

Pesticide Rinsate Biobeds for Conserving Water Quality

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Recent pesticide sales reported for Canada indicates that the agricultural and non-agricultural sectors combined account for annual sales of about 90 to 130 million kilograms of active ingredients. Pesticide rinsate biobeds are above- or in-ground structures that support a biomatrix comprised of lignin-rich organic matter, humified organic matter and soil, typically in a 2:1:1 ratio. Biobeds were invented by Swedish farmer Mr. Göran Ohlsson to recycle rinsate associated with tank cleaning, thereby aiding in the conservation of surface and ground water quality. Biobeds have been adopted by agricultural and non-agricultural sectors in a wide range of European and Latin American countries. This research highlights recently installed single-cell and two dual-cell biobeds in the Canadian Prairies. The biobeds received a total of 67 unique pesticide active ingredients over multiple-years and were highly effective for a range of commonly used pesticide products. More than two-thirds of the unique active ingredients detected in biobed influent samples had concentrations $> 1\mu\text{g/l}$, including high detections ($>14,000\mu\text{g/l}$) for herbicides 2,4-D, fenoxaprop and MCPA. In contrast, about two-thirds of the total unique active ingredients detected in effluent samples had concentrations $< 1\mu\text{g/l}$, with many active ingredients not detected in biobed effluent that were present in biobed influent.