



Pymble Ladies' College Scientific Rite of Passage at Vision Valley

Partnering with Civica's ArborSafe and Quantal BioScience, Pymble is breaking new ground in STEM education for girls through real-world climate research in the Australian bush.

Nestled in a remote pocket of bushland near the Hawkesbury River, Vision Valley, Pymble Ladies' College's outdoor education campus, is a place for year 9 girls to challenge themselves physically, socially and emotionally. In 2023, the College set a bold new ambition: to also challenge students academically, by embedding real-world science research into the heart of their four-week residential program.

Partnering with female-led microbiology firm **Quantal BioScience** and long-term tree risk management partner **Civica**, the school launched a groundbreaking live research project exploring the role of native flora in tackling climate change. The project, known as **Communities for MethyloTroph Discovery (C4MD)**, is already delivering stunning results – being well on the way to presenting the largest collection of methyloTroph data in Australia by the end of the year, and possibly the world.

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"We see our program as a rite of passage. And a rite of passage should challenge the girls physically, emotionally, and now academically"

Tom Riley, Head of campus, Vision Valley.

From Bush Retreat to Living Laboratory

The site itself is unique – over 90% native bushland bordering a National Park. "There's nowhere else like this," Tom noted. "It's not replanted or converted farmland. It's a real valley – that includes a richness of the flora that makes it a perfect site for something like this."

Working with **Quantal BioScience**, students are collecting and analysing bacterial samples from the leaves of Australian native trees to explore the presence of methyloTrophic bacteria – organisms that can naturally break down methane, one of the most potent greenhouse gases.

Key outcomes

90+

Year 9 students engaged across 3 rotations in live climate research.

Top 1

World's largest methyloTroph dataset in progress – with potential global significance.

100%

Actionable insights for climate and urban planning – linking tree species to methane reduction.



To facilitate the research, Civica's ArborSafe platform has played a critical role. Initially used to manage tree safety across the campus, ArborSafe's detailed mapping and species tagging capabilities became invaluable when the microbiologists from Quantal BioScience needed help identifying trees quickly.

"Our scientists said, 'We're not ecologists – how are we going to know what species is which, and quickly?' And I said, 'Well, we've got all our trees tagged.' That's where ArborSafe became key," Tom explained.

Hands-On, High-Tech Science – Led by Women

Each student group engages in live DNA extraction and colony counting in the field, working alongside Quantal BioScience's two female founders and researchers. The program gives the girls early exposure to scientific pathways and role models they might not otherwise encounter until University.

"What's so powerful is that this is real science. There's no answer key. If we don't find anything, that's still a result.

That's science," Tom said.

In addition to practical laboratory techniques like DNA sequencing, the girls are taught plant morphology and identification by Civica's arborists, who bring deep ecological knowledge to the project.

"Neil, our arborist from Civica, teaches the students about leaf shape, hydrophobicity, and ecology. He brings plant science to life – and that connection to the natural world is something we really value," Tom explained.

Building the Future of Data-Driven Science

Now in its third rotation, the program has already evolved. More accessible trees have been tagged, and sampling expanded to explore whether mycorrhizal growth correlates with species, water proximity, or canopy position. The data sets created are not just educational, they are potentially valuable to councils, researchers and climate scientists worldwide.

"By year's end, we'll know which trees host the most mycorrhizal bacteria. That could inform future planting to reduce pollution around cities or landfills. It's real-world impact," Tom said.

Conclusion

As the program continues to grow and evolve, Pymble Ladies' College is proving that the future of science doesn't have to wait until university. It can start right here, in the heart of the bush, with a group of curious Year 9 girls – and a harmonica-sized DNA sequencer.

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"The third time we ran it, we knew we'd got it right. So many kids stayed behind to ask more questions. That's how you know it's working,"

**Tom Riley, Head of campus,
Vision Valley.**

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your organisation.

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Case study

4 Key Benefits



1. Real-world scientific learning

Students participate in cutting-edge microbiological and ecological research, gaining hands-on experience not typically offered until university-level science.



2. Strong female STEM role models

Led by two female microbiologists and supported by female educators, the program empowers girls to see themselves in scientific careers.



3. Enhanced tree data insights

Civica's ArborSafe enables easy access to species information, improving scientific accuracy and enhancing tree risk management simultaneously.



4. A deeper connection to nature

Through ecological immersion and plant education, students build a meaningful connection to the Australian bush – and their role in protecting it.