



Green Gown Awards
Australasia

Creating Impact

2020 Case Study



THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

Germinate – May Contain Seeds

Germinate – ‘May Contain Seeds’ is part of a larger research effort funded by the University of Newcastle Vice Chancellor’s Grand Challenge. This university wide competition invited teams to pitch approaches responding to the challenges of mosquito populations as they affect social spaces, recreational activities and pose major health risks to humans. The School of Architecture and Built Environment’s (SABE’s) team applied landscape design principles and participatory design approaches in a new kind of environmental experiment.

The University’s Callaghan Campus is located in close proximity to the estuarine coastal habitats within the Hunter Wetlands National Park; promoting mosquito breeding after king tide events and periods of high rainfall while the remnant bushland on campus provides a perfect resting place for the females to return to and lay their eggs. As global temperatures rise and weather conditions become increasingly unpredictable, this in turn creates the perfect breeding conditions for dormant mosquito populations to become highly active in areas of surrounding coastal habitats, wetlands and bushlands. Our preliminary research uncovered that female mosquitoes are attracted to carbon dioxide, body odour and heat. Their key motivation is finding sustenance (human blood) and to produce eggs. The Callaghan Campus is ripe with food sources, habitat for eggs, and there are few

predators. Therefore, our approach needed to consider how we could shift humans out of being a source of sustenance. Thus, our idea to test how aromatic plants can manage mosquitoes by confounding their senses and inhibiting their host seeking stimuli.

We pondered; “What would happen if we increase the quantity of aromatic plants on campus in an attempt to repel mosquitoes while allowing humans and mosquitoes to maintain their intertwined ecosystems?”

Rather than simply designing appropriate gardens in the University’s various settings, we also wanted to engage and activate students, visitors, and staff. Thus, we decided to approach this through the act of seed dispersal or seed bombing. The seed-ball-bombs are in gumball machine dispensers, which are strategically located around campus. Each seed-ball-bomb mix takes into account the adjacent planting context (native bush, cultivated lawns, etc.) and we have designed them to sprout plants, which are appropriate to their sites. Seed germinators (students, staff, etc.) make a small donation through the repurposed gumball machine (seed-ball dispenser) and then distribute them across

the landscape by throwing them. The funds raised from the gumball dispensers contribute to re-establishing Koala habitat recently destroyed in bushfires as well as purchasing more seed-bomb making supplies to support workshops with local community groups. As a further educational outreach component, we host school groups to make seed-bombs as a collaborative environmental awareness project. Once dispersed, the seed-bombs naturally decompose providing a basis for plants to germinate. We selected the seed mixtures for their seasonal aromas and for specific site conditions across diverse campus microclimates. This project proposes a long-term, living laboratory solution without

reliance on the routine application of pesticides or toxins. The plants are a natural, non-invasive and a respectful method of researching ways in which we can coexist with mosquitoes in our shared environments while actively engaging others to participate in the research project more widely.

FIND OUT MORE



Environmental & Social Benefits

The benefits of this project is across three broad domains: Research in a living laboratory, Kinaesthetic learning and experiential education, and Frameworks for campus activation.

Research in a Living Laboratory: This is a live project and research experiment; we have findings regarding mosquitoes and human environments generally. We could not predict how well the seeds would germinate, whether or not people would voluntarily participate, and ultimately the effect on both the humans' consciousness of our intertwining ecologies or the effectiveness of repelling mosquitoes. By providing a safe place for experimentation and allowing for failure and creative risk taking, this project serves as an exemplar for other living laboratories on campus.

Kinaesthetic learning and experiential education: The project is an interactive platform for demonstrating how mosquitoes play an important role in the campus ecosystem. It further identifies how they exist and offers a proposal for how we can coexist with them. By learning through doing both those who are making the new ecologies learn about their environments as well as those participating in the seed-bomb, making workshops extends the knowledge of the research project through to other outlets.

Frameworks for campus activation: By engaging campus users directly, this project provides a means for campus activation. Openly inviting and encouraging participants into the research project but more broadly in the co-creation of campus built environment. In addition to this, the resulting planting adds colour, vibrancy and a light scent to our campus landscapes. This in turn reinvigorates the shrub layer dominated by turf and lomandra, by distracting the mosquitos and creating a vibrant garden setting this encourages students and staff to sit and study outside.

Edward O. Wilson defined Biophilia as *"The innate sense of belonging to the natural world."* Biophilia's philosophy is based on the concept that humans have an innate inner connection with nature, wildlife and flora, and that this connection is indispensable for their mental, physical and spiritual well-being. More, broadly Germinate embraces biophilia via the improvement of the natural outdoor spaces that enhances the quality of humans' wellbeing, reducing the impacts of stresses and anxiety that can manifest in the closed-off, fabricated environment of classrooms. The carefully selected native and exotic species provide strong fragrances creating an invisible barrier to the mosquito senses and highly active pedestrian corridors reducing the risk of contracting potential blood borne diseases the mosquito carries and nuisance biting. Engaging the community in actively participating in helping test the research investigation demonstrated how ecosystems, ecologies and greenspaces play a significant role in our urban environment. Socially, the expansion of the research into educative workshops where participants were shown techniques on how to create seed bombs and further their knowledge on new landscape design principles, assisted to promote environmentally sustainable techniques within the community to reduce invading mosquito populations without poisoning other ecologies with chemical pesticides.

Leadership & Engagement

This project responds uniquely to a difficult challenge through playful and creative yet deeply researched means. The Germinate project engages researchers, staff and students from across schools, faculties, divisions and campuses and these collaborations and leadership have facilitated life-long experiences and raised awareness of all those involved.



Wider Societal Impact

The project provides a practical low tech and low cost example of implementing SDG 11: Sustainable Cities and Communities as well as SDG 15: Life on Land. By providing open source, DIY access to the project, we are purposefully inviting others to innovate and make their own intertwined ecologies.

Top 3 Learnings

When playfully invited, visitors, students and staff are enthusiastic shapers of their built and natural environments

Healthy and intertwined human and non-human ecologies rely on thoughtful and creatively considered regimes of care

It is possible to deter mosquitos through aromatic plant species and their essential oils