

USE OF WOOD ASH IN THE FOREST AND ITS EFFECT ON THE CHEMICAL ELEMENT FLOW IN BLUEBERRIES (*VACCINIUM MYRTILLUS L.*)

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Wood ash is a biological residue produced by the combustion of wood or their products (chips, sawdust, etc.). Fertilizing is one of the main ways for using wood ash because it contains high amount of nutrients that are necessary for the development of plants and trees. Using wood ash as a fertilizer allows to solve following problems – ensures efficient utilization and disposal of wood ash from industrial areas and prevents valuable nutrients from being wasted.

Several studies have proved that fertilization with wood ash affects only topsoil. Also, wood ash can contain high amount of heavy metallic elements and metalloids such as Cd, As and Pb which can cause poisoning of a plant.

One of the main goals of the policy in Latvia is to preserve and increase the amount of forest land areas. After deforestation processes soil buffer capacity and nutrient reserves reduces what causes soil acidification and deterioration of growing conditions. To avoid these adverse processes and improve forest growth condition, wood ash is used as a fertilizer.

The wild-growing blueberries (*Vaccinium myrtillus L.*) is one of the most popular berries which are located in Europe, North America and Asia. They are deciduous species as they shed leaves during fall seasons preparing for winter. In some studies blueberries are used as a model species for forest ecosystem monitoring as they are sensitive to environmental changes (temperature, humidity, soil chemical composition, etc.).

The aim of our research was to analyse the flow of chemical elements in blueberries in the forest areas which was fertilized with wood ash.

For research were chosen two pine forest areas which was fertilized with fly and bottom wood ash. Approximately 3 tons per hectare. In order to evaluate the impact of wood ash on the forest, two different types of plots were selected in each area – fertilized and control.

Blueberry samples were dried till air-dry condition and digested in the mixture of HNO₃:H₂O₂ (6:2) using the closed microwave digestion system. The chemical element concentration was determined by ICP-MS.

The distribution of wood ash in the forest area did not change the macro and micro element content of blueberry berries.

The research results show that in the area which was fertilized with fly wood ash there is observable trend that in the fertilized sampling plots rare earth element content in blueberry roots are ~2-5 times higher than in the plant root system of control plots.

Calculated transfer factor values indicate that content of micro and rare earth elements accumulates in the root system of blueberry plants.

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