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Use of Phytotechnologies for Remediation Soil of Kazakhstan Contaminated by Pesticides

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Widespread use of pesticides in agricultural practices mean that all countries, including Kazakhstan, one way or another are faced with stockpiles of obsolete pesticides. Source of toxic chemicals into the ecosystem are the former warehouses of pesticides and use of phytoremediation technologies seem here appropriate.

In field test, two test plots were set up at sites around of the former warehouses to study effect of added fertilizers/surfactants on phytoextraction in monoculture/mixed culture by *Cucurbita pepo L. pumpkin*, *Xanthium sturmariium*, *Ambrosia artemisifolia*, *Artemisia annua*, *Ranunculus retroflexus* and *Helianthus annuus*. Two control treatments included the contaminated soil without fertilizer/surfactants and without plants and the contaminated soil with fertilizer/surfactants and without plants.

Shows the initial mass of pesticide in the soil was reduced by more than one-half in a growing season. Plants accumulated significant concentrations of pesticides into plant tissue compared to the initial concentrations in soil; however, the mass pesticides taken up into plant tissue represents a very small fraction of the total pesticides mass in the soil. Therefore, the reduction of pesticide concentrations in soil was not due to plant uptake of pesticides. These processes are mostly responsible for changes in pesticide concentrations in the soil. Addition of fertilizer/surfactants appeared to increase plant biomass production and increase the amount of pesticide accumulated in plant tissue, translocation factor and biological absorption coefficient. The decline observed in soil pesticide concentrations suggests practically remediation processes may be functioning; however, mechanisms other than phytoremediation are apparently responsible for this change.

Keywords: soil, wild plant, phytoremediation, dichlorodiphenyltrichloroethane, hexachlorocyclohexane

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