

**Comments Received on Regenerative Agriculture Definition\***  
**Comment Period: May 2024**

\*These are written comments received via email to [RegenerativeAg@cdfa.ca.gov](mailto:RegenerativeAg@cdfa.ca.gov) or through chat box via public listening sessions. Written comments submitted in the Zoom chat box during public listening sessions and work group sessions will be posted elsewhere. You may submit a written comment at any time to [RegenerativeAg@cdfa.ca.gov](mailto:RegenerativeAg@cdfa.ca.gov). Comments will be posted at the end of each month.

<b>Date</b>	<b>Written Comment</b>
5/1/24	<p>Regenerative Agriculture</p> <p>Our soils, air, water, and ecosystems are inextricably tied. Regenerative agriculture recognizes that our soil is a living ecosystem comprising billions of diverse microorganisms. Regenerative agriculture supports practices that enhance the ability of soils to store, transform, and cycle nutrients in the soil, grow healthier food, retain more water, and better absorb carbon that can help slow or reverse the impacts of climate change. In short, if we take care of our soils, our farms prosper, more water is conserved, and therefore more water is available for beneficial uses, and our environment thrives. That is why Metropolitan is engaged in this effort.</p> <p>Metropolitan believes a broad definition of ‘regenerative agriculture’ should be considered for the Environmental Farming Act Science Advisory Panel. A broad definition is appropriate given the diversity of California and its agriculture. This definition should account for differences in climate, agricultural practices, crops grown, and support a definition applicable to all of California’s diverse agricultural regions.</p> <p>Recommended Elements of a Preferred Definition</p> <p>Based on the widely recognized principles of soil health from the Soil Health Academy, the Metropolitan Water District recommends the definition focus on the following principles:</p> <ol style="list-style-type: none"> <li>1. Minimize soil disturbance. Healthy soils contain soil aggregates, mycorrhizal networks, and living roots that feed beneficial microorganisms, trap moisture, capture carbon, and create pore spaces for air and water. Tillage can impair these structures and reduce the number of microorganisms in the soil by exposing them to heat and UV rays from the sun. Recommended practices: Use no- or low-tillage practices such as no-till drills for seeding. Preserve living roots in the soil by crimping crop stubble instead of discing.</li> <li>2. Minimize chemical application. Some applied chemicals have a detrimental impact on surface and groundwater quality. While striving toward zero or near-zero chemical applications, ongoing reductions should be pursued. The use of compost builds a healthier soil biology.</li> </ol>

	<p>Recommended practices: Use manure, compost, biosolids, or other organic fertilizers. Design crop rotations to provide beneficial soil inputs (e.g., nitrogen-fixing crops such as peas and vetches.) Consider natural soil amendments such as biochar to improve the infiltration and water-holding capacities of poor-quality soils.</p> <p>3. Keep soils covered. Bare soils lose moisture to evaporation and expose microorganisms to high temperatures and topsoil to erosion. Both crop stubble and cover crops can be used to armor the soil to prevent these losses.</p> <p>Recommended practices: Terminate crops using crimper-rollers to flatten stubble rather than discing, to create a layer of ‘armor’ on top of the soil. Plant appropriate cover crops in between cash crop rotations rather than leaving fields idle.</p> <p>4. Encourage crop and microbial diversity. Monoculture tends to exhaust soils and reduce the variety of microorganisms, creating the need for large fertilizer inputs. A well-designed crop mix and crop rotation can be used to counteract these effects. For example, multispecies mixes of cover crops can be customized to provide the right balance of nutrient inputs, including species selected for their nitrogen-fixing, soil loosening, and pest-repelling abilities.</p> <p>Recommended practices: Diversify crops and design crop rotations to incorporate a variety of compatible crops, including multispecies cover crops.</p> <p>5. Recognize context and regional variation and limitations. Not all practices will be suited for every agricultural region of the state. For example, some areas have soils with significant amounts of clay, and tillage may be necessary to prepare the soil for planting. In others, seeds from cover crops may interfere with neighboring fields. For these reasons, any regenerative certification should reflect context and recognize the unique soil conditions and climates of different areas of the state while pursuing measurable improvements through ongoing use of the above recommended practices.</p>
5/6/24	<p>The definition of “regeneration” is to bring new and more vigorous life to an area or to revive. The use of synthetic herbicides and pesticides is completely at odds with this definition. Glyphosate strongly disrupts soil biology as it is toxic to beneficial microflora and earthworms and ultimately to humans. Pesticides often have negative effects on non-target organisms and are contributing to the biodiversity crisis we are facing.</p> <p>I am here to ask that CDFA define regenerative with organic as the starting point.</p> <p>A definition of regenerative agriculture that omits the principles of organic agriculture as a baseline will lead to consumer confusion and greenwashing.</p> <p>I also realize that in order to really regenerate California we need a critical mass of farmers to participate and change their pesticide and herbicide heavy practices. It takes time to wean off chemical heavy agriculture. For farmers that are choosing this route, the communication strategy could be that they are “Transitioning to Regenerative Practices” without watering down a meaningful definition of regenerative agriculture.</p> <p>I also think that we need to rethink the financial burden on farmers who are implementing organic and regenerative practices and are obtaining certification to communicate that claim to their customers.</p>

	<p>Certified farmers having to prove that they do things differently than the conventional high input - output model that is damaging to environmental and human health requires extra time and money that only a few can afford.</p> <p>Only if that dynamic is reversed and the farmers who pollute are the ones paying the higher price, or in other words, the farmers who implement practices that are better for human and environmental health, are rewarded financially, will we see a drastic change in participation.</p> <p>The Healthy Soils Program is a step in the right direction to lessen that financial burden and to drive change.</p> <p>California is a leader in setting environmental, human health and climate goals and sets the bar for other jurisdictions as well. In my previous career in the building industry I have seen this play out with the California Air Resource Board “Composite Wood Products Airborne Toxic Control Measure”. This regulation created positive change in the wood industry all over North America and beyond by restricting formaldehyde emissions from wood products.</p> <p>I trust that California is able to set an ambitious target with regenerative agriculture that includes soil health and biodiversity as foundational elements, which leads to meaningful change and improvements in environmental and human health.</p>
5/8/24	<p>Acknowledging regenerative agriculture as an integrative approach to farming and ranching with the aim of rehabilitating, conserving and enhancing agroecosystems. The word agroecosystem encompasses three major pillars: The food/fiber production system/s, the ecology and environment that the system/s functions with- in and around, and the social-economic sphere that the system/s directly and indirectly affect as well. Measurable indicators should provide scientific evidence that those systems are achieving regenerative goals. Management approaches should be adaptable based on the farm and environmental context. I think we need a transitioning framework to guide farms along a spectrum of regenerative, as it is knowledge intensive and may take many years to see benefits. Acknowledging roots in indigenous knowledge and organic farming is crucial. Whether or not a farm needs to be organic to be regenerative should be further discussed</p>
5/17/24	<p>While we understand the intention of a California definition is for state policy and programs, we believe the repercussions will be widespread. As organic leaders on the national stage, we are already fielding questions from policymakers, companies, and consumer groups throughout the country who are watching how California’s process unfolds. A decision to define regenerative without using organic as a baseline will contribute to consumer confusion and could serve as precedent for programs in other states that would further undermine the organic sector.</p> <p>We ask the State to consider how a definition of regenerative agriculture not grounded in organic certification will undercut organic farmers and the organic market in the following ways:</p>

1. Organic farmers cannot compete in a market where regenerative farmers are subsidized by State government but not held to the same high bar. Transitioning to organic and maintaining organic certification costs time and money. Not only are organic farmers required to conserve soil, water, wetlands, woodlands, and wildlife, they must farm without synthetic pesticides or fertilizers. It is untenable for organic farmers to absorb the high costs to comply with the strict environmental standards built into organic regulations while competing for the same school food contracts and government incentives as less regulated regenerative farmers.

2. A loose definition of regenerative agriculture erodes trust in the organic label. Consumers trust organic as a guarantee of environmentally responsible practices, including avoidance of synthetic inputs. Yet, businesses already use regenerative labels to tap into this consumer demand for values-based products, but without strict standards, verification, and accountability in place for the regenerative claim. California's definition would sanction and legitimize these regenerative labels at the grocery store, creating consumer confusion and jeopardizing consumers' willingness to pay for organic.

3. Misuse of taxpayer dollars on a weak regenerative standard undermines investments in the organic sector. Over the last few years, California has established an organic acreage climate target, incentivized organic food in schools, invested \$10 million in organic transition, awarded \$1.85 million for organic technical assistance, and reserved \$6 million to support farmers to develop organic system plans. Ongoing investment in the organic sector depends on the good use of these taxpayer dollars. If California does not embed strong standards and a verification mechanism in the definition of regenerative, taxpayer dollars will inappropriately support farmers with no accountability. This misuse of public funds jeopardizes all agricultural investments, including in the organic sector.

4. The trajectory of regenerative mirrors the history of organic. Like regenerative agriculture today, organic farmers in the 1970s and 80s adhered to general principles of harmonizing with nature but with decentralized and unregulated certification programs. California was the first state to define organic practices in the 1979 Organic Food Act. The State then amended the law in 1990 to include enforcement. The same year, Congress enacted the Organic Foods Production Act, which enshrined organic certification in federal law. What started as a definition led to verification and certification to ensure accountability and transparency. This history of organic should not be ignored in the State's efforts to define regenerative, and a weak definition of regenerative agriculture today could lead to a weak certification program tomorrow that undercuts organic certification.

The undersigned groups ask that the State build on the growth and success of the organic market by using organic as the starting point for the regenerative definition. Without significant public investment, U.S. organic food sales reached \$63.8 billion in 2023.<sup>1</sup> Organic sales account for about 3% of U.S. farm receipts even though organic acreage is still less than 1% U.S. farmland,<sup>2</sup> and over 80%<sup>3</sup> of Americans consumer organic food on a regular basis.

	<p>The undersigned groups acknowledge that organic farming has its roots in Indigenous knowledge and knowledge brought to the United States by enslaved Africans. Iroquois in the Northeast, the Haudenosaunee on the East Coast, and the Ojibwe across the Great Plains, to name just a few, developed complex systems of intercropping, livestock integration, cover cropping, and crop rotation to sustain their communities for thousands of years. George Washington Carver, the son of an enslaved woman and an agricultural scientist, inventor, and educator at Tuskegee University sought to revitalize southern soil and developed a crop rotation method using legumes to fix nitrogen.</p> <p>Over the past fifty years, organic farmers have built on Indigenous knowledge and knowledge brought by enslaved Africans. With this foundation, organic farmers have led the way on many of today's climate-smart practices. The undersigned groups understand that the California Department of Food and Agriculture (CDFA) is engaging in a consultative process with Tribal governments. We support this process and efforts to recognize the contributions of traditional ecological knowledge in the organic and regenerative movements. We seek to understand how the history of institutionalized racism and white supremacy has shaped our food and agriculture system, and ways that organic and regenerative advocates can support food sovereignty in tribal communities.</p>
5/22/24	<p>We request the Work Group recommend a definition of regenerative agriculture that is holistic, verifiable and that meaningfully helps the state achieve justice, sustainability and long-term economic well-being in our food systems.</p> <p>While Black, Indigenous, and People of Color (BIPOC) have a rich history of farming and stewarding land, the current, mainstream agricultural system disproportionately harms BIPOC communities.</p> <ul style="list-style-type: none"><li>• Farmwork is one of the most dangerous occupations. In 2019, farmworkers accounted for 10% of worker-related deaths despite representing less than 1% of California's workforce. Farmworkers often face compounding environmental exposures from pesticides, extreme heat, and smoke. In California, the overwhelming majority of farmworkers are Mexican immigrants, many of whom live and work with unstable migratory status and face social disenfranchisement under the U.S. detention and deportation system.</li><li>• In high pesticide use areas, Latinx children are 91% more likely to attend schools experiencing the top 25% of pesticide exposure than their white peers. Synthetic pesticide exposure is associated with Parkinson's disease, various cancers, reproductive disorder and endocrine disruption, Attention Deficit Disorder, impaired neurobehavioral development, diabetes, and asthma.</li><li>• Indigenous farmworkers, about 40% of California's farm workforce, face additional language and cultural barriers that make them less likely to file complaints about workforce safety., non-Spanish speaking workers' risk of illness and injury increases when occupational safety and workers' rights trainings are inaccessible.</li></ul>

- About 75% of farmworkers in California are undocumented and can face workplace retaliation and deportation if they speak out about workplace abuses.
- Farmers of color experience discrimination and systematic exclusion from government resources. According to the Farmer Equity Act of 2017, farmers of color do not have equitable access to land in California, receive less in federal payments than their white counterparts, and receive insufficient and inappropriate technical assistance and financial support.
- Regenerative agriculture often points to the importance of land practices with Indigenous roots, such as diversification practices, without:
  - Providing appropriate credit to native tribes or Indigenous groups
  - Recognizing their worldviews
  - Recognizing the criminalization of Indigenous land practices like cultural burning

Recognizing the systematic killing and removal of Indigenous stewards from their ancestral territories

Historically, regenerative agriculture definitions have omitted agrochemical reduction. Certain practices associated with regenerative agriculture, like no-till and cover cropping, can increase dependency on harmful herbicides unless agrochemical reduction is prioritized and incentivized. Many pesticide corporations claim that their products support regenerative agriculture, ignoring that agrochemicals contribute significantly to the biodiversity crisis, greenhouse gas emissions, environmental racism and harm to human health. Therefore, it is critical that CDFA push against this type of greenwashing of regenerative and ensure its definition does not uphold or expand dependency on agrochemicals.

Regenerative agriculture definitions have also historically not addressed genetic engineering (GE). Use of GE crops has dramatically increased the use of hazardous pesticides including glyphosate, 2,4-D and dicamba. An emerging suite of products derived from genetic engineering are being developed and deployed in agriculture, including GE insects, GE soil microbes, and gene-silencing pesticides. Data point to a range of genetic, ecological and public health risks associated with these technologies. It is critical that CDFA ensures that its definition excludes these problematic technologies.

Rooted in Indigenous knowledge, regenerative agriculture has the potential to restore ecosystem health so that majority BIPOC and all agricultural communities experience equitable health and socio-economic outcomes. **To support this shift, we recommend the Board adopt a definition of regenerative agriculture that:**

- Acknowledges the historic mass violence that attempted to systematically erase Indigenous People and knowledge

	<ul style="list-style-type: none"> <li>• Recognizes the Indigenous origins of regenerative agriculture, which centers the interconnectedness between environmental, animal and human health, and returning land to Indigenous stewardship as a regenerative agriculture solution</li> <li>• Includes agrochemical reduction and sets organic agriculture as the minimum standard of regenerative agriculture, but builds upon it by including social welfare and labor standards and promoting a more expansive, systemic shift on-farm, such as the adoption of diversification practices.</li> <li>• Organic agriculture provides a beginning foundation for equity by prohibiting synthetic pesticide and fertilizer use as well as being a third-party verified certification. <ul style="list-style-type: none"> <li>• Regenerative Organic Certified is an example that builds on organic standards by including worker voice, living wage, and anti-discrimination commitments.</li> <li>• While certification is accessible to many farmers, pathways for low-cost verification should be developed for farmers of color and small-scale farmers that face barriers to certification, such as cost, but are utilizing regenerative, low-chemical input practices.</li> <li>• At the same time, California should continue to expand the \$300 million investment in organic transition from USDA in addition to California’s own \$10 million program to ensure that the transition to organic and regenerative organic/organic certification is possible for all farmers.</li> </ul> </li> <li>• Explicitly includes farmworker health, safety and dignified wages; animal welfare; crop diversification and soil-health building practices; and equitable access to land, resources and markets for farmers of color</li> </ul> <p>In conclusion, the definition of regenerative should be reserved for producers who go beyond organic certification, implementing diversification and soil health-building practices that increase biodiversity and ecosystem services, while also having a strong commitment to safeguarding and uplifting civil and labor rights, like a dignified wage for farmworkers. Regenerative agriculture must increase planet, human and animal health and recognize their interdependencies and the Indigenous origins of regenerative agriculture.</p>
5/22/24	<p>Regenerative farming should include agroecological principles, including prioritizing and promoting native wildlife, clean air and water. An urgent concern in defining regenerative agriculture is to ensure that it is not co-opted by the greenwashing behind claims behind regenerative grazing. The realities of livestock grazing are often in direct contradiction to the goals of regenerative agriculture.</p> <p>The Department’s stated goals include fostering “climate smart, resilient and regenerative food systems” that “improve agriculture’s effect on the environment, encourage wise stewardship of water and natural resources, eliminate waste and are regenerative, e.g., practices that enhance ecosystems and improve the land.”</p>

At current rates of beef and dairy production, cattle grazing does none of these things, and makes it nearly impossible to genuinely reach these goals.

The industry's outsized claims about the magic of regenerative grazing do not hold up to scientific analysis in any scale or replication. The reality is that decades of research demonstrate the damages wrought by livestock grazing. In fact, beef and dairy are the leading source of agricultural greenhouse gas emissions, water use, land use, and manure pollution in California and beyond, as well as lethal management of native wildlife like wolves who are vital to the health of our ecosystems.

We also know, right in our own backyard at the Point Reyes National Seashore in Marin County, California, that grazing cattle (some of whom are labeled "regenerative") are not only polluting biodiversity hotspots but are also the motivation for fencing native Tule elk from natural water resources, with horrific ecological consequences and suffering. This is not regenerative.

Regenerative agriculture does not require livestock production. On the contrary: climate scientists say food system reform must include massive reductions in meat and dairy production, *especially* from grazing animals.

Grazing cattle not only don't permanently sequester carbon in the ground at scale: they are also a top source of methane emissions in the United States (methane is more than 80 times more potent than carbon in the short term) as well as nitrous oxide. This simply isn't a smart climate solution. Nor is it a regenerative one.

Cattle grazing in California is not a water-smart solution either. Cattle production is an extremely thirsty way to produce food. While California faces historic drought, which continues to worsen with climate change, food production that requires as much water as beef and dairy makes very little sense. Cattle production, through pasture and supplemental feed and forage for grazing animals, is the leading source of water use. It is likely to cause deep instability for California's economy as well as the livelihood of farmers and ranchers who instead would benefit from a just transition to more water-smart agriculture.

And while in California we are all worried about wildfire, the truth is that grazing livestock are historically the reason for disturbed natural fire patterns. Cattle are not a wildfire solution. The window at which point cattle might do more good than harm is exceedingly small, and the rest of the time they are known to spread highly flammable invasive cheatgrass. Grazing cattle also require an enormous amount of land. Grass-fed cattle production is the leading source of global deforestation, driving devastating habitat loss and species extinctions – a threat to biodiversity that is further exacerbated by targeted wildlife killing programs. While none of us working towards regenerative solutions want to see more feedlots – such as the atrocity on I-5, which is certainly not the solution – we simply don't have the land to increase grazing and call it an environmental solution either.



In any production system, cattle are ultimately an inefficient way to produce food. For the amount of food we get, the environmental toll of beef and dairy production simply isn't sustainable or regenerative.

While we want to encourage better practices among beef and dairy producers, regenerative grazing proponents should demand rigorous metrics and standards to ensure that beef and dairy production are not simply rubber-stamped as regenerative. Strong and clear definitions and standards to guide policy will help uphold the integrity of the "regenerative" label for those producers who are truly implementing best practices, increase consumer confidence in regenerative products, and ensure that we're creating a meaningful shift toward a more sustainable food system.

We urge CDFA to include the following in its regenerative definition:

- All regenerative claims must be subject to clear, rigorous, and science-based metrics and standards.
- Any claims about the environmental benefits of regenerative agriculture or a particular farm must be backed up by scientific evidence to avoid greenwashing.
- Livestock grazing should not be included as an inherent or required part of the definition of regenerative farming.
- CAFOs and other industrial-scale livestock producers should not be allowed to use the "regenerative" claim.
- Regenerative farms must be organic, or in the process of transitioning to organic production.
- Regenerative operations must include ecosystem health and integrity as a verifiable standard via EIRs.
- Regenerative farms must be committed to non-lethal coexistence with native wildlife, including:
  - nonlethal predator conflict resolution with practices such as range riders, fladry, fencing, dogs, llamas or lights;
  - nonlethal coexistence with native wildlife like gophers, prairie dogs and coyotes;
  - no contracts with lethal wildlife management programs; and
  - nontoxic farming practices without pesticides or rodenticides.
- Regenerative grazing operations must show that their cattle are not allowed to cluster in natural waterways.
- Regenerative grazing operations must complete an environmental assessment to show that cattle aren't grazing in proximity to endangered species.

Even in best-case scenarios, enhanced grazing practices have steep environmental costs. While ecologically driven improvements to grazing practices are welcomed, they require clearly defined standards and work best with drastically reduced herds and an overall wide scale reduction in consumption and production. Improved practices cannot deflect from that point, and they cannot reduce the negative impacts of grazing on biodiversity and the climate crisis at a meaningful level without a dramatic reduction in beef consumption.

	<p>There are other forms of food production and farming that can effectively build and restore soils, sequester carbon, and regenerate degraded landscapes and ecosystems, and do not entail the disproportionate land use and greenhouse gas emissions of grazing livestock or the intense displacement and killing of native wildlife. These include food trees, legume cultivation, veganic or stock-free gardening and farming, perennial vegetable farming, and more.</p> <p>Please ensure that the decision around how grazing influences and is or is not part of the definition of regenerative agriculture is grounded in scientific evidence and a commitment to the Department’s goals of enhancing ecosystems and fostering resilient food systems. Livestock grazing need not be part of regenerative farming, and if it is to be considered, the standards should be extremely rigorous and the circumstances exceptional.</p>
5/24/24	<p>The CDFA’s mission is to serve the citizens of California by promoting and protecting a safe, healthy food supply and enhancing local and global agricultural trade. Defining Regenerative Agriculture inclusively aligns with this mission by fostering innovation, improving environmental outcomes, and supporting the diverse needs of California’s agricultural community.</p> <p>The term Regenerative Agriculture has the potential to connect consumers to their food in a powerful way. While each agricultural commodity requires different farming techniques, it is clear that all agriculture requires soil, water, and coexistence with local wildlife. Therefore, the definition of Regenerative Agriculture should include science-based measurements that encourage farming techniques improving soil health, water quality, and ecosystem biodiversity.</p> <p>At Sun Valley Rice, we proudly support the efforts of California rice farmers over the last 30 years to continuously improve farming techniques, enhancing soil health, air quality, water quality, and providing habitats for over 200 species of wildlife including millions of migratory birds.</p> <p>California stands out among other agricultural areas because it produces over 400 unique commodities, far more than any other state. Consequently, the CDFA has the distinctive responsibility of creating a definition of Regenerative Agriculture that includes the diverse farming techniques specific to each commodity.</p> <p>The CDFA’s definition should focus on improving soil health, water quality, and biodiversity, without restricting practices solely to those that meet organic certification standards. Limiting the term to organic only would exclude many farmers committed to sustainability but not certified organic. A narrow definition risks discouraging California producers from engaging in regenerative practices, thereby limiting the overall impact on soil health, water quality, and biodiversity. With only 4% of California’s farmland certified Organic, defining Regenerative Agriculture as organic-only would severely limit the potential positive impact of larger-scale Regenerative Agriculture.</p>

	<p>To empower California producers, including rice farmers, the definition of Regenerative Agriculture must:</p> <p><b>Emphasize Core Principles:</b> Focus on practices that enhance soil health, water quality, and biodiversity. These principles are fundamental to sustainable agriculture and resonate with the goals of improving the environment and agricultural productivity.</p> <p><b>Encourage Continuous Improvement:</b> Support farmers in their journey to continuously improve their practices. This includes providing resources and incentives for adopting new and innovative techniques that align with regenerative principles.</p> <p><b>Foster Inclusivity:</b> Allow for a wide range of sustainable practices, not limited to organic certification. This inclusivity ensures that more farmers can participate and contribute to regenerative goals, increasing the overall impact.</p> <p>By adopting a broad and inclusive definition of Regenerative Agriculture, the CDFA can support the diverse needs of California’s agricultural sector while promoting environmental stewardship and resilience. This approach will ensure that Regenerative Agriculture remains a dynamic and evolving practice, capable of addressing the complex challenges of food security, biodiversity, and climate change.</p>
5/25/24	<p>We support the urgent need to adopt regenerative agricultural practices that mitigate climate change, improve soil health, restore biodiversity, enhance ecosystems, and contribute to human health. Past experience with poorly defined and unenforceable terms like Integrated Pest Management (IPM) and Sustainable Agriculture raises serious problems that well-intentioned efforts to define regenerative could repeat and, in the process, stifle the growth and continuous improvement of certified organic practices. Organic is a necessary baseline or foundation of a new regenerative standard because it eliminates the use of petrochemical pesticides and fertilizers in meeting the existential environmental and health crises of our time. A standard for “regenerative” must do this as well if it is to be helpful and not harmful in advancing the critical changes needed in this time of crises.</p> <p>CDFA’s Environmental Farming Act Science Advisory Panel (SAP) proposes a framework for developing a definition. However, that framework will be ineffective if definitions, policies, and rules fail to meet these criteria:</p> <ol style="list-style-type: none"> <li>1. Definition clarity and enforceability;</li> <li>2. Systems plan (establishes baseline for management practices intended to create resiliency and prevent pests);</li> <li>3. Rigorous standard for allowed/prohibited substances list with a mechanism for incorporating real-time data on hazards and alternatives into reevaluation of allowed list;</li> <li>4. Certification and enforcement</li> </ol>

system (third party enforcement); 5. Process for public participation to ensure a feedback loop for continuous improvement; and 6. Funding to ensure elements are carried out in a robust way.

Regenerative agriculture must be organic.

Organic agriculture, which has been widely adopted in California, fits the issues in the framework proposed by the SAP as well as the criteria above.

Organic agriculture can mitigate climate change.

Agriculture is a major contributor to climate change. In a recent article in Science, Clark et al. show that even if fossil fuel emissions were eliminated immediately, emissions from the global food system alone would make it impossible to limit warming to 1.5°C and difficult even to realize the 2°C target. According to the International Panel of Climate Change, agriculture and forestry account for as much as 25% of human-induced GHG emissions. The contribution of animal agriculture has been estimated at 14.5% to 87% or more of total GHG emissions. These estimates include emissions of carbon dioxide, methane, nitrous oxide, and ammonia. The carbon dioxide contribution largely comes from converting land from natural forest to pasture or cropland.

While recognizing practices that sequester carbon in the soil “regenerative agriculture” employing toxic chemicals ignores the direct climate impacts of synthetic nitrogen fertilizers, the damage to soil health caused by pesticides and chemical fertilizers, and the fact that pesticide and fertilizer manufacturing is dependent on fossil fuels—as key ingredients as well as for the heat and energy driving chemical reactions. It is important to see through this deception.

Organic practices preserve natural lands and biodiversity. Natural forests are more effective than tree plantations in sequestering carbon. Preserving natural land increases biodiversity, which also reduces dependence on petroleum-based pesticides. Organic farms are required to “comprehensively conserve biodiversity by maintaining or improving all natural resources, including soil, water, wetlands, woodlands, and wildlife.

Organic agriculture benefits human health. By avoiding the use of antibiotics and toxic pesticides, organic agriculture protects farmworkers and consumers.

The USDA organic seal is backed by an enforceable inspection system. CDFA should start by defining “regenerative” as—at a minimum—meeting organic standards.

<p>5/25/24</p>	<p>Climate change, soil health, biodiversity – these pressing issues demand a shift towards regenerative agriculture. However, past experiences with terms like "Integrated Pest Management" (IPM) and "Sustainable Agriculture" highlight the dangers of loose definitions. We must avoid repeating these mistakes and potentially hinder the growth of organic practices.</p> <p>Organic agriculture is the essential foundation for any new "regenerative" standard. It eliminates harmful petrochemicals, directly addressing environmental and health crises. Any "regenerative" standard must follow this example to be truly beneficial.</p> <p>The proposed framework by CDFA's panel has potential only if it ensures:</p> <ul style="list-style-type: none"> <li>Clear and enforceable definitions;</li> <li>A holistic systems plan for building resilience and preventing pests;</li> <li>A rigorous list of allowed/prohibited substances, with constant updates based on new scientific data;</li> <li>Third-party certification and enforcement;</li> <li>Open participation for continuous improvement; and</li> <li>Adequate funding to support these elements.</li> </ul> <p>In essence, regenerative agriculture must encompass organic principles.</p> <p>California's widely adopted organic practices perfectly align with the proposed framework and the criteria above. Organic agriculture demonstrably mitigates climate change – a major contributor from agriculture. Studies show that even without fossil fuels, food systems alone could prevent meeting climate targets. Organic practices address this by:</p> <ul style="list-style-type: none"> <li>Reducing reliance on synthetic fertilizers, which contribute to greenhouse gases;</li> <li>Protecting soil health, damaged by conventional pesticides and fertilizers; and</li> <li>Avoiding fossil fuel use in pesticide and fertilizer production.</li> </ul> <p>Organic practices also benefit biodiversity by preserving natural lands and reducing reliance on harmful pesticides. Additionally, organic farming protects farmworkers and consumers by eliminating antibiotics and toxic pesticides.</p> <p>The USDA organic seal offers a strong, enforceable inspection system. CDFA should build upon this by defining "regenerative" as meeting, at minimum, all organic standards. This ensures a clear foundation for truly regenerative practices.</p>
<p>5/29/24</p>	<p>California to needs define regenerative agriculture with organic certification as the base</p>

5/29/24	<p>We are writing to express our support and provide input on your efforts to define regenerative agriculture. As small-scale vineyard owners, we need CDFA's definition to be practical and clear.</p> <p>From our experience, the following elements are essential to a definition of regenerative agriculture:</p> <ul style="list-style-type: none"> <li>- Soil Health: Emphasizing practices that enhance soil structure, fertility, and microbial activity.</li> <li>- Biodiversity: Encouraging diverse plant and animal life on the farm.</li> <li>- Water Management: Promoting efficient water use and conservation methods.</li> <li>- Community and Economic Resilience: Supporting local food systems and economies.</li> <li>- Farmer Well-being: Ensuring that regenerative practices are accessible and beneficial to farmers of all sizes.</li> </ul> <p>Providing education, technical assistance, and financial incentives will be key to widespread adoption.</p> <p>At Jordan Oaks Vineyard, we employ several regenerative practices, including careful water management, cover cropping, and planting hedgerows that attract and provide habitat for local wildlife.</p> <p>In addition to our farming activities, we also open our vineyard up to agro-tourism, inviting visitors to experience the beauty of our vineyard and learn about sustainable farming practices firsthand. This not only educates the public about the importance of regenerative agriculture but also supports our local economy.</p> <p>We have observed that while our customers are interested in knowing that our grapes are farmed using regenerative practices, there is no demand for more costly organic grapes in our area. Because of this, we urge you to avoid restricting the definition of regenerative agriculture to organic only practices. It is important that regenerative practices are affordable and accessible to small, family farmers.</p> <p>Also, please recognize that every crop is different, and the definition of regenerative agriculture must include a wide variety of farming practices based on three pillars of regenerative agriculture: farming to improve soil health, water quality, and biodiversity.</p>
5/29/24	<p>Definition – Regenerative Agriculture</p> <p>Regenerative agriculture is a philosophy that deals with increasing and maintaining the natural resiliency of agricultural systems and the environment while preserving the resilience of agricultural businesses and the people who live and work in agricultural communities.</p> <p>Resilience (noun): the capacity to withstand or to recover quickly from difficulties; toughness.</p> <p>Definition Commentary</p> <p>Resilient Agricultural Systems suppress damaging plant diseases, insects, nematodes, and other pests through natural means without the use of synthetic pesticides, fumigants, or GMO's. They also work to supply needed plant nutrients</p>

without the use of synthetic fertilizers. Regenerative practices that increase the resiliency of agricultural systems should focus on improving and maintaining soil health and diversity within the farm ecosystem.

Regenerative agriculture practices should also have a positive impact on the environment and our natural resources. Environmental resiliency should involve reducing the negative impacts of carbon dioxide on the environment by sequestering carbon in soils. Regenerative practices should also maximize water use efficiency, water infiltration and retention in soils, and reduce erosion. Environmental resiliency also involves minimizing the impact of agricultural inputs and activities on the flora and fauna outside of field boundaries.

Resilient agricultural businesses are profitable, diversified, have the potential for growth, and they create opportunities for stable employment for agricultural workers. Preserving the resiliency of agricultural communities should involve community projects and philanthropy on the part of the regenerative businesses.

#### Organic Alignment

Grimmway believes that regenerative agriculture should be aligned with organic farming practices and standards, similar to the beliefs of Robert Rodale, the father of regenerative agriculture (Rodale, 2015). Both have similar practices and goals of creating resiliency of agricultural systems, but organic agriculture has known standards and an enforcement mechanism, while regenerative agriculture currently does not. This great weakness of regenerative agriculture could lead to claims of “green washing” and abuse of the term. At minimum, organic agriculture should be considered a form of regenerative agriculture, and any other form of regenerative agriculture, which is not organic, should have national standards and an enforcement mechanism.

As CDFA considers the definition of regenerative agriculture, we recognize that conventional agriculture does not fit perfectly within the definition of regenerative agriculture. We recognize this, even as a company that grows conventional vegetable products for our customers, in addition to our large organic operation. Regenerative agriculture imparts resiliency to agricultural systems through natural means, while conventional agriculture imparts resilience by chemical means. Therefore, it can be argued that the use of synthetic pesticides and fertilizers in conventional systems, and the use of GMOs by others, do not fall within the scope of regenerative agriculture.

#### The Classification of Tillage

It is generally agreed that “minimum tillage” should be a practice associated with regenerative farming because of its beneficial effects on carbon sequestration and overall soil health. The problem with requiring “no-till or minimum tillage” for regenerative agriculture, however, is that it would essentially exclude growers of root and tuber crops, like carrots and potatoes despite all the other regenerative aspects of their farming, because they do not have the option for minimum tillage. To be inclusive of all crops and farming operations, in a way that recognizes the adoption and use of many other regenerative practices by these same farmers, regenerative standards would need to be flexible on the emphasis placed on “minimum tillage.”

#### Practices and Outcomes

	<p>There is some debate about whether regenerative agriculture should be practice-based or outcomes-based. The reality of outcomes-based programs is that they are difficult to implement, monitor, and maintain. Determining outcomes will require sampling, testing, interpretation of results, and monitoring that could be expensive and burdensome to agricultural businesses and regulators. It could even discourage adoption of regenerative agriculture. “Outcomes” would have to be determined across different crop types, geographies, soil types, environmental conditions and other factors, and those who judge outcomes will have to understand the nuances associated with different farming enterprises and what should be acceptable for those businesses. These difficulties will affect the sustainability of regenerative agriculture programs, and an outcomes-based approach is not recommended.</p> <p>Programs that are practice-based, like the National Organic Program, are more manageable and easier to regulate. They are also more stable than outcomes-based programs, and they are effective. We suggest that program requirements for regenerative agriculture be practice based with limited focus on specific outcomes. Regenerative practices that lead to resiliency in agricultural systems should be identified, and regenerative agriculture programs should focus on the implementation of those practices for different farming operations to the extent that they are applicable.</p>
5/29/24	<p>We are pleased to submit the following comments on behalf of Friends of the Earth and our 119,000 members in California and 4.7 million members and advocates nationwide. Friends of the Earth is the U.S. voice of the world’s largest network of grassroots environmental organizations, with groups in 74 countries. For more than 50 years, Friends of the Earth has worked at the nexus of environmental protection, economic policy, and social justice to fundamentally transform the way our country and the world value people and the environment.</p> <p>CDFA’s process to define “regenerative agriculture” has broad implications for the food system in California and nationwide. Stakeholders across the country – including policymakers, government agencies, and corporations – are watching California and tracking the outcome of this process. Policymakers and agencies at the federal and state levels may use California’s definition of regenerative as the basis for legislation or rulemaking. And as major players in the food system increasingly invest in “regenerative agriculture” programs, California’s definition will have implications across the marketplace. We ask the Work Group, the California State Board of Food and Agriculture, and CDFA to take seriously the reality that California’s definition will have wide-ranging impacts on policy and markets nationwide.</p> <p>We urge you to make organic certification the baseline for California’s definition of regenerative agriculture. Organic is a clearly defined, verifiable, and enforceable certification that has a proven track record of meeting the broadly defined goals of regenerative agriculture, as established by decades of research. These outcomes include:</p> <p>Prioritizing soil health:</p> <ul style="list-style-type: none"> <li>- Science shows all classes of pesticides widely used in conventional agriculture pose a grave threat to organisms that are critical to healthy soil and soil carbon sequestration.<sup>1,2</sup> Organic certification is the only food label that prohibits the use of all synthetic fertilizers and all classes of hazardous pesticides. Organic farmers are prohibited from using over 900 synthetic pesticides otherwise allowed in agriculture, even when terms like ‘regenerative’ or ‘sustainable’ are applied.</li> </ul>



- Organic producers foster soil health through legally required practices such as cover cropping, crop rotations, and the application of compost, mulch, green manure, or crop residues to build fertility.<sup>3</sup> Nearly 90% of organic farmers use cover crops, which help sequester carbon and prevent soil erosion.<sup>4</sup>

#### Improving resilience to climate change:

- Long-term trials show that organic fields have 30–50% greater soil aggregation, which increases water holding capacity, and ten times higher water infiltration than conventional fields.<sup>5</sup> Water conservation allows organic farms to be more resilient to the impacts of climate change, including drought.<sup>6</sup>
- Organic farming has been shown to yield more than conventional farming in times of weather extremes.<sup>7,8</sup> Over forty years of research from the Rodale Institute demonstrates that, in times of drought, organic yields are up to 40% greater than conventional yields.<sup>9</sup> Organic farms are better prepared for an increasingly unpredictable climate.

#### Improving soil carbon sequestration:

- The relationship between plant root systems and soil organisms is critical for carbon sequestration. Organic farmers protect soil organisms by eliminating toxic pesticides. Research shows that organic farms can store up to [25% more carbon in soil](#) and achieve [deeper, more persistent carbon storage](#) than conventional farms.<sup>10,11</sup>
- Trials conducted by the USDA found that organic farms can sequester, on average, 400-600 more pounds of carbon per acre than conventional farms, including conventional no-till farms.<sup>12,13</sup>

#### Reducing greenhouse gas emissions and energy use:

- A scientific review found that, on average, land in organic production emits 43% fewer greenhouse gasses than the same amount of land in conventional production.<sup>14</sup> Other research shows that organic farms emit less nitrous oxide, a greenhouse gas 298 times more potent than carbon dioxide. Conventionally managed soils release 56% more nitrous oxide on average than organically managed soils.<sup>15,16</sup>
- Synthetic pesticides and fertilizers, which are prohibited in organic agriculture, are derived from fossil fuels and are energy-intensive to produce.<sup>17,18,19</sup> A scientific review found that organic systems can significantly reduce energy use compared to conventional.<sup>20</sup>

#### Protecting biodiversity:

- On average, organic farms host 50% more organisms than conventional farms.<sup>21,22</sup> The increased populations of beneficial insects, birds, mammals, reptiles, and soil organisms on organic farms help manage pests without use of toxic pesticides.<sup>23</sup>
- Organic farms safeguard essential pollinators by not using neonicotinoids and other toxic pesticides. Pollinators like bees are the cornerstone of a dependable food supply – they're responsible for one of every three bites of food we eat.<sup>24</sup> Yet pollinator populations are in decline, in part because U.S. agriculture has become 48 times more toxic to pollinators and other insects since the introduction of neonicotinoid pesticides.<sup>25</sup>

#### Improving community health and well-being:

- Organic farmers protect people from unhealthy exposure to toxic pesticides. Decades of data show that pesticides can disrupt the healthy functioning of our bodies. Pesticide exposure is linked to cancers, asthma, neurological and reproductive disorders, and endocrine disruption.<sup>26,27</sup> Organic farming protects farmworkers, communities, and consumers from these harms. Children are most vulnerable to pesticide exposure, and repeated studies have shown that children who eat organic food as part of their diets have dramatically lower pesticide residues in their urine compared to those who eat conventional diets.<sup>27-29</sup>
- Organic farms stimulate local economies. Counties with high levels of organic agricultural activity are known as “organic hot spots.” Organic hot spots, on average, decrease county poverty rates and increase median household income.<sup>30</sup>

Organic certification is a robust way to verify practices on the ground, as a range of regenerative agriculture practices are legal requirements for certified organic farmers:

- Reduce tillage (or no-, minimal-, conservation-) - The standards state: “Tillage and cultivation practices must maintain or improve the condition of soil and minimize soil erosion” (7 CFR 205.203(a))
- Use cover crops - Required (7 CFR 205.203(b))
- Use crop rotations - Required (7 CFR 205.203(b))
- Use compost, mulch, green manure, or crop residues - Required (7 CFR 205.203(b) and 7 CFR 205.205)
- Protect/cover the soil - Required, though there is no specific requirement to keep soil covered (7 CFR 205.203(a))
- Ecological site-specificity - The regulatory definition includes site-specificity. “Organic production” is defined as “A production system that is managed ... to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.”
- Prohibit synthetic pesticides - Required (7 CFR 205.105(a))
- Prohibit synthetic fertilizers - Required (7 CFR 205.203)
- Prohibit genetically engineered seeds - Required (7 CFR 205.105(e))

Any meaningful definition of regenerative agriculture must include elimination of the use of toxic pesticides. As shown above, pesticides commonly used in California and across the U.S. undermine regenerative agriculture goals of protecting soil health and biodiversity, reducing GHGs and climate impact, and safeguarding community well-being.

California’s definition of regenerative agriculture must also prohibit genetic engineering (GE). To date, use of GE crops equals use of toxic herbicides. 98.18% of GE acreage in the U.S. is crops engineered to be tolerant to glyphosate, and increasingly also to glufosinate, dicamba, and 2,4-D.<sup>31</sup> While reducing tillage is recognized as a regenerative practice, the vast majority of no- and minimum-till farmers in the U.S. use toxic herbicides to terminate cover crops and control weeds.<sup>32,33</sup> These chemicals are associated with significant harm to soil organisms that are central to regenerative agriculture.<sup>34,35</sup> (Of note, the impact of tillage on the soil greatly depends on the depth and type of tillage that is selected, frequency of tillage, and other practices that are used in the overall farming system. Organic farmers often use tillage as part of a holistic management system that is able to improve and regenerate soil.)

	<p>What's more, a novel suite of products derived from genetic engineering are being developed and deployed in agriculture, including GE insects, GE soil microbes, and gene-silencing pesticides. Scientists and independent experts have raised a range of genetic, ecological, and public health risks associated with these technologies.<sup>36,37,38</sup></p> <p>CDFA should use a definition of genetic engineering rooted in the definition of modern biotechnology from the Codex Alimentarius of the United Nations Food and Agriculture Organization that includes both conventional genetic engineering and gene editing techniques. Making organic the baseline of regenerative agriculture would successfully exclude these harmful technologies, as all genetic engineering is prohibited in organic production.</p> <p>In conclusion, decades of research demonstrate that organic is a leading form of regenerative agriculture. Defining regenerative agriculture separately from organic risks confusing consumers, eroding trust in the organic seal, and undermining California's well-established organic market – California accounts for 36% of nationwide organic sales. A definition using organic as the baseline will help advance California's sustainability, equity, and economic goals, and set a strong precedent for stakeholders that are watching across the nation.</p>
5/29/24	<p>I believe that "Regenerative Agriculture" must start with a baseline that has been tried and is trusted for over 40 years: Organic. We must build upon this solid foundation to increase awareness of the practices that are proven to capture carbon, increase biodiversity, reduce/eliminate inputs, BUILD SOIL ORGANIC MATTER, increase farmer productivity and profits. We need to build upon and improve animal welfare standards. We need to build upon and improve social fairness and labor practices. We need to build upon and respect indigenous knowledge. We need to farm with reverence to the context of place; land, water, community (all species).</p> <p>Consumers know organic, consumers trust organic. Organic needs to become the standard available food, fuel, fiber through adequate funding, government and NGO support. Growers who are able can constantly improve upon their practices. There needs to be adequate education opportunities.</p>
5/29/24	<p><u>Narrow definition versus broad definition:</u> "Regenerative agriculture" has a history and has been around for decades. The Rodale Institute prompted it as "regenerative organic farming," because not all organic practices are regenerative. John Jeavons of Biointensive Agriculture preached "We practice an agriculture that does not work in terms of soil." Regenerative agriculture, in its narrow sense, has always focused on soil.</p> <p>Why? About four of every five animals that walk the earth are nematodes, and many of the genera inhabit the macropores in soil, living inside water bubbles, and the plow destroys those macropores, not only pulverizing the watery dens but smashing them with plow pans, as tires do too. A Yolo County extension person told me that the march to extinction of anecic worms by the plow has only been rivaled by bison's march to extinction. Soil has a half-life, a half-life of fertility, and the death process is ongoing on every farm; thus, the need for regeneration.</p> <p>However, the notion has been co-opted by many speakers at your sessions to mean something else, the broader definition which is the spitting image of the dream of the USDA's <b>1948 Yearbook of Agriculture</b>, but the language has</p>

changed a whit we have added climate change to the reinvented wheel of agriculture. RE- derives from classical languages, Greek and Latin, and it means a sense of "back or again" and GENERATE comes from Greek, meaning born - the co-opted definition could be dubbed with accuracy "born-again agriculture."

Many of the comments so thus far received share a peephole at farming. True, USFS research shows all soils, forest and field, to be deficient in its historic endowment of pyro carbons (biochar components) and the the USFS recommends that we make biochar with Charbosses and Carbonator kilns and market the product to farmers to regenerate the missing mineral. That's a science-based practice as well as an indigenous cultural practice. The overview is missing, because the speakers who contribute are uninformed - they haven't bothered to do their homework - the detailed study and research that's needed for a replete and comprehensive viewpoint.

Status-quo draft definition: I thought one speaker hit the mark with his criticism of an "outcome-based" definition versus a "practice-based" definition. Practices (BMPs) are the heart of what we do and don't do. The draft definition says "practice selection is based on the best available science for that production system and the measurement of outcomes." I've seen this before - it's called adaptive management, and the US EPA uses it over and over again for regulation. It's a cybernetic process - set your goal (science), apply your BMP (science) and monitor (test the outcome." In fact, the EPA manual for regulators on soil is online: ***National Management Measures for the Control of Nonpoint Pollution from Agriculture.*** It's another reinvention of the wheel

Some of the principles have filtered down into law. For example, Calaveras County was declared Phase II Community by the EPA and consequently adopted rules, requiring farmers to use "Natural Resource Conservation Service" and "[UCCE] Extension" BMPs. The term BMP first appeared in CZARA, and coastal farms have had to consider practices for decades. The NRCS devised a code of standards for BMPs - CPS's - and I bet 1% of the speakers have studied the CPS codes. For example, to prevent stream erosion, the choices of BMPs include riprap, live-staking, vegetation, gabions, cribbing, etc. People who see a fence or a farm gate never think that these devices are CPS's - "access control" practice standard devices, formerly called "use exclusion" b the NRCS. A definition of regenerative may have to include notions of coded and uncoded CPS's.

Myths: I was appalled by the conceit of some comments, like the fellow who talked nonsense "...the ecosystems on our ranches..." He was talking crop fields as if they were fully fledged ecosystems. In wild nature, plants capture sunshine and minerals and store it as biomass - water is a mineral. Nature has a built-in intelligence ins eeds so that selection occurs - the right gene pool in the right niche, so to speak. We eradicate the natural order and fill the niche with crop plants. Decades ago, a Swiss journal ***Environmental Conservation*** drew a line of distinction between a genuine ecosystem with all its working parts and an "eco-complex" which is a hodge-podge of plants. In 1894, an American biologist defined ecology as (the science of) a collection of plants and animals - that's no longer the case. By the 1940's British ecologist Arthur Tansley redefined ecology in terms of energy flow - as Aldous Huxley phrased it "how plants and animals make a living.' Food pyramids" and "food chains," you recall. Since then, the concepts have been refined. Eugene Odum, a famous name in ecology, defined it as "structure and function." "disturbance" biology coined the word resilience - how well a plot of land rebounds from disturbances like floods, fires, plows, chainsaws, etc.

The NRCS once defined soil health as the ability to renew without interventions. Crops and farms ask the land for more than it can give, so renewal means amendments. The Water Board requires farmers who irrigate to fertilize exactly as needed - as well as other states that adhere to nutrient budget designs - BMPs that require a measurement of left-over nitrogen in the soil, a measurement of nitrogen in the water used for irrigation, an estimate of the yield to be harvested so that so that no overfertilization or under fertilization occurs. Estimate the N needed, subtract the N in the soil and the N to come about with irrigation, and fertilize accordingly. Is this regenerative?

Perhaps sustainability has an angle - no half-life to the soil and its fertility. A farmer uses the soil to grow crops without using it up. Rodale Institute manages their acres closing the loop, adding what is taken away in nutrients by fertilizing with manures and organic products. The American Society of Agronomy has a webinar series on sustainable agriculture, and in the first webinars of the series, a speaker points out that tillage is culpable. It isn't needed, it lends the soil to erosion, decimates the soil life, wastes macropores and micropores - but no-till works with conventional herbicides but not so well with organic methods. A truly regenerative, sustainable agriculture has not been engineered, devised or developed yet. It's all still on the drawing board.

The commenters all deride synthetic without realizing that Organic can use synthetics as a last resort if they preplan it in the OSP, Organic System Plan. And tillage may be worse than synthetics, though probably not, and concentration levels of natural substances used in organic agriculture are equally bad as synthetics, though such pesticides are unlikely to persist.

Another point to be made - how do we regenerate soil after draft and dry depositions. In 1995 **Science** reported on pesticides found in Siskiwit Lake, an isolated lake on an island national park that never saw industry, sitting in Lake Superior, the cleanest great lake. PCBs, Toxaphene, etc - mercury, a former seed fungicide - dieldrin, DDT - all this stuff in layers after 1940 falls from the sky and persists in fields. Scientists cored the Arctic ice and found toxaphene in layers after 1940 - I never knew that cotton grew in the Arctic! Regenerative has to recognize the evolving state of soil on the farm and forest - the constant rain of chemicals. The National Park Service, in its WACAP study, found tissues of high-elevation brook trout infused with mercury, dieldrin and DDT, sometimes at levels higher than the EPA permits in fish for eating.

So far, the commenter and speakers who delved into the definition of regenerative agriculture seemed to me to be naive. They like to remake farming in another image, but they are clueless on how to remake soil.

Confusion: Sustainable farming means the farm continues its product 500 years from now, not harming soil, or water (environment) communities (equity) and the bottom-line of growers (economics). What are the principles of regenerative agriculture - how does a farmer stop erosion, manage nutrient cycles (like cadmium in rock phosphate fertilizers), prevent drift and atmospheric depositions of chemicals, maintain pure and wholesome food, be self-sufficient energy-wise, cope with climate change and remain a part of the ecosystem that the farm was carved out of. That the broader scope and meaning of regenerative agriculture, a pipedream on the table, not a practice on the soil.

	<p>A definition is one thing, putting it on the ground is another. I don't envy the task of the panel, and I don't see how you all can do it. Regenerative is a term often used in contrast to extractive, but all farms to some degree are extractive. Nonsense like nutrient density being a feature of organic is false - hydroponic, now certified organic in some places, swells tomatoes twice soil-based organic tomatoes - with water! Somehow, I see this effort going nowhere, except to rehash the past history in a born-again vocabulary that enables greenwashing. A ceiling on population is the most sensible thing to do - shrinking agriculture's footprint in a world bloating in population is impossible. As Dr Sandler, former medical director of NASA once said to a student who begged to know why he spent his MD career with the space program, "Space is our last hope for a clean environment." That is a kind of optimism, and it may be the kind of optimism that has to define regenerative agriculture.</p>
5/30/24	<p>I am concerned that “regenerative” agriculture, which is widely considered to be a solution for reducing or even reversing climate change, will have negative impacts if not properly defined. Unfortunately, a movement by promoters of chemical-intensive agriculture has fooled some environmentalists into supporting toxic “regenerative” agriculture. The so-called “regenerative agriculture” promoted by these groups ignores the direct climate impacts of nitrogen fertilizers, the damage to soil health caused by pesticides and chemical fertilizers, and the fact that pesticide and fertilizer manufacturing is dependent on fossil fuels—as key ingredients as well as for the heat and energy driving chemical reactions. It is important to see through this deception.</p> <p>The climate crisis and the devastating decline in biodiversity are escalating because of uncontrolled and unnecessary reliance on toxic chemicals. These threats to life require a meaningful holistic strategy to end our fossil fuel dependence and use of materials that release harmful levels of noxious gases (including greenhouse gases).</p> <p>Agriculture must—across the board and on an expedited five-year schedule—shift to organic practices. Organic practices both sequester carbon and eliminate petroleum-based pesticides and synthetic fertilizers. Importantly, the data show that organic agriculture now operates without sacrificing productivity or profitability. While the vested economic interests in the petroleum and chemical industry cling to the status quo, there are good jobs and money to be made in a green economy.</p> <p>We need a national plan to shift to 100% organic farming. Organic land management is more effective at reducing emissions and sequesters carbon in the soil. There is already a national program for certifying farms that meet organic standards. Organic operations must “comprehensively conserve biodiversity by maintaining or improving all natural resources, including soil, water, wetlands, woodlands, and wildlife.”</p> <p>Undefined “regenerative” agriculture falls short by ignoring the direct climate impacts of nitrogen fertilizers, the damage to soil health and ecosystem services caused by pesticides and chemical fertilizers, and the fact that pesticide and fertilizer manufacturing is dependent on fossil fuels—as key ingredients and for the heat and energy-driving chemical reactions.</p>

	<p>We need a national land management plan. Preserving natural land increases biodiversity, reducing dependence on petroleum-based pesticides, and is more effective in sequestering carbon. Biodiversity buffers against damage from climate change—for example, by protecting shorelines from storm damage.</p> <p>Preserving natural lands and transitioning farms to organic production should be the cornerstones to combating climate change.</p>
5/30/24	<p>Regenerative Agriculture excludes any production system where the following issues are present:</p> <p>Soil fertility based on synthetic nitrogenous fertilizers. Frequent cultivation tillage in field crops and bare soil in orchard and vineyards. Little or no crop rotations or cover cropping. Pest management based on highly toxic materials that have the potential to move off target. Pest management that is not based in an Integrated Pest Management approach. Irrigation practices that ignore natural water cycles, deplete aquifers, create salinity impaired soil and cause water quality concerns. Irrigated crops that rely on interbasin water transfers, especially if the end commodity is consumed outside of either basin. Where there is no systems approach to including and enhancing biodiversity above and below soil. Production systems that depend in some degree on a work force that lacks legal status. Crops where the scientific consequences agrees that the that processed form that it is consumed is toxic to humans. Such as alcoholic products and most likely, cannabis.</p> <p>To define what is regenerative agriculture will take a great deal of consensus building to create an actual definition. An after a definition is agreed upon it will take a tremendous amount of science to develop biological based production methods that build soil, sequesters carbon, and rebuilds other ecosystem services.</p> <p>Multi-national food companies and consumers are willing to spend extra money to support regenerative agriculture. Governments are willing to spend public money to support regenerative agriculture. And markets are being formed for various schemes to support regenerative agriculture. All these efforts should be based on a definition of regenerative agriculture that is regenerative to the earth and biodiversity.</p>
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