

ชื่อเรื่อง

The Capability of Vetiver Hedgerows on Decontamination of Agrochemical Residues : a Case Study on the Production of Cabbage at Nong Hoi Development Center Chiang Mai, THAILAND

ชื่อผู้วิจัย

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ปีที่ดำเนินการ

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Abstract

The study was conducted in a cabbage field at Nong Hoi Development Center, Chiang Mai, in order to determine the movement and degradation of agrochemicals applied on cabbage which focused on their impacts on soil sediment and especially in vetiver. Split-plots in RCB was designed in the area of 15x72 m² at sixty per cent slope. Each block consisted of cabbage and vetiver hedgerows (VHRs) lined vertically at 3 and 6 m apart. Before and after transplanted on July 13, the pesticides, i.e. carbofuran, monocrotophos, and alachlor were applied in single and double doses. On September 29, an approximate 78 days after transplanted the cabbages were harvested and were brought to the laboratory together with soil, sediment (from the small reservoir below the experimental plots), and vetiver grass for analysis.

The analytical data revealed that most of the tested pesticides applied on cabbages could be translocated and up taken by crops, adsorbed by soil as well as sediment in different amounts. The vetiver was capable of pesticide absorption as indicating by the residues of carbofuran, monocrotophos and alachlor found at the percentage of 0.001-0.006, 0.09-0.25 and 0.01-0.08 of the total amount of active ingredient application, respectively. In soil, only alachlor was detected between 3.69-7.56 per cent. While, the percentage of residues found in cabbage for carbofuran, monocrotophos and alachlor were 0.005-0.01, 0.75-0.91 and 0.01-0.09, respectively. Moreover, alachlor residues detected from the single and double doses were exceeded the maximum residue limit (MRL). This event was also occurred in the cabbage applied with the double dose of monocrotophos. The loss of surface soil by run-off which could

be evaluated in term of sediment was at the medium level 22.5 ton per hectare. Aside from the rate of leaching the sediment was also an accumulation site for alachlor and carbofuran residues at the percentage of 0.02-0.5 and 0.002 of the total active ingredient admitted, respectively. No data were available for the absorption of nitrate fertilizer by vetiver in the experiment. The study concluded that the vetiver hedgerows played an important role in contribution to the process of captivity as well as decontamination of agrochemicals especially pesticides and preventing them from contamination and accumulating in crops, streams and other ecosystems. Due to the lacking of data upon the relationship between vetiver and agrochemicals, altogether with this study which is a preliminary one, therefore further study for more details is still needed.

Vetiver hedgerows, pesticide residues, carbofuran, monocrotophos, alachlor.