

Growing Solutions Discussion Guide

Post-Screening Questions

- Did the film leave you with any unanswered questions? If you were able to interview any of the characters in the film to pursue answers to those questions, which characters would they be and what would you ask each of them?
- Did you have a favorite or least favorite character in the film, and why? Did any characters seem especially convincing or unconvincing in their statements?
- How would you describe regenerative agriculture to a family member or friend who hasn't seen the film? How would you describe acequias? Or the seed-saving project in Maine? Or perennial polyculture? Or, why some people are trying to increase the farmer workforce?
- Do you think it's feasible that some of the farming methods discussed in the film could be used more widely in the U.S. or globally? Why or why not?
- Do you support the expanded use of these methods? Why or why not?
- How could topics discussed in the film be relevant to your school? (Example: sourcing food for your cafeteria in a way that supports regenerative practices.)
- Is there an organization, effort or philosophy depicted in the film that you would most like to work for, or most want to work against?
- Is there anything you might push your local government leaders or your community to do, in response to what you've learned from the film?
- If you were creating a "sequel" to this film, what topics/questions would you want to concentrate on?

Quiz Questions based on *Growing Solutions*

How quickly are some farmers restoring their soil, and how do these numbers contrast with what conventional wisdom says is possible?

Geologist David Montgomery highlighted farmers around the world who are building several inches of soil in a matter of years to decades, while the academic literature says “it takes [nature] centuries to build an inch of soil.”

What methods are farmers using to build soil this quickly?

According to David Montgomery, farmers built soil faster by combining three farming practices: 1) Not plowing their fields; 2) Using cover crops to keep their soil protected; and 3) Growing a diversity of crops.

What are the main components of regenerative agriculture, as described by farmer Gabe Brown?

1. If possible, stop tilling the soil.
2. Keep armor on the soil. “We never want to see bare soil.”
3. Diversity rather than monoculture – to match the diversity of nature.
4. Keeping a “living root” in the ground as long as possible throughout the year.
5. Livestock integration. “Nature doesn’t function without animals.”

How can regenerative agriculture help a farmer economically?

Regenerative methods reduce the amount of money farmers spend on “inputs” – which refers to costs such as fertilizers, pesticides (herbicides, fungicides, etc.) and tractor fuel. These are a large portion of a farmer’s expenses.

What is an exudate, and what does it contain?

Something produced by a living organism and then released. Plant exudates contain mostly sugar, plus a little bit of protein and carbohydrate.

Why does a plant put out exudates?

It’s putting out what it needs to attract the types of bacteria and fungi that will help the plant grow.

What are “carbon sinks” and how does agriculture play a role in this phenomenon? What is the role of grazing animals?

Carbon sinks are places where carbon is stored. Examples of carbon sinks are forests, soil, and the ocean. Farming practices can either aid or inhibit the process of storing carbon in the soil (known as carbon sequestration).

Grazing sends a signal to a grazed plant that it needs to slough off more root exudates to attract soil biology (i.e., bacteria and fungi). So, it does more photosynthesis, collects energy and then pumps more carbon into the soil to attract biology (bacteria and fungi) that will help it put out new growth.

Why is it harder to avoid tillage on an organic farm?

Organic farmers cannot use herbicides to clear out weeds, but organic standards do not forbid them to use tillage. If an organic grower is growing annual crops, she needs a clean seedbed to plant into (meaning one without weeds).

What are some of the phrases used to describe an acequia?

1. A ditch
2. A system for sharing water
3. A system of governance
4. A system of allocation and distribution (of water)
5. A democratic tradition or custom (“true democracy”)
6. A community

Why are military veterans considered good candidates for farmer training?

1. They are accustomed to difficult work, often in the outdoors.
2. They are mission-oriented, so the idea of helping the country solve its problem of a farmer shortage could resonate with them.
3. As farmer-in-training Laron Murrell says, veterans are used to getting up early and keeping a schedule. They do a lot of problem-solving, in which they are trained to not panic but to take time to assess the situation.
4. The therapeutic benefits of farm work might be helpful to veterans suffering from post-traumatic stress disorder (PTSD).

Why is it helpful to preserve many different varieties of plants?

- Some varieties are better at resisting droughts than others. Climate change is making droughts more common, therefore making drought resistance an even more important trait in our crops.
- Some plant varieties might possess undiscovered medicinal benefits. Others fill an important niche that keeps a local ecology healthy, even if they don’t benefit humans directly.
- Preserving plant species also helps preserve a cultural heritage, since foods are closely tied to culture.

How is a prairie ecosystem different from our conventional agricultural fields?

- The prairie features plants growing in polyculture (many plants together), rather than a monoculture (all one type of plant), as is common in our farm fields.
- This plant diversity is a defense against pests, so a prairie doesn’t need chemical treatments to ward off pests. It doesn’t need herbicides because it is always covered with a thick layer of plant life, so there is no place for weeds to take hold.
- Farming systems emphasize annual crops – which die each year and have to be replanted – while a prairie is dominated by perennial crops that last many years.
- Prairies make their own fertility, while farm fields often need added fertilizers to enhance a crop’s growth. So, the prairie functions entirely on sunlight, whereas the fertilizers added to farm fields are derived from fossil fuels.
- A prairie grows topsoil, while farm fields with annual crops tend to lead to soil erosion because they are sometimes left bare for large portions of the year.

How are perennial crops potentially part of a sustainable future for agriculture?

- Perennial crops reduce the need for tillage, which means they protect topsoil, the basis of our agriculture.
- They are more resilient in the face of the extreme weather events that are becoming more common, such as droughts, floods and heat waves.
- Perennial crops put down deeper roots and have more root mass than annual crops, and thus store more carbon. This makes perennial fields a larger carbon sink than farm fields full of annual crops, meaning that perennial crops are part of a strategy to combat climate change.
- By preserving topsoil, we are also preserving the nutrients that are bound up in soil, which humans need for good health.

Further Reading

Books

- *Dirt to Soil: One Family's Journey into Regenerative Agriculture*, by Gabe Brown
- *Growing a Revolution: Bringing Our Soil Back to Life*, by David R. Montgomery
- *The Hidden Half of Nature: The Microbial Roots of Life and Health*, by David R. Montgomery and Anne Bikle
- *Soil Biology Primer*, by Elaine R. Ingham
- *Mayordomo: Chronicle of an Acequia in Northern New Mexico*, by Stanley Crawford
- *Consulting the Genius of the Place: An Ecological Approach to a New Agriculture*, by Wes Jackson
- *The Biological Farmer: A Complete Guide to the Sustainable & Profitable Biological System of Farming*, by Gary F. Zimmer with Leilani Zimmer-Durand

Websites

- Arcadia Center for Sustainable Agriculture (Virginia) – Veteran Farmer Program
<http://arcadiafood.org/programs/veteran-farmer-program>
- The Land Institute – Perennial Crops: New Hardware for Agriculture
<https://landinstitute.org/our-work/perennial-crops/>
- Medomak Valley High School (Maine) – Heirloom Seed Project
<http://www.mvhsheirloomseedproject.com/what-we-do>
- New Mexico State University – Acequia Culture (lists journal articles and additional links)
<https://alcaldesc.nmsu.edu/acequia-culture.html>
- Regeneration International – Why Regenerative Agriculture?
<https://regenerationinternational.org/why-regenerative-agriculture/>