

УДК 630 \* 630 \* 431.5 431.1

**G. Ya. Klimchik**, Phd (Agriculture), assistant professor (BSTU);  
**V. V. Usenya**, D. Sc. (Agriculture), deputy director (Forest Institute of Belarus NAS);  
**N. V. Gordey**, Phd (Agriculture), senior researcher (Forest Institute of Belarus NAS);  
**L. I. Mukhurov**, assistant lecturer (BSTU)

### DESCRIPTION OF FIRES ACCORDING TO THEIR ORIGIN FEATURES

The article deals with the problems of forest fires emergence and their quantity in 6 forestries of the Republic of Belarus during 2006-2011. The analysis of fire's origin features is given here depending on the period of the year, month, a day of the week, time of the day. The obtained data shows that nowadays with the development of road network in the woods, urbanization of the population and its technical equipment, fire hazard is possible in any daytime in fire-risk season when there is the III class of fire danger under the weather conditions.

**Introduction.** The greatest number of forest fires occurs in dense populated and developed road network regions. These regions are forests around the cities, settlements, country sites and so on.

During certain years, fires hazard is naturally connected with dryness of particular year, as well as during the periods of picking mushrooms and gathering berries, when they are ripen.

Researches of last decades note that knowing of fire-risk months, days of the week and day time, visitation intensity of forest territories makes possible to carry out fire prevention events in proper time and differentially [1].

**Main part.** Our research was carried out in 6 forestries of Minsk and Brest state production forestry enterprises: Borisov experiment forestry, Stolbtsy experiment forestry, Baranovichy forestry, Kobrin experiment forestry, Uzda forestry and Negoreloye forestry experimental station.

The number of fires distribution during 2006–2011 in a section of forestries is shown on drawing.

The most fire dangerous year for the last five years was 2006. This year there were 124 fires in four studied forestries that made 55.9% of all cases. 2009 is also characterized as the fire danger year. 68 ignitions were mentioned in six studied forestries that made 23.7% of all cases (Figure).

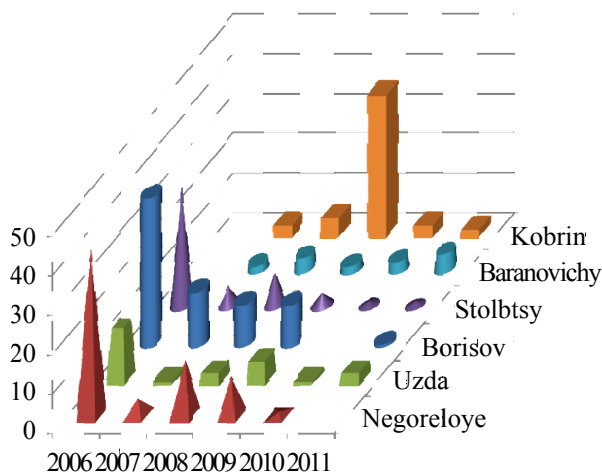
In 2010–2011 due to favorable weather conditions (rather rainy summer) there was a sharp reduction of ignitions in the forest. Only 9 and 12 cases respectively that makes 3.1% and 4.2%.

The average fire area is as follows: Uzda forestry - 0.232 hectares, Borisov - 0.458 hectares, tares, Kobrin - 0.653, Negoreloye - 1.648 hectares. The considerable average fire area in Negoreloje forestry is connected with two upper fires in 2006.

The fires number and area distribution by months and days of the week during the fire-dangerous season indicates that forest fires have the anthropogenous origin. The greatest number of fires and their area is registered, generally in weekends. That's why it is necessary to increase both the number of given prevention mass – educative actions and the surface patrol [2].

Distribution of number of forest fires during months of a fire-dangerous season in a section of forestries is given in Table 1.

Analyzing obtained data of fire origin during months of fire-dangerous season, it should be noted that 64.1% of them fall on spring months. First of all it is connected with the fact that after snow melting there is a very fast drying of burning conductors, in the second – with mass visit of people to forests during spring holidays and weekends for the purpose of outdoor rest; in the third – with making of agricultural fire sites, whereas uncontrollable fire passes from fields into forests. The second flash of number is noted during summer maturing of berries.



Distribution of fires number by years

Distribution of fires number by days of the week is given in Table 2.

According to our researches any clearly marked regularity isn't traced in distribution of fires number by days of the week. Their increase to a little degree occurs in days off and holidays, as well as on Monday. Although in the middle of the week (Wednesday) the increase in quantity of fire cases is noted too.

The distribution of the number of fires per hour within forestries investigated is given in Table 3.

Table 1

**Distribution origin of forest fires number by months**

Forestry	Indicator	Month								Total
		March	April	May	June	July	August	September	October	
Uzda	Number, pc.	–	6	10	5	4	3	–	–	28
	Part, %	–	21,4	35,7	17,9	14,3	10,7	–	–	100,0
	Area, hectare	–	1.13	2.25	2.16	0.4	0.56	–	–	6.50
Borisov	Number, pc.	–	17	20	8	22	7	–	1	75
	Part, %	–	22,7	26,7	10,7	29,3	9,3	–	1,3	100,0
	Area, hectare	–	10.04	9.58	1.49	9.28	3.97	–	0.01	34.37
Negoreloje	Number, pc.	3	37	25	1	2	2	1	–	71
	Part, %	4,2	52,1	35,2	1,4	2,8	2,8	1,4	–	100,0
	Area, hectare	0.459	7.47	106.284	0.500	1.900	0.110	0,001	–	116.994
Baranovichy	Number, pc.	–	6	4	4	–	1	1	–	16
	Part, %	–	37,5	25,0	25,0	–	6,3	6,3	–	100,0
	Area, hectare	–	5.31	0.81	2.8	–	2.0	0.01	–	10.93
Kobrin	Number, pc.	–	24	15	4	5	1	–	–	49
	Part, %	–	49,0	30,6	8,2	10,2	2,0	–	–	100,0
	Area, hectare	–	8.74	8.94	0.2	14.08	0.03	–	–	31.99
Stolbtsy	Number, pc.	–	7	13	12	11	3	2	–	48
	Part, %	–	14,6	27,1	25,0	22,9	6,3	4,2	–	100,0
	Area, hectare	–	0.49	1.72	1.46	2.11	0.38	0.03	–	6.19
Total	Number, pc.	3	97	87	34	44	17	4	1	287
	Part, %	1,0	33,8	30,3	11,8	15,3	5,9	1,4	0,3	100,0
	Area, hectare	0.459	33.457	129.584	8.610	27.770	7.050	0.041	0.010	206.974

Table 2

**Distribution of fires number by days of the week**

Forestry	Indicator	Week days							Total
		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday, holidays	
Uzda	Number, pc.	5	1	6	1	6	3	6	28
	Part, %	17,9	3,6	21,4	3,6	21,4	10,7	21,4	100,0
Borisov	Number, pc.	12	12	12	4	10	12	13	75
	Part, %	16,0	16,0	16,0	5,3	13,3	16,0	17,3	100,0
Negoreloje	Number, pc.	9	15	9	11	7	5	15	71
	Part, %	12,7	21,1	12,7	15,5	9,9	7,0	21,1	100,0
Negoreloye	Number, pc.	3	4	3	1	1	1	3	16
	Part, %	18,8	25,0	18,8	6,3	6,3	6,3	18,8	100,0
Baranovichy	Number, pc.	8	1	11	5	7	8	9	49
	Part, %	16,3	2,0	22,4	10,2	14,3	16,3	18,4	100,0
Stolbtsy	Number, pc.	10	3	10	3	1	11	10	48
	Part, %	20,8	6,3	20,8	6,3	2,1	22,9	20,8	100,0
Kobrin	Number, pc.	47	36	51	25	32	40	56	287
	Part, %	16,4	12,5	17,8	8,7	11,1	13,9	19,5	100,0

Table 3

**Distribution of fires number (%) by hours**

Forestry	Time of the fire. hour					
	6.00–9.00	9.00–12.00	12.00–15.00	15.00–18.00	18.00–21.00	after 21.00
Uzda	7.1	10.7	46.4	28.6	7.1	–
Negoreloye	1.4	12.7	26.8	39.4	18.3	1.4
Baranovichy	–	–	68.8	25.0	6.3	–
Kobrin	–	20.4	34.7	34.7	4.1	6.1
Borisov	1.3	24.0	45.3	21.3	8.0	–
Stolbtsy	–	4.2	47.9	37.5	6.3	4.2
Total	1.4	14.6	40.8	31.7	9.4	2.1

By the time of occurrence of forest fires during the day observed the largest number from 12 to 18 hours, and that is characterized by an increased willingness to forest fuel of ignition. It accounts for 72.5% of the fires.

The distribution of the number of fires by fire danger classes are given in Table 4.

Analyzing cases of forest fires and fire danger classes due to weather conditions, it should be noted that over 50% of them are in Class III. During this period drying of burning wires (needles, moss, etc.) and their readiness to fire occurs quite intensive.

The incidence of forest fires in classes I and II indicates the drawbacks of the calculation of the complex refractive flammability of forests when a roll of 2.6 mm and more comprehensive indicator of precipitation is derecognized. Also, in some cases this is due to insufficient dense network of observation points when cancellation of the complex index is according to the weather station and in a wider range there was no rain.

Distribution of the number of fires by dominant species in four forestry enterprises is given in Table 5.

Table 4

**Distribution of fires number by classes of fire danger**

Indicator	Class of fire danger				Total
	I	II	III	IV	
Number.pc.	3	9	140	94	246
Part, %	1.2	3.7	56.9	38.2	100.0
Area, hectare	0.190	1.00	114.057	64.310	179.557

Table 5

**Distribution of fires number by prevailing species, piece/%**

Prevailing species											Other	Total
Pine forests			Spruce forests			O	A	B	As	Al b		
Total	Incl.		Total	Incl.								
	Pine mossy	Pine fern		Spruce fern	Spruce sorrel							
<u>148</u> 76.3	<u>72</u> 37.1	<u>50</u> 25.8	<u>22</u> 11.3	<u>8</u> 4.1	<u>7</u> 3.6	<u>2</u> 1.0	<u>1</u> 0.5	<u>11</u> 5.7	<u>1</u> 0.5	<u>6</u> 3.1	<u>3</u> 1.5	<u>194</u> 100.0

Analysis of the Table 5 shows that the largest number of fires occurred in forestry enterprises listed coniferous plantations, particularly in the pine (76.3% of cases). Most types of flammable pine forests are mossy pine forests (37.1%) and fern (25.8%) in the types of habitat conditions A2-B2; of spruce forests - spruce fern and sorrel in edaphotopes B2-C2.

**Conclusion.** In modern conditions of developed forest road network, an urbanization of the population and its technical equipment, forest fires happens almost evenly on all days of the week. The main number of forest fires falls on early

spring and summer that is connected with mass visits of forests by people in spring and during periods of mass maturing and picking mushrooms as well gathering berries.

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Received 28.01.2013