



Cd, Cu Zn, 19-23 %, Cu – 12- 15 %.

( . 2).

1200 /

Cd, Cu. : Zn Cd,

Cu> Cd> Ni> Zn> Pb. Zc

Cd -

| 2.   |   | 5 / , / . , , - ( , / ; |             |             |             |             |      |             |             |             |             |             |      |
|------|---|-------------------------|-------------|-------------|-------------|-------------|------|-------------|-------------|-------------|-------------|-------------|------|
|      |   | - )                     |             |             |             |             |      |             |             |             |             |             |      |
| , /  |   |                         |             |             |             |             |      |             |             |             |             |             |      |
| .    |   | Cd                      | Cu          | Ni          | Pb          | Zn          | Zc   | Cd          | Cu          | Ni          | Pb          | Zn          | Zc   |
|      |   | 0,25                    | 0,43        | 0,59        | 0,32        | 4,35        | -    | 0,25        | 0,43        | 0,59        | 0,32        | 4,35        | -    |
| 300  | 3 | <u>3,02</u>             | <u>16,1</u> | <u>6,84</u> | <u>2,85</u> | <u>38,6</u> | 74,9 | <u>2,45</u> | <u>14,1</u> | <u>4,96</u> | <u>1,65</u> | <u>36,1</u> | 60,4 |
|      |   | 12,1                    | 37,4        | 11,6        | 8,9         | 8,9         |      | 9,8         | 32,8        | 8,4         | 5,1         | 8,3         |      |
| 1200 | 3 | <u>10,85</u>            | <u>36,5</u> | <u>9,29</u> | <u>3,45</u> | <u>176</u>  | 191  | <u>8,31</u> | <u>29,0</u> | <u>8,12</u> | <u>3,16</u> | <u>168</u>  | 158  |
|      |   | 43,4                    | 84,9        | 15,7        | 10,8        | 40,6        |      | 33,2        | 67,4        | 13,7        | 9,8         | 38,6        |      |
| 300  | 6 | <u>2,61</u>             | <u>15,2</u> | <u>6,21</u> | <u>2,65</u> | <u>26,2</u> | 66,5 | <u>2,17</u> | <u>12,3</u> | <u>3,05</u> | <u>1,37</u> | <u>21,2</u> | 47,6 |
|      |   | 10,4                    | 35,3        | 10,5        | 8,3         | 6,0         |      | 8,7         | 28,6        | 5,1         | 4,3         | 4,9         |      |
| 1200 | 6 | <u>9,61</u>             | <u>32,3</u> | <u>8,86</u> | <u>3,95</u> | <u>153</u>  | 172  | <u>7,36</u> | <u>27,5</u> | <u>7,34</u> | <u>3,03</u> | <u>146</u>  | 144  |
|      |   | 38,4                    | 75,1        | 15,0        | 12,3        | 35,3        |      | 29,4        | 63,9        | 12,4        | 9,4         | 33,6        |      |
| 0,95 |   | 0,42                    | 1,60        | 0,51        | 0,21        | 6,37        | -    | 0,33        | 1,17        | 0,38        | 0,15        | 6,00        | -    |

(6 / ),

300 / 1200

/ 1-1,1 3 / ,

Zc 1,16-1,3

( . 3).

Zc 1,24 - 1,36

| 3. , / . - , |   |             |             |             |             |            |      |             |             |             |             |            |      |
|--------------|---|-------------|-------------|-------------|-------------|------------|------|-------------|-------------|-------------|-------------|------------|------|
| , /          |   |             |             |             |             |            |      |             |             |             |             |            |      |
|              |   | Cd          | Cu          | Ni          | Pb          | Zn         | Zc   | Cd          | Cu          | Ni          | Pb          | Zn         | Zc   |
|              |   | 0,12        | 3,62        | 0,58        | 0,54        | 35,2       | -    | 0,12        | 3,62        | 0,58        | 0,54        | 35,2       | -    |
| 300          | 3 | <u>1,45</u> | <u>6,54</u> | <u>1,29</u> | <u>1,79</u> | <u>188</u> | 20,7 | <u>1,22</u> | <u>5,31</u> | <u>1,37</u> | <u>1,48</u> | <u>164</u> | 17,3 |
|              |   | 12,1        | 1,8         | 2,2         | 3,3         | 5,3        |      | 10,2        | 1,46        | 2,36        | 2,74        | 4,68       |      |
| 1200         | 3 | <u>1,73</u> | <u>8,15</u> | <u>1,84</u> | <u>1,95</u> | <u>258</u> | 26,7 | <u>1,41</u> | <u>7,63</u> | <u>1,54</u> | <u>1,75</u> | <u>235</u> | 22,3 |
|              |   | 14,4        | 2,2         | 3,2         | 3,6         | 7,3        |      | 11,7        | 2,1         | 2,65        | 3,24        | 6,68       |      |
| 300          | 6 | <u>1,36</u> | <u>6,28</u> | <u>1,21</u> | <u>1,45</u> | <u>171</u> | 18,7 | <u>1,17</u> | <u>5,19</u> | <u>1,12</u> | <u>1,27</u> | <u>158</u> | 15,8 |
|              |   | 11,3        | 1,7         | 2,1         | 2,7         | 4,8        |      | 9,7         | 1,4         | 1,93        | 2,35        | 4,5        |      |
| 1200         | 6 | <u>1,61</u> | <u>7,36</u> | <u>1,86</u> | <u>1,78</u> | <u>234</u> | 24,5 | <u>1,36</u> | <u>6,47</u> | <u>1,49</u> | <u>1,51</u> | <u>215</u> | 20,5 |
|              |   | 13,4        | 2,0         | 3,2         | 3,3         | 6,6        |      | 11,3        | 1,8         | 2,57        | 2,79        | 6,1        |      |
| 0,95         |   | 0,09        | 0,51        | 0,11        | 0,12        | 12,40      | -    | 0,08        | 0,39        | 0,10        | 0,08        | 12,9       | -    |

Zc ( . 2).

8,2-9,7 %.

300 /

3 /

: Cd> Zn > Pb > Ni > Cu. 1.

1200 / 6

«

».

II

3-6

Cu 37,4- 84,9

Zc 15,5 – 16,5%.

Zc 1968, . 13-18.

3 / 23 %,

## AGROECOLOGICAL PROPERTIES OF SANDY SODDY-PODZOLIC SOIL UNDER THE APPLICATION OF VERMIHUMUS

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**Summary.** Vermihumates had a positive effect on total exchangeable bases, the phosphorus–potassium status of soil, and its humus content and contributed to the decrease in the concentration of mobile heavy metals in the soil. When vermi humates were applied in combination with lime, the Zc of mustard decreased by 23% on average compared to the effect of liming at a rate of 3 t/ha.

**Key words:** vermi humates, vermicompost, sewage sludge, heavy metals, liming, soddy-podzolic soil.