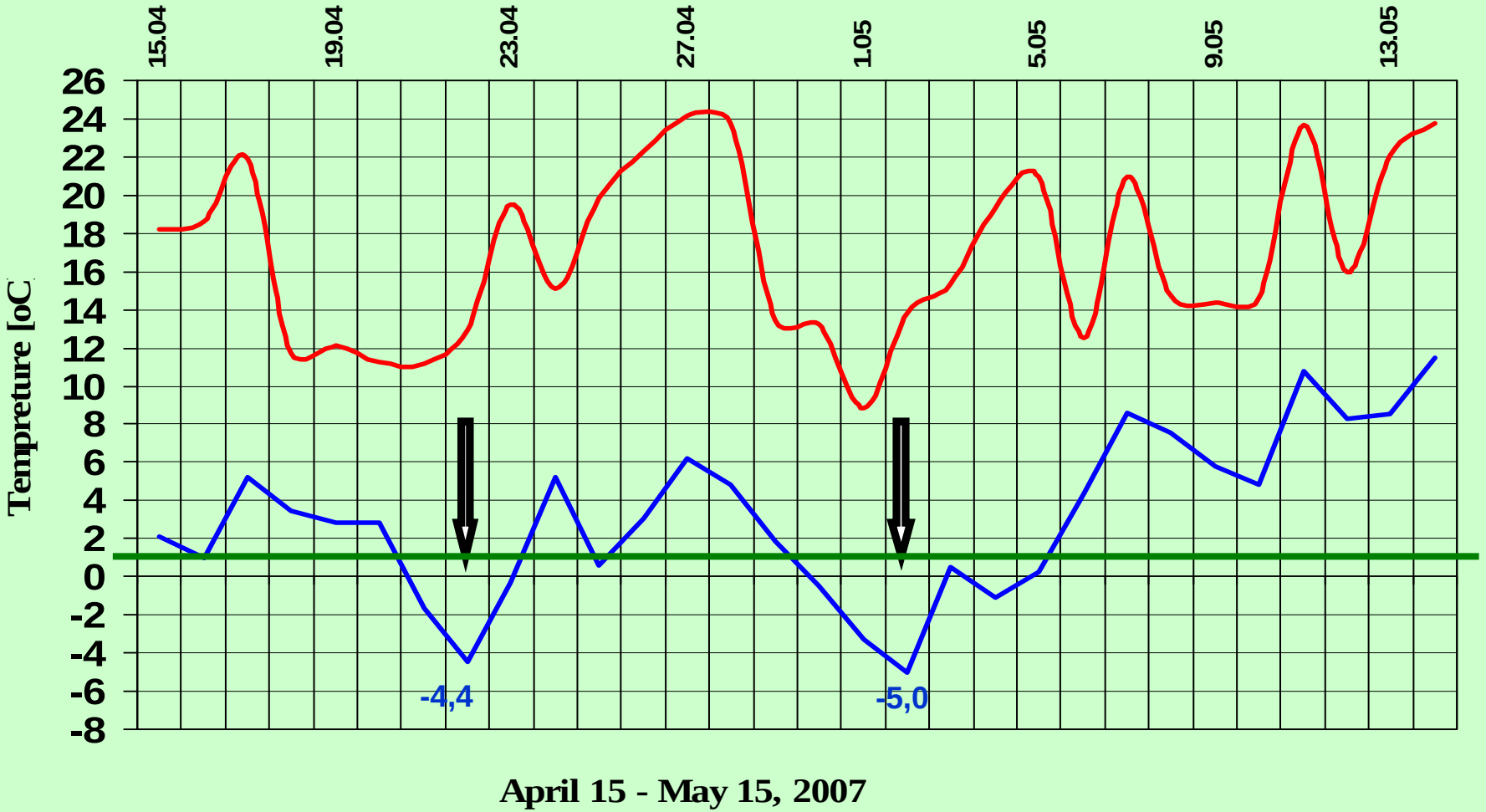
RESULTS

EXPERIMENT II

2005-2007

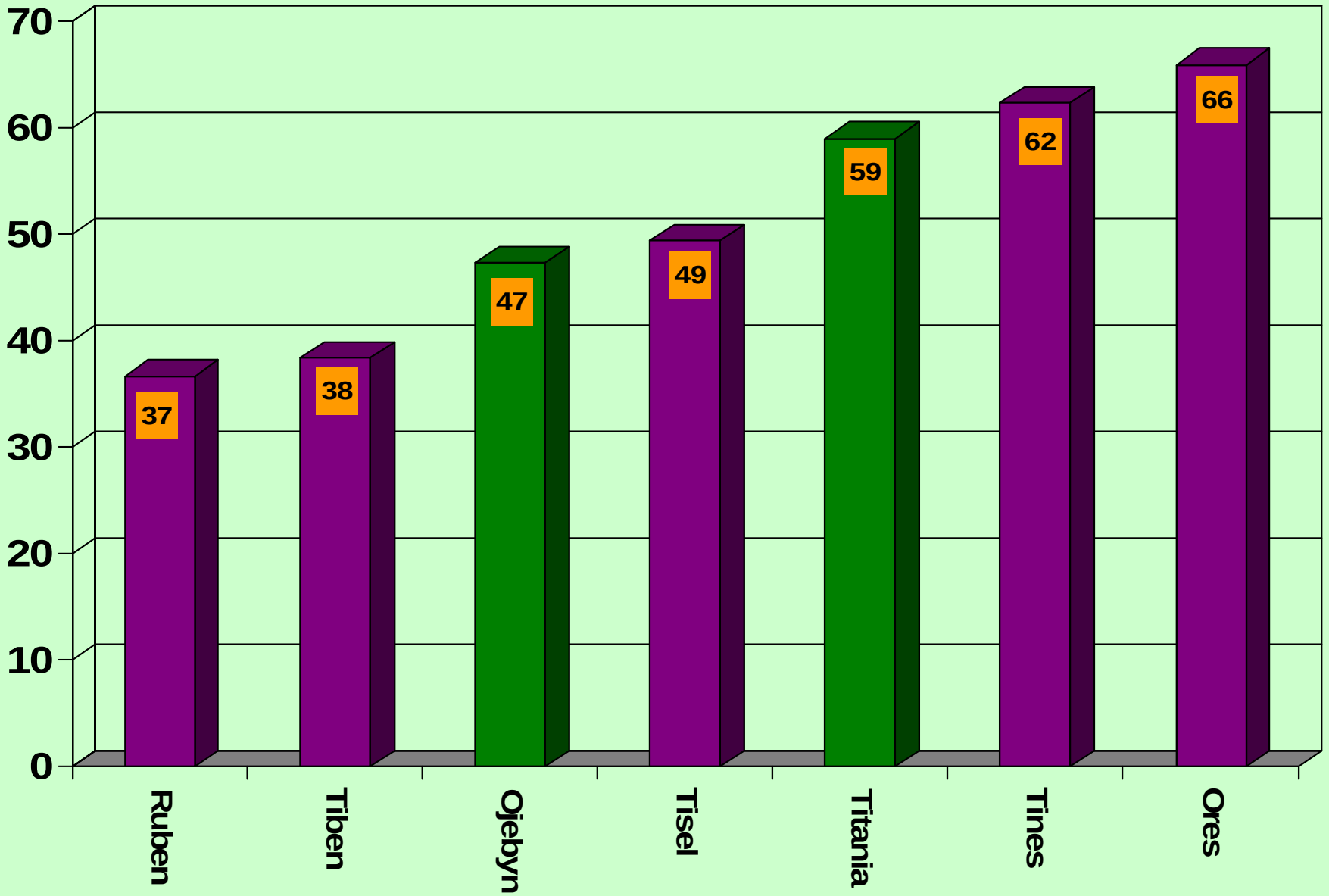
MAXIMUM and MINIMUM TEMPERATURES

Experimental Station (SD) Dąbrowice near Skierniewice, Central Poland – 2007

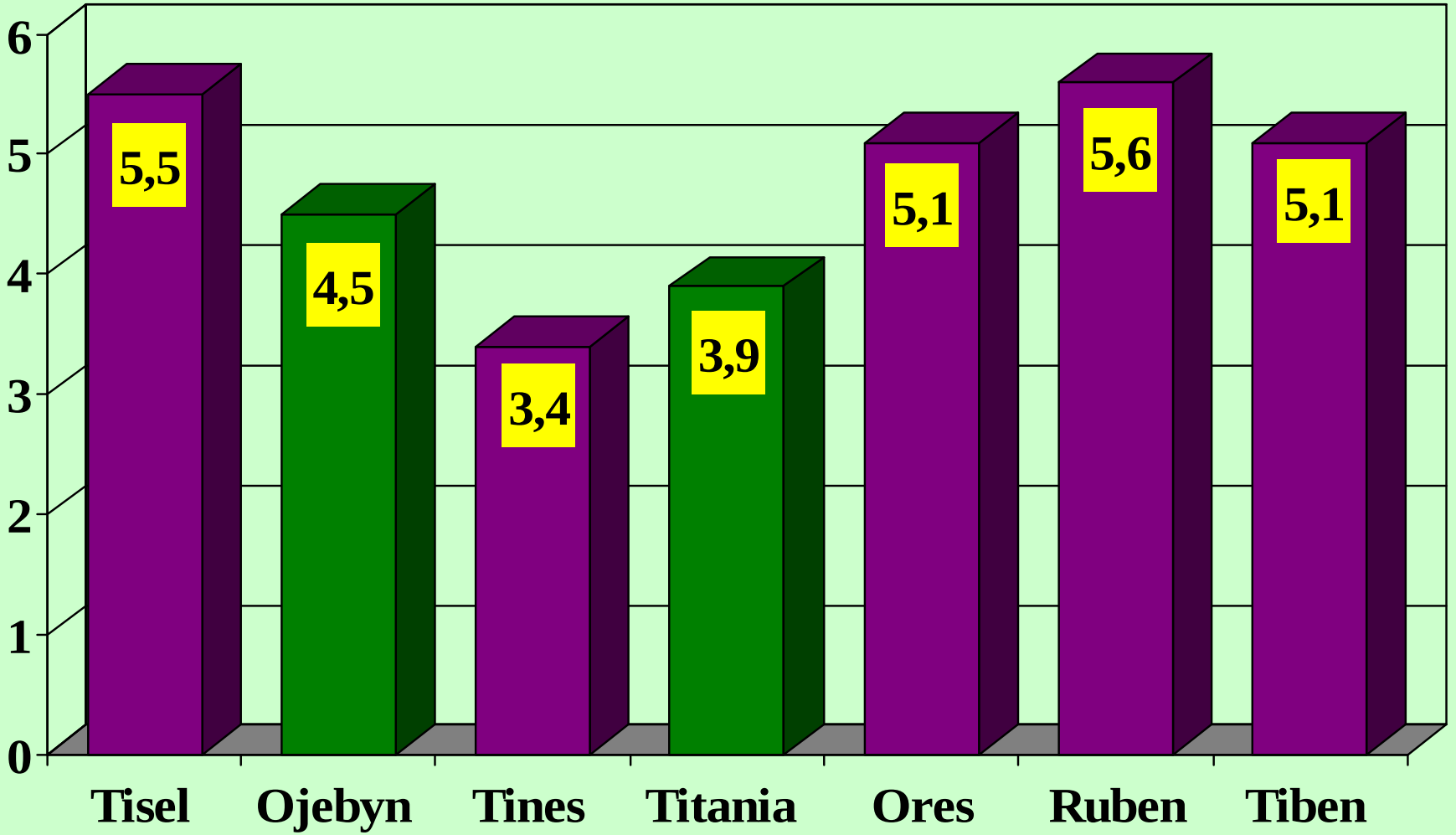


April 15 - May 15, 2007

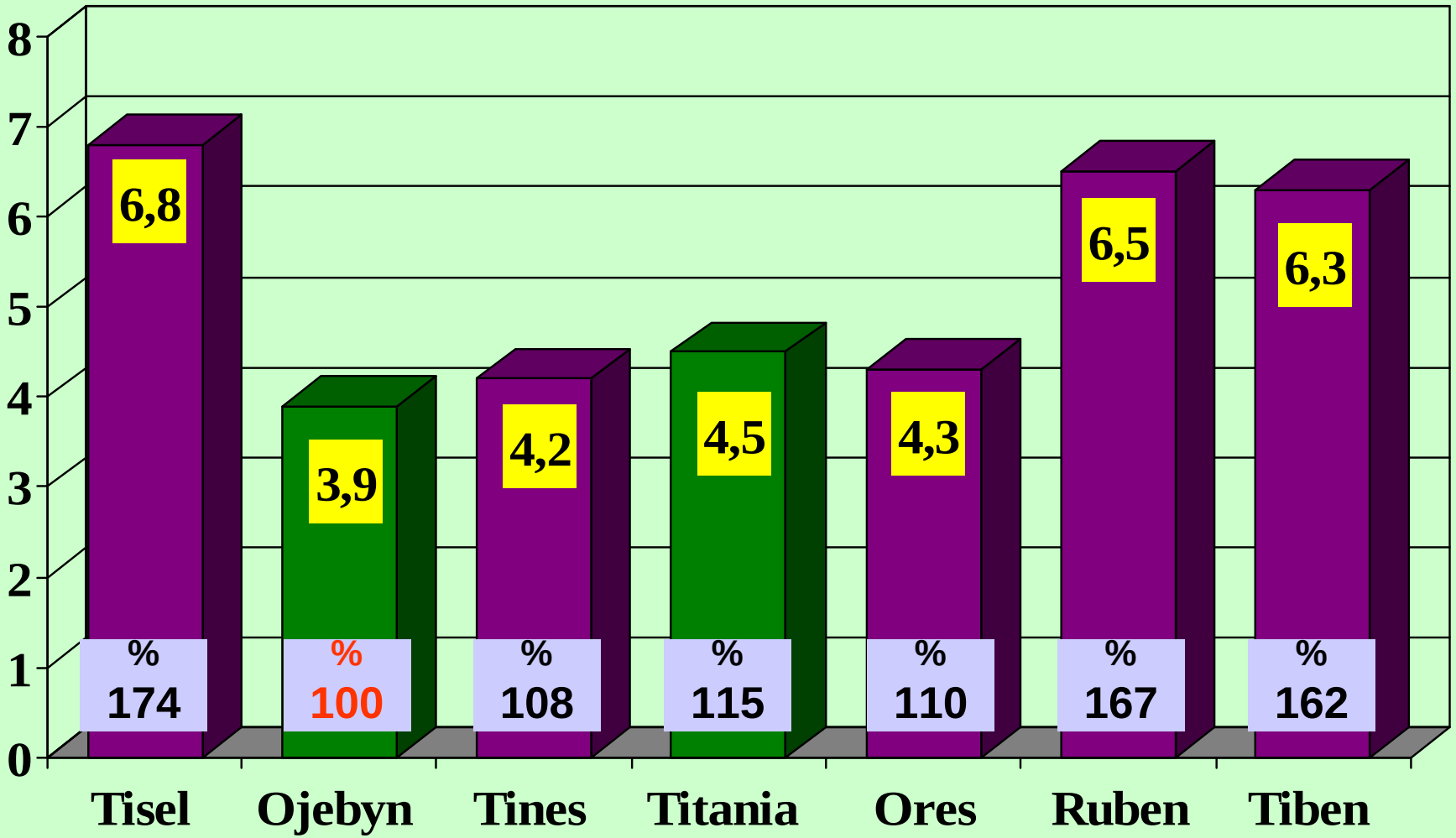
SPING FROST DAMAGES TO FLOWER BUDS, Experiment II – spring 2007 [%]



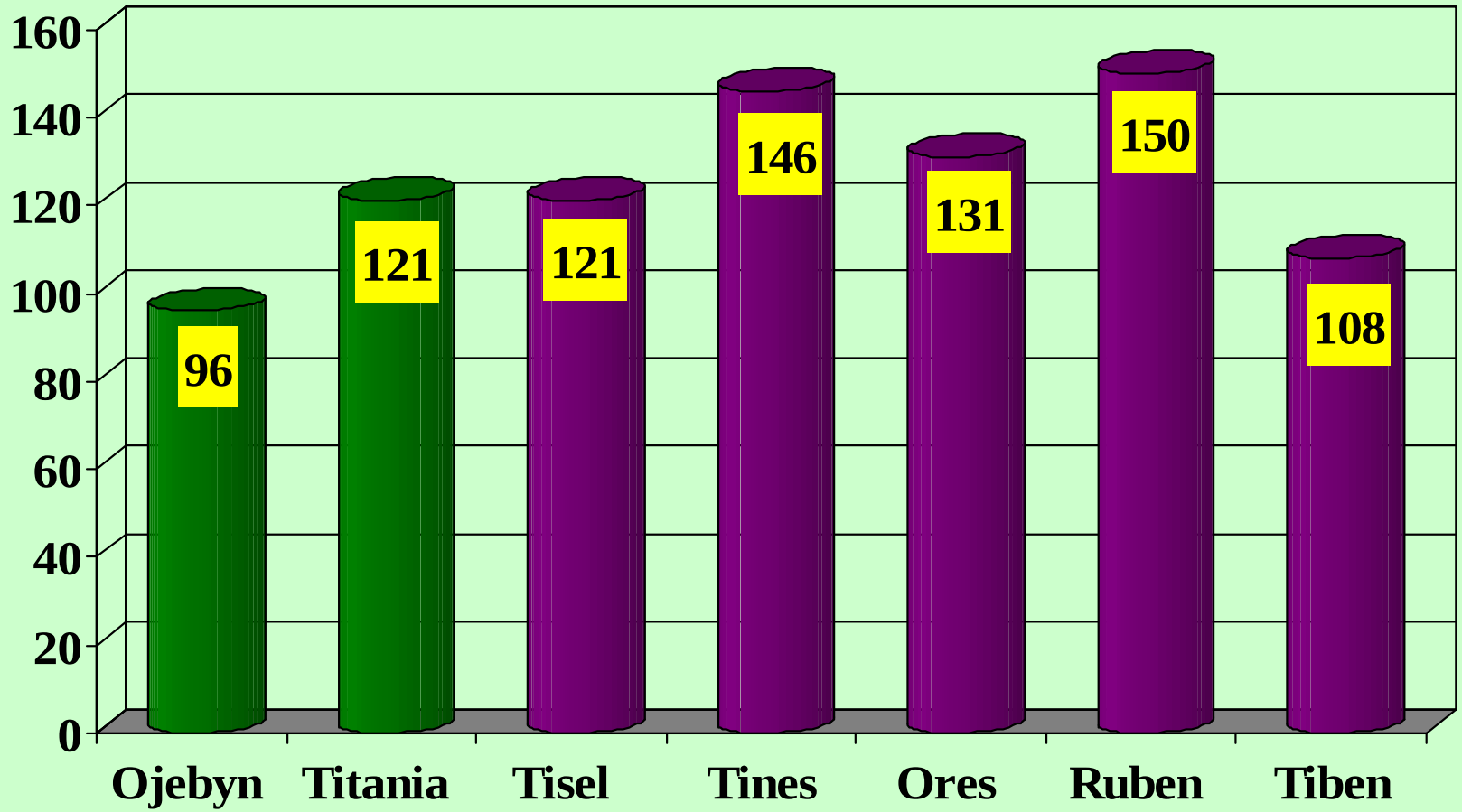
FRUIT YIELD [t/ha]
(Experimental Station Dąbrowice, 2007
(cultivars arranged according to time of fruit ripening)
Experiment II **– established in 2002**
2007 –picking by harvester



FRUIT YIELD [t/ha]
(Experimental Station (SD) Dąbrowice,
Experiment II - established in 2002
Average for 2006-2007 – harvester picking



FRUIT SIZE (weight of 100 berries) [g]
Experimental Station Dąbrowice,
Experiment II – established in 2002
Average for 2005-2007



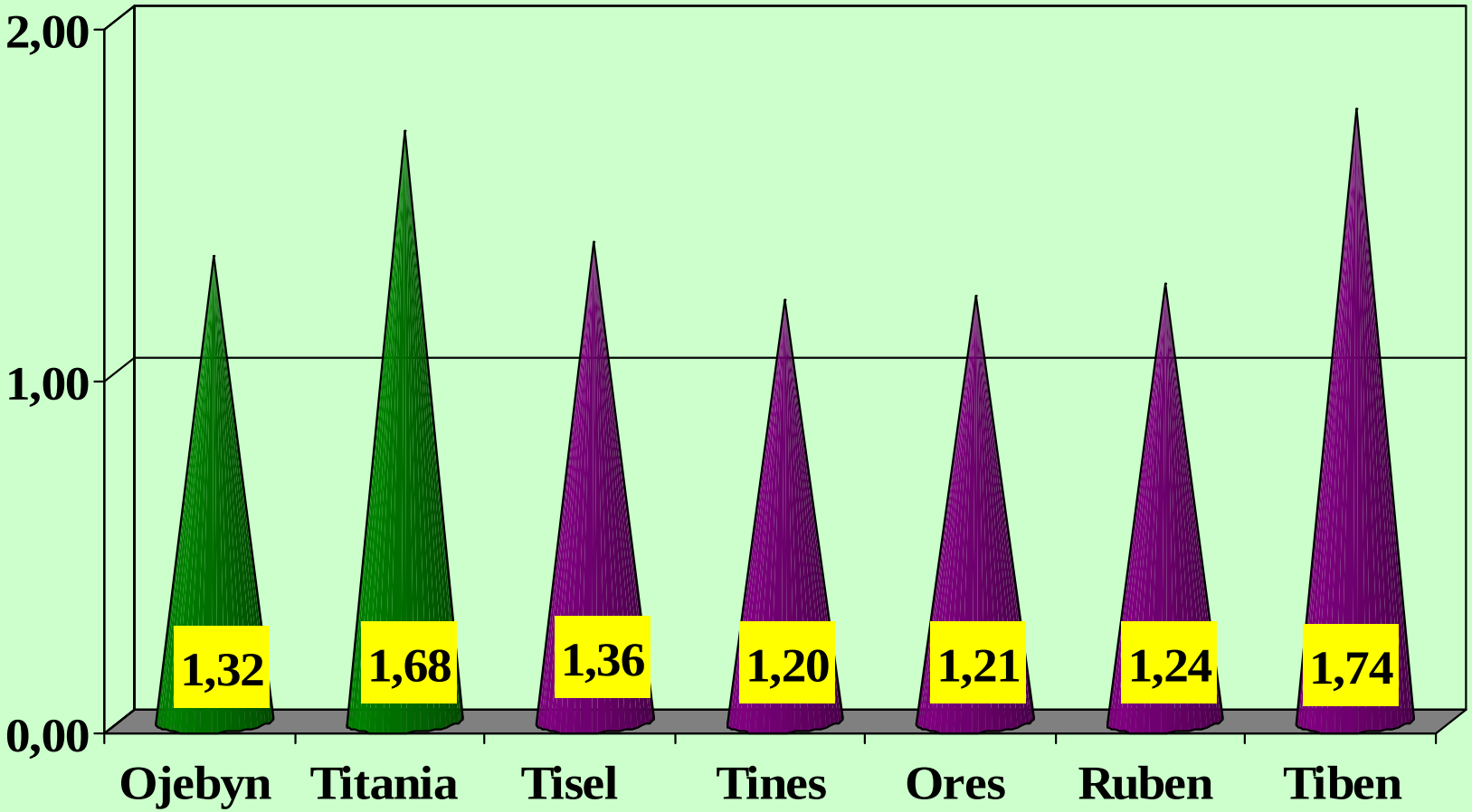
FIELD RESISTANCE TO FUNGAL DISEASES

EXPERIMENT II (average for 2005-2007), [ranking scale 1-5]

Cultivar	Infection by fungal diseases		
	Powdery mildew	Leaf spot	White pine blister rust
1. Ojebyn	*1,0*	*3,7*	*2,7*
2. Titania	*1,0*	*2,5*	*1,0*
3. Tisel	1,0	2,9	1,0
4. Tines	1.0	3,4	1,8
5. Ores	1,0	2,7	1,0
6. Ruben	1,0	2,9	1,0
7. Tiben	1,0	2,0	1,2

Ranking scale: 1-5, 1 – no symptoms, 3- medium, 5 – very severe symptoms

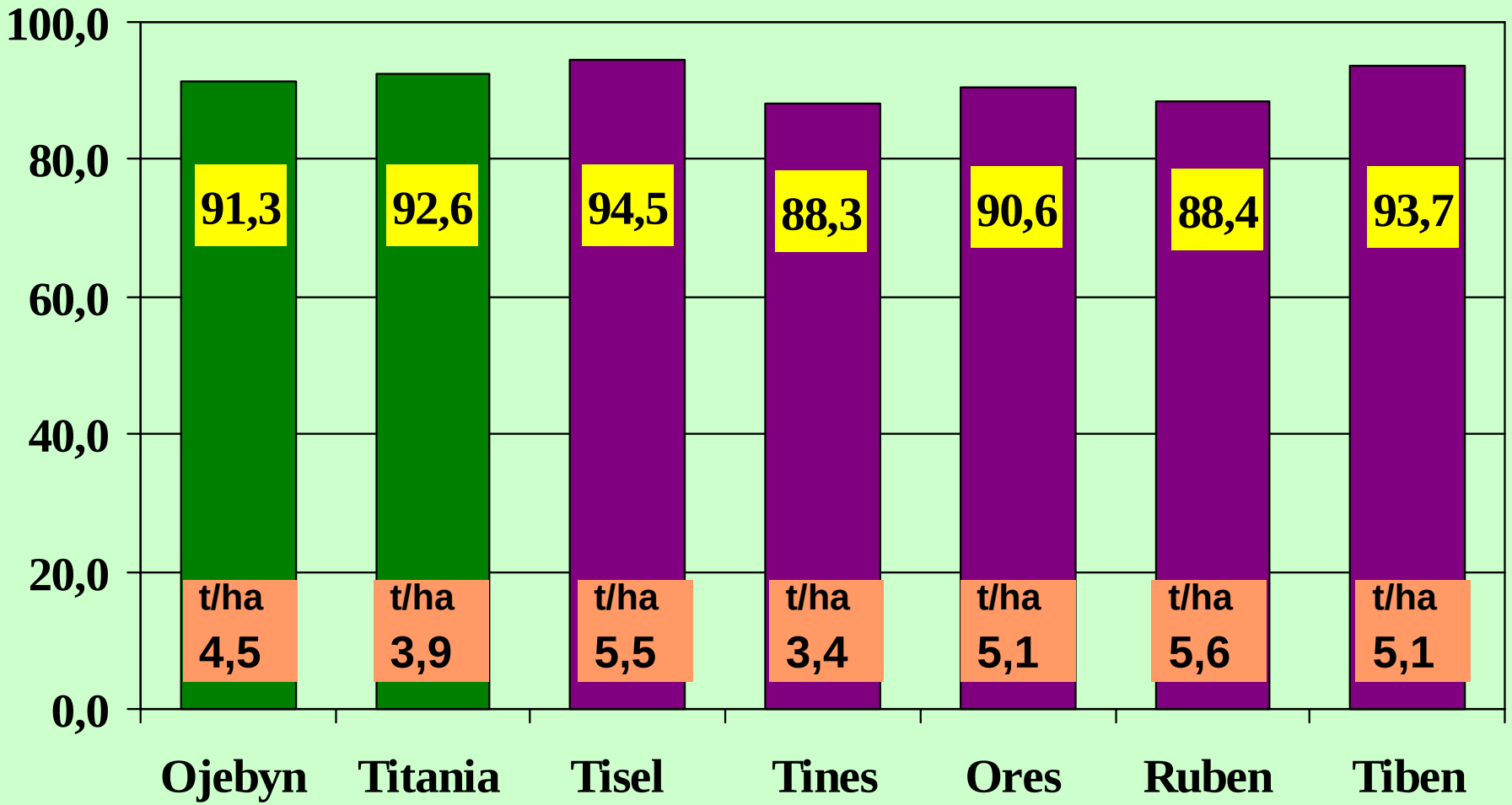
BUSH SIZE (heigh x width) [m²]
SD Dąbrowice, (average for 2005-2007)
Experiment II – established in 2002



Shoot damages: the highest - 'TITANIA' medium - 'TISEL', 'ORES'. 'RUBEN'
the lowest - 'OJEBYN', 'TIBEN' i 'TINES'

Effectiveness of fruit picking by harvester [%] (Experimental Station Dąbrowice, 2007)

Experiment II - established in 2002



CONCLUSIONS

1. New Polish cultivars confirm their high fruit productivity. Moreover, they produce large or medium-size fruits.

2. From other studies we know that these cultivars posses high processing suitability

3. All new Polish cultivars examined in both experiments demonstrate good usefulness for the fruits picking by harvesters. In this respect, they equal with the standard cultivars ‘Ojebyn’, ‘Ben Lomond’ and ‘Ben Connan’, but they are better than standard cultivar ‘Titania’.

4. Plants of ‘Tisel’, ‘Ruben’, ‘Ores’ and ‘Tiben’ are also resistant or low susceptible to the main fungal diseases.

5. Implementation of these cultivars into commercial plantations will allow further blackcurrant production intensification in Poland.

6. Presented results confirm that the Polish blackcurrant breeding program has been effective and we except to release next cultivars soon with increased production value.

THANK YOU