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Hygienic Assessment of Food and Biological the Values of Wheat Grain Grown with the Use of Plant Growth Stimulants: Rostbisol, Oxyhumate, Bakor and Dorilin

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ABSTRACT

Hygienic assessment of food products obtained from food crops treated with pesticides and the establishment of permissible residual amounts of pesticides in them is an important link in the system of measures that ensure the prevention of poisoning with pesticides and prevent the possibility of harmful effects on public health.

KEYWORDS: *wheat plants, environmental objects, smooth surface*

To solve the tasks, hygienic studies were carried out to determine the residual content of Rostbisol, Oxyhumate, Bahor and Dorilin in wheat grown with the use of the above plant growth stimulants.

Studies have shown that the growth stimulators studied were found in very small quantities and mainly only on the day of sowing the seeds they treated in the soil of the sown field and in the air above the field.

When spraying wheat plants with 0.5% Rostbisol on the day of treatment in the air, the drug was determined at a concentration of 0.07 mg/m3, 0.15 mg/kg in the soil of the sown field, 0.3 mg/kg in the leaves, 0.2 mg/kg in the roots. On the 2nd day after treatment: the drug was not detected in the air above the field, in the soil, Rostbisol was preserved in an amount of 0.06 mg / kg, in the leaves and roots of wheat - 0.2 mg/ kg. When processing wheat plants with 0.25% Rostbisol, its residual amounts were detected only on the first day of application: in the air – 0.002 mg/m3 and in the soil – 0.005 mg/kg. When using 0.12% Rostbisol, environmental objects and wheat plants did not contain residual amounts of the drug (Table 1.1).

Table 1.1 The content of Rostbisol in environmental objects, in plants and wheat grains

Drug concentration and sampling day	Air, mg/m3	The soil of the sown field, mg/kg	Soil at the edge of the field, mg/kg	Spring water, mg/l	Wheat plants, mg/kg		
					Leaves	Roots	Wheat grain tsy of the new harvest
0.5% solution							0
1 day	0,07	0,15	0	0	0,3	0,2	
2 day	0	0,06	0	0	0,2	0,2	
3 day	0	0	0	0	0	0	
0.25% solution							0
1 day	0,002	0,005	0	0	0	0	
2 day	0	0	0	0	0	0	
3 day	0	0	0	0	0	0	
0,12% solution							0
1 day	0	0	0	0	0	0	
2 day	0	0	0	0	0	0	
3 day	0	0	0	0	0	0	

The study of the degree of pollution of environmental objects with the use of 0.005% and 0.001% Oxyhumate showed that only on the first day of treatment the drug was determined in the air at concentrations of 0.001 mg/m3, 0.002 mg/m3 and in the soil 0.005 mg/kg and 0.002 mg/kg, respectively (Table 1.2).

Table 1.2 Content of Oxyhumate in environmental objects, in plants and wheat grain

Drug concentration and sampling day	Air, mg/m3	The soil of the sown field, mg/kg	Soil at the edge of the field, mg/kg	Spring water, mg/l	Wheat plants, mg/kg		
					Leaves	Roots	Wheat grain tsy of the new harvest
0.005% solution							0
1 day	0,002	0,005	0	0	0	0	
2 day	0	0	0	0	0	0	
3 day	0	0	0	0	0	0	

0.002% solution							0
1 day	0,001	0,002	0	0	0	0	
2 day	0	0	0	0	0	0	
3 day	0	0	0	0	0	0	
0,001% solution							0
1 day	0	0	0	0	0	0	
2 day	0	0	0	0	0	0	
3 day	0	0	0	0	0	0	

The use of the growth stimulator Bahor 0.1% and 0.01% when growing wheat led to contamination of the air and soil with the drug only on the first day of processing. Pollution levels were insignificant: 0.02-0.01 mg/m3 in the air, and 0.09-0.05 mg/kg in the soil (Table 3.3).

The use of Doriline in concentrations of 1.0% and 0.5% on the day of treatment polluted the air above the treated field in concentrations of 0.04-0.06 mg/m3 and the soil - 0.02-0.04 mg/kg. The use of 0.25% Doriline did not lead to pollution of environmental objects (Table 1.3).

Table 1.3 The content of phosphorus in environmental objects, in plants and wheat grains

Drug concentration and sampling day	Air, mg/m3	The soil of the sown field, mg/kg	Soil at the edge of the field, mg/kg	Spring water, mg/l	Wheat plants, mg/kg		
					Leaves	Roots	Wheat grain tsy of the new harvest
0.1 % solution							0
1 day	0,02	0,09	0	0	0	0	
2 day	0	0	0	0	0	0	
3 day	0	0	0	0	0	0	
0.01 % solution							0
1 day	0,01	0,005	0	0	0	0	
2 day	0	0	0	0	0	0	
3 day	0	0	0	0	0	0	
0,001 % solution							0
1 day	0	0	0	0	0	0	
2 day	0	0	0	0	0	0	
3 day	0	0	0	0	0	0	

Rostbisol, Oxyhumate, Bahor and Dorilin were not found in the grain of the harvested crop.

Therefore, it can be concluded that the studied drugs pollute environmental objects slightly and only in the first 2 days. The wheat grain of the resulting crop does not contain residual amounts of plant growth stimulants.

Table 1.4 The content of Dorylin in environmental objects, in plants and wheat grains

Drug concentration and sampling day	Air, mg/m3	The soil of the sown field, mg/kg	Soil at the edge of the field, mg/kg	Spring water, mg/l	Wheat plants, mg/kg		
					Leaves	Roots	Wheat grain tsy of the new harvest
1.5 % solution							0
1 day	0,04	0,06	0	0	0	0	
2 day	0	0	0	0	0	0	
3 day	0	0	0	0	0	0	
0.5% solution							0
1 day	0,02	0,04	0	0	0	0	
2 day	0	0	0	0	0	0	
3 day	0	0	0	0	0	0	
0,25% solution							0
1 day	0	0	0	0	0	0	
2 day	0	0	0	0	0	0	
3 day	0	0	0	0	0	0	

A special place in the hygienic assessment of food products obtained from plants treated with pesticides belongs to the determination of their organoleptic properties.

The study of the organoleptic properties of wheat grains grown using Rostbisol, Oxyhumate, Bahor and Dorilin was applied GOST 10 967 – 90.

The color, smell and taste of grain – these signs were determined organoleptically, i.e. with the help of human sensory organs (volunteers).

The color, smell and taste characterize the freshness of the grain, and in the future - the quality of bread.

Studies have established that the experimental samples of wheat grain samples did not differ in organoleptic properties from control samples: the grain was light yellow in color, had a shiny, smooth surface; the smell was pleasant, without foreign impurities, the taste was good.

1. The studied drugs pollute environmental objects (air and soil) slightly. Residual amounts of Rostbisol, Oxyhumate, Bahor and Dorilin are not detected in wheat grain.
2. The organoleptic properties of grain samples grown using the studied growth stimulants do not differ from control samples.
3. The studied preparations contributed to an increase in wheat yield. Oxyhumate and Dorilin have the best stimulating effect, Oxyhumate increased the yield of wheat grain by 2 times. The weight of 1000 grains was greatest when using 0.005% Oxyhumate solution.
4. The positive effect of the studied preparations on the protein content in wheat grains, the amount of raw gluten and its quality (elasticity and extensibility) has been established. The vitreousness of the wheat grain of the experimental samples did not change in comparison with the control values.
5. From a hygienic standpoint, the studied concentrations of Rostbisol, Oxyhumate, Bahor and Dorilin when used on wheat crops do not cause objections and can be recommended for use in agricultural production.

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