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August 22, 2016

The Potential of Perennial Wheat

Can we reclaim the integrity of American wheat?



A field of Kernza interspersed with alfalfa in early spring.
PC: The Land Institute

You likely have heard that the wheat we consume today in America is very different from the wheat that some of our grandmothers once used to bake wonderful strudels. After 8000 years as a staple of

Events

the human diet, today's wheat is a profoundly [hybridized version of the grains](#) our ancestors grew. The majority of the wheat we consume today is produced in high-yield monocultures, devoid of the nutrients that were present in historic strains, and now shows up in foods that never contained wheat traditionally, such as ice cream, hot dogs and pickles. The expansive use of nutritionally stripped-down wheat has led to an enormous upsurge of [wheat-related food sensitivities](#) in America. Not only do these overly-hybridized cultivars trouble our guts, industrial wheat production is also highly destructive to the land on which it's produced.



A large monocrop wheat field in Kansas. PC: National Geographic.

We grow a lot of wheat in America. The Pacific Northwest is one of the most productive wheat-growing regions in the world thanks to its mild, Mediterranean-like climate. In 2015, the United States ranked as the [second highest exporter of wheat](#), measured by dollar value, with 14.5% of global wheat exports. As one of the country's biggest agricultural exports, wheat plays a [huge role](#) in the American economy. Yet its production is contributing to the degradation of biodiverse prairie ecosystems and the pervasive problem of diminishing soil fertility.

Restoring Oceans, Restoring Climate: Fire & Ice, Food & Water, Floods & Droughts



We'll explore how oceans work as systems, extremely complex and interrelated processes where the whole is far greater than the sum of its parts. We will step beyond our conventional assumptions to hear from forward-thinking scientists, ocean restoration experts, fisheries professionals and activists about the remarkable possibilities of regenerated abundant oceans for a healthy and livable planet, on land and at sea.

When: November 18-20, 2016

Where: Geological Lecture Hall, Harvard University, Cambridge, Massachusetts

Tickets: Regular, \$150; Early-Bird (by October 16, 2016), \$100; Student/Low-income, \$20



Pesticides being sprayed on a conventional wheat field. PC: The Guardian

The production of wheat was transformed in the 1950s and 60s through the Green Revolution movement, when a high-input industrial model promised to [rapidly increase crop yields](#). Current large-scale wheat production still draws from the industrial model, relying [heavily on chemical inputs](#) to fertilize crops and keep pests at bay. Because the wheat grown in industrial production is an annual plant, it cannot develop thick root systems and the land must be tilled again before each planting. The repeated cycle of land disturbance [exacerbates soil erosion](#), depletes soil nutrients, and sends disastrous quantities of nitrogen runoff into waterways.

One organization seeks to revolutionize grain production with the introduction of perennial wheat. For nearly 40 years, researchers at the [Land Institute](#) have been studying alternatives to growing annual wheat plants in monocultures. They believe that perennial grains are the future of worldwide grain-production.



The harvesting of crossbred wheat for analysis. PC: Land Institute.

Volunteer and scholarship opportunities available- please contact info@bio4climate.org

Registration opens soon!

Water - and Climate - Solutions in Plain Sight: A talk by Judith Schwartz



*"Judith Schwartz, who has looked deeply into the challenges and solutions around Earth's soil in her 2013 book, *Cows Save the Planet*, has since turned her sights towards water. In this talk and discussion, she will focus on reframing our global environmental challenges in a way that illuminates potential solutions...Judith will offer examples from around the world that she's encountered in reporting for her newest book, *Water in Plain Sight: Hope for a Thirsty World*."*

When: Monday, September 19, 2016, 7-

Unlike annual grains grown in monocultures, perennial grains grown in mixtures contribute to the growth of prairie ecosystems that are [biodiverse](#), [highly productive](#), and [resilient to climate change](#). The extensive root systems of perennials allow the plants to reach deeper for water and nutrients, while maintaining looser soil that allows more water to infiltrate. [Perennial polycultures can](#) produce more biomass than annuals, simultaneously halting soil erosion and improving soil fertility. Scientists at the Land Institute have been breeding perennial wheat and [domesticating perennial intermediate wheatgrass](#), which they have dubbed "Kernza." They hope that by growing it, wheat producers can restore soil to good health.



A lush, 72-acre plot of Kernza. PC: Land Institute.

These efforts are showing substantial promise. Kernza is growing in test plots around the world and has already been used in experiments by ecologically-minded food retailers, bakers, distillers and breweries. Land Institute agroecologist, Lee DeHaan, initially projected a 50- to 100-year timeline for introducing the perennial grain to the mainstream food system, but he and his colleagues now expect the grain to be ready for commercialization in 20 to 25 years. With advances in production like the Kernza project, American wheat might once again become a domestic crop we can be proud of.

-Jacqueline Sussman

**A new short film by Peter Byck:
*One Hundred Thousand Beating
Hearts***

8:30 PM.

Where: Hunnewell Building, Arnold Arboretum, Boston, MA.

Tickets: \$5 nonmember; use code "Bio4climate" to waive the registration fee. [Register here!](#)

Co-sponsored by the Arnold Arboretum and Bio4Climate.

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**About
Bio4Climate**

Through education, policy and outreach, our mission is to promote the power of the natural world to stabilize the climate and to restore biodiversity to ecosystems worldwide. Collaborating with organizations around the globe, we advocate for the restoration of soil, and of grassland, forest, wetland, coastal and ocean ecosystems-along with the



Will Harris, former industrial farmer in Georgia, has turned into a passionate, regenerative agriculture practitioner. He tells his engaging story in this new short film by Peter Byck, who brought us Soil Carbon Cowboys.

associated carbon, water and nutrient cycles - to draw down excess atmospheric greenhouse gases, cool the biosphere, and reverse global warming, for the benefit of all people and all life on earth.

Learn more about our ongoing projects, upcoming events and find additional information and resources at bio4climate.org.

Geo-Engineering: An Idea Whose Time Ought Never Come

[Read Executive Director of Bio4Climate Adam Sacks' post](#) on why we cannot rely on human technologies to solve climate change.

Dung Beetles are as Important as Pollinators



A dung beetle doing its thing. PC: National Geographic

Dung beetles are heroes that help keep billions of acres of grasslands healthy. They can move a ton of dung per acre into the ground overnight,

opening soils to air and water, and storing carbon beneath the surface. Like pollinators, the 7,000 species of dung beetle are threatened by human-made chemicals. [Here's that story from Mother Jones](#) - and be sure to watch the video!