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Vertical and horizontal distribution of ¹³⁷Cs in zone of Chernobyl contamination in Russia

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Peculiarity of vertical migration of Cs-137 was investigated in zones of Chernobyl contamination (Bryanskaya, Orlovskaya, Tulskaya and Kaluzhskaya districts). Vertical distribution of Cs-137 on inviolate places characterizing by minimal penetration of peak of maximal concentration for the depth about 2-4 cm in dependence of type of soil and intensity of processes of byoturbation.
Practically all quantity of Cs-137 in inviolate soils accumulated in upper 0-15 cm. The waterlogged soils as well as acidic soils of the pine forests are exclusion of this rule, where Cs-137 на may migrate for the big depth. For example the sandy soils without feature of podzolic processes in the first 5 cm contain 97% quantity of radionuclide. In dernovo-podzols the first 5 cm contain only about 60% of Cs-137 and observed second peak of vertical distribution of Cs-137, related with accumulation of radionuclide in illuvial horizont.
Vertical distribution of Cs-137 in arable soils and adjacent slopes of dry valleys is formed greatly by processes of erosion and accumulation. There is observing the alternation zones of previously erosion and accumulation inside of the arable slope. On the flood planes of small rivers accumulation of radionuclide is discovered on the billow near the river-channel, peak of vertical distribution of Cs-137 placed on the 5-10 см depth. In marshi soils is usually discovered decreasing of Cs-137 in 0-25 cm depth relatively of soils of higher geomorphological positions, probably because of penetration of radionuclide in greater depth. But, in periodically wet conditions of flood plane depressions it can formed local spots of contamination in 5 times bigger then soils of adjacent dry hills.

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