

The decreasing of corn root biomembrane penetration for acetochlor with vermicompost amendment

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One of the topical environmental security issues is management and control of anthropogenic (artificially synthesized) chemical agents usage and utilization. Protection systems development against toxic effects of herbicides should be based on studies of biological indication mechanisms for identification of stressors effect in organisms. Lipid degradation is non-specific reaction to exogenous chemical agents effects. Therefore it is important to study responses of lipid components depending on the stressor type. We studied physiological and biochemical characteristics of lipid metabolism under action of herbicides of chloracetamide group. Corn at different stages of ontogenesis was used as testing object during model laboratory and microfield experiments. Cattle manure treated with earth worms *Essenia Foetida* was used as compost fertilizer to add to chain: chernozem (black soil) -corn system.

It was found several acetochlor actions as following:

- decreasing of sterols, phospholipids, phosphatidylcholines and phosphatidylethanolamines content;
- increasing pool of available fatty acids and phosphatidic acids associated with intensification of hydrolysis processes;
- lypase activity stimulation under effect of stressor in low concentrations;
- lypase activity inhibition under effect of high stressor level;
- decreasing of polyenoic free fatty acids indicating biomembrane degradation;
- accumulation of phospholipids degradation products (phosphatidic acids);
- decreasing of high-molecular compounds (phosphatidylcholin and phosphatidylinositol) concentrations;
- change in the index of unsaturated and saturated free fatty acids ratio in biomembranes structure;

It was established that incorporation of vermicompost in dose 0.4 kg/m² in black soil lead to corn roots biomembrane restoration. It was fixed the decreasing roots biomembrane penetration for acetochlor in trial with vermicompost. Second compost substances antidote effect is the soil microorganism's activation (ammonification and associative nitrogen fixation improvement).