

Mendel University in Brno

Faculty of Forestry and Wood Technology

Department of Geology and Soil Science

Appendix for diploma thesis

Evaluation of experimental field data from the modified earth resistance method used in trees and stands as integrated with selected classically estimated soil properties.

2015/2016

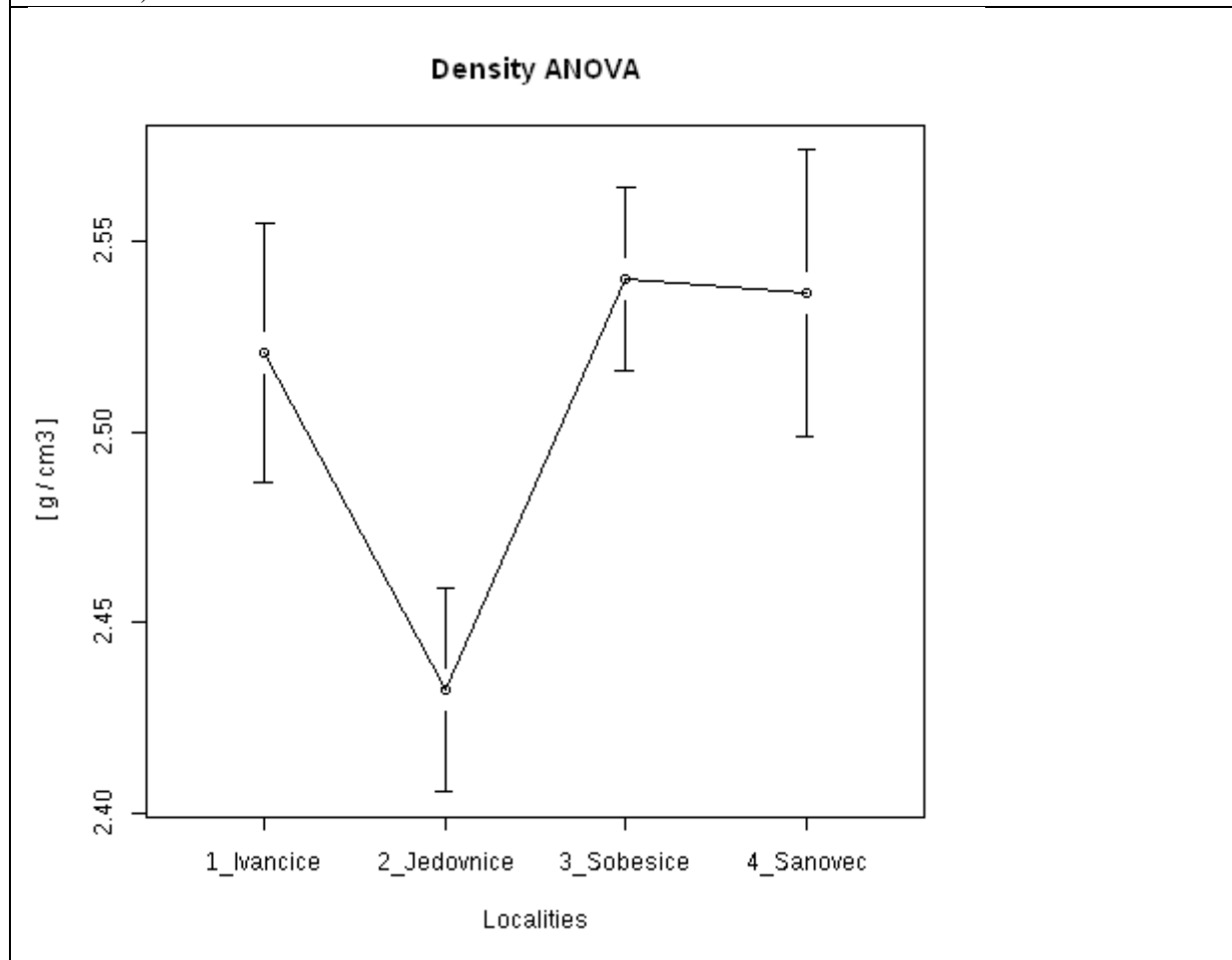
Author: Bc. Pavel Jagoš

Supervisor: **doc. Ing. Valerie Vranová, Ph.D.**

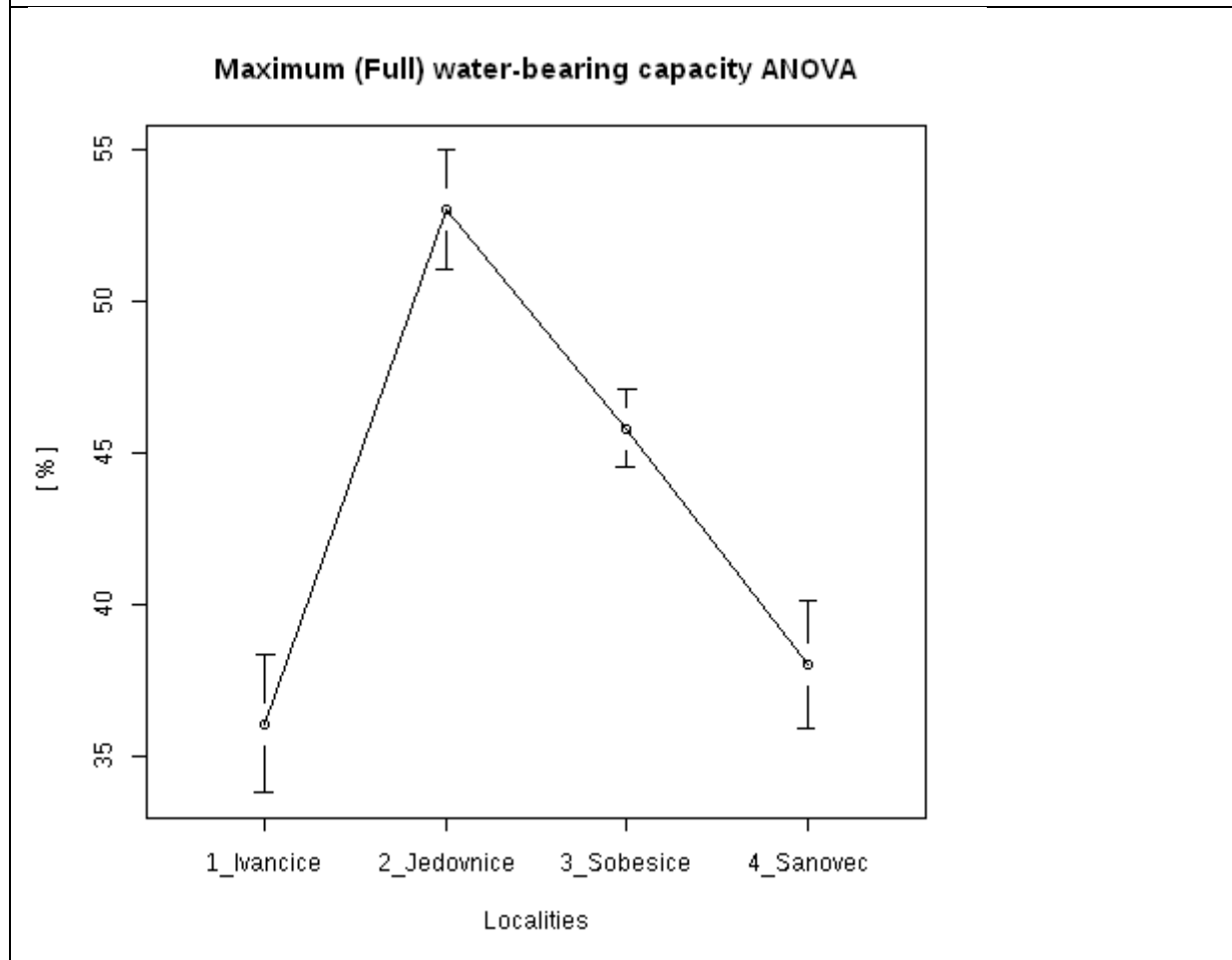
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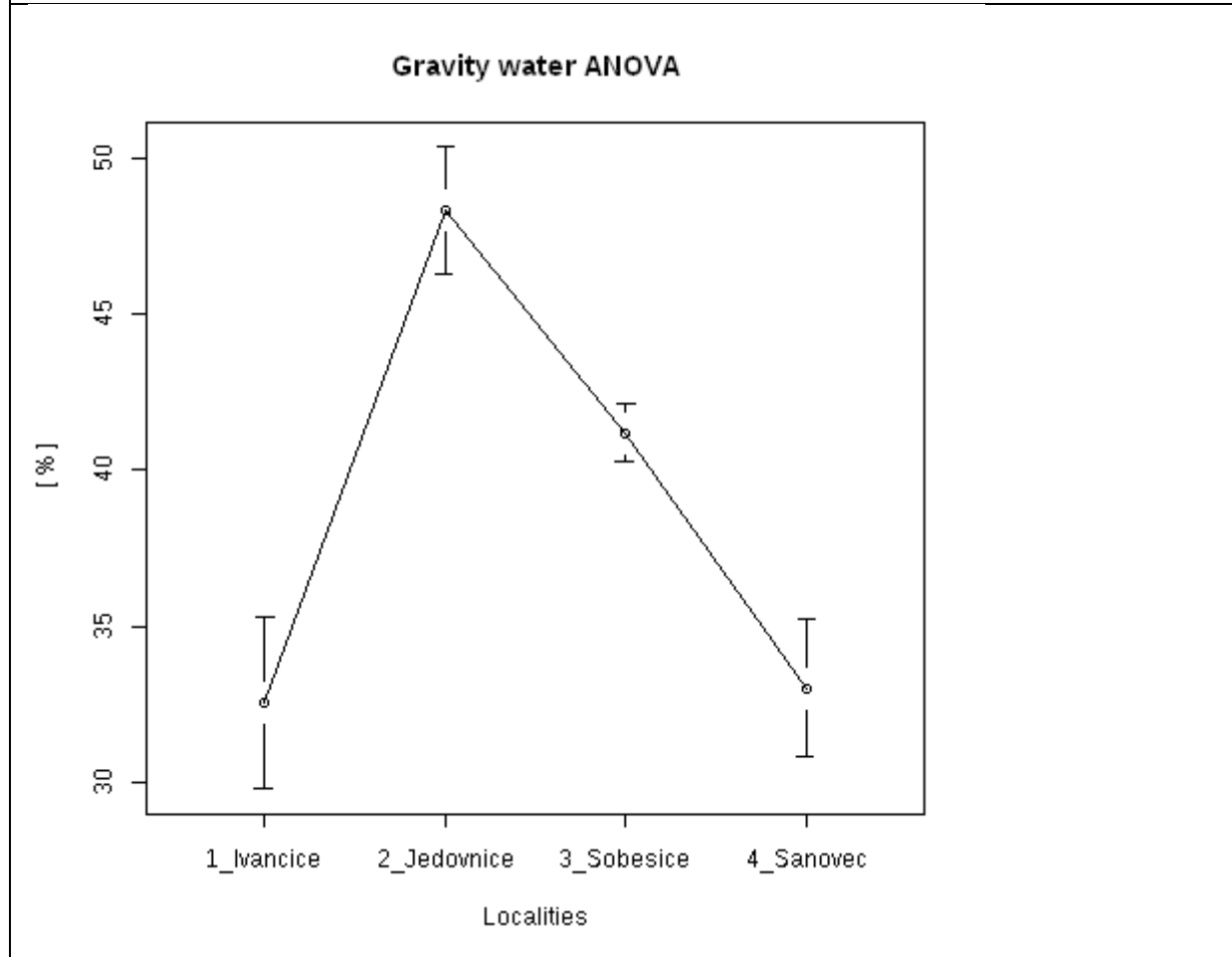
Appendix 1: Statistical significant difference in Density found Jedovnice-Ivancice, Sanovec-Jedovnice, Sobesice-Jedovnice.



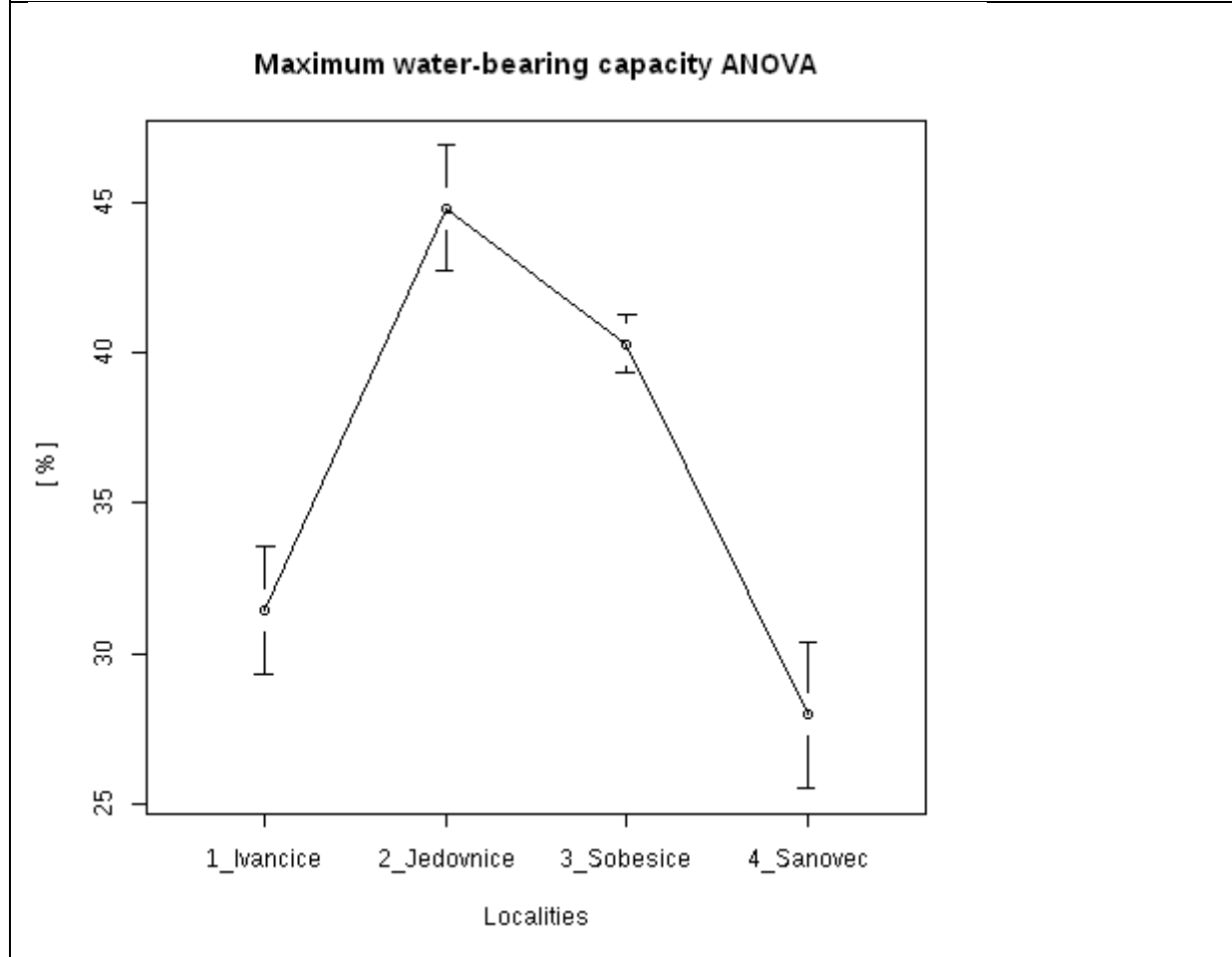
Appendix 2: Statistical significant difference in Maximum (Full) water-bearing capacity found between Jedovnice-Ivancice, Sobesice-Ivancice, Sanovec-Jedovnice, Sobesice-Jedovnice, Sobesice-Sanovec.



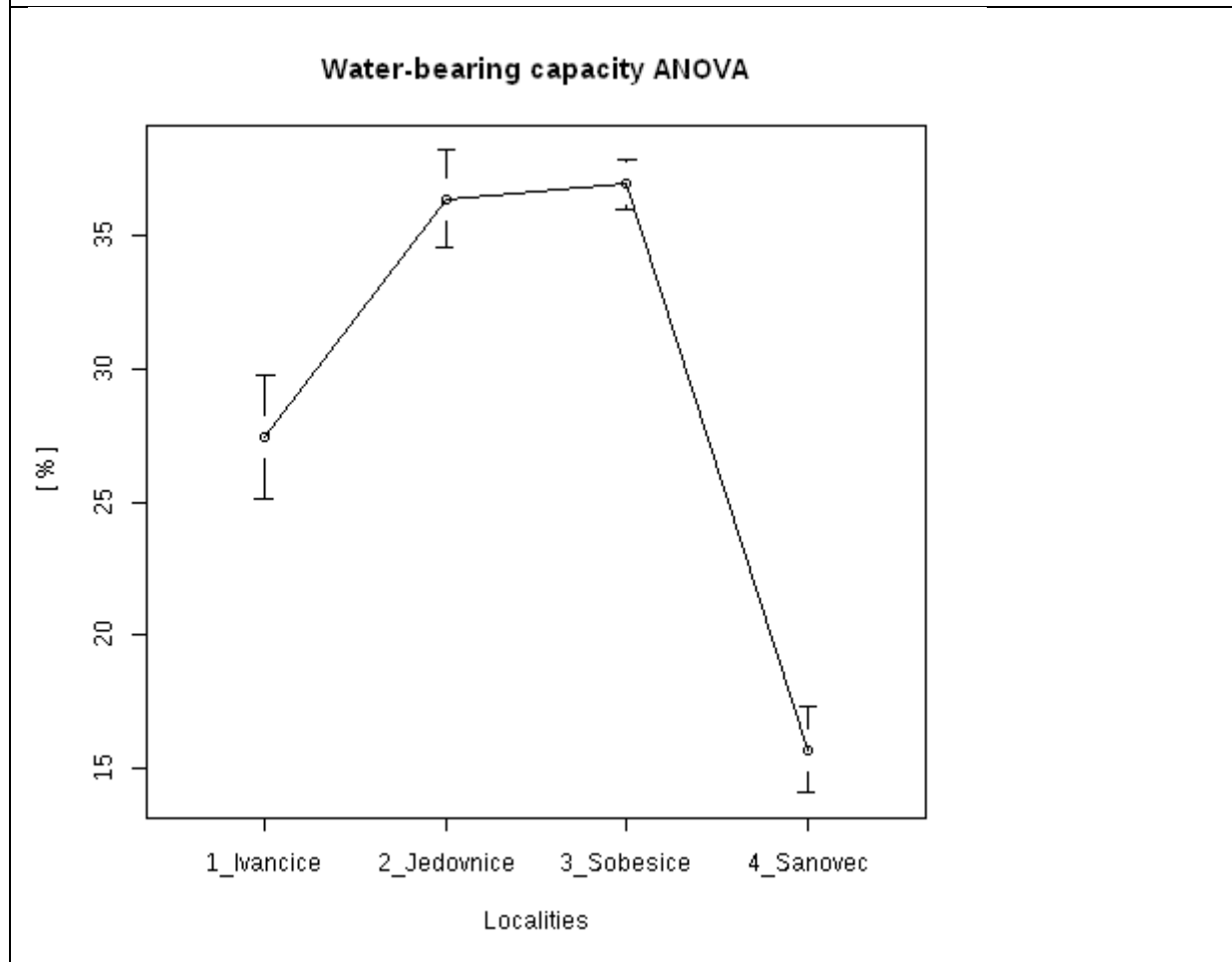
Appendix 3: Statistical significant difference in Gravity water found between Jedovnice-Ivancice, Sobesice-Ivancice, Sanovec-Jedovnice, Sobesice-Jedovnice, Sobesice-Sanovec.



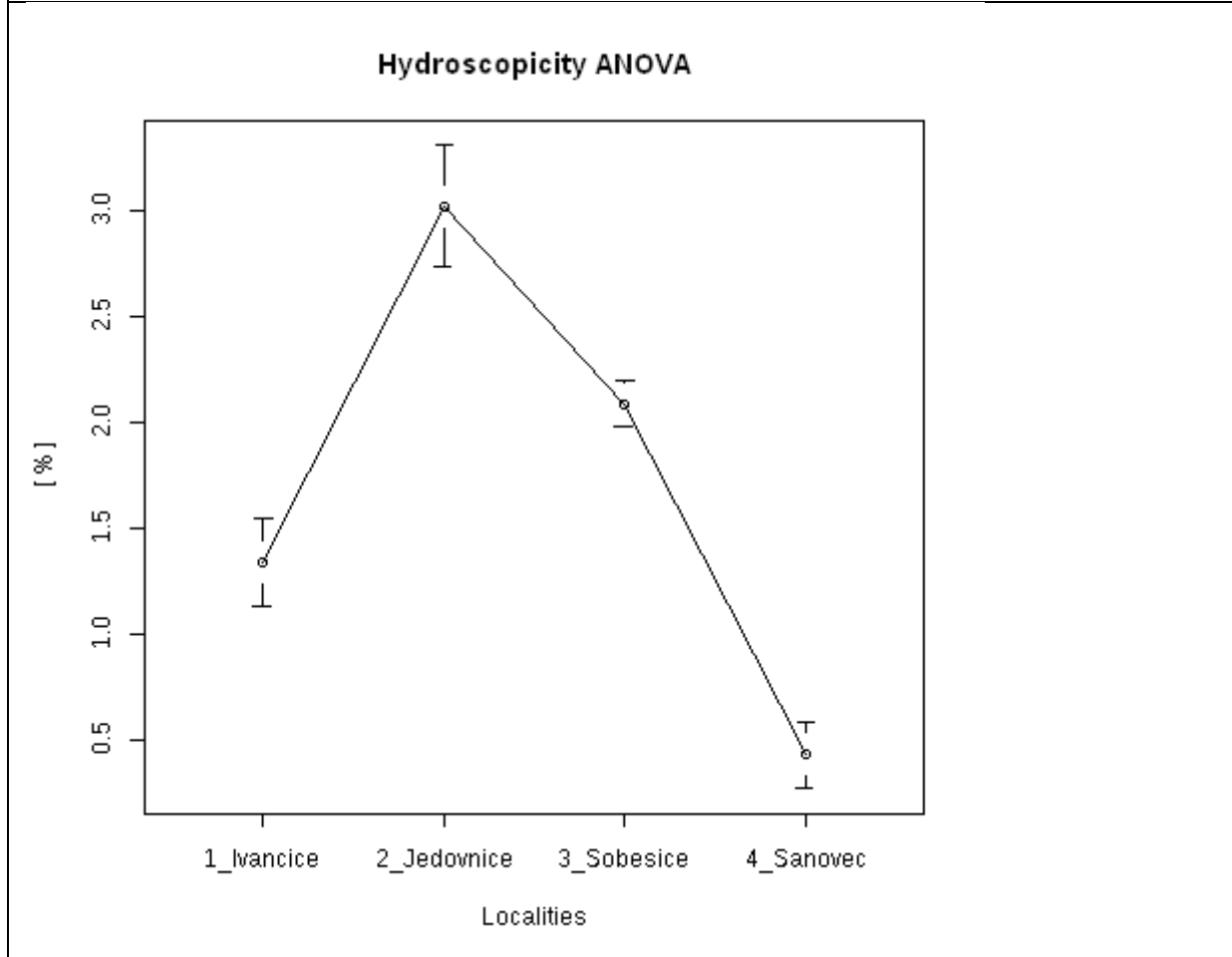
Appendix 4: Statistical significant difference in Maximum water-bearing capacity found between Jedovnice-Ivancice, Sobesice-Ivancice, Sanovec-Jedovnice, Sobesice-Jedovnice, Sobesice-Sanovec.



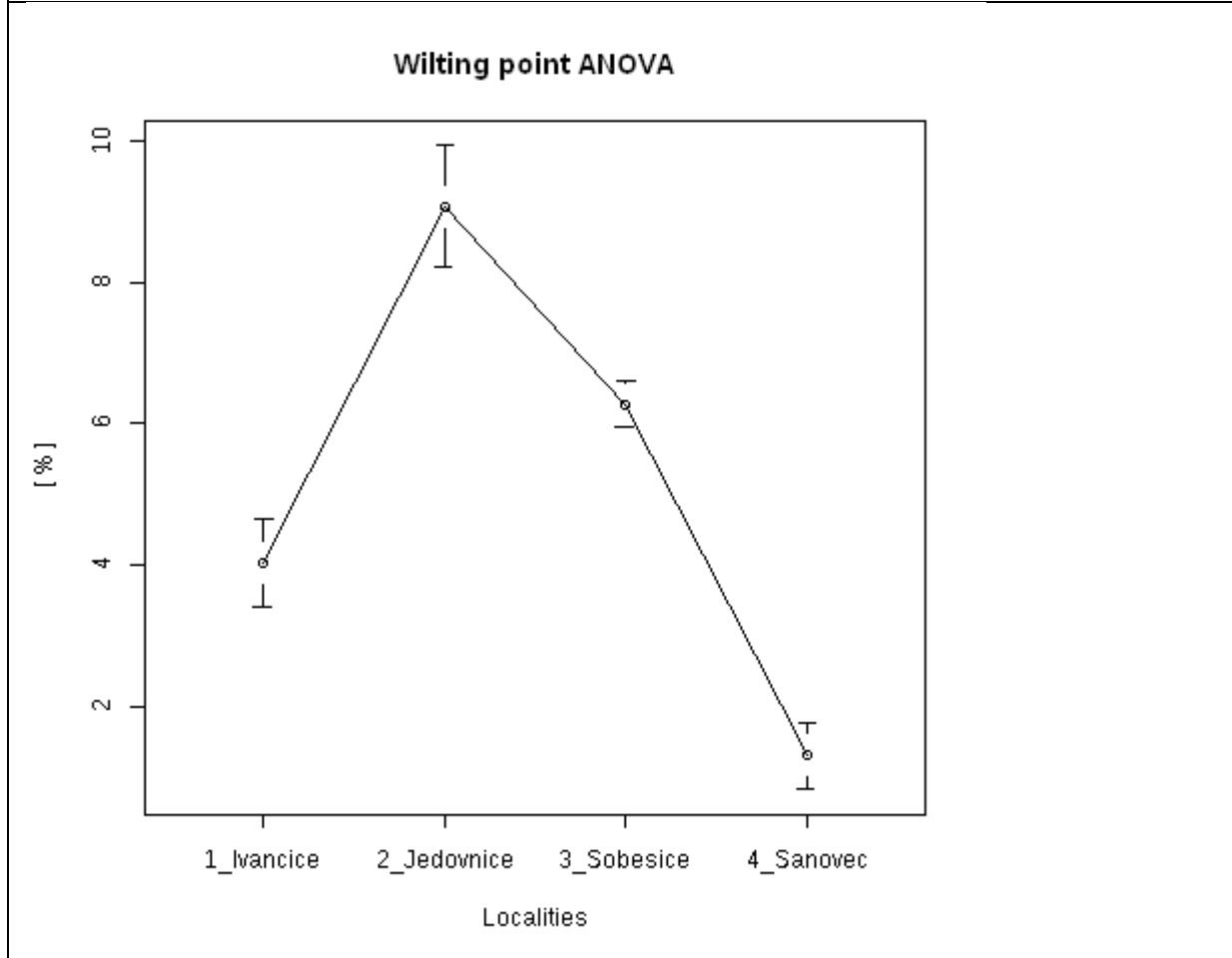
Appendix 5: Statistical significant difference in Water-bearing capacity (24 hrs draining) found between Jedovnice-Ivancice, Sanovec-Ivancice, Sobesice-Ivancice, Sanovec-Jedovnice, Sobesice-Sanovec.



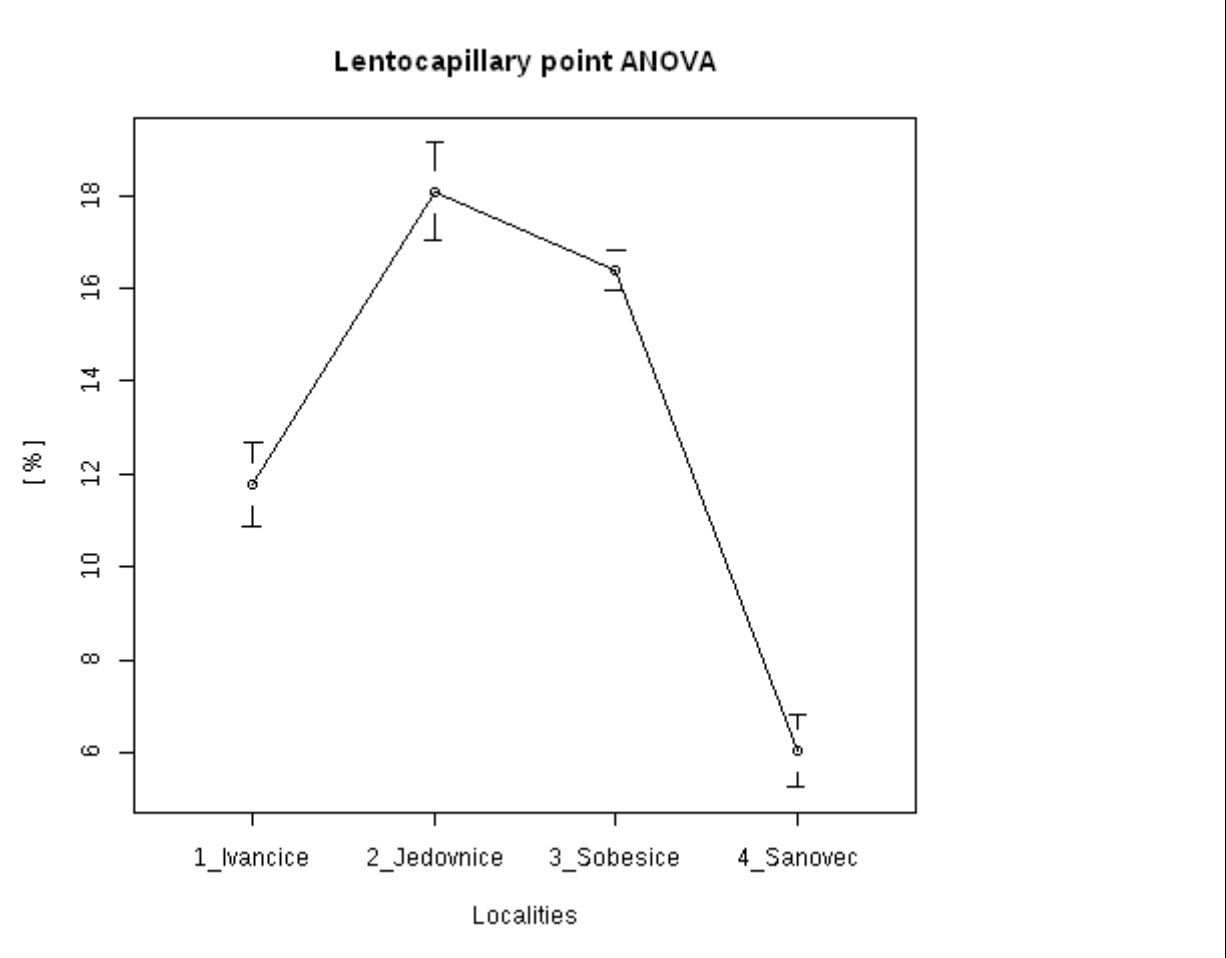
Appendix 6: Statistical significant difference in Hydroscopicity found between Jedovnice-Ivancice, Sanovec-Ivancice, Sobesice-Ivancice, Sanovec-Jedovnice, Sobesice-Jedovnice, Sobesice-Sanovec.



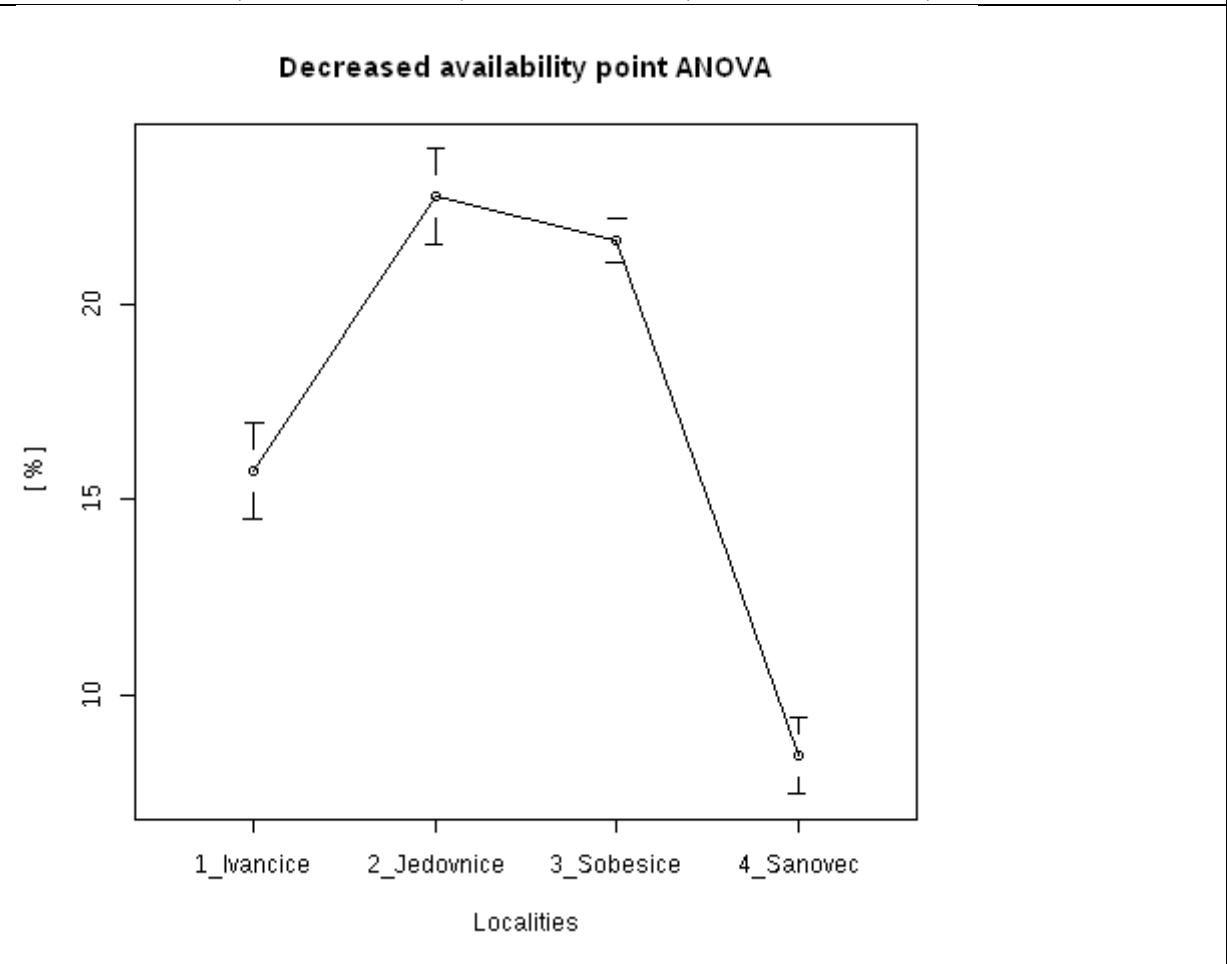
Appendix 7: Statistical significant difference in Wilting point found between Jedovnice-Ivancice, Sanovec-Ivancice, Sobesice-Ivancice, Sanovec-Jedovnice, Sobesice-Jedovnice, Sobesice-Sanovec.



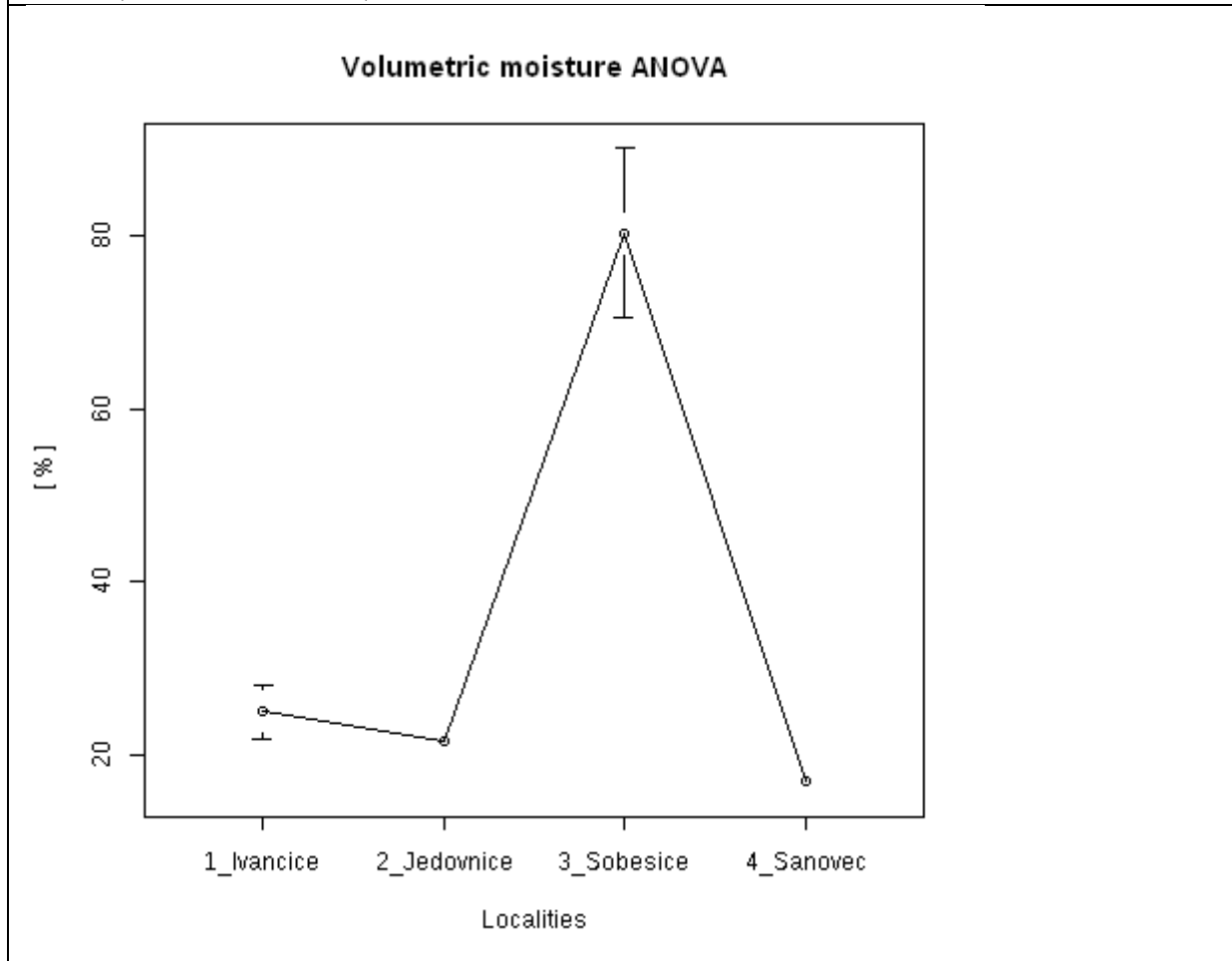
Appendix 8: Statistical significant difference in Lentocapillary point found between Jedovnice-Ivancice, Sanovec-Ivancice, Sobesice-Ivancice, Sanovec-Jedovnice, Sobesice-Jedovnice, Sobesice-Sanovec.



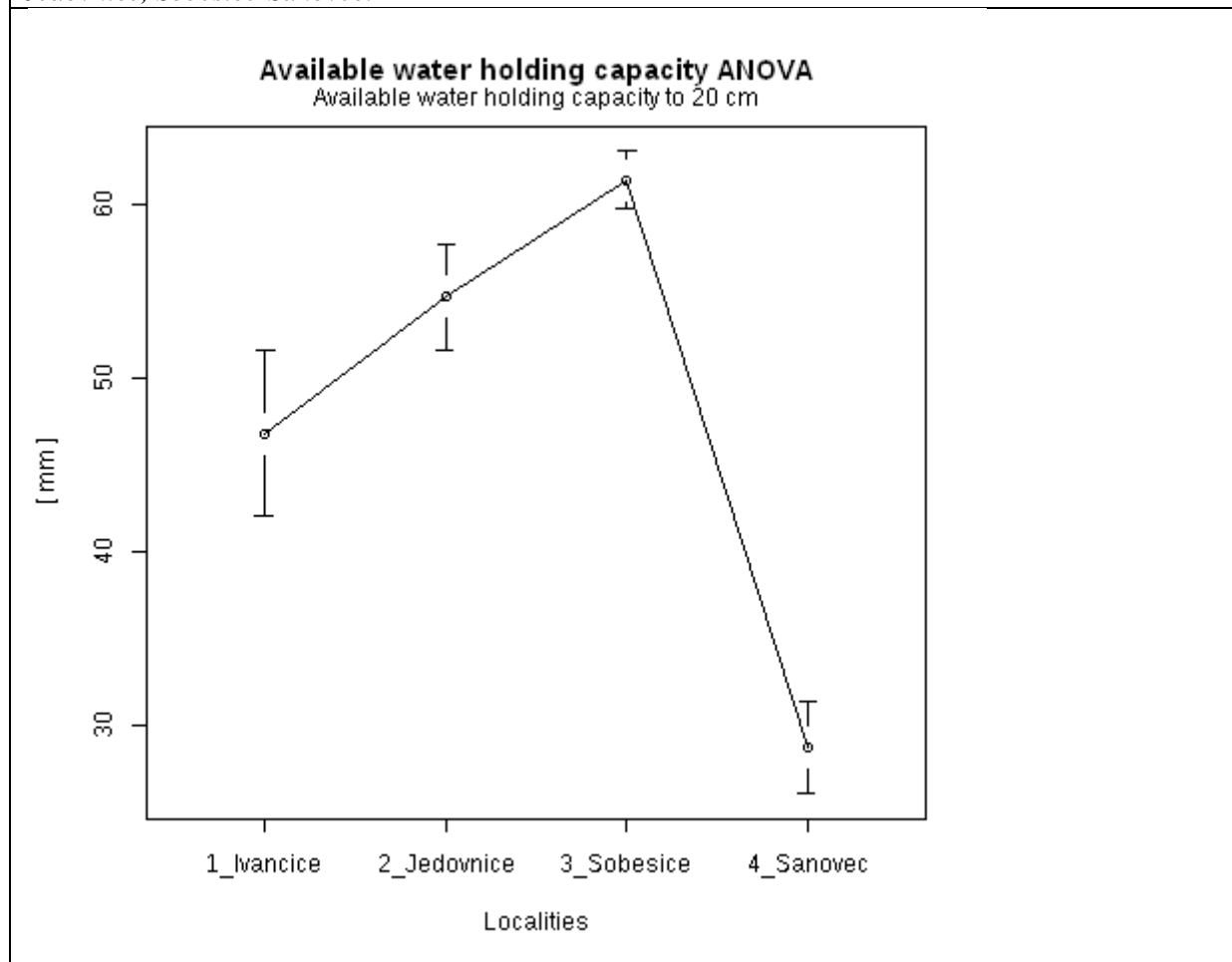
Appendix 9: Statistical significant difference in Decreased availability point found between Jedovnice-Ivancice, Sanovec-Ivancice, Sobesice-Ivancice, Sanovec-Jedovnice, Sobesice-Sanovec.



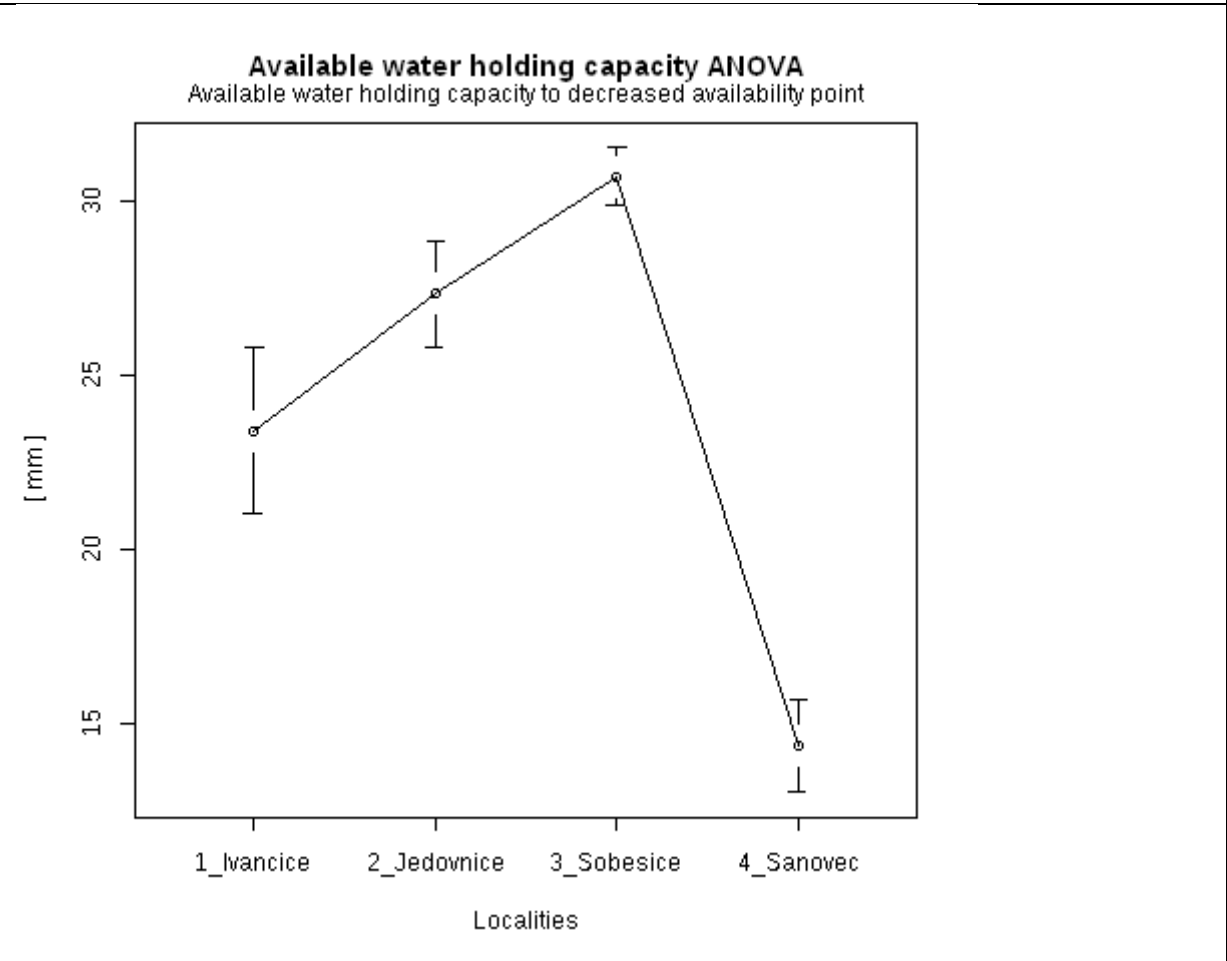
Appendix 10: Statistical significant difference in Volumetric moisture found between Sobesice-Ivancice, Sobesice-Jedovnice, Sobesice-Sanovec.



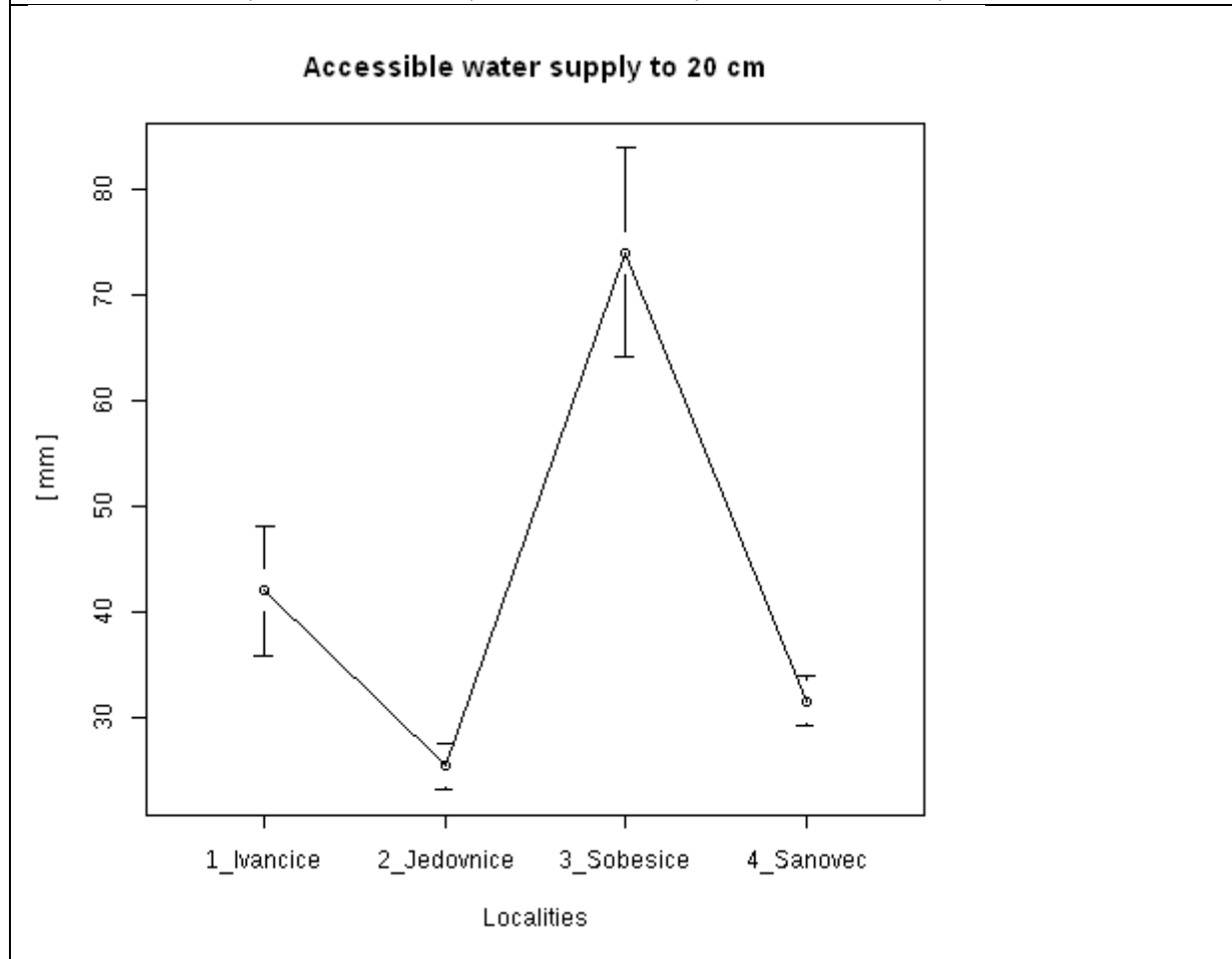
Appendix 11: Statistical significant difference in Available water holding capacity to 20 cm found between Jedovnice-Ivancice, Sanovec-Ivancice, Sobesice-Ivancice, Sanovec-Jedovnice, Sobesice-Jedovnice, Sobesice-Sanovec.



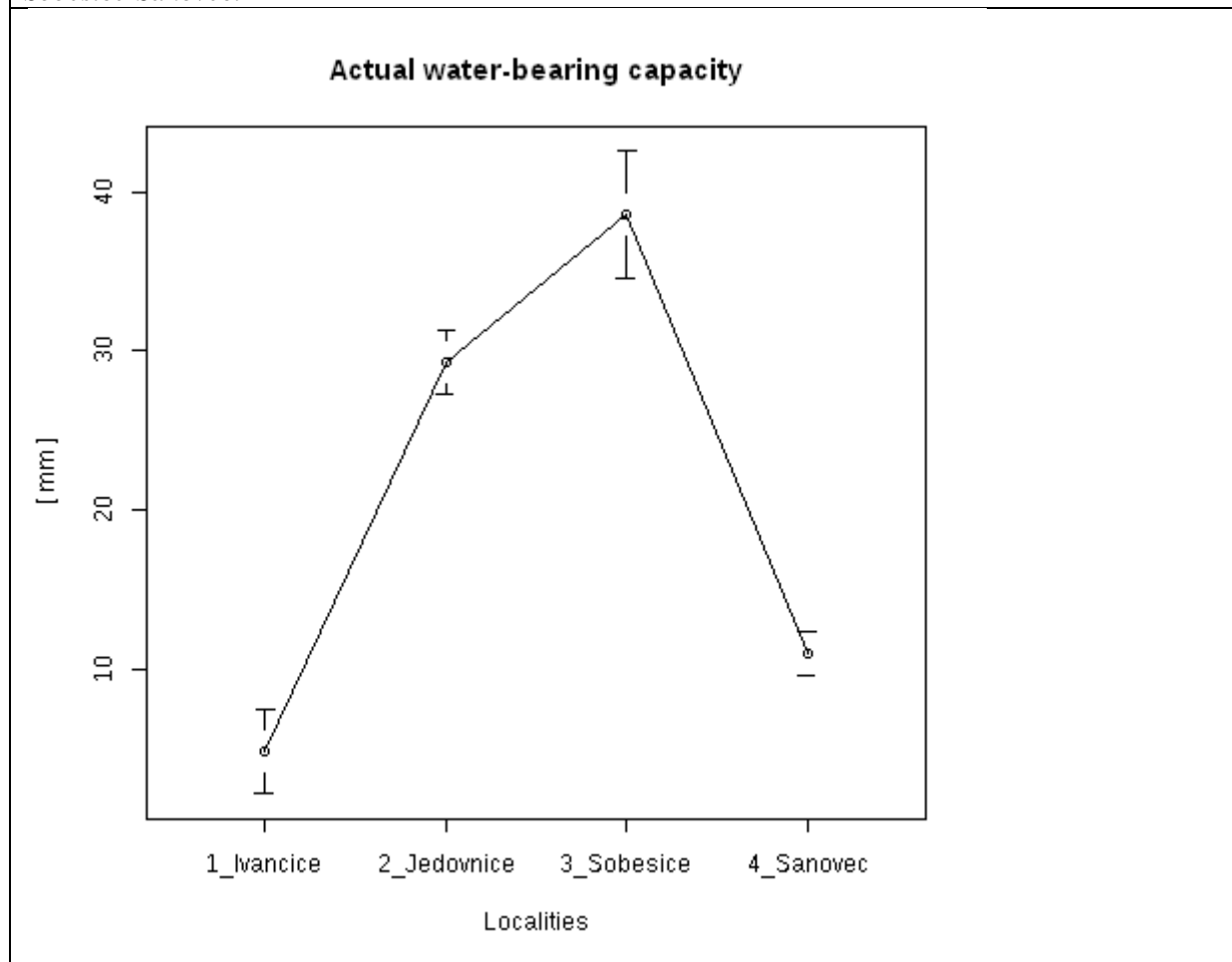
Appendix 12: Statistical significant difference in Available water holding capacity to decreased availability point found between Jedovnice-Ivancice, Sanovec-Ivancice, Sobesice-Ivancice, Sanovec-Jedovnice, Sobesice-Jedovnice, Sobesice-Sanovec.



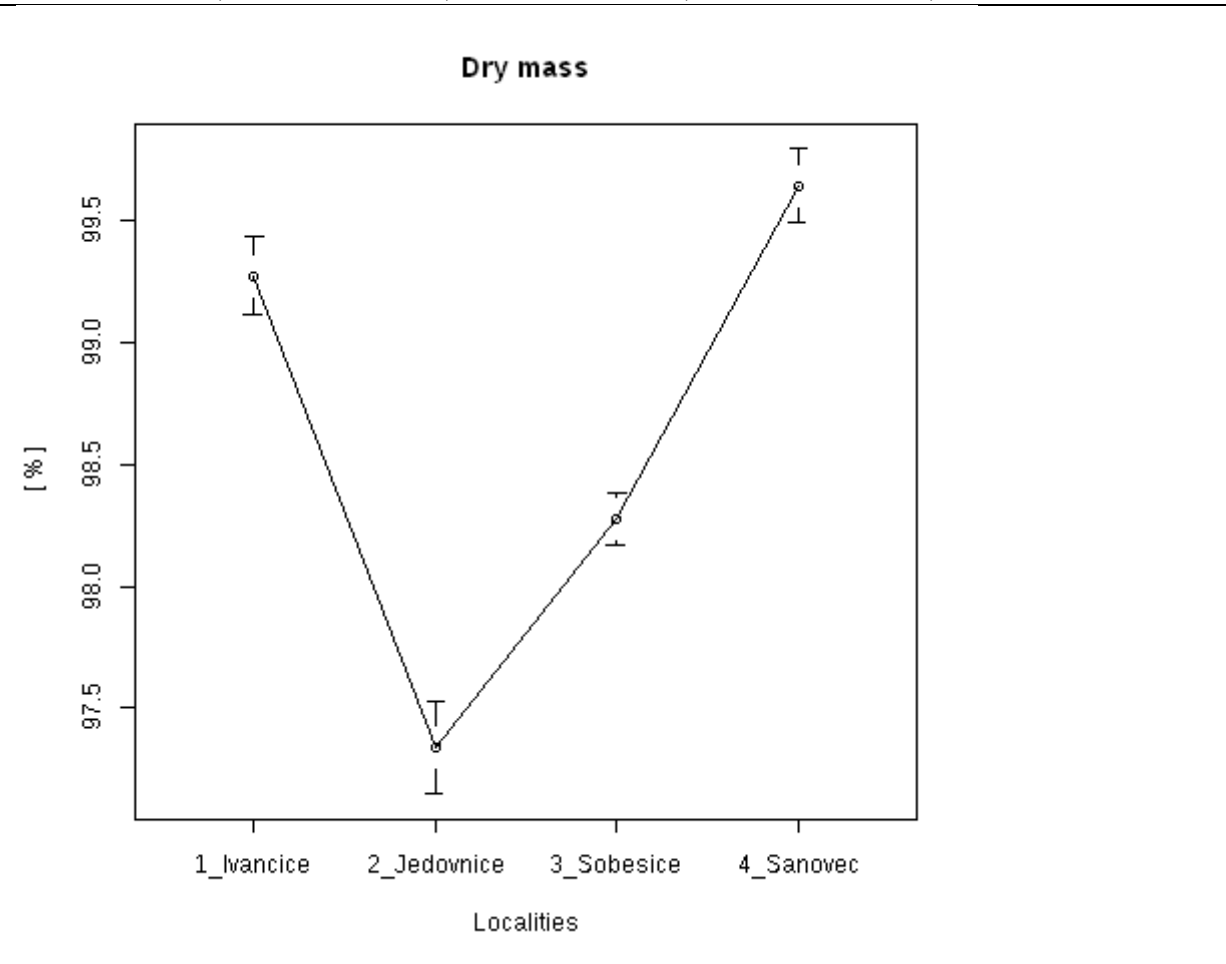
Appendix 13: Statistical significant difference in Accessible water supply to 20 cm found between Jedovnice-Ivancice, Sanovec-Ivancice, Sobesice-Ivancice, Sobesice-Jedovnice, Sobesice-Sanovec.



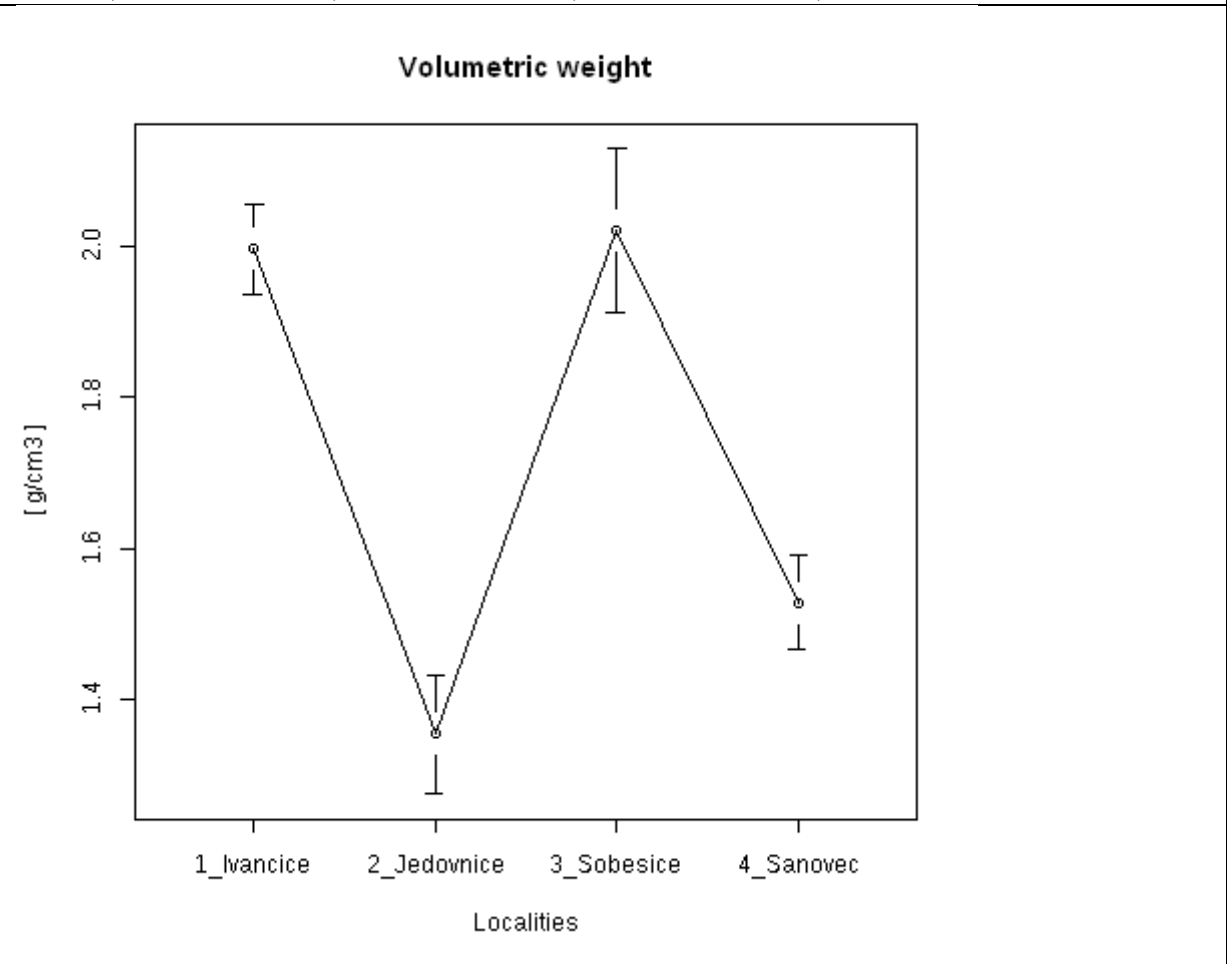
Appendix 14: Statistical significant difference in Actual water-bearing capacity found between Jedovnice-Ivancice, Sanovec-Ivancice, Sobesice-Ivancice, Sanovec-Jedovnice, Sobesice-Jedovnice, Sobesice-Sanovec.



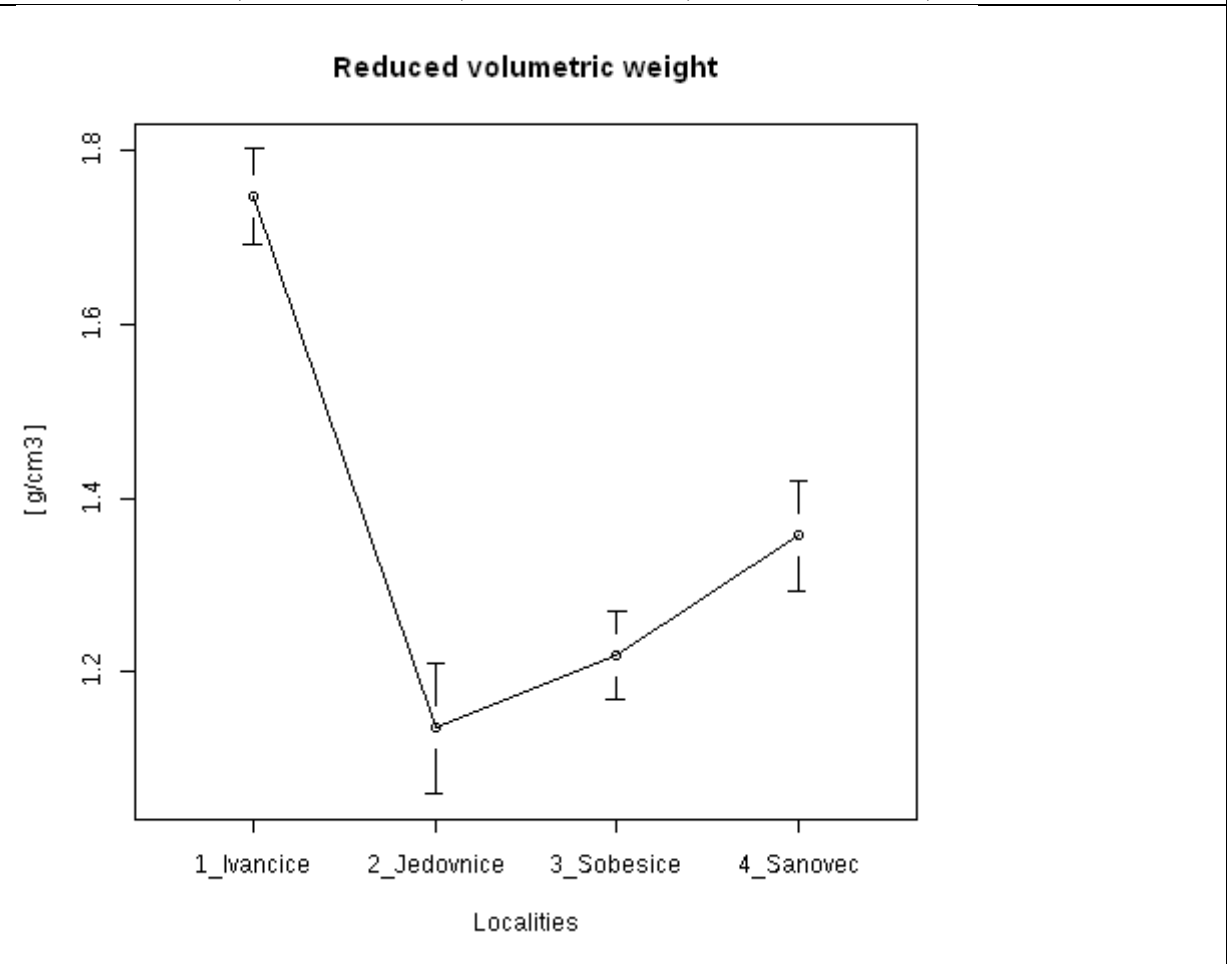
Appendix 15: Statistical significant difference in Dry mass found between Jedovnice-Ivancice, Sanovec-Ivancice, Sobesice-Ivancice, Sanovec-Jedovnice, Sobesice-Jedovnice, Sobesice-Sanovec.



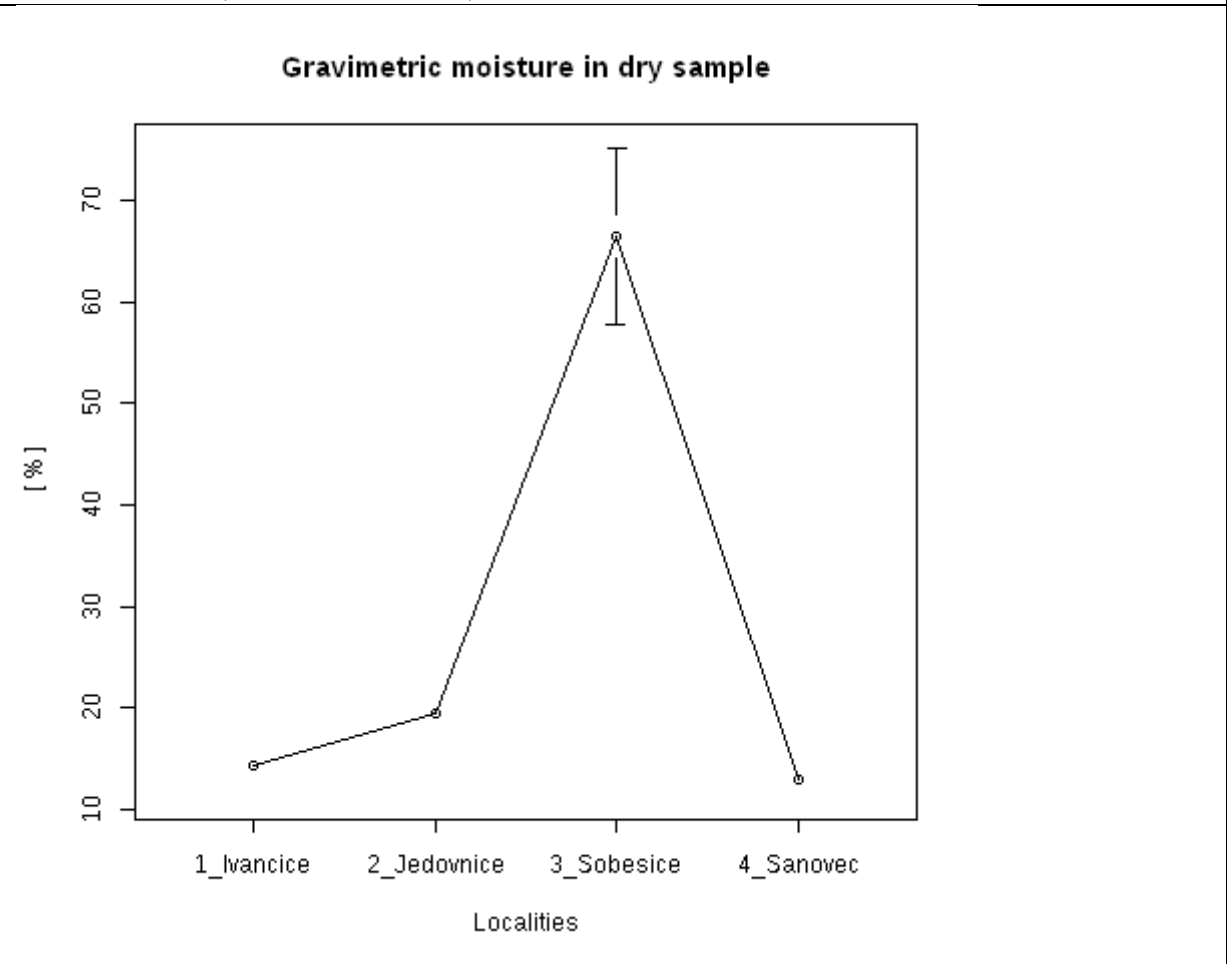
Appendix 16: Statistical significant difference in Volumetric weight found between Jedovnice-Ivancice, Sanovec-Ivancice, Sanovec-Jedovnice, Sobesice-Jedovnice, Sobesice-Sanovec.



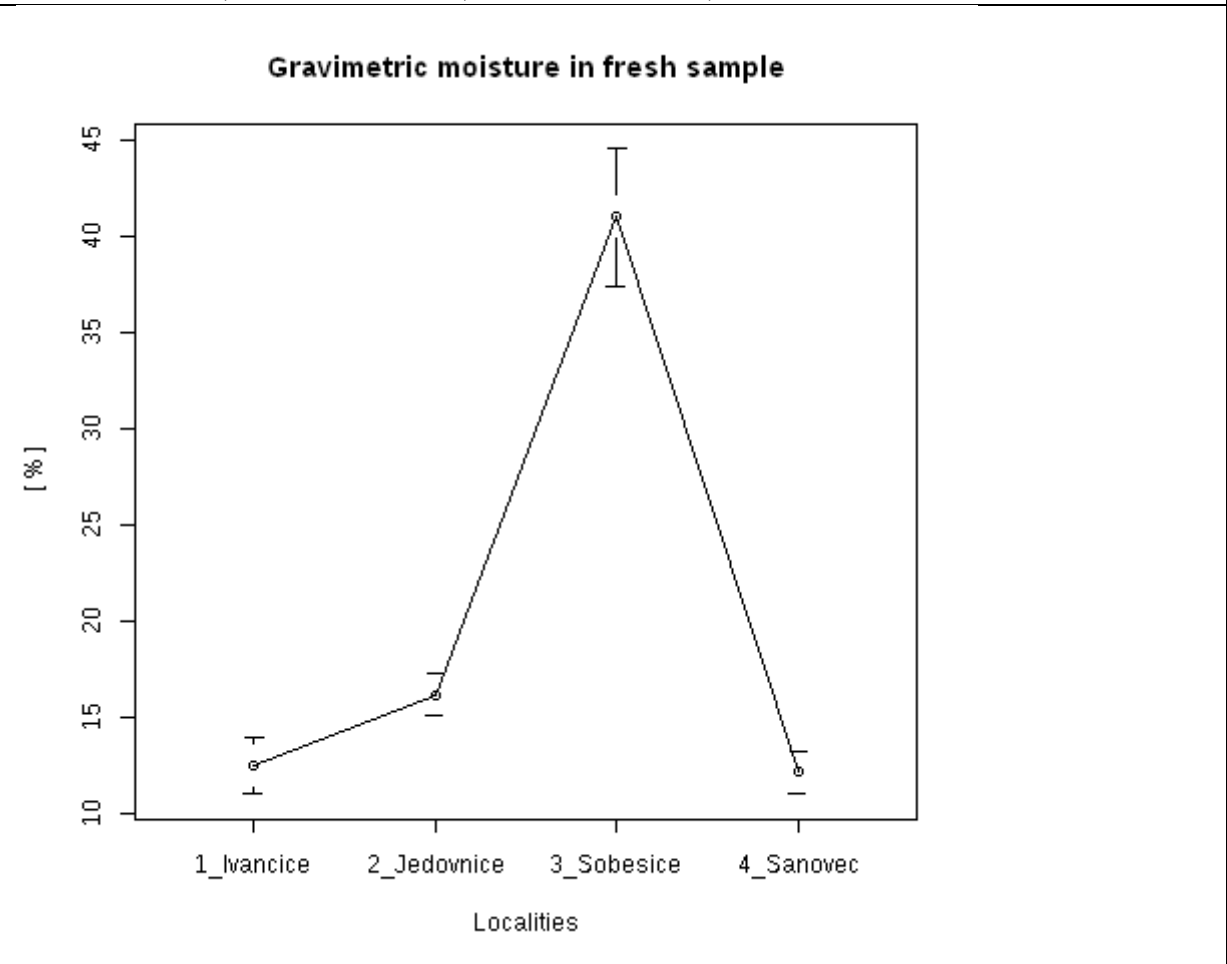
Appendix 17: Statistical significant difference in Reduced volumetric weight found between Jedovnice-Ivancice, Sanovec-Ivancice, Sobesice-Ivancice, Sanovec-Jedovnice, Sobesice-Sanovec.



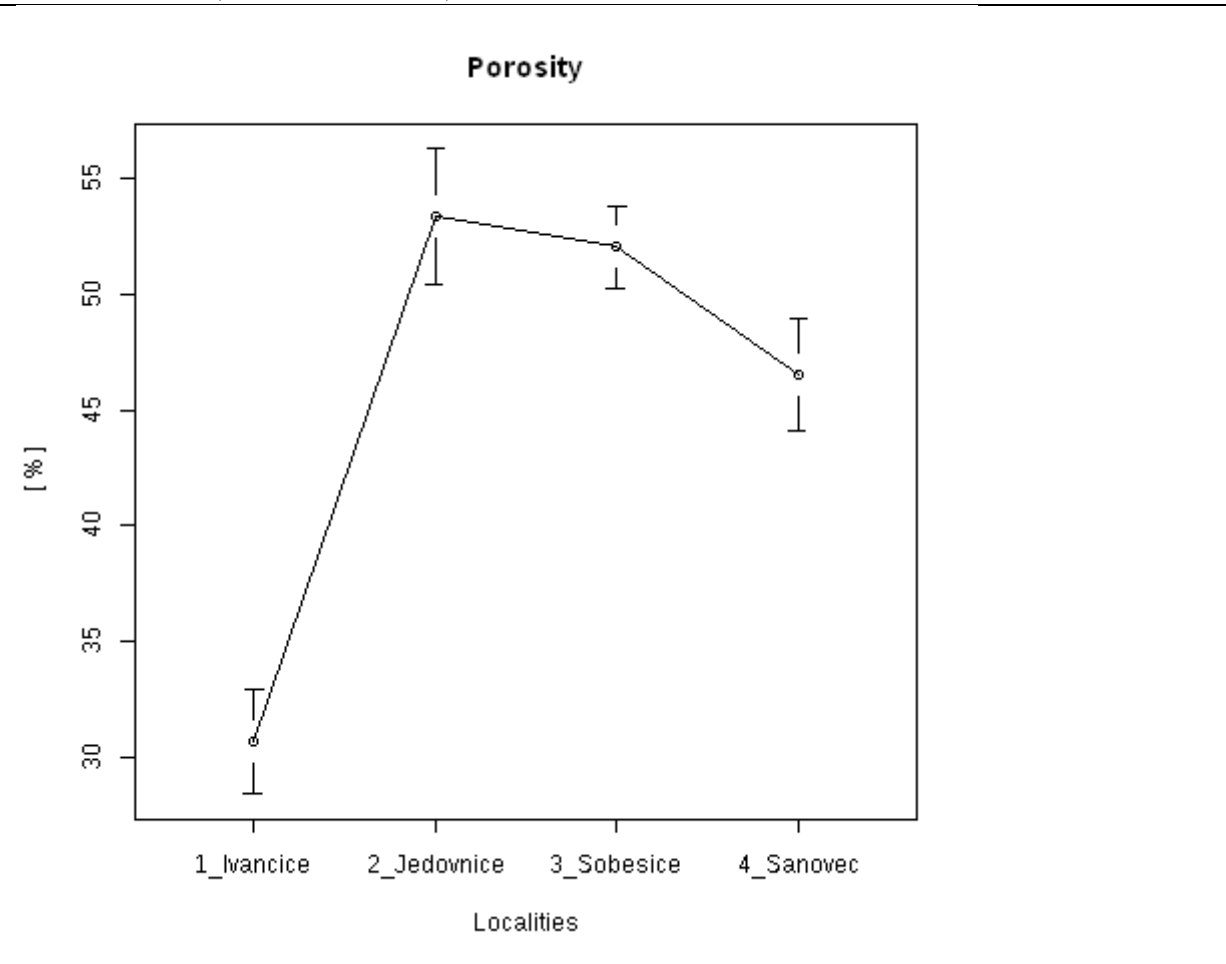
Appendix 18: Statistical significant difference in Gravimetric moisture in dry sample found between Sobesice-Ivancice, Sobesice-Jedovnice, Sobesice-Sanovec.



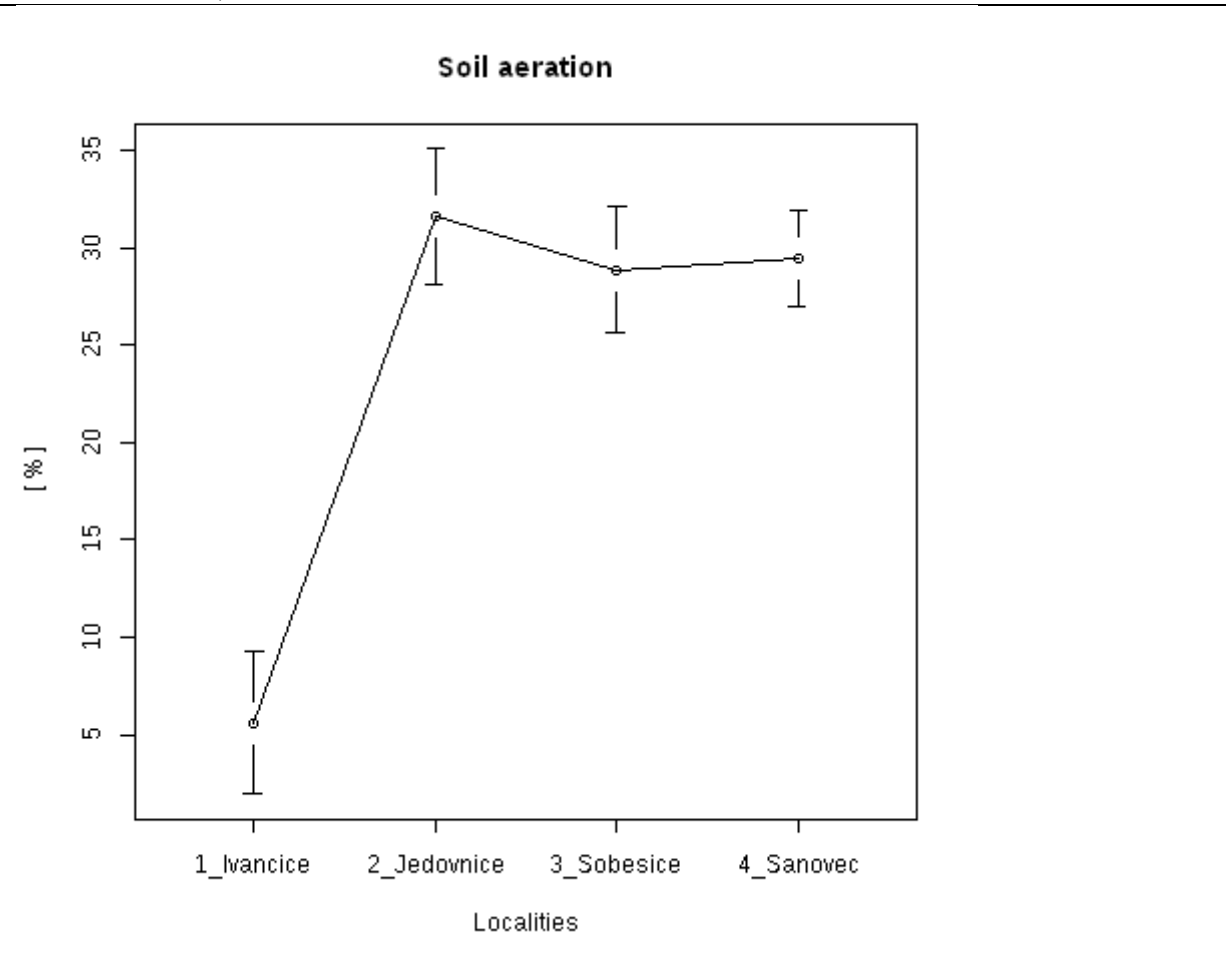
Appendix 19: Statistical significant difference in Gravimetric moisture in fresh sample found between Sobesice-Ivancice, Sanovec-Jedovnice, Sobesice-Jedovnice, Sobesice-Sanovec.



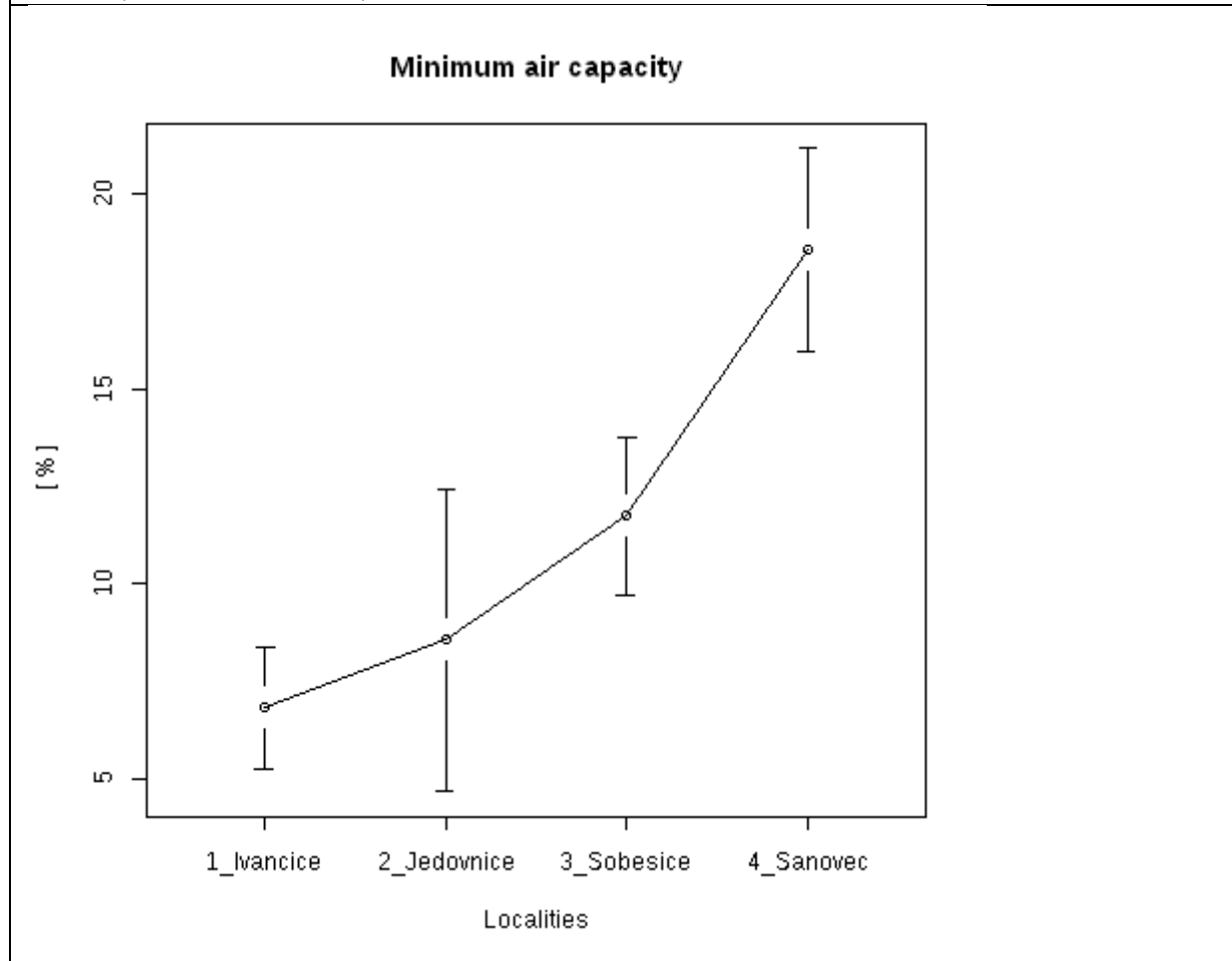
Appendix 20: Statistical significant difference in Porosity found between Jedovnice-Ivancice, Sanovec-Ivancice, Sobesice-Ivancice, Sanovec-Jedovnice.



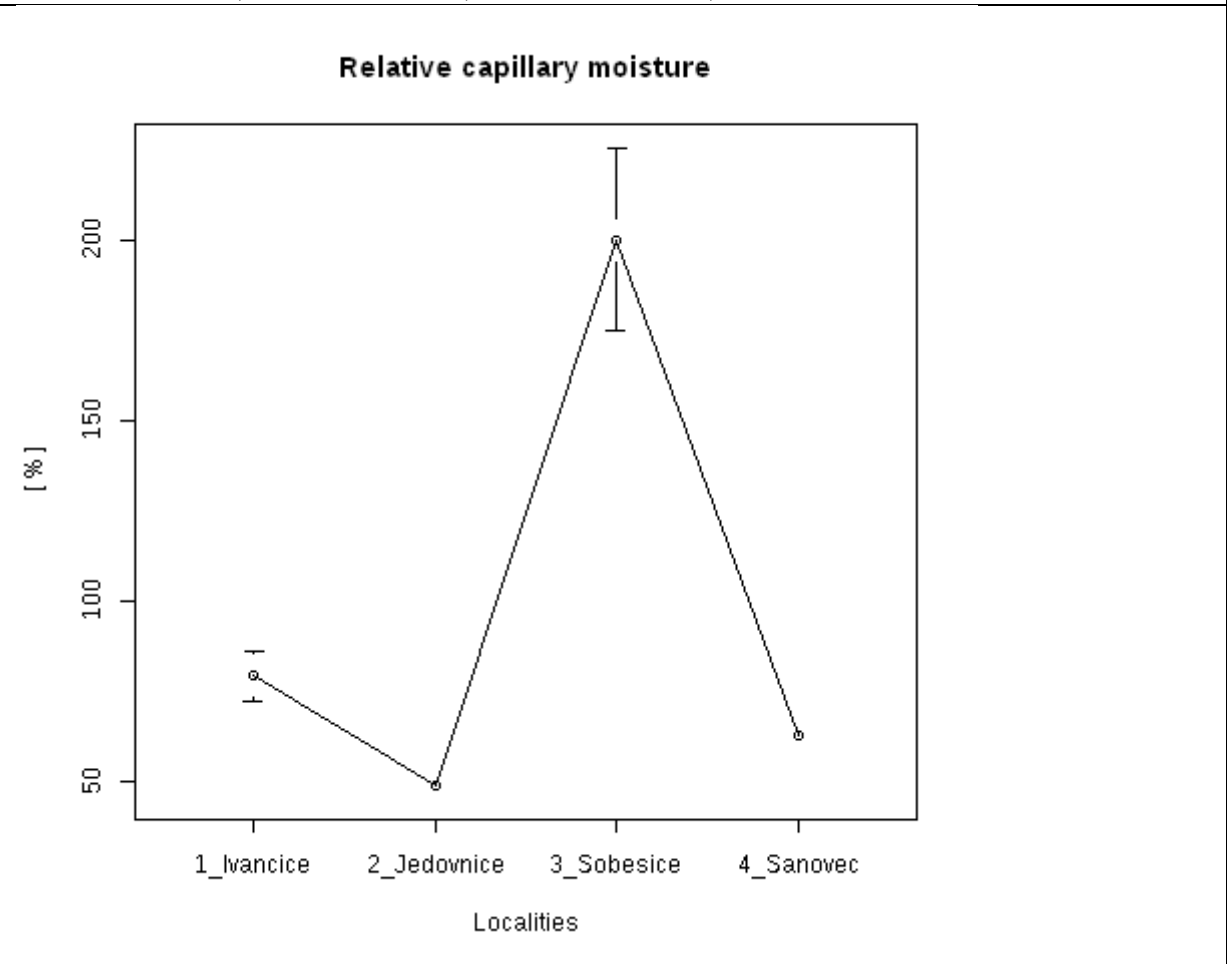
Appendix 21: Statistical significant difference in Soil aeration found between Jedovnice-Ivancice, Sanovec-Ivancice, Sobesice-Ivancice.



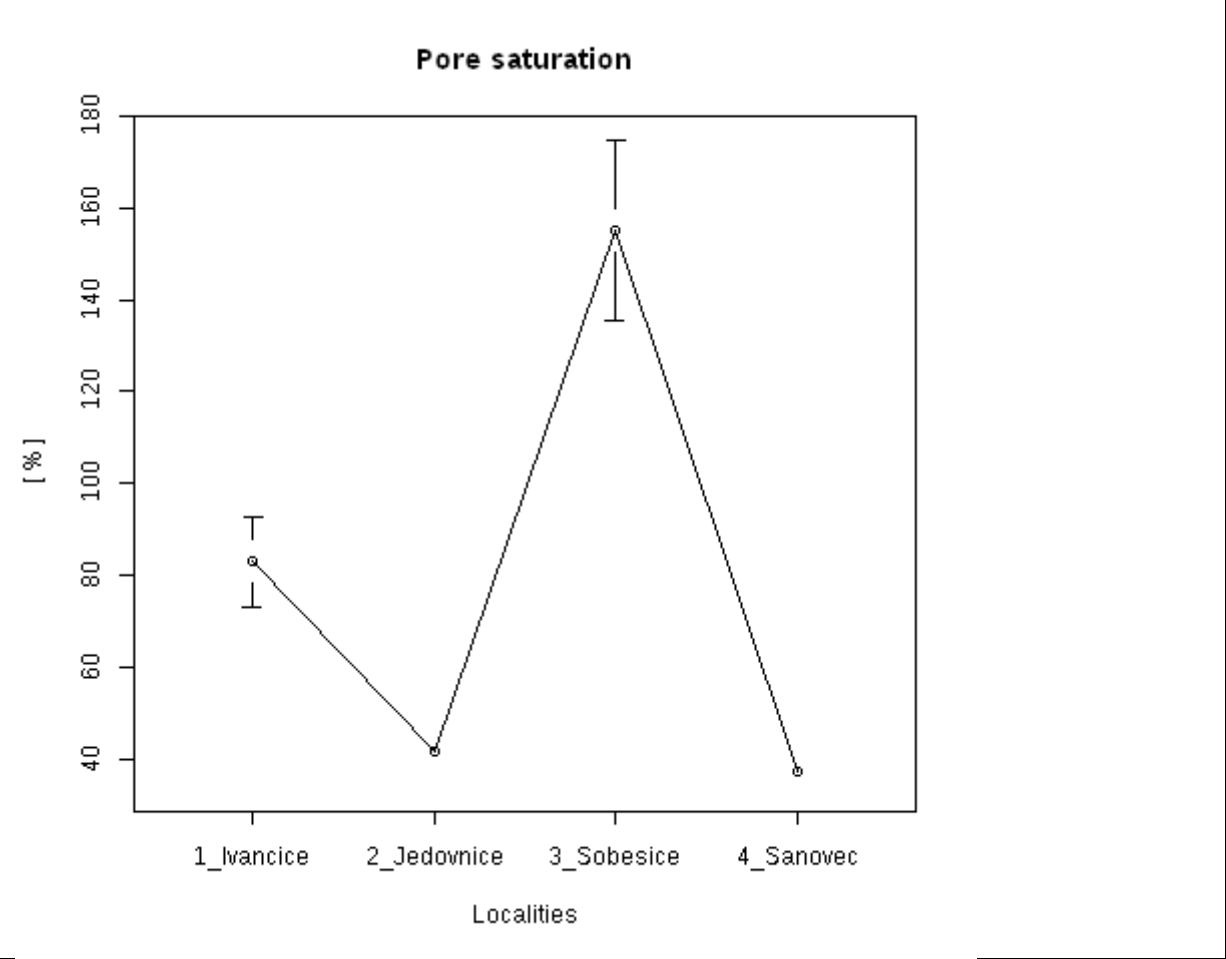
Appendix 22: Statistical significant difference in Minimum air capacity found between Sanovec-Ivancice, Sanovec-Jedovnice, Sobesice-Sanovec.



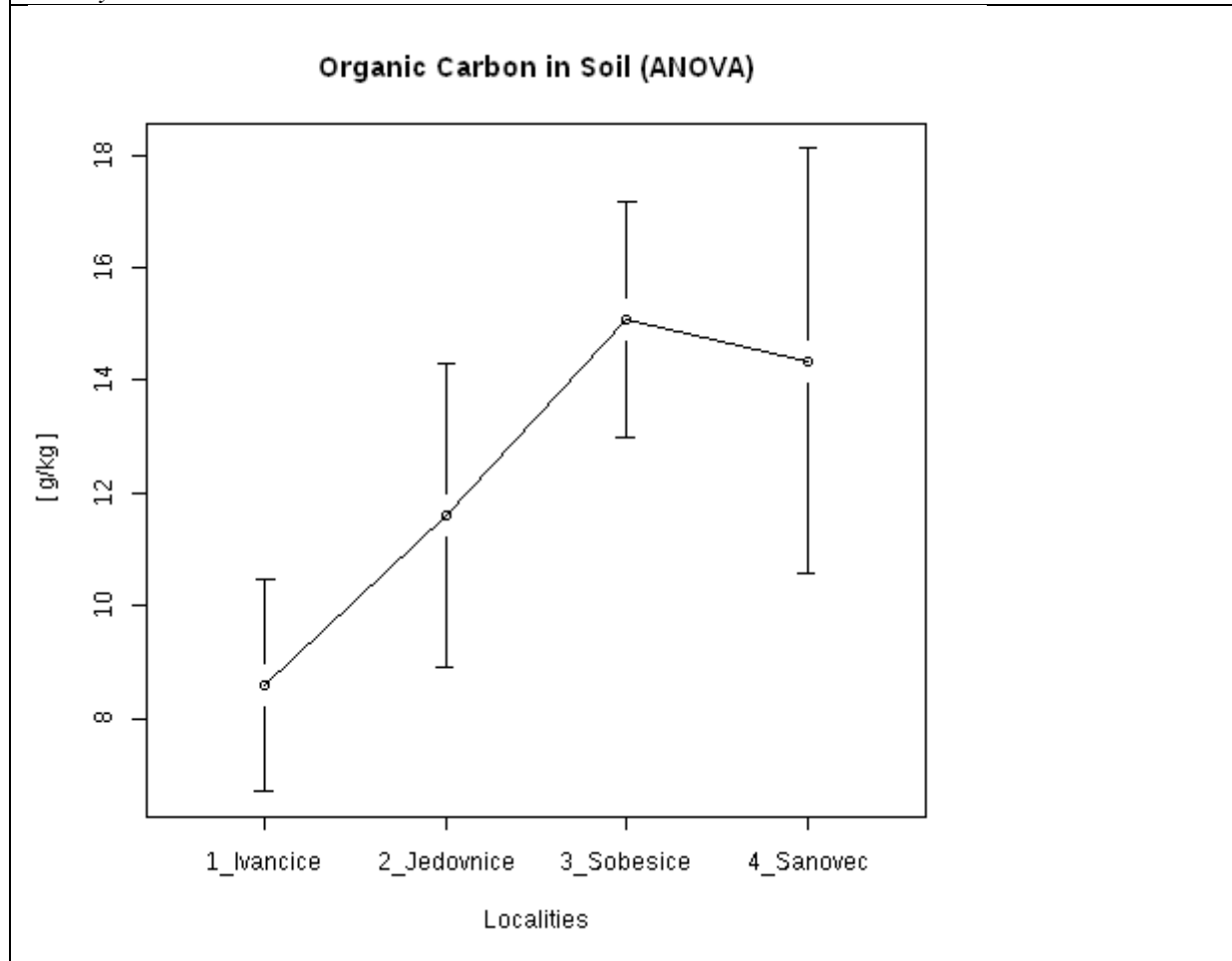
Appendix 23: Statistical significant difference in Relative capillary moisture found between Jedovnice-Ivancice, Sobesice-Ivancice, Sobesice-Jedovnice, Sobesice-Sanovec.



Appendix 24: Statistical significant difference in Pore saturation found between Jedovnice-Ivancice, Sanovec-Ivancice, Sobesice-Ivancice, Sobesice-Jedovnice, Sobesice-Sanovec.



Appendix 25: Statistical significant difference in Organic Carbon in Soil was not found between any locality.



Appendix 26: comparing p-values for laboratory results by Tukey HSD test ($\alpha = 0.05$)

P-value Tukey HSD	Jedovnice-Ivancice	Sanovec-Ivancice	Sobesice-Ivancice
Density [g/cm ³]	0.0018857	0.8936397	0.8419005
Maximum (Full) water-bearing capacity [%]	0.0000000	0.4631406	0.0000000
Gravity water (1/2 h draining) [%]	0.0000000	0.9859787	0.0000001
Maximum water-bearing capacity (2 h draining) [%]	0.0000000	0.0656963	0.0000004
Water-bearing capacity (24 h draining) [%]	0.0000000	0.0000000	0.0000000
Hydroscopicity [%]	0.0000000	0.0000000	0.0000002
Wilting point [%]	0.0000000	0.0000000	0.0000002
Lentocapillary point in 33%	0.0000000	0.0000000	0.0000000
Decreased availability point [%]	0.0000000	0.0000000	0.0000000
Volumetric moisture [%]	0.7861463	0.0643517	0.0000000
Available water holding capacity to 20 cm [mm]	0.0053495	0.0000000	0.0000000
Available water holding capacity to decreased availability point [mm]	0.0053495	0.0000000	0.0000000
Accessible water supply to 20 cm [mm]	0.0006421	0.0298781	0.0000000
Actual water-bearing capacity [mm]	0.0000000	0.0004764	0.0000000
Dry mass S ^h [%]	0.0000000	0.0027412	0.0000000
Volumetric weight [g/cm ³]	0.0000000	0.0000000	0.968751
Reduced volumetric weight [g/cm ³]	0.0000000	0.0000000	0.0000000
Gravimetric moisture in dry sample [%]	0.3700752	0.9465257	0.0000000
Gravimetric moisture in fresh sample [%]	0.0541486	0.9917767	0.0000000
Porosity [%]	0.0000000	0.0000000	0.0000000
Soil aeration [%]	0.0000000	0.0000000	0.0000000
Minimum air capacity [%]	0.8094514	0.0000000	0.0557899
Relative capillary moisture [%]	0.0054839	0.1731458	0.0000000
Pore saturation [%]	0.0000031	0.0000000	0.0000000
Organic Carbon in Soil [g/kg]	0.7441604	0.0625913	0.1255483

Appendix 27: comparing p-values for laboratory results by Tukey HSD test ($\alpha = 0.05$)

P-value Tukey HSD	Sanovec- Jedovnice	Sobesice- Jedovnice	Sobesice- Sanovec
Density [g/cm ³]	0.0000494	0.0000989	0.9977599
Maximum (Full) water-bearing capacity [%]	0.0000000	0.0000214	0.0000004
Gravity water (1/2 h draining) [%]	0.0000000	0.000097	0.0000006
Maximum water-bearing capacity (2 h draining) [%]	0.0000000	0.0233114	0.0000000
Water-bearing capacity (24 h draining) [%]	0.0000000	0.9728567	0.0000000
Hydroscopicity [%]	0.0000000	0.0000000	0.0000000
Wilting point [%]	0.0000000	0.0000000	0.0000000
Lentocapillary point in 33%	0.0000000	0.0268658	0.0000000
Decreased availability point [%]	0.0000000	0.4349343	0.0000000
Volumetric moisture [%]	0.4809659	0.0000000	0.0000000
Available water holding capacity to 20 cm [mm]	0.0000000	0.0237247	0.0000000
Available water holding capacity to decreased availability point [mm]	0.0000000	0.0237247	0.0000000
Accessible water supply to 20 cm [mm]	0.3690132	0.0000000	0.0000000
Actual water-bearing capacity [mm]	0.0000000	0.0000072	0.0000000
Dry mass S ^h [%]	0.0000000	0.0000000	0.0000000
Volumetric weight [g/cm ³]	0.0068571	0.0000000	0.0000000
Reduced volumetric weight [g/cm ³]	0.0000069	0.2582916	0.006261
Gravimetric moisture in dry sample [%]	0.1110439	0.0000000	0.0000000
Gravimetric moisture in fresh sample [%]	0.0154051	0.0000000	0.0000000
Porosity [%]	0.000357	0.8743321	0.0038862
Soil aeration [%]	0.737036	0.641193	0.9922948
Minimum air capacity [%]	0.0000014	0.3488435	0.0008548
Relative capillary moisture [%]	0.3487442	0.0000000	0.0000000
Pore saturation [%]	0.9295024	0.0000000	0.0000000
Organic Carbon in Soil [g/kg]	0.7461631	0.715366	0.9924552

Appendix 28: Resistivity levels depending on distance measured in North, South, East, West – Ivančice.

Ivancice Distance [cm]	North Resistivity [$\Omega \cdot m$]	South Resistivity [$\Omega \cdot m$]	East Resistivity [$\Omega \cdot m$]	West Resistivity [$\Omega \cdot m$]
0	165.7	121.7	168	120.5
30	208.6	149.4	195.2	151.3
60	213.5	153.4	199.7	157.8
90	216.4	155.7	201.6	160.4
120	217.4	156.8	202.4	161.6
150	218.1	157.4	203	162.4
180	218.4	157.8	203.2	162.9
210	218.6	158	203.5	163.1
240	218.7	158.1	203.5	163.2
270	218.9	158.3	203.7	163.4
300	218.9	158.4	203.8	163.5
350	219	158.5	203.9	163.5
400	219.2	158.6	204	163.6
450	219.3	158.8	204.1	163.7
500	219.4	158.9	204.2	163.9
600	219.6	159.3	204.2	164.2
700	220	160	205	165
800	220.8	161.5	205.6	167

Appendix 29: Resistivity levels depending on distance measured in North, South, East, West – Jedovnice.

Jedovnice Distance [cm]	North Resistivity [$\Omega \cdot m$]	South Resistivity [$\Omega \cdot m$]	East Resistivity [$\Omega \cdot m$]	West Resistivity [$\Omega \cdot m$]
0	228.3	283	215.5	290.6
30	289.5	337	310	324
60	312	344	325	345
90	320	348	334	354
120	324	349	336	357
150	324.5	349	336	358
180	325	350	336	358
210	325	350	337	358
240	325	350	337	358
270	325	350	337	358
300	325	350	337	358
350	325	350	337	358
400	325	350	337	359
450	326	350	337	359
500	326	350	337	359
600	326	351	338	359
700	327	352	338	359
800	331	354	340	361

Appendix 30: Resistivity levels depending on distance measured in North, South, East, West – Soběšice.

Sobesice Distance [cm]	North Resistivity [$\Omega \cdot m$]	South Resistivity [$\Omega \cdot m$]	East Resistivity [$\Omega \cdot m$]	West Resistivity [$\Omega \cdot m$]
0	72.4	104.7	111.5	95
30	253	269.5	241.1	253
60	414	416	397	407
90	489	497	476	485
120	535	531	529	530
150	557	548	554	551
180	571	561	566	564
210	579	569	572	572
240	584	575	575	577
270	587	578	579	579
300	590	580	580	581
350	593	584	583	584
400	596	589	587	590
450	599	593	589	593
500	601	599	592	597
600	609	608	601	605
700	625	624	622	623
800	650	706	710	688

Appendix 31: Resistivity levels depending on distance measured in North, South, East, West – Šanovec.

Sanovec Distance [cm]	North Resistivity [$\Omega \cdot m$]	South Resistivity [$\Omega \cdot m$]	East Resistivity [$\Omega \cdot m$]	West Resistivity [$\Omega \cdot m$]
0	3.9	1.4	8.6	4.4
30	18	15	50	13
60	24	37	70	28
90	50	79	105	68
120	89	128	147	125
150	161	179	185	203
180	212	206	229	255
210	255	255	274	316
240	308	305	310	358
270	350	331	347	383
300	378	363	374	412
350	420	406	410	447
400	464	442	432	466
450	502	478	469	514
500	545	503	502	561
600	641	581	576	656
700	753	690	706	762
800	868	772	807	865