

Richmond Review Article – Keeping the SS Food Security afloat in hazardous seas

By Stephen C. Mullins

Recently I was reading about how banana crops worldwide are being threatened by Panama disease, a fungal pathogen that is very difficult to control that attacks the roots of banana plants. To my own surprise, the more I read about the pending banana disaster, the more I was reminded of the fate of the RMS Titanic, which sank over 100 years ago.

At first glance this association might seem strange, but it is not random at all. The causes of disasters are often quite clear afterwards, and the sinking of the Titanic is a spectacular example of that. The Cunard Line naval architects thought they had taken every precaution to make sure the ship was “unsinkable”. Turns out, the iron used in the hull became brittle in arctic seas, and the bulkheads dividing the ship into separate compartments weren’t high enough – when the ship’s bow filled with water, each bulkhead in turn was overtopped until the ship sank. And because the designers had downplayed concerns that unanticipated problems might cause a disaster, there weren’t enough lifeboats to save everyone. The Titanic’s technology simply wasn’t robust enough to meet the challenges it faced.

So how does this famous shipwreck relate to the threat of a banana fungus destroying crops? The answer lies in understanding that our global food system is a product of technology just as surely as the Titanic was. From the machines that plant, maintain and harvest crops, to the trucks, trains and ships that transport them, to even the crops themselves (which are now often genetically manipulated), technology permeates everything in agriculture. And when that technology fails, you get problems like the banana blight.

The banana crisis can be summed up in one word: monoculture. The bananas you buy from your grocery store are almost guaranteed to be the Cavendish variety, the type grown worldwide almost to the exclusion of all other types of bananas, though there are hundreds of varieties in nature. Those others just don’t have as many desirable qualities as the Cavendish, which has the best combination of consumer appeal and ease of cultivation, so they are ignored.

Monoculture crops are notoriously vulnerable to attacks by pests, pathogens and adverse weather conditions like drought, factors aggravated by climate change and international trade (which makes the transmission of pests much easier). This is not theory, but hard fact. For example, the Cavendish banana is a replacement for the Gros Michel variety that was largely destroyed as a viable crop in the 1950s by Panama disease. The Cavendish variety was thought to be immune to Panama disease, so it was adopted worldwide, but the key problem, the hazards of monocultures, was erroneously thought to be more manageable with newer farming technologies. Now, unbelievably, it looks like the Cavendish is going to be wrecked by the same ‘iceberg’ that destroyed the Gros Michel.

This wouldn’t such a severe concern if only banana crops were at risk of worldwide failure, but the problem of crop diseases and pests is not just confined to them. According to a new research report in the journal *Global Ecology and Biogeography*, by the year 2050 opportunistic pests, viruses, bacteria, fungi, blights, and other threats to crops will saturate food growing areas all across the globe unless we take action.

The answer to this challenge lies in making our food system more robust. In essence, like in a ship, we have to build bulkheads to prevent one leak from flooding the whole ship. But right now our food system is moving in the opposite direction, creating more worldwide monocultures like that of bananas, not less. According to the UN Food and Agriculture Organization (FAO), “presently, only about 30 crops provide

95% of human food energy needs, four of which (rice, wheat, maize and potato) are responsible for more than 60% of our energy intake.” And within that narrow selection of crop types, less and less varieties are getting used. In fact, FAO suggested that "the diversity of cultivated crops declined by 75% during the 20th Century and a third of today's diversity could disappear by 2050".

So it looks like our food system has icebergs on the horizon, and the SS Food Security, built with a thin hull and no bulkheads, is sailing full speed ahead into them. Fortunately, there are a lot of things we can do to make our food system resilient, which I will talk about in later columns, so this story doesn't have to end in disaster. Unlike the Titanic, it is fortunate that we can see the threat long before we hit it, because the saga of that tragic ship is one best told only once.

Steve Mullins is the communications manager for Richmond Food Security Society. We work to ensure that all people in the community have access to safe, nutritious, culturally appropriate foods that strengthen our environment and society. To contribute, check out www.richmondfoodsecurity.org and find out how you can get involved.