

Agroecology is Important to Ecological Practices

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What is Agroecology? This is a question I've been asked many times by family and friends wondering what I've been studying in university. When I first said I'd be transferring from the science program at the University of Saint-Boniface to Agroecology at the University of Manitoba I got a few quizzical looks. As a person who grew up in Winnipeg, this program intrigued me because I wanted to learn more about my surroundings here in southern Manitoba — which is largely agricultural land. The combination of studying agriculture and striving to protect the environment seemed ideal to me.

Over the years, I have come to understand that Agroecology is an approach to integrate more ecological practices into our food production systems. An important part of this system is to find ways to deal with the waste and end-products. This topic was interesting to me and was the focus of my undergraduate research project. With the mentorship of Dr. Francis Zvomuya in the Soil Science Department, I set up a growth room experiment using switchgrass to examine phytoremediation of biosolids as an alternative method to spreading biosolids on agricultural land when municipal lagoons are decommissioned.

Municipal lagoons are a common form of wastewater treatment in small and medium-sized communities. Sludge accumulation at the bottom of municipal lagoons gradually reduces wastewater treatment efficiency and will eventually require removal. Biosolids (stabilized sewage sludge) provide beneficial plant nutrients and can reduce the need for commercial fertilizers, thus providing an economic benefit to farmers. However, finding suitable land within economic distances to spread the biosolids can be difficult in Manitoba because land application of biosolids faces competition for land from hog manure production. Another alternative, trucking of biosolids to landfills, can be unaffordable for small communities with limited budgets. Therefore, the use of plants to remove nutrients and contaminants from biosolids is a promising alternative to land spreading and landfilling of biosolids. My research project therefore looked at the potential of using switchgrass (a native perennial grass in the prairies) for the remediation of heavily contaminated soils such as biosolids.

Undertaking a research project as an undergraduate student had many personal and professional benefits. It broadened my professional network because I had the opportunity to work with professors, technicians, and students in the Soil Science Department that I wouldn't have interacted with or met otherwise. This experience therefore taught me how to balance independence and collaboration in the lab. For students who are just starting their research project, I would tell them to seek feedback and guidance from their advisors as often as possible. They have years of experience conducting research and are so knowledgeable.



Karine Ferguson (left) and Morgan Hope (right) collecting biosolids at the municipal lagoon in Niverville, MB.

An undergraduate research project also taught me important time management skills. Adding a research project to classes and extracurricular activities forced me to manage numerous responsibilities at once. I therefore learned how to manage my time efficiently without completely stressing myself out. For me, one of the most difficult parts of the project was understanding and analyzing the statistical results. This takes a lot of patience and it is important to remember that it is impossible to do everything at once. An undergraduate research project therefore helped me understand published works and statistical analysis. This will be incredibly beneficial for me if I decide to take on a master's program.

Finally, undertaking an undergraduate research project can seem like a daunting task and it's true that it is a lot of work, but it is worth it in the end. Presenting your work to an audience is intimidating, but it is a great opportunity to practice your public speaking skills in a professional setting. Looking back, I know that my perseverance and organization skills were key in completing this project and obtaining the Agroecology medal at my graduation. If everything goes well (and it will in the end), working on a research paper will feel like a very rigorous yet satisfying lab where you accomplish something that you are proud of.

