Antibiotic Resistance Future Scene

Global Issues
Junior Division
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Matilda inspected her cherry orchard, as she did every day. She also used automated methods. Bark-embedded sensors and Beebots, a swarm of bee-like nanobots that fly continuously between the trees, scan for signs of infection. Matilda's cherry farm was one of many rural farms in the Australian state of Tasmania. Cherries are now one of Tasmania's biggest businesses. Tasmania is the only known location in the world where no cherry trees have been infected with the antibiotic-resistant disease *Pseudomonas avium*. It's one of the few bacteria of the pseudomonas genus known not to spread by air. The bacteria can be transmitted by water, soil, or plant material. So it can still travel between countries on muddy boots, freight ships, or crates of fresh fruit.

The beauty of cherry blossoms is revered around the world.

Just a few bacteria are enough to infect a tree. Quickly, the whole orchard is infected. The beautiful blossom-covered trees; reduced to dry, brittle sticks. Now, all eyes are on Matilda and her fellow farmers. Tasmanian cherry trees are a test case for reviving the species. Can cherry trees grown in Tasmania be used to reseed cherry orchards in other countries? Matilda's notes and information received from automated farm sensors are included in her daily report to the International Institute of Antibiotic-Resistant Agriculture (IIARA).

Cherries have a unique flavor, combining sweet and sour.

For many years, research and funding related to antibiotic resistance have focused on humans. While there has been some medical progress for humans, the technology for plant treatments is only beginning. Even if trees are treated, antibiotic-resistant bacteria can live for years in soil or water.

Pseudomonas avium is a well-known concern for cherry farmers. Until several years ago, it had been treated with antibiotics added to irrigation. By the time the antibiotic-resistant strain was first identified in Spain in 2039, it had already spread across Europe. It appeared in Chile and Hong Kong a few months later. Many orchards were ruined, sending family farms and corporations into bankruptcy. A once $12 billion industry was drastically reduced.

Antibiotic-resistant diseases move swiftly through agricultural areas.

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Legal disputes between farmers and insurance companies are ongoing. Farmers were expected to report the first sign of disease to IIARA. However, many quietly cut down the infected tree and hoped for the best. There were even stories of entire orchards being burnt down just before the harvest season.

Beebots monitor vast areas of crops for signs of infection.

At the beginning of the outbreak, various “miracle-cures” like coating tree trunks with syrup were advertised, claiming to protect the trees or cure the disease. None of them had been thoroughly researched or proven to work. Many farmers tried these ideas, despite government-funded education programs against misinformation. Many cherry farmers like Matilda found it hard to know what to believe.
As an island, Tasmania has the physical buffer needed to avoid infection so far. Australia already has the strictest biological-quarantine requirements globally and Tasmania’s state-level government applies even more rules. Importing any fruit and vegetables to Tasmania is banned. This ban includes products from mainland Australia. So far, these methods have worked to prevent the spread of the disease.

Rebuilding the cherry industry is a separate concern. The introduction of modified avocado plants helped to stabilize that industry in recent years. Researchers are working to develop immune strands of cherry trees to see if they can help cherry farmers. The basic technology is well-established, but it is unclear if it will be successful.

Native possums often eat cherry fruit which helps seed new trees via their waste droppings.

A Beebot buzzed beneath the blossoms of one cherry tree, recording a blemish on the trunk. After a tense moment, the bot determined they were only scratches from a possum. Matilda sighed. It was difficult living with so much uncertainty. At least the farm’s income was good for now. The worldwide cherry shortage caused by the closure of so many farms meant that prices tripled last summer. There still hadn’t been enough produced to meet demand. This year they would again increase prices. Beyond that, who knew? She leaned against a tree and looked out towards the surrounding farms. She needed a plan. They all did.

Use the six-step FPS process to identify an Underlying Problem and develop an Action Plan in response to the issue of antibiotic-resistant disease on cherry trees in Tasmania in 2042 and beyond.

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