Climate Change, Droughts, and the Future: How Plants Can Help Us Find an Alternative Scenario

The last four decades have provided insurmountable evidence that the planet is experiencing rising temperatures, a situation that is perhaps irrevocable. The traditional view holds that this will lead to a unilateral move towards northern climes from both animal and plant species, the death of a wide variety of species across the globe, and an inability for humanity to feed itself.

Scaremongering or an inconvenient truth? Unfortunately, the latter seems more likely, although scientists have recently uncovered promising avenues that may avert disaster. The core of the issue is drought-tolerance and climatic resilience. In order to ensure an extension of our lease on this planet, we need to lower emissions both as individuals and through government policy, but we also must make significant inroads into concrete solutions for an ever-changing atmosphere.

Plants, Climate, and Thirst

How do plants respond to the changes we're experiencing in the earth's atmosphere? The short answer is: we don't know. At least not exactly. A study by the University of Washington shows that it's incredibly difficult to predict exactly how species will react to a changing environment, with up to 60% of plant species showing a preference for warmer climes. There are far too many variables at play for accurate predictions.

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What scientists are able to do is consider the response of specific traits to experimental stimulations. These test how species react to water loss and carbon differentials. Under water-limiting conditions, the trade-off is particularly obvious and presents the basic problem plants face: during drought, do you continue photosynthesis or close off the stomata (and risk starvation)?

The choice rests on essentially two traits: the plant's so-

called ‘internal plumbing’ and its ‘breathing apparatus.’ The Fynbos of South Africa offers some insight, with plants that close their stomata more likely to survive increased temperatures. Another study led by Christine Scoffoni suggests that the salt levels of cell sap can provide insight into which plants are more likely to survive. With these results in tow, we can make educated guesses on which plants to invest in going forward.

It’s Not All Good News (Spoiler: But There is a Silver Lining!)

Bearing the aforementioned in mind, consider the potential future of corn (the major crop of many countries, including the United States). When temperatures reach higher than 95 degrees, corn does not reproduce. Considering the bleak projections for greenhouse gas emissions by 2040, it’s a very real possibility that corn-based products will be a luxury of a distant past.

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Speaking at Ted Global, Jill Farrant provides a promising answer by suggesting the use of 'resurrection' plants as drought-tolerant crops. These plants can survive droughts by lying dormant, resurrecting when given water. They can tough it out with just 5% of their cellular water for years. Using these plants as models for drought-tolerant crops it is possible to create resilience against persistent droughts (which, let's face it, are going to happen).

What are the Options for Individual Households?

Ensuring our planet continues to be a hospitable environment for humanity, we need both the government and individuals to make drastic changes to the status quo. While this can be a little daunting to the average homeowner, there's still plenty that can be done in terms of plant choices and gardening practices.

Households should try and steer clear of the obvious; think luscious green landscaped grass in the middle of a desert, for example (yes, we're talking to you, Los Angeles) Instead, invest in aesthetically pleasing plants that won't hurt the environment.

For example, the succulent is an excellent alternative to plants that require a lot of water. These resilient plants can survive with very little water (just monthly during winter!); if anything, overwatering is the more likely problem. A cultural shift towards a preference for this type of plant, one that requires very little care, would go a long way in reducing carbon emissions and water shortages.

In addition, individuals should consider growing their own produce on a small scale, using natural fertilizers (think compost heaps over nasty commercial varieties) to create

sustainable produce. With the potential to cut down supermarket consumption by a very respectable 20%, doing this is more than a token gesture.

What Does the Future Look Like?

The findings that certain plant species are moving towards warmer climates is evidence that, when it comes to climate change, there are multiple variables other than just temperature. While the planet is undeniably getting warmer, there's potential for us (and other living species) to adapt to more challenging environments. Plants that can survive the challenging conditions we are throwing at them can offer a solution. Of course, reducing emissions is still a key part of the necessary strategy. All is not lost… yet.

Further Reading:

- *How plants respond to drought* – The Conversation
- *How We Can Make Crops Survive Without Water* – TED
- *A Guide To Succulent Plant Care* – Jim's Mowing
- *Drought – tolerant crops to the rescue in Kenya* – ICRISAT

Editor Recommends this video: