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Radial growth peculiarities of oak (*Quercus robur* L.) in Lithuania

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Radial increment data on oak gathered from 43 experimental plots in Lithuania support the hypothesis that individual stands indicate disparate responses to the influence of temperature and precipitation factors. One of the factors influencing a high rate of similarity in radial growth amongst individual oak stands is geohydrological growth conditions. Much of the course of identical growth is characteristic of stands growing in clay soil with a ground water level depth greater than 5 m. Similar growth patterns are characteristic of stands growing in soils of varying mechanical compositions, but at higher ground water levels of 1.2 to 1.5 m.

Reactions of oak stands to meteorological factors depend upon the depth level of ground waters and the consequent regime of moisture in the soil. The reactions are: 1) intensitive to both temperature and precipitation; 2) more sensitive to the temperature regime than to hydrology; 3) more sensitive to precipitation and 4) sensitive to temperature as much as to precipitation.

Due to different climate-growth reactions it is important to use the data from as more analogous habitats as possible when compiling long-term tree ring chronologies in Lithuania.

Key words: oak growth, environmental influences, Lithuania

INTRODUCTION

One of the most suitable tree species for dendrochronological studies is the oak. The bound is clearly distinguishable for early and late growth, similar to that of pine, ash or spruce. The oak also has the highest longevity for trees in Lithuania, but in rare cases, living oak trees of over 300 years may be found. The series of ring growth in trees of such age are quite reliable in establishing growth dynamics of average duration cycles of 50 to 60 years, but not longer. Establishment of consistent cycles of over 100 years is not possible even with ring growth series of such time duration due to the decline of the reliability of information on environmental growth conditions (Shijatov, 1986). Long-term chronologies, therefore, are preferably drawn by the utilization of oakwood extracted from various objects. A certain number of long-term chronologies has been made till now, and the principles of their construction have been discussed (Bauch et al., 1975; Feliksik, 1975; Lambert et al., 1991; Wazny et al., 1991; amogst other), but many questions remain unsolved. Especially complicated are the principles of compiling long-term chronologies in Lithuania. The amount of precipitation is sufficient here – 616 mm (within 1893 –1982 hydrological years) with the average air temperature of 6.4°C within the same period. Besides, a very great range of changes of temperature and precipitation has been observed when comparing the data of different months. For example, the average winter temperature has changed from – 0.1°C in 1925 to –10.3°C in 1940 to the average March temperature from +5.2°C in 1921 to –9.0°C in 1952, while the June precipitation from 158 mm in 1901 to 6 mm in 1940. Many questions arise because of such a great fluctuation of meteorological factors. One of them is: how do the trees growing under different geohydrological conditions respond to them, and the second: is it correct to include into the master chronologies the tree ring series if the trees grew in different habitats. These questions could be answered only after investigations of the radial growth regularities of the growing oaks. One of the first methods of evaluation of these regularities is calculation of the similarity percentage within separate data of the study plot and estimation of the response to the influence of climatic factors.

MATERIALS AND METHODS

The objective of the study was to evaluate the dynamics of the radial growth of oak and its dependence on natural environmental conditions. For this purpose, 43 experimental plots were selected throughout the territory of Lithuania (see Fig. 1). These plots and stands were selected for the diversity of their environmental growth conditions. Their characteristics are in part presented in Tables 1 and 2. Other data relevant to the experimental plots is discussed in J. Kairaitis (1978 a, b).

We will not mention here the dendrochronological data accumulation and processing methods in detail, as they have already been described in the previous works of the Dendroclimatochronological laboratory researchers (Bitvinskas, 1974; Kairaitis, 1978 a, b; Karpavičius, 1978; Stupneva et al., 1978; Karpavičius, 1984; Karpavičius, 1994; Karpavičius et al., in press, and others).

Data provided by the national forestry assessment reports was first utilized for the description of local growth conditions. However, the regularities disclosed during subsequent analysis of radial growth revealed the data to be insufficient for a valid explanation. Thus, geological bores at a total of 18 stands were taken for means of supplementary soil analyses. Primary attention was focused on the examination of mechanical soil composition and ground water level. Where possible, the examination compass was lowered to a depth of 6 m.

No fewer than 50 trees from each stand which contained a sufficient number of trees were cored in a singular direction. Subsequent to the preparation for analysis and synchronization, establishing missing and double rings, the cored samples were measured utilizing an 'MBS-1" microscope. The obtained measurements were to a 0.1 mm of accuracy. Early and late wood specimens were measured separately.

Growth trends from each series of raw ring widths were extracted by means of a 20-year moving average at 5 year intervals, in accordance with the procedures developed by Bitvinskas (1974). Synchronism in radial growth was evaluated by the application of the formula (Bitvinskas, 1974):

$$S = \frac{n^{+}\,100}{n - 1},$$

where n^{+} – is the number of coincident intervals, n – is the number of compared tree rings.

Correlation coefficients were computed in order to determine the reaction of radial growth to changes of temperature and precipitation. Calculations of these coefficients and the evaluation criteria applied to determine reliability were used in accordance with the methodology described by G. Zaicev (1984). Mean meteorological data were utilized in the computations of correlation coefficients for various periods of time: month, group of months, hydrological year, etc. In total, 45 groups were formulated, comparing them on the basis of temperature and precipitation for distinct time intervals.

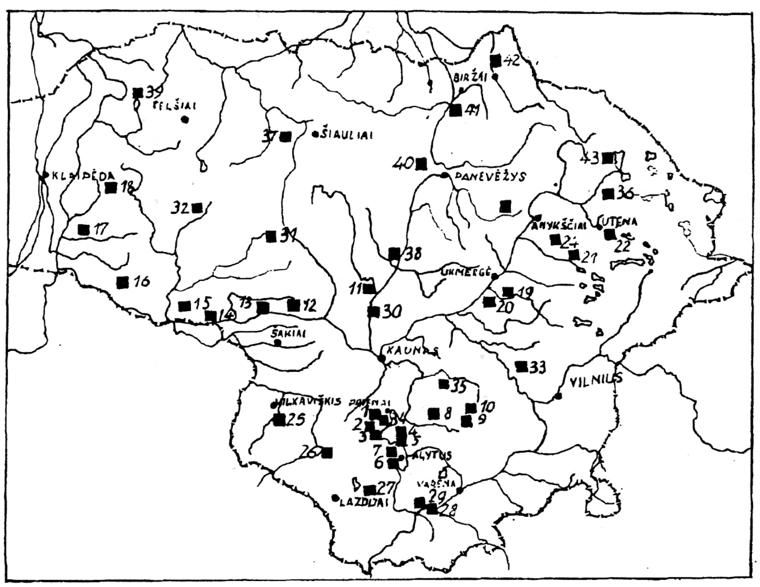

Fig. 1. Location of the experimental plots in Lithuania
Pav. 1. Tyrimo barelių išsidėstymas Lietuvoje

Table 1. **Characteristics of Lithuanian oak stands at testing plots**
1 lentelė. **Lietuvos ąžuolynų tyrimo barelių charakteristikos**

N of test plot	Area of forest administration	Forest district	N of tree block	Type of forest	Age of sample	Density	Stand hgt.	Stand diam.	Bonitet	N of samples	Stand tree composition
4	Alytus	Punia	9	Oxalido-Quercetum	184	0.7	29	56	II	59	6O, 4S, +B, +L
5	Alytus	Punia	12/20	Oxalido- Piceetum	268	0.6	26	50	III	37	7S,2O, 1Ar
9	Prienai	Aukštadvaris	39/5	Oxalido-Quercetum	227	0.7	28	48	II	57	5O, 4S, 1P, +M
11	Kėdainiai	Cinkiškės	2	Aegopodio-Quercetum	136	0.5	26	60	II	52	5O, 3S, 2B, 1
13	Jurbarkas	Vytėnai	2	Hepatico-Oxalido-Quercetum	147	0.5	19	30	III	87	10O
15	Jurbarkas	Jūrava	93/11	Oxalido-Quercetum	98	0.9	29	40	I	87	10O
16	Šilutė	Pagėgiai	75/39	Oxalido-Quercetum	162	0.7	29	48	II	87	8O, 2B, +L, +S
17	Šilutė	Norkaičiai	66/4	Hepatico-Oxalido-Quercetum	107	0.7	25	32	II	93	9O,1S
18	Kretinga	Vežaičiai	53/9	Aegopodio-Quercetum	264	0.8	26	52	III	86	6O, 3S, 1Ap
27	Veisėjai	Seirijai	3	Hepatico-Oxalido-Quercetum	155	0.3	26	82	II	76	2O, 6B, 2Ap
30	Kaunas	Babtai	1/2	Hepatico-Oxalido-Quercetum	182	0.8	26	52	II	85	10O, +B, +Ap
31	Raseiniai	Viduklė	4/4	Hepatico-Oxalido-Quercetum	156	0.7	24	38	II	86	10O, +B, +S
32	Rietavas	Kaltinėnai	24	Oxalido-Nemoroso-Quercetum	184	0.6	23	44	III	86	10O, +Ah
34	Prienai	N. Ūta	48	Oxalido-Nemoroso-Quercetum	210	0.6	28	42	I	87	4O, 3S, 2B, 1Ap
39	Plungė	Plateliai		Hepatico-Oxalido-Quercetum	135	0.7	26	42	II	30	6O, 3L, 1B, +S
41	Pasvalys	Pasvalys	24/1-3	Aegopodio-Quercetum	180	0.6	24	48	III	86	10O
42	Biržai	Biržai	68/2	Aegopodio-Quercetum	177	0.6	27	32	II	87	6O, 3Ap, 1B, +Ar, +S

Code for trees: O — oak, S — spruce, P — pine, B — birch, Ap — aspen, Ah — ash, Ar — alder, M — maple, L — linden.

Table 2. **Data of soil testing at the experimental stands**
Lentelė 2. **Tyrimo barelių dirvožemių duomenys**

N of test site	Ground water depth (m)	Soil description summary
4	5.5	Slightly wavy relief. Sand
5	1.5—5.0	Wavy relief. Standing water in hollows. Sand mixed with gravel
9	>5.0	Wavy relief. 20 cm layer with humus (A_1 horizon), followed by sand. Gravel at a depth of 1.7 m. Loam of 10 to 15 cm layer at a depth of 2.7 m. Sand at a depth of 3 m and lower
11	>2.5	Flat relief. 10 cm layer with humus (A_1). Gravely loam to a 1.6 m depth. Deeper is clay mixed with stones
13	>3.0	Nemunas River Valley. 30 cm layer with humus (A_1), followed by gravely sand of brownish color
15	3.3	Slightly wavy microrelief. 30 cm layer with humus (A_1) type clay, followed by light loam to a 1.5 m depth. At 1.5 m to 2 m depth is sand, followed by blue gravely sand mixed with clay at greater depths
16	1.5	Flat reflief. 60 cm layer with humus (A_1), followed by sand at greater depth
17	>6.0	Flat relief. 40 cm layer with humus (A_1), followed by 20 cm of blue sand. Loam at a 60 cm depth, leading into clay at a depth of 1.6 m. Clay extends to 1.8 m followed by sand. Green, relatively dry sand at a depth of 5.6 m
18	1.5	Weakly manifested relief. 30 cm layer with humus (A_1), followed by sandy loam, leading into loam at the depth below. Clay commences from a depth of 1.6 m
27	1.5	Wavy relief. Lake shore. 30 cm layer with humus(A_1). Deeper is sand mixed with gravel
30	> 3.6	Slightly wavy relief. 30 cm layer with humus (A_1). Sand and gravel interlayered with clay at greater depths. Good drainage
31	2.7	Sharply pronounced relief. 15 cm layer with humus (A_1). Yellow sand to a depth of 1.2 m. Clay at depths of 1.2 m to 1.5 m, followed by sand, leading to gravel at 2.4 m
32	1.2	30 cm layer with humus (A_1), commencing with loam leading into bluish clay at a depth of 1.4 m
34	> 7.0	Weakly pronounced relief. 20 cm layer with humus (A_1), commencing with smooth clay becoming drier with depth
39	1.5 - 8.0	Hilly relief. To 1.8 m from hill tops is light loam, followed by sand
41	2.4	Slightly wavy relief. 10 cm layer with humus (A_1) followed by red clay at greater depth
42	> 6.0	Pronounced microrelief. 25 cm layer with humus (A_1). Damp loam to a depth of 60 cm. Red clay at greater depths
43	1.2	Slightly wavy relief. 20 cm layer with humus (A_1). Sandy loam at greater depths

Mean meteorological data for the climatic groups are presented in Table 3.

Table 3. **Mean meteorological data for the climatic groups**

Climatic groups			
No.	**Period**	**No.**	**Period**
1	IX M_0;	15	XII + I + II M_0;
2	X M_0;	16	III + IV M_0;
3	XI M_0;	17	III + IV + V M_0;
4	XII M_0;	18	IV + V M_0;
5	I M_0;	19	IV + V + VI M_0;
6	II M_0;	20	IV + V + VI + VII M_0;
7	III M_0;	21	IV + V + VI + VII + VIII M_0;
8	IV M_0;	22	V + VI M_0;
9	V M_0;	23	V + VI + VII M_0;
10	VI M_0;	24	V + VI + VII + VIII M_0;
11	VII M_0;	25	VI + VII M_0;
12	VIII M_0;	26	VI + VII + VIII M_0;
13	M_0;	27	VII + VIII M_0;
14	IX + X + XI M_0;	28	VII + VIII M_1+M_0;
29	V + VI + VII + + VIII M_1+M_0;	38	M_3;
30	M_0+M_1;	39	M_1+M_2+M_3+M_4;
31	VII + VIII M_1;	40	M_2+M_3+M_4;
32	V + VI + VII + + VIII M_1;	41	M_3+M_4;
33	M_1;	42	M_4;
34	M_2;	43	M_0+M_1+M_2;
35	M_1+M_2;	44	M_0+M_1+M_2+M_3;
36	M_1+M_2+M_3;	45	M_0+M_1+M_2+M_3+M_4;
37	M_2+M_3;		

where M_0 is the current hydrological year, and M_1, M_2,...are the meteorological data for each previous year.

Results of meteorological observation compiled at the Kaunas Meteorological Station during the years of 1893 to 1969 were applied in the calculations. The meteorological station was selected for its location at the center of Lithuania, as well as for its record of long- term observations with only brief intervals between 1915 and 1922. The report was supplemented by climatic data gathered at the Vilnius and Kaliningrad (Königsberg) weather stations.

RESULTS AND DISCUSSION

It has been determined earlier that the reaction of the general features of oak to changes of meteorological factors exhibits a variety of differences (Kairaitis, 1978a). Briefly reviewed are the other possible reasons for the manifestation of such differences.

Calculation of similarity percentages is one of the methods allowing to evaluate distinctions appearing in the dynamics of the radial growth of a tree – ring series. Manipulating data from various experimental plots, 903 values of similarity percentage have been produced and they show its variability ranging from 46 to 90% (see Table 4). Based on the technique described in the works of various researchers including Bitvinskas (1974), Eckstein (1972), and others, three groups of experimental plots were formulated by the derived similarity percentages for an evaluation of synchronism amongst individual objects. In Group I the synchronism of radial growth data amongst the experimental plots was higher than 80, in Group II $S \geq 75$, and in Group III $S \leq 60\%$. A preliminary overview of the specific plots which fell into same group leads to the inference that synchronism amongst the plots is associated with climatic districts in Lithuania, or the distance between the compared sites. For example, Group I of $S \geq 80\%$ was comprised of experimental plots Nos. 1, 2, 8 and 34. Group II ($S \geq 75\%$) was comprised of plots Nos. 11, 20, 21, 23 and 36. The inference supports the data presented by Bitvinskas (1974), regarding synchronic dependency by distance between the objects under comparison. However, several exceptions were also noted. The strong similarities found among testing plots Nos. 16 and 20 or Nos. 32 and 42 are problematic to explain on the basis of regional climatic distinctions or distance, whreas plots Nos. 7, 10 and 30 resulted in $S \leq 60\%$. Neither can the differences be explained by the age of the trees. For example, though plots Nos. 7 and 8 are both over 200 years old, their S=78%, whereas plots Nos. 14 and 15, both less than 110 years of age, show a mere S=68%. A number of other analogous examples were found.

Testing results indicated strong synchronism both amongst and in comparison with other stands growing in clay soil, where the depth of ground water is more than 5 m. For example, such situation occurs for plots Nos. 1 and 34, where S=88%. The results concur with conclusions deduced by other researchers that local growth conditions are one of the factors influencing the annual course of radial growth (Kolchin et al., 1977 and others). Conversely, low levels of synchronism are typical of stands growing in sand, loam and gravel soils, where ground water levels are also deeper than 5 m, for example in plots Nos. 5 and 17. The described results allow an assumption that synchronism is associated with the hydrological regime of a stand. The hydrological regime characteristic of clay soil fluctuates more slowly than that of sandy soil. Relationship between the composition of soil and its water regime has been described by von Wilpert (1991). Such a conclusion is also supported by the fact that stands

Table 4. **Percentage of similarity among several oak chronologies**
Lentelė 4. **Panašumo procentas tarp atskirų ąžuolynų rievių serijų**

No. of trial plot	2	5	7	8	10	11	14	15	16	17	18	20	21	23	27	30	32	34	36	39	42	43
1	86	73	78	83	64	68	66	68	71	59	71	75	66	64	71	59	66	88	66	61	61	66
2	X	69	78	80	64	64	63	58	61	59	64	71	63	64	64	56	65	85	66	61	58	66
5		X	64	78	64	66	68	61	58	59	61	63	58	63	71	53	69	68	58	59	64	64
7			X	78	59	59	61	59	63	58	66	59	61	56	66	51	61	90	61	52	59	64
8				X	64	64	66	61	71	56	56	71	59	64	71	46	69	81	63	68	64	66
10					X	73	61	69	73	64	69	69	64	66	63	58	71	63	71	83	76	61
11						X	78	66	73	75	66	83	75	75	49	68	68	66	81	80	66	75
14							X	68	64	60	64	78	69	71	58	63	69	64	69	68	64	63
15								X	66	68	60	69	64	63	56	64	54	66	64	66	50	68
16									X	68	76	80	58	63	63	64	75	69	71	73	63	58
17										X	71	71	56	68	47	63	66	64	66	64	68	63
18											X	76	54	68	59	58	75	69	61	69	73	61
20												X	75	76	63	64	78	69	81	80	66	71
21													X	75	64	56	63	64	76	71	58	66
23														X	49	54	68	56	75	73	69	64
27															X	73	68	69	54	53	63	62
30																X	56	68	53	51	61	56
32																	X	61	73	68	75	66
34																		X	64	59	56	68
36																			X	74	68	80
39																				X	69	64
42																					X	64
43																						X

grow synchronically at $S \geq 75\%$, not only in soils of diverse mechanical composition, but also at ground water depths of 1.2–1.5 m. For example, plot No. 16 is characteristic of sand soil, Nos. 18 and 32 of clay soil. Specific growth is also characteristic of stands growing on lake shores, such as in plots Nos. 27 and 43. Their specific dynamics of growth is closely related to the level of the lake water, although they grow in sandy soil with high ground water levels (1.2 to 1.5 m). That the dynamics of radial growth is related to fluctuations in the water levels of lakes has been also reported by Pakalnis (1975).

Oak stands growing under conditions of macro relief are also characteristic of specificity in the course of radial increments, because they exhibit low similarity percentages, both within the stand and when compared to other stands, for example at plots Nos. 30 and 39. Other tendencies in the characteristics of the course of growth were also noted during the testing at the experimental plots, but due to the dearth of data on fluctuations in moisture content of the soil, these are problematic to explain.

The reaction of separate courses of growth at tree stands to fluctuations in meteorological factors were next reviewed (Fig. 2). Four major types of growth reactions were grouped, based on observed correlation coefficients between radial growth at the individual experimental plots and corresponding data on temperature and precipitation during varying time periods. These are as follows:

Type 1 includes oak stands of low sensitivity to the impact of temperature and precipitation. The correlation coefficients derived with these factors rarely reach 0.34.

Type 2 includes oak stands more sensitive to the regime of temperature than to precipitation. By temperatures during varying time periods, r between 0.35 and 0.44 prevails, whereas by precipitation, r rarely reaches 0.24 (0.34).

Type 3 includes oak stands very sensitive to the impact of precipitation, where r reaches 0.44, in comparison to the impact of temperature, where r reaches only 0.24.

Type 4 includes oak stands equally sensitive to temperature and precipitation.

Types analogous to 2 and 3 have been noted by J.F.Bauch and D.Eckstein (1975). Some of the oak stands could be designated to one type based on coefficients with meteorological factors during one period, and to another type based on results with another period. However, such differences are not significant and will not be further discussed.

Characteristic of Type 1 oak stands, as observed at plots Nos. 16, 27 and 43, is that they grow in sandy or loamy soils, have an average or thick layer (about 40 cm) with humus, and ground water appears at a depth of 1.2 to 1.5 m. However, even such a high water level at the plots does not always ensure an adequate supply of water to the trees. At

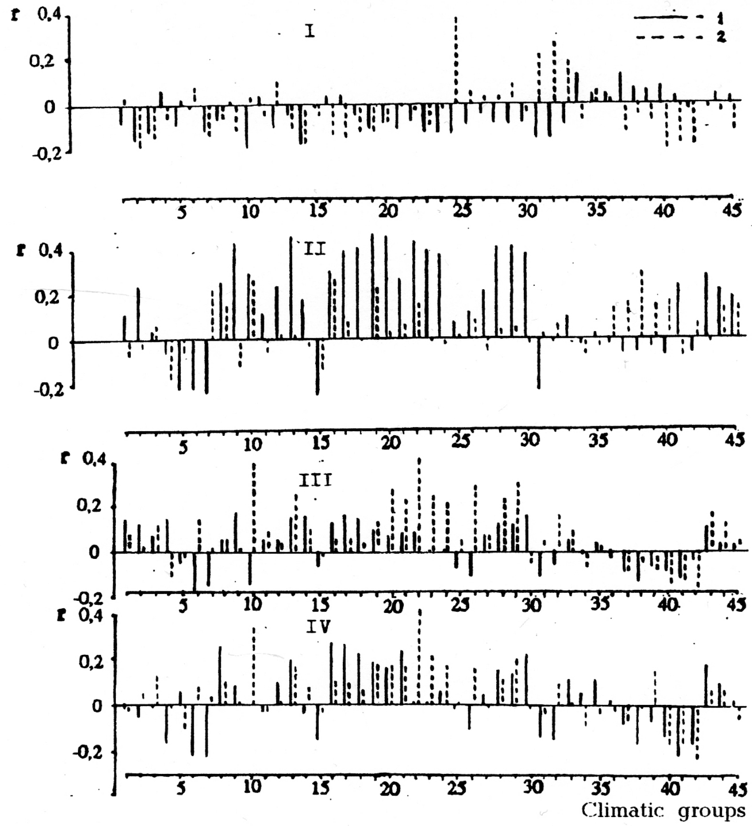

Fig. 2. Types of reaction of oak stands resulting from the impact of climatic factors. Correlation coefficients of annual radial increments by temperature (*1*) and by precipitations (*2*)
Pav. 2. Ąžuolynų reakcijos tipai priklausomai nuo klimatinių veiksnių poveikio. Metinio radialinio prieaugio koreliaciniai koeficientai su temperatūromis (*1*) ir krituliais (*2*)
Note: description of climatic groups is given in Table 3

the cessation of warm dry season, the water level can fall sharply. An occurrence of this nature is indicated by the positive correlation coefficients derived with the application of precipitation data for the month of July with r reaching 0.34 and negative coefficients with the application of temperatures during the same month with $r = -0.24$, which were evidenced at all the experimental plots listed.

Type 2 stands, sensitive to temperature fluctuation, grow in soil characteristic of a thin layer of loam or sand at the surface, leading into loam which then graduates into clay, as evidenced by plots Nos. 18 and 32. At some stands, sand is again found below the clay, as in plot No. 17, or sand intermixed with clay as in plot No. 15. Except for plot No. 17, the ground water level is at a depth of 1.2 to 3 m. As illustrated by soil data at these experimental plots, fluctuations in water levels have a strong impact when water reaches the layer of clay, which due to its poor permeability impedes the filtration of the water to greater depths. Therefore, temperatures which enhance the evaporation of water surplus have a positive impact, particularly during the warm seasons, as seen by climatic Group 16–27.

Type 3 oak stands characteristically grow in sandy or gravel soil with a deep ground water level (>5 to 6 m), as evidenced by plots Nos. 4, 5 and 9. Moisture deficiency is often likely to occur due to the excellent water depth filtration and the deep level of ground water. This is indicated by the strong positive correlation coefficients derived with precipitation with r ranging from 0.24 to 0.44. In comparison, the coefficients with temperatures are slightly positive or negative, rarely reaching 0.34.

Type 4 characteristic responses are of oak stands which grow in soils of either pure loam or clay or which have a thin horizontal strip of sand at the surface. Ground water levels of over 6 m are common to the stands, as evidenced by plot No. 42.

Specifically due to the poor water permeability of clay, the layer just below the surface of the soil may become drenched, whereas at greater depths there is a moisture deficiency. This phenomenon was observed during the sounding procedures in the test of the soil. Although water was found in the micro depressions at the surface of the soil at some of the stands, the clay would progressively become drier and harder at greater depths. The assumption is thus made that water to the oaks is supplied from reserves at 1 to 2 m in depth. This provides an explanation for relatively sensitive responses of oak stands both to temperature and to precipitation, the predominant values of r = 0.24–0.34.

In order to derive a more thorough explanation of the sensitivity of oak stands to the influences of temperature and precipitation, a long-term study on various mechanical compositions of soil and moisture distribution among its horizons must be undertaken.

CONCLUSION

The dynamics of radial increment growth of oak trees in Lithuania correlates with meteorological climatic factors, mechanical soil composition, depth levels of ground water, moisture regime and a host of other factors.

Especially radial growth dynamics at Lithuanian oak stands is closely related to the level of ground and surface waters. It is observed that trees growing even in soils of differing mechanical composition indicate a more highly similar response at $S \geq 75\%$ when ground water is found at a similar depth, than for trees growing in soil of the same composition, but at highly varied water depth levels.

Oak radial growth responses to the influence of temperature and precipitation are also related to the geohydrological conditions at the stands. Four categories of climate-growth responses in Lithuanian oak stands have been formulated: 1) insensitive to both temperature and precipitation; 2) more sensitive to the temperature regime than to hydrology; 3) more sensitive to precipitation; and 4) sensitive to temperature as much as to precipitation. It supplements and helps to better understand the results obtained by T.Wazny and others (1991) in their research of radial increase regularities of oak stands in Poland.

Due to the above-mentioned differences, it is essential to use the data from as more analogous habitats as possible when compiling long-term ring series in Lithuania. Without taking into consideration the above-mentioned fact, the dendroscales will be applicable only for the evaluation of common climatic signals. It is possible to judge the habitat conditions by the peculiarities of the currently growing trees, but for this purpose additional research is needed.

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ĄŽUOLŲ (*QUERCUS ROBUR* L.) RADIALINIO PRIEAUGIO YPATUMAI LIETUVOJE

R e z i u m ė

Gautieji ąžuolynų radialinio prieaugio duomenys iš 43 tyrimų barelių parodė, kad individualūs medynai skirtingai reaguoja į temperatūrų ir kritulių poveikį.

Vienas veiksnių, lemiančių didelį atskirų medynų radialinio prieaugio dinamikos panašumą, yra jų geohidrologinės augimo sąlygos. Panašiausia augimo eiga pasižymi medynai, augantys molio dirvožemiuose, kuriuose gruntinis vanduo giliau kaip 5 m. Panašia augimo eiga pasižymi ir medynai, augantys skirtingos mechaninės sudėties dirvožemiuose, kuriuose yra aukštas (1,2 – 1,5 m) gruntinių vandenų lygis.

Priklausomai nuo gruntinių vandenų lygio ir drėgmės režimo dirvožemyje ąžuolynai į meteorologinius veiksnius reaguoja šitaip: 1) nejautriai ir į temperatūras, ir į kritulius; 2) jautriau į temperatūrinį režimą nei į hidrologinį; 3) jautriau į kritulius; 4) jautriai ir į temperatūras, ir į kritulius.

Sudarinėjant ilgaamžes rievių chronologijas Lietuvoje, dėl skirtingos prieaugio reakcijos į klimatinius veiksnius svarbu, kad radialinio prieaugio duomenys būtų kiek galima iš analogiškesnių geohidrologinių sąlygų.

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ОСОБЕННОСТИ РАДИАЛЬНОГО ПРИРОСТА ДУБОВ (*QUERCUS ROBUR* L.) В ЛИТВЕ

Р е з ю м е

Данные радиального прироста дубов, полученные с 43 пробных площадок, показали, что индивидуальные древостои на влияние температуры и осадков реагируют неодинаково.

Одним из факторов, определяющих высокое сходство радиального прироста отдельных древостоев, являются геогидрологические условия их роста. Наиболее высокое сходство свойственно древостоям, растущим на глинистых почвах, уровень грунтовых вод в которых ниже 5 м. Сходным ходом роста отличаются и древостои, растущие на почвах различного механического состава, но с высоким уровнем (1,2 – 1,5 м) грунтовых вод.

В зависимости от уровня грунтовых вод и режима влажности в почве дубравы на влияние метеорологических факторов реагируют: 1) нечувствительно как на температуру, так и на осадки; 2) более чутко на температурный режим, чем на гидрологический; 3) более чутко на осадки, чем на температуру; 4) чутко как на температуру, так и на осадки.

Для создания долгосрочной хронологии годичных колец в Литве в связи с различной реакцией радиального прироста на влияние климатических факторов весьма важно, чтобы данные по радиальному приросту были как можно из более аналогичных геогидрологических условий.