Flowering Plants and Pollinators: Promoting Biodiversity and Food Security in Urban and Peri-urban Ecosystems.

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Maintenance of ecosystem services is increasingly viewed as integral to sustainable management of natural and built environments. Pollination by animals is a crucial step in the production of much of the world's food supply, and the great majority of our most nutritious foods. However, domesticated honeybees are in decline, and the diverse set of proximate reasons for the decline is ultimately linked to overdependence of industrial agriculture on this single species. One solution is to augment crop pollination by increasing wild pollinator resources, habitat and connectivity in forested, agricultural, peri-urban and urban landscapes. For example, we show that retention of aggregated forest harvest residue in farm adjacent short rotation plantations on sandy loam can augment soil N and P and greatly increase pollinator resources. Likewise, in urban environments, urban agriculture plots such as those found in rooftop, terrace or community gardens can be useful habitat for wild pollinators, thus increasing the security of our food supply, and biodiversity maintenance through the provision of wild food resources to pollinators and frugivores. We propose that agriculture could be established in sites historically avoided for reasons of soil contamination, such as road or railroad verges and cemeteries, if planting is guided by knowledge of which species sequester heavy metals in their leaves or reproductive parts. Finally, selection of urban trees can focus on fruiting, animal-pollinated species rather than wind-pollinated species, which cause allergic reactions for over 10% of the population.

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Melanie J. McCavour is a PhD Candidate at the Université du Québec à Montréal (UQAM), Department of Biology and teaches Biodiversity, Sustainable Forest Management and Reproductive Plant Ecology for Concordia University's Loyola College for Diversity and Sustainability, and for the Department of Geography, Planning and Environment. In her teaching she looks at the importance of biodiversity maintenance from a holistic perspective and emphasizes the connections between sustainability and health. In her research, she explores the effects of forest fine woody debris in hybrid *Populusspp*. plantations on soil fertility, tree yield, diversity and precocity of fruiting plant species and pollination success. Melanie has been working with the North American Pollinator Protection Campaign to find legislative ways to protect pollinator diversity and abundance in North America under NAFTA since 2009; first in Washington, DC as an intern with the USDAForest Service and since 2010, from Montreal, Quebec. She is now exploring ways in which pollinators might be best protected through other legislative and non- legislative (certification, environmental assessment, BMPs) means and hopes to link existing pollinator protective measures to current sustainability criteria under the Convention on Biological Diversity and other bodies.