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## PLANTS ARE INTELLIGENT

As an agronomist, I love plants and soils. We are on an amazing road of research and discovery both in soils and plants. Plants are the key, 99.7 percent of life on earth is plant life. We would be gone in two weeks without them. A new book, [Brilliant Green: the Surprising History and Science of Plant Intelligence](#), by plant neurobiologist (yes, plant neurobiologist), Stefano Mancuso and journalist, Alessandra Viola, makes a compelling and fascinating case not only for plant intelligence, but maybe even plant rights. This book details how plants, even though they don't have a brain and central nervous system like ours, still are aware of and proactive in their environment. They are more important to us than we have popularly imagined and they deserve more respect than we give them.

We have largely viewed animals as unthinking automatons, simple slaves to instinct. But research in recent decades has shattered that view. We now know that not only are chimpanzees, dolphins and elephants thinking, feeling and personality-driven beings, but many others are as well. Animals have a brain, but plants don't have a brain. How can they solve problems, act intelligently or respond to stimuli without a brain? Intelligence is the ability to solve problems and plants are amazingly good in solving their problems. Plants face many of the same problems as animals, though they differ in their approach. Plants have to find energy, reproduce and stave off predators. To do these things, Mancuso argues, plants have developed smarts and sentience. To solve their energy needs, most plants turn to the sun – in some cases literally. Plants are able to grow through shady areas to locate light and many even turn their leaves during the day to capture the best light.

Some plants supply themselves with energy by preying on animals, including everything from insects to mice to even birds. The Venus flytrap may be the most famous of these, but there are at least 600 species of animal-eating flora. Plants use complex trickery or provide snacks color to lure in pollinators, communicating either through direct deception or rewards. Plants have evolved an incredible array of chemical compounds to ward off predators and attract symbiotic partners. The bottom of the plant may be the most sophisticated of all though. Scientists have observed that roots do not flounder randomly but search for the best position to take in water, avoid competition and garner chemicals. In some cases, roots will alter course *before* they hit an obstacle, showing that plants are capable of “seeing” an obstacle through their many senses.

Humans have five basic senses. But scientists have discovered that plants have at least 20 different senses used to monitor complex conditions in their environment. According to Mancuso, they have senses that roughly correspond to our five, but also have additional ones that can do such things as measure humidity, detect gravity and sense electromagnetic fields. So, instead of a single powerful brain, Mancuso argues that plants have a million tiny computing structures that work together in a complex network, which he compares to the Internet. The strength of this evolutionary choice is that it allows a plant to survive even after losing 90% or more of its biomass.

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