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FEATURES OF RADIOACTIVE CONTAMINATION OF FORESTS AND FORESTRY PRODUCTION OF THE STATE ENTERPRISE «KOROSTEN FOREST-HUNTING ENTERPRISE»

Forest massifs of the state enterprise «Korosten forest-hunting enterprise» are located within «the western track» of emissions after the Chernobyl NPP catastrophe; and the radioactive contamination of the area was caused mainly by $^{134+137}$ Cs. Investigation of the forests of this forestry enterprise was carried out in 1991. One (of five) mixed sample of soil was taken per 100 ha of forest plantations during the investigation. As far as forest blocks of the state enterprise «Korosten forest-hunting enterprise» in most cases have smaller areas, the results of the survey showed the rates of the soil radiation contamination density for 60 − 70% of these areas.

The analysis of the obtained data (Table 1) allows to draw conclusions that there is no forests with radiation contamination density of soil more than 15 Ci/km^2 on the territory of this forestry enterprise. But these territories are prohibited to conduct any forestry activity. Thus, there are no areas in the state enterprise to be imposed restrictions concerning the stay of workers in the forests in extreme cases (suppression of fires).

Table 1

Distribution of the areas of forest plantings of the state enterprise «Korosten forest-hunting enterprise» according to the density of soil radiation contamination by $^{134+137}$Cs, (Ci/km^2)

Forestry	Area of zones, ha					Total, ha
	0,01–2,0	2,01−5,0	5,1–7,0	7,01–10,0	10,01−15,0	
Bekhy	2576,7	2541,5	1446,0	807,6	230,0	7602,0
Omelyanivka	2050,3	2976,1	337,6	−	−	5363,6
Turchynivka	3440,0	150,0	−	−	−	3590,0
Ushomyr	3895,6	2698,8	210,0	265,0	−	7069,4
Shershniv	5259,0	962,0	−	−	−	6221,0
Total	17221,6	9328,4	1993,4	1072,6	230,0	29846,0

Two hundred and thirty ha of forest plantings with soil radiation contamination density of 10,01 – 15 Ci/km^2 are concentrated in the north-eastern part of Bekhy forestry. The provision of wild berries, herbs and edible mushrooms as well as wild game animals shooting (wild boar, European roe, elk) is completely prohibited here. Besides, there are some restrictions (provision of firewood) in the forest massifs with mentioned radiation contamination density of soil.

3296,0 ha of the state enterprise «Korosten forest-hunting enterprise» forests were introduced the ban to use non-timber forest products. These forest plantings with radiation contamination density of soil more than 5 Ci/km^2 occupy 11,0% of the forestry enterprise total territory. Forest plantings with soil radiation contamination density of 2,01 − 5,0 Ci/km^2 which occupy an area of 9328,4 ha (31,3%) are permitted for provision of non-timber forest products but only with required radiation control. Restrictions to carry out silvicultural activity and to use forestry production were not imposed in the area of 17221,6 ha.

It is necessary to mention that the current radiological situation in the forests of the state enterprise «Korosten forest-hunting enterprise» has significantly improved. It is due to the disintegration of the main dose-forming radionuclides. Large volumes of wood that serve as a raw material for manufacturing various wood products to use in national economy of the state and abroad are produced in the forest massifs of this forestry enterprise. Because uncontrolled use of wood can cause overexposure of consumers it requires systematic radiological control of radiation contamination levels.

The data obtained from the survey of radiological control (Table 2) prove that the wood products of the forest enterprise can be considered relatively «pure» from the radioecological point of view.

The analysis of data showed that the lowest levels of radiation contamination are characteristic for processed timber. The radiological control of 18 lumber samples was carried out: 7 samples with ^{137}Cs specific activity less than 50 Bq/kg (38,9% of the total number of samples of this product type); and 11 samples with specific activity ranging from 50 to 100 Bq/kg (61,1% of the total number of samples of this product type). Lower levels of radiation contamination were detected in samples of wood without bark, plywood raw material, pulpwood, raw material for fasteners works and technological wood comparedto other types of wood products which were subjected to radiological control in 2012. The radiocesium specific activity in samples of mentioned types of wood products of the state enterprise «Korosten forest-hunting enterprise» did not exceed 100 Bq/kg. Somewhat higher levels of radiation contamination were observed in samples of wood with bark. The results of radiological control showed that ^{137}Cs specific activity ranged from 100 to 200 Bq/kg in 18% (off the total) of samples of wood with bark.

Considerably higher levels of radiation contamination were observed in samples of fuel wood (firewood). Thus, radiological control of 58 samples of this type of wood product was carried out: 13,8% of samples showed 400 Bq/kg specific activity of this radionuclide; 5,2% of samples – in the range of 300 − 400 Bq/kg; 34,4% of samples − in the range of 200 − 300 Bq/kg; and 5,2% of samples − ranging from 100 to 200 Bq/kg. The specific activity of radiocaesium did not exceed 100 Bq/kg (Table 2) in 41,4 % of samples (off the total amount of fuel wood (firewood)).

Table 2

Distribution of wood samples and wood products according to the ranges of ^{137}Cs specific activity in the state enterprise «Korosten forest-hunting enterprise» in 2012, (Bq/kg)

Type of production	Number of samples, units						The total number of samples, units
	< 50	50−100	100–200	200–300	300−400	>400	
Timber in the rough							
Wood with bark	9	9	4	–	–	–	22
Wood without bark	–	9	–	–	–	–	9
Plywood raw material	5	14	–	–	–	–	19
Pulpwood	5	18	–	–	–	–	23
Raw material for fasteners works	–	7	–	–	–	–	7
Technological wood	6	18	–	–	–	–	24
Processed timber							
Lumber	7	11	–	–	–	–	18
Production of economic, cultural and household goods							
Fuel wood (firewood)	–	24	3	20	3	8	58
Total	32	110	7	20	3	8	180

In 2012, the examination of 180 samples of wood and wood products of forestry enterprise was carried out. There was no sample detected with ^{137}Cs specific activity exceeding the established admissible levels.

It should be noted that the data relating to radiation contamination of non-timber forest products in the state enterprise «Korosten forest-hunting enterprise» in 2012 are absent. It is critical from the radioecological point of view and can not be considered as a completely satisfactory radiation control of forestry production.