

SAFE RECYCLING OF HORSE MANURE FOR AGRICULTURAL PURPOSES

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Background

Huge amounts of horse manure is either burnt or illegally deposited. Treated correctly it is a good source for plant nutrition and valuable as a soil improvement or for other horticultural uses. To ensure a safe return to agriculture, aspects such as residues of unwanted compounds should be considered. For instance, there is not much knowledge about the fate of pharmaceutical residues in horse manure.

Aim of research

The main aim of the project was to develop a method for analysing several pharmaceutical compounds in a single sample and to study how selected pharmaceuticals decompose in manure using different biological methods. Another objective was to map customer interest in possible peat substitutes made of local resources, e.g horse manure.

Methods

Commonly used equine medicines were selected for the study. In total, 70 samples of horse manure and horse manure compost were analysed.

The Ultra Performance Liquid Chromatography- tandem mass spektrometer (UPLC MS/MS) was used to develop the analysing method.

Manure from treated horses and horse manure with additions of controlled amounts of medicines were composted outdoors in a windrow consisting of horse manure and freshly cut grass. In a pot trail, earthworms were added to some of the manure from the treated horses to study the effect of worm action on the biodegradation of pharmaceutical residues.

A survey on use and preferences of soil and fertilizer products was conducted among 100 garden centre customers.

Findings

The analysing method was found capable of analysing all four active ingredients at the same time. Contents of pharmaceutical residues in horse manure were highest 1-2 days after treatment, with some variation between substances. After this peak, residue contents in manure decreased rapidly.

Degradation of the added medicines was slow in the composting trials. In the compost windrow, the contents of medicines decreased gradually throughout a 60-day period, with slightly different degradation curves for the various substances. Three of the tested active ingredients were still detectable in the compost after 60 days. The earthworm trials need be improved and repeated, as many worms also died in the untreated horse manure pots.

The customer survey showed that there is a certain interest for peat-free, locally produced soil and fertiliser products. Approximately half of the respondents replied that they are willing to pay as much as 20 % more for such products.

Main conclusions

The project provided a basis for the further development of horse manure as a pharmaceutical residue-free product. Manure from treated horses should be kept apart from other manure for the

first 1-3 days after medical treatment. Strategies for the management of such manure should be developed so that this resource can be used safely in plant production.

Keywords: horse manure, veterinary medicines, decomposition