Eurasian provenance experiment of Scots Pine - trial at Sambor in Ukraine

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Aims:

- Describe current status of the trial
- Presenting the latest results
- Comparing results with local Lvov population performance
- Looking for the growth and survival patterns

Description of the series

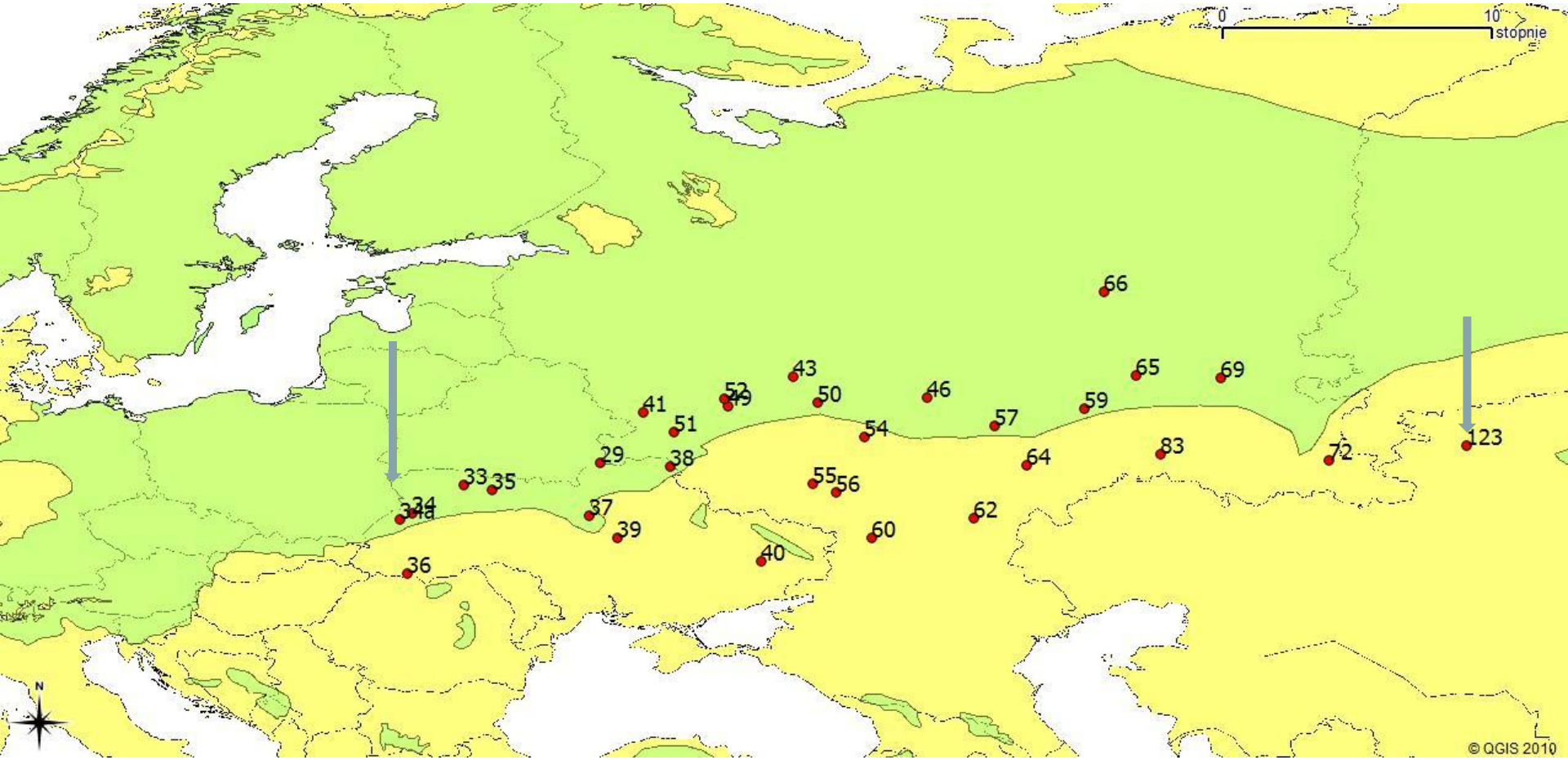
- In the years 1973 to 1976 Rusian Scots Pine was established with 113 provenances and 33 planting sites
- One of them is trial in Sambor near Lviv (East Roztocze region)
- Result of the series was published by Shutayev and Giertych
- In summarizing they using published results from Sambor trial after 11 years of growth
- Now we presenting data after 33 years from planting

Studied populations

No	P. No	Prowenance	Name	Latitude N	Longitude E	No	P. No	Prowenance	Name	Latitude N	Longitude E
1	29	Гомельська	Gomyel	52° 14’	31° 40’	18	55	Воронежська	Voronyezh 1	51° 38’	39° 28’
2	33	Рівненська	Rovno	51° 32’	26° 36’	19	56	Воронежська	Voronyezh 2	51°08’	40°15’
3	34	Львівська (Лопатин)	Lopatyn	50° 30’	24° 45’	20	57	Пензенська	Pyenza	53° 50’	46° 00’
4	35	Житомирська	Zhitomir	51° 14’	27° 40’	21	59	Улянівська	Ulyanovsk	54° 14’	49° 35’
5	36	Ів. Франківська	Iv. Frankowsk	48° 07’	24° 03’	22	60	Ростовська	Rostov	49° 36’	41° 48’
6	37	Київська	Kiyev	50° 21’	31° 00’	23	62	Волгоградська	Volgograd	50° 10’	45° 24’
7	38	Сумська	Sumy	52° 01’	34° 00’	24	64	Саратовська	Saratov	52° 05’	47° 21’
8	39	Черкаська	Chyerkassy	49° 37’	32° 05’	25	65	Татарська	Tatarstan	55° 40’	51° 26’
9	40	Донецька	Donyetsk	48° 50’	37° 36’	26	66	Кіровська	Kirov	58° 49’	50° 06’
10	41	Смоленська	Smoliensk	54° 00’	33° 00’	27	69	Башкирська	Bashkortosta	55° 30’	54° 40’
11	43	Московська	Moskva	55° 32’	38° 57’	28	72	Башкирська	Bashkortosta	52° 24’	58° 40’
12	46	Горківська	Nizhyegorod	54° 56’	43° 50’	29	83	Оренбургська	Oryenburg	52° 47’	52° 15’
13	49	Калузька	Kaluga	54° 25’	36° 16’	30	86	Новосибірська	Novosibirsk	53° 50’	82° 20’
14	50	Рязанська	Ryazan	54° 40’	39° 45’	31	91	Алтайська	Altaiski Kral	51° 32’	81° 10’
15	51	Брянська	Bryansk	53° 30’	34° 15’	32	123	Кустанайська	Kustanal	52° 80’	63° 50’
16	52	Орловська	Oryel	54° 50’	36° 00’	33	125	Семипалатинсь	Syemipalatin	50° 40’	80° 38’
17	54	Тамбовська	Tambov	53° 12’	41° 20’	34	34a	Львівська	Lvov	50° 05’	24° 00’

Range 10° 42’ N **58° 20’E**

Studied populations

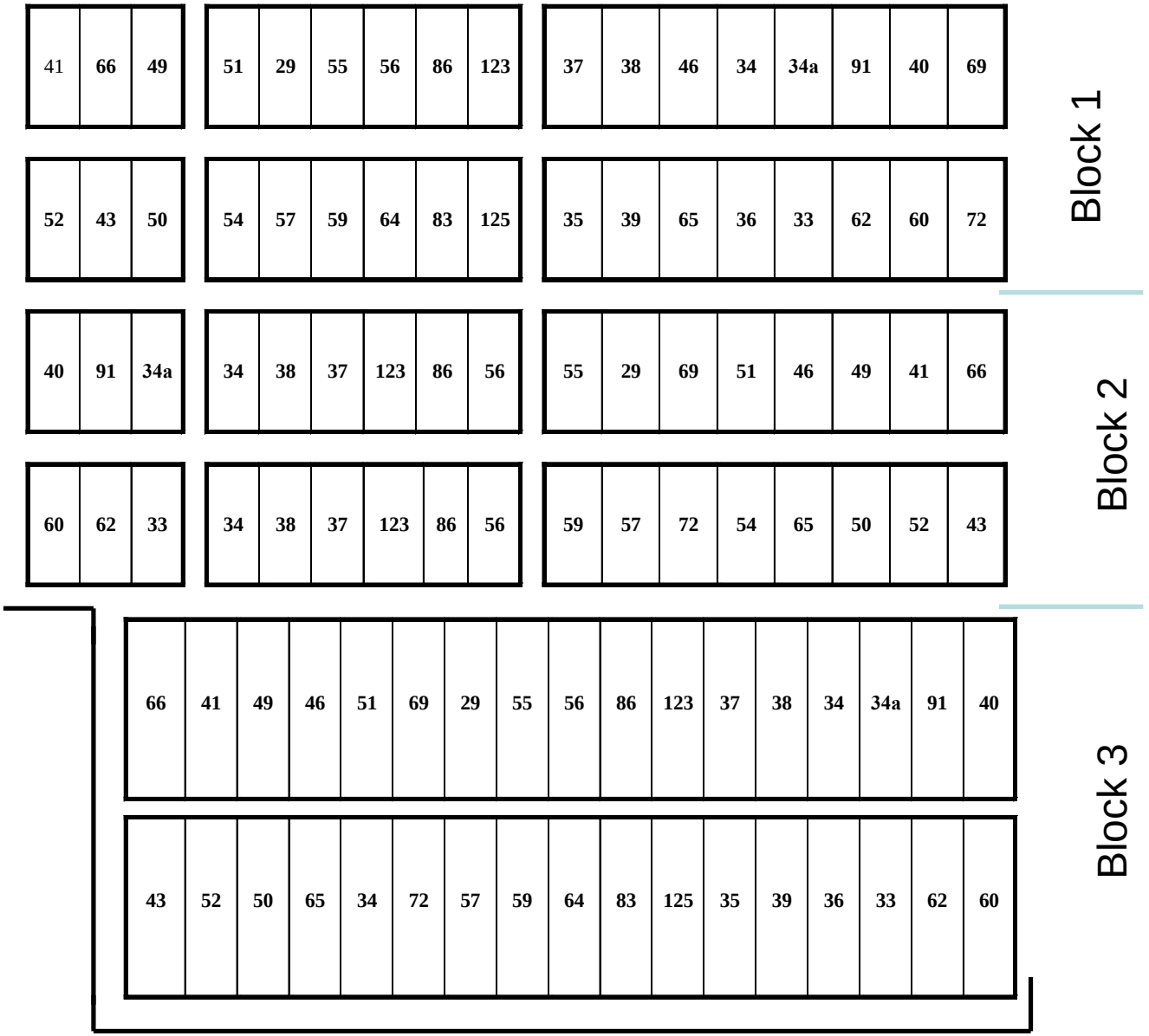


58.20 °

Experimental site description

Year of planting:1975
Spacing: 2.0 x 0.75 m
Area: 13,25 ha
Area per provenance: 0.2 , 0.3 or 0.45 ha
No of block: 3

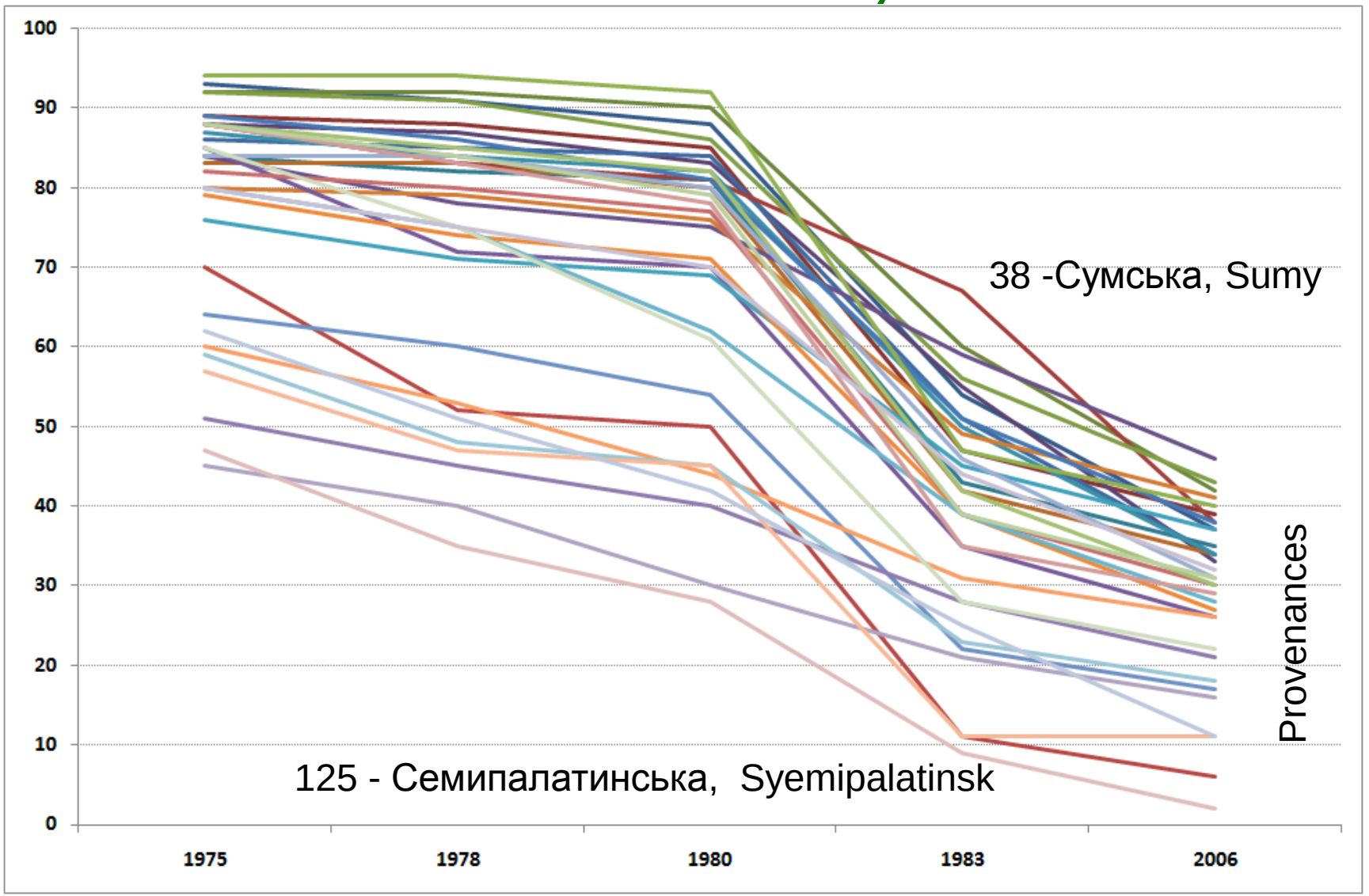
Trial scheme



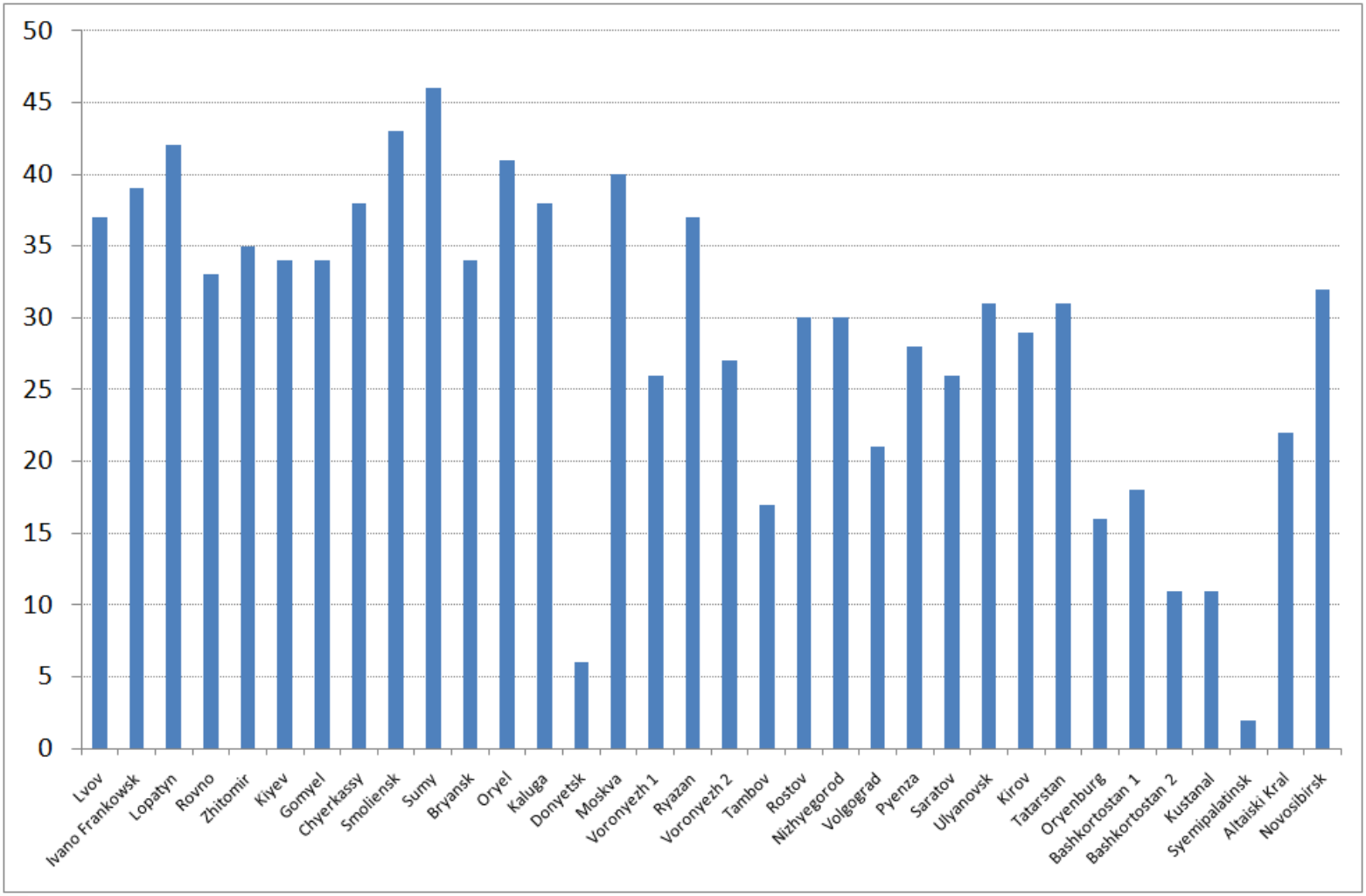
Methods

- Survival was calculated
- DBH and Height – measured
- Result are presented also on the map in standard deviation units

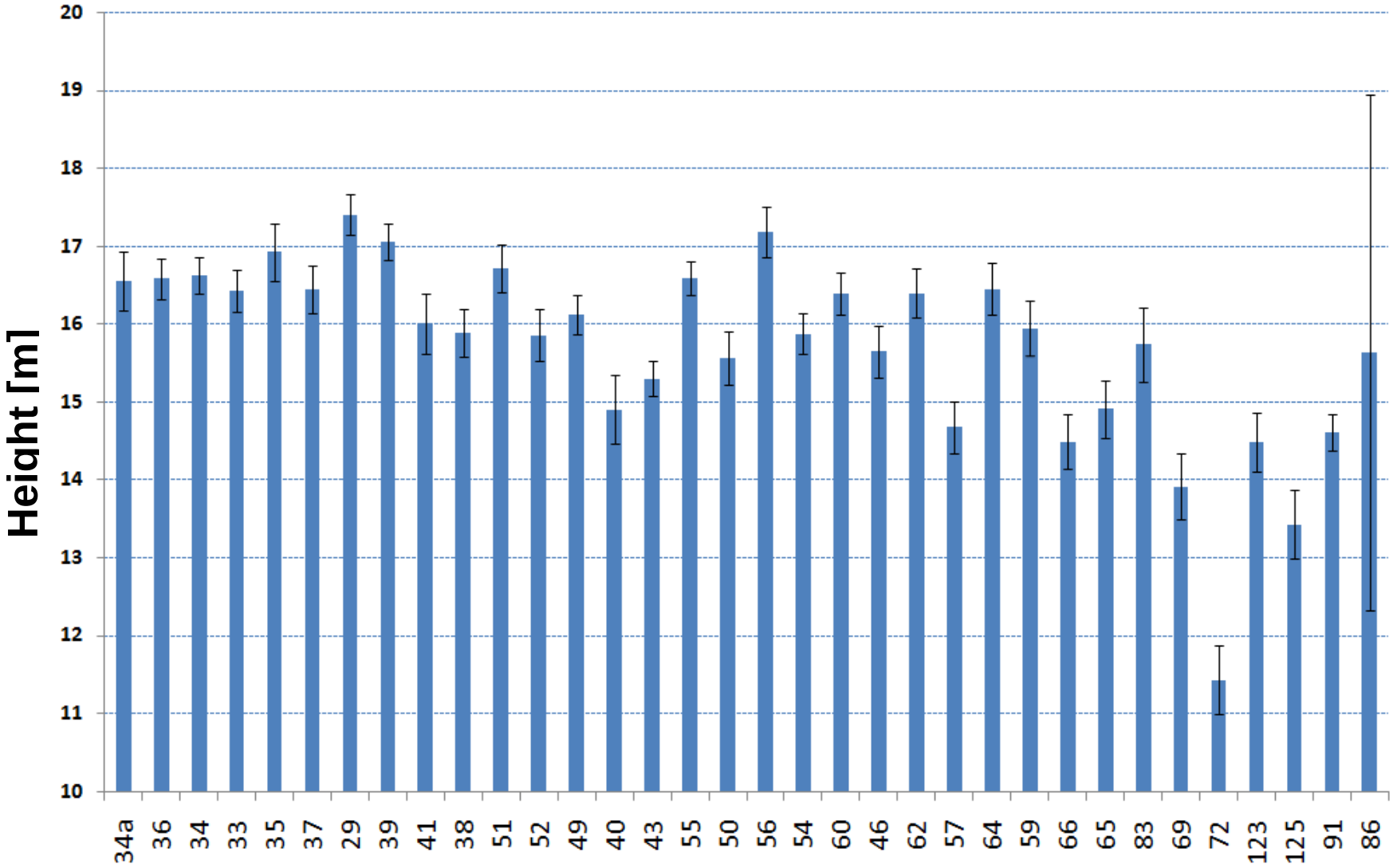
Survival after 33 years.



Survival


50
45
40
35
30
25
20
15
10
5
0
Lvov
Ivano Frankowsk
Lopatyn
Rovno
Zhitomir
Kiyev
Gomyel
Chyerkassy
Smoliensk
Sumy
Bryansk
Oryel
Kaluga
Donyetsk
Moskva
Voronyezh 1
Ryazan
Voronyezh 2
Tambov
Rostov
Nizhyegorod
Volgograd
Pyenza
Saratov
Ulyanovsk
Kirov
Tatarstan
Oryenburg
Bashkortostan 1
Bashkortostan 2
Kustanal
Syemipalatinsk
Altaiski Kral
Novosibirsk

Growth after 33 years.



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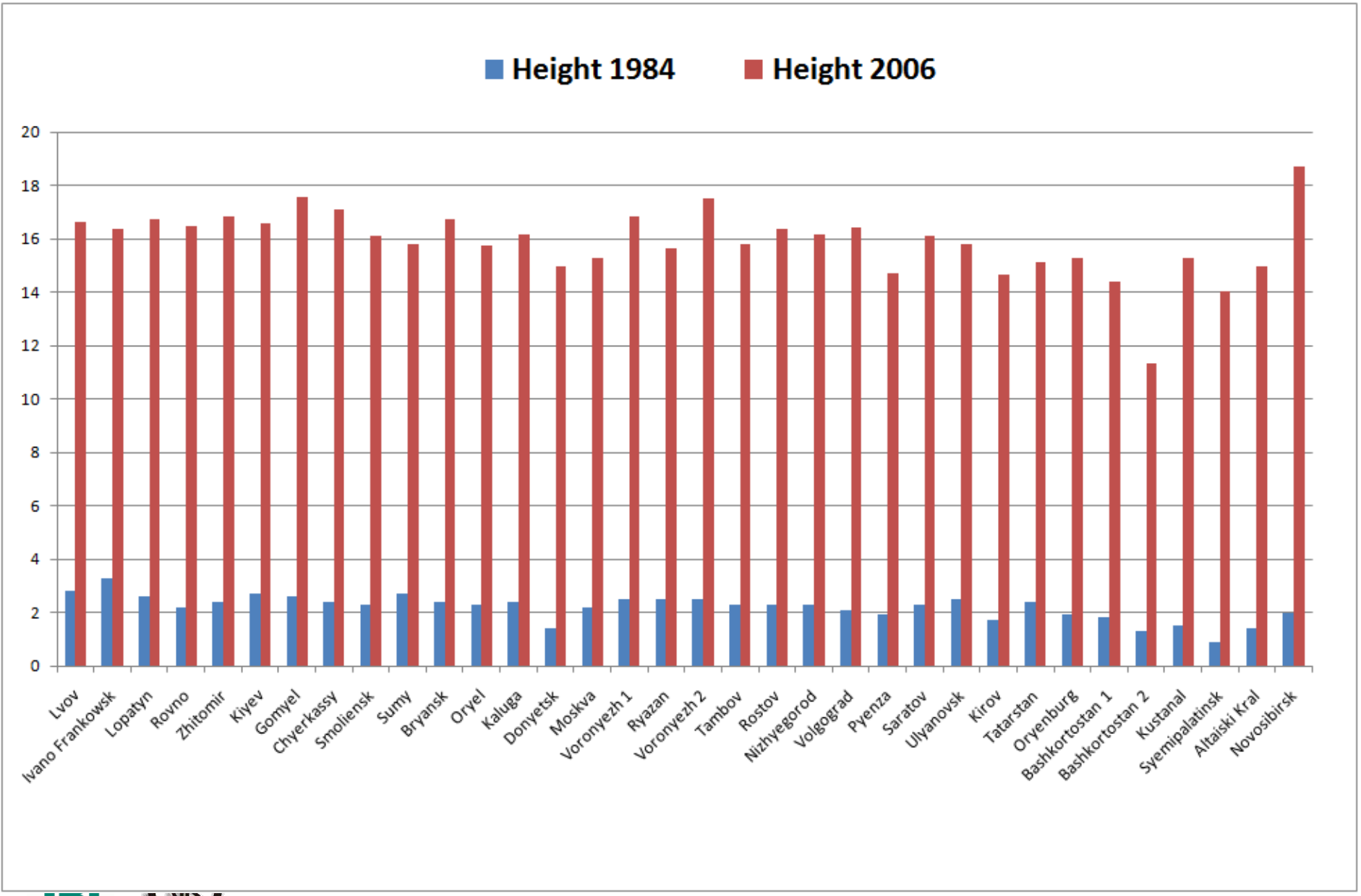
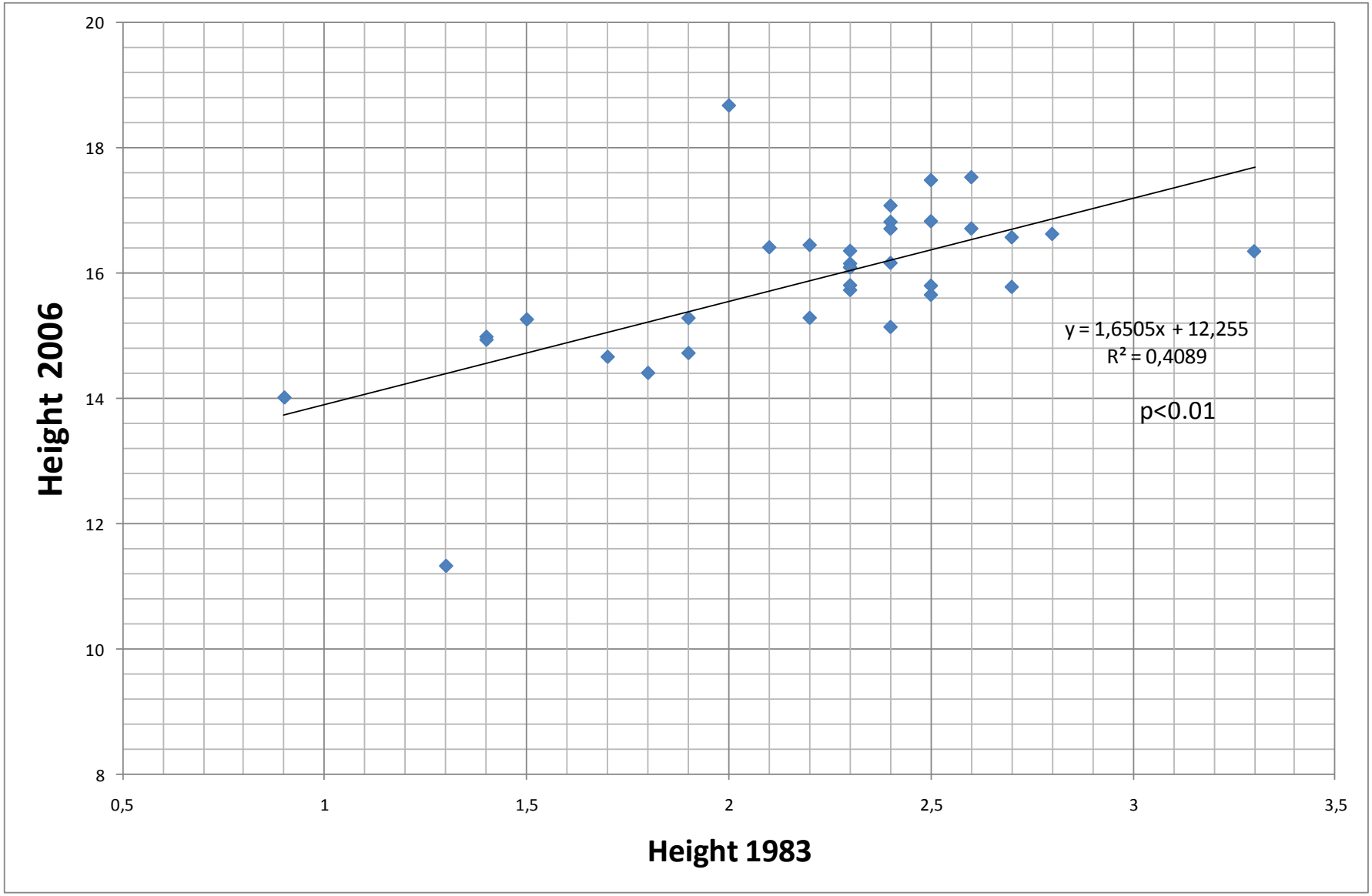
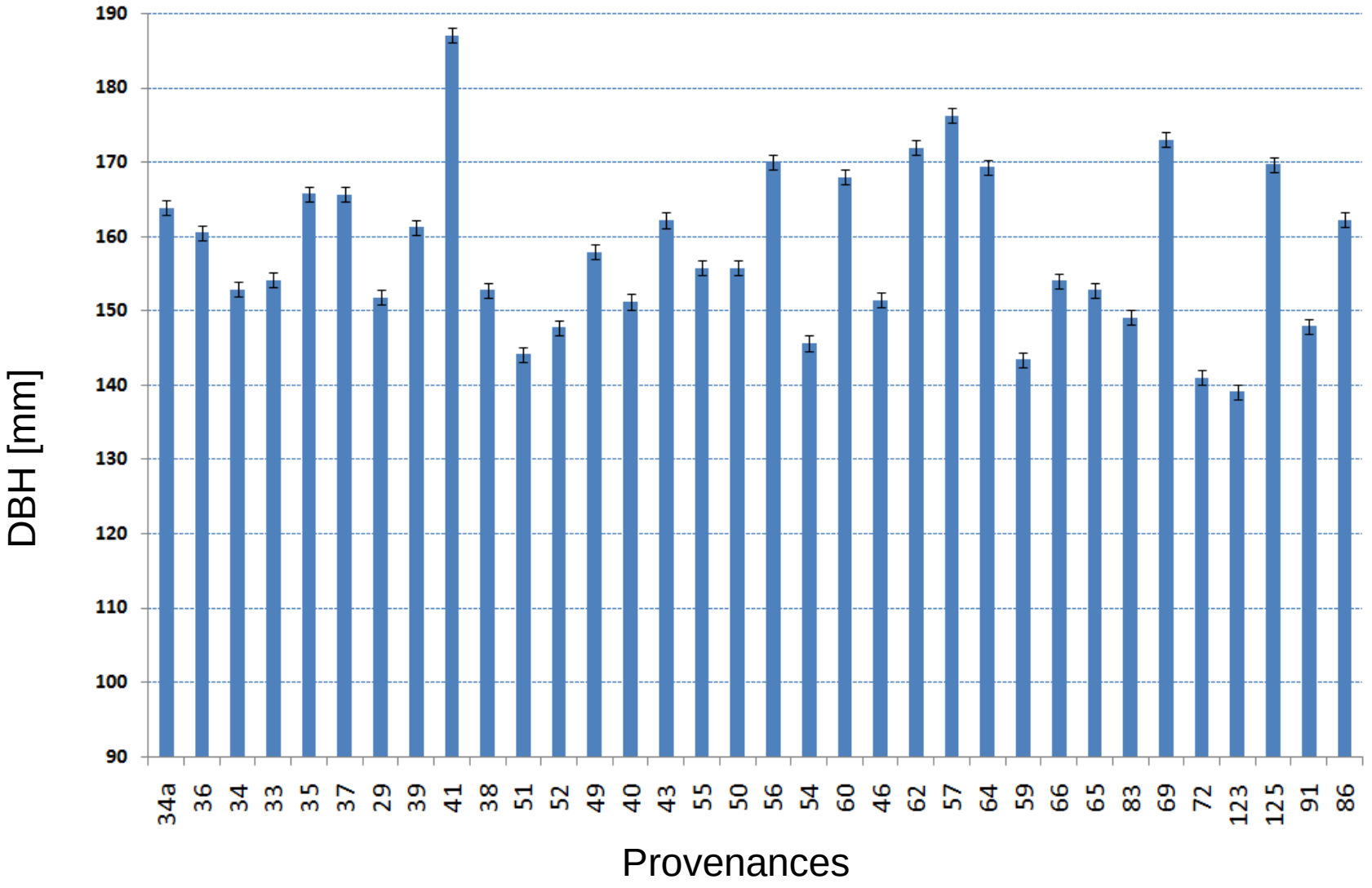
Treebreedex



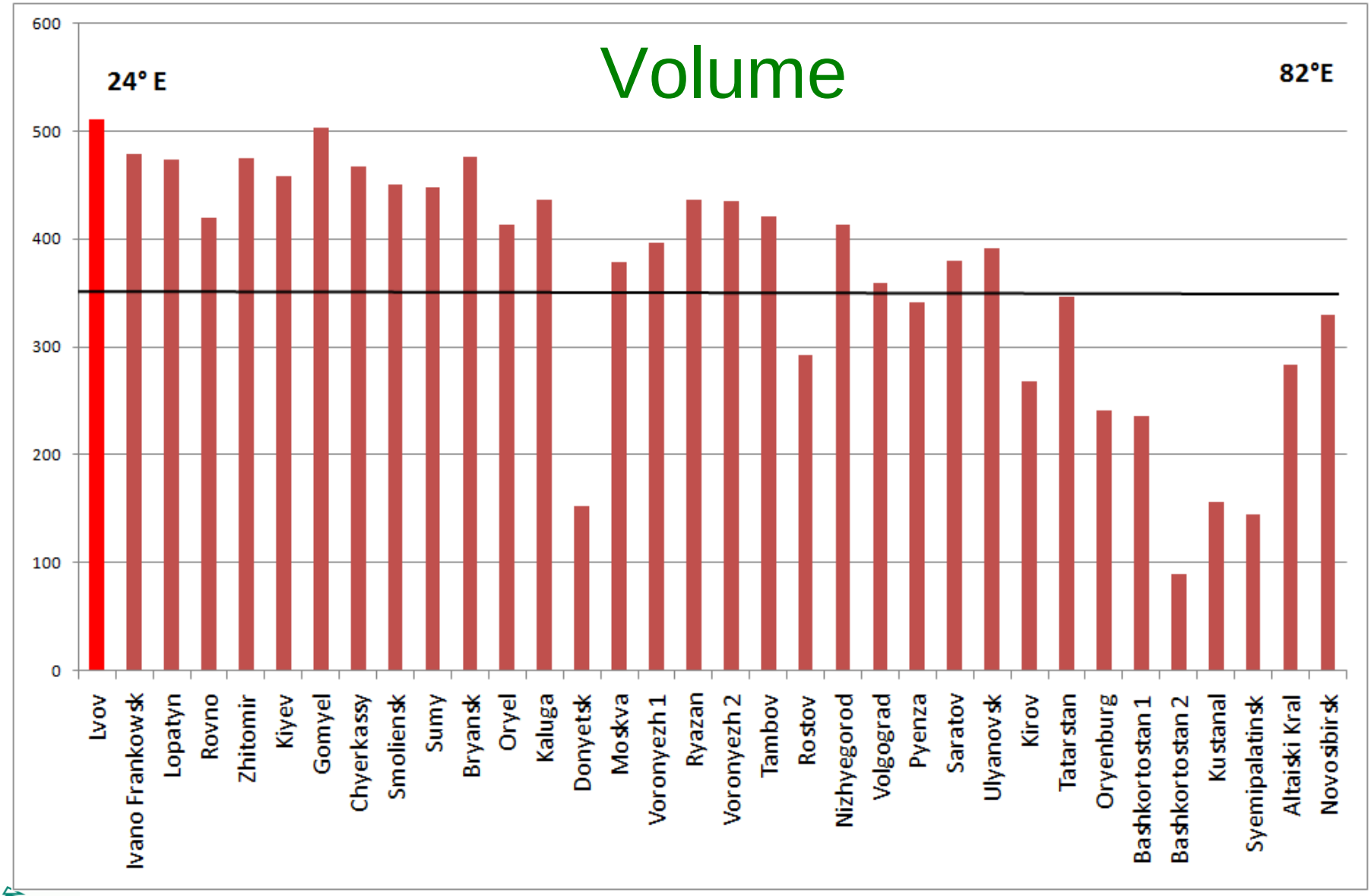
IBL Treebreedex

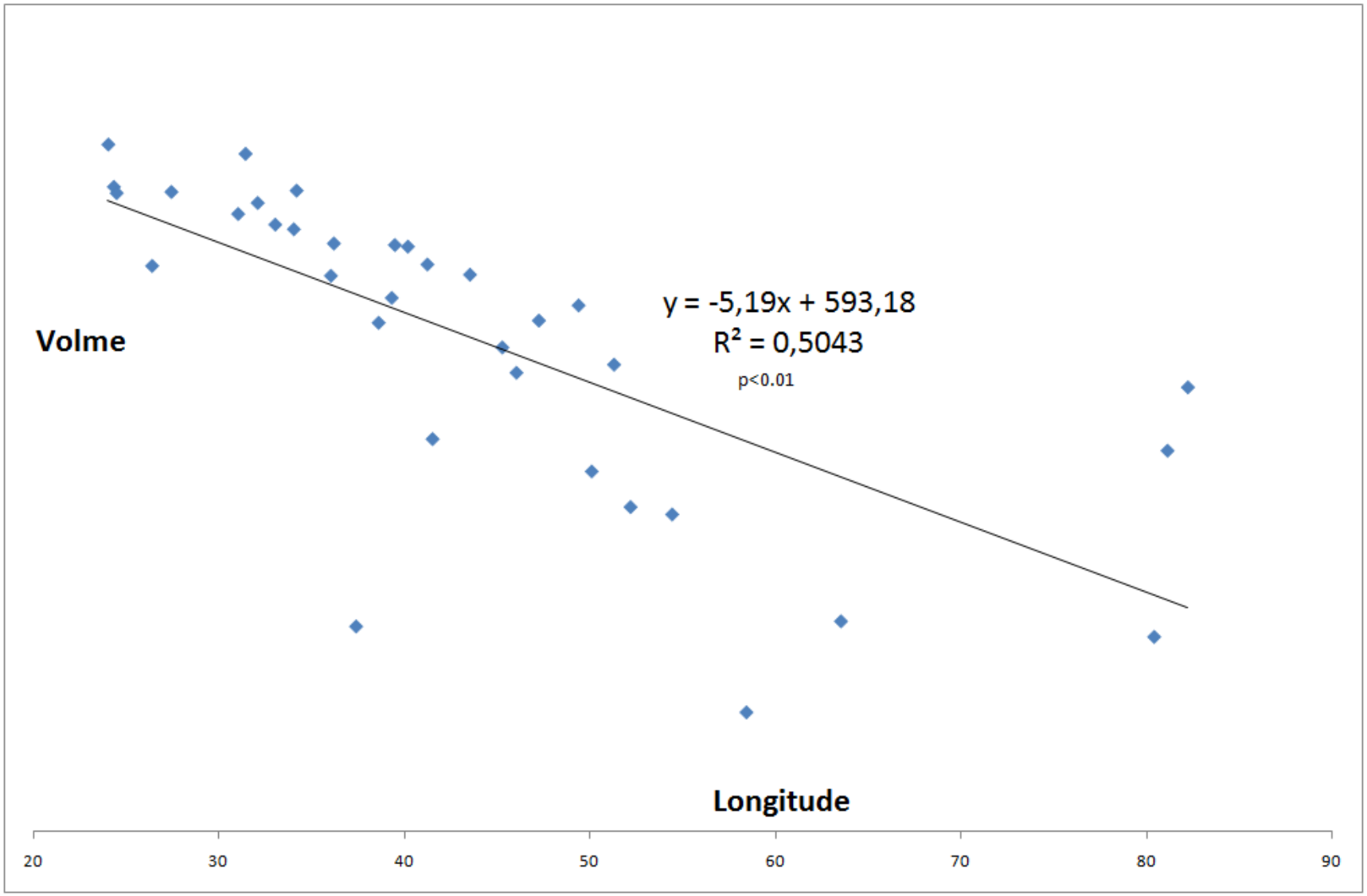

Height 2006
Height 1983
20
18
16
14
12
10
8
0,5
1
1,5
2
2,5
3
3,5
y = 1,6505x + 12,255
R² = 0,4089
p<0.01

Growth after 33 years.



Volume


24° E
82°E
600
500
400
300
200
100
0
Lvov
Ivano Frankowsk
Lopatyn
Rovno
Zhitomir
Kiyev
Gomyel
Chyerkassy
Smoliensk
Sumy
Bryansk
Oryel
Kaluga
Donyetsk
Moskva
Voronyezh 1
Ryazan
Voronyezh 2
Tambov
Rostov
Nizhyegorod
Volgograd
Pyenza
Saratov
Ulyanovsk
Kirov
Tatarstan
Oryenburg
Bashkortostan 1
Bashkortostan 2
Kustanal
Syemipalatinsk
Altaiski Kral
Novosibirsk


Volme
y = -5,19x + 593,18
R² = 0,5043
p<0.01
Longitude
20
30
40
50
60
70
80
90

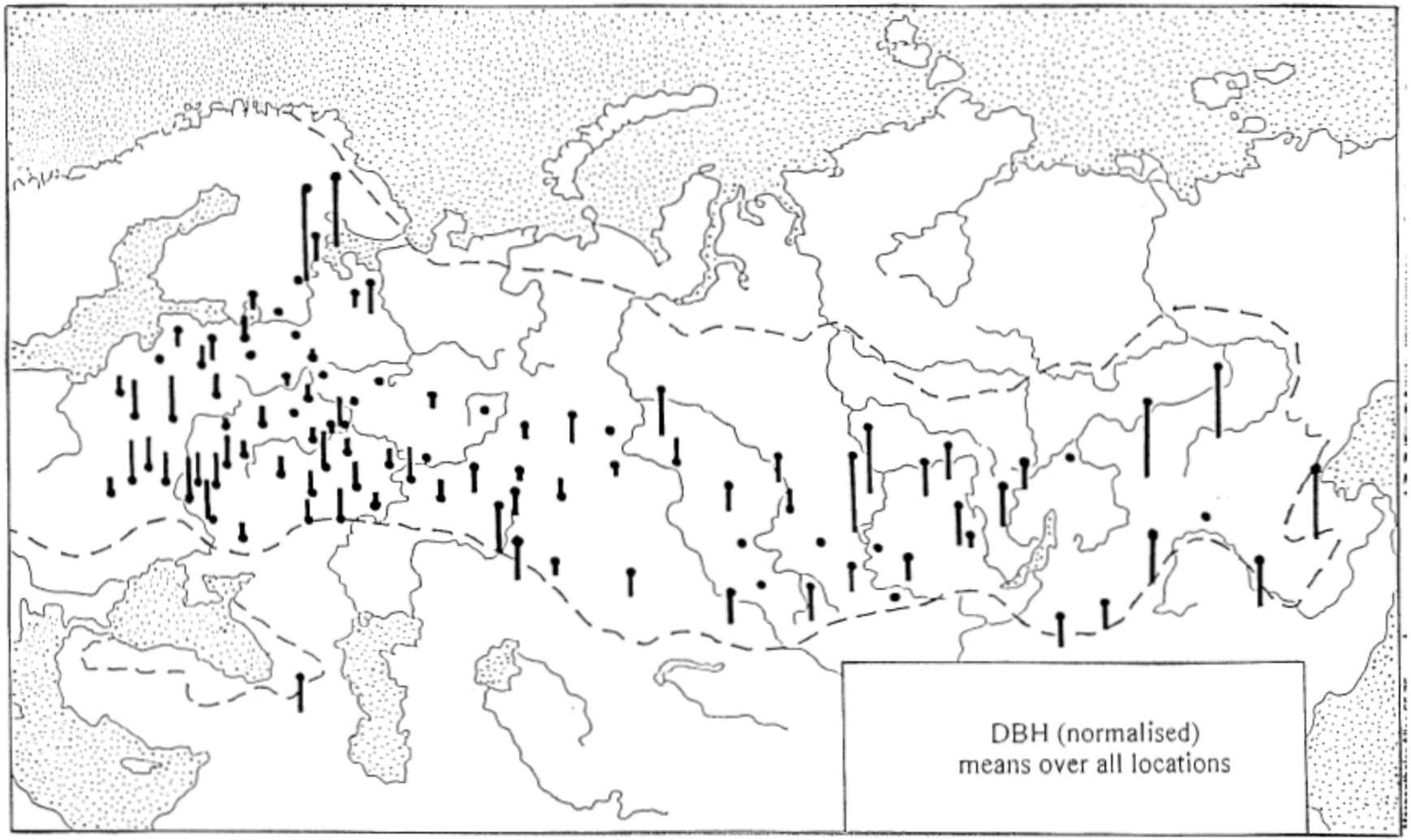


Fig. 2. – Diameter at breast height (DBH) of different provenances of Scots pine expressed in units of standard deviation from the location mean and averaged over all locations from which data for a provenance is available (at least 3). The radius of a dot corresponds to ± 0.15 standard deviations.

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Genetic Subdivisions of the Range of Scots Pine (*Pinus sylvestris* L.) Based on a Transcontinental Provenance Experiment

By A. M. SHUTYAEV[1]) and M. GIERTYCH[2])[3])

(Received 16th February 2000)

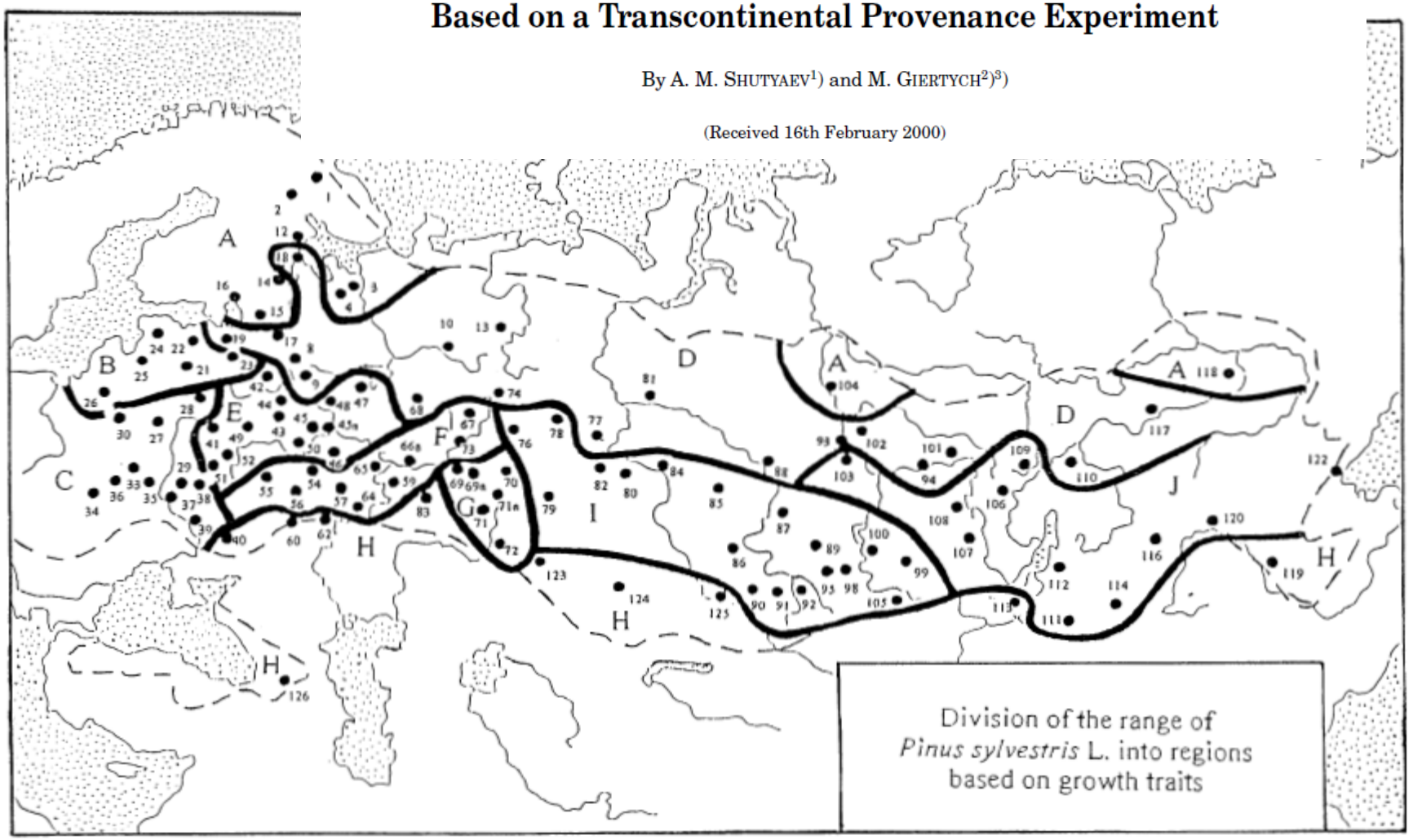

Fig. 7. – Proposed division of the range of Scots pine in the former USSR on the basis of growth traits as observed on 113 sample populations tested at 33 locations.

Heritability

DBH

$variances:
Prov Residuals
116.9974 2089.656

$sd.variances:
Prov Residuals
0 9602.431

$BS.heritability:
BS.herit sd.herit
0.2120811 0.922888

$variances:
Prov Residuals
116.9974 2089.656

$sd.variances:
Prov Residuals
0 9602.431

$Genotypic.heritability:
Genotypic.herit sd.herit
0.7132209 0.004474393

Volume

$variances:
Prov Residuals
0.0008270825 0.01146277

$sd.variances:
Prov Residuals
1.059522e-012 6.498451e-011

$Genotypic.heritability:
Genotypic.herit sd.herit
0.9780172 0.2008099

Discusion

- Missing data about quality traits
- In Ukraine parallel plots exist from this series, to make some common conclusion common evaluation is needed
- The correction of the data is needed in some cases because of different spacing caused by mortality

Summary

- Longitude - strong influence on growth
- Local provenance is the best in terms of growth
- Based on the results from the series transfer from East to West is not recommended

Thank you for your attention