



# Organic Management Practices Ensure a Sustainable Future

## FIGHTING FOR A LIVABLE PLANET: ECOSYSTEM CONSERVATION

What sets organic apart from current conventional thinking and practice is its systems approach. As a land management practice, it relies on an appreciation and understanding of the value of soil health and biodiversity. With methods that incorporate the importance of soil organic matter and the role of soil organisms in breaking it down to produce nutrients for the plant, the organic system is resilient, retains moisture, and sequesters carbon. Only soil supplements and pest management materials or substances are allowed to be introduced

into the system under federal organic standards if they are evaluated as compatible with the soil system, do not endanger health, and are deemed essential. In this context, new products (whether biological or synthetic) cannot be used as substitute inputs in an otherwise conventional system that does not implement an ecological-based approach to soil management.

The studies in this section address a range of scientific reviews over 2021 that explore the various dimensions of organic, with significant research on emerging biological controls. Studies range from the health of the environment to

human health and diet. One study finds that organic food consumption among children is associated with higher scores measuring fluid intelligence (problem solving and abstract thinking) and working memory.

Because “sustainable” agriculture is not defined with the legal restrictions of certified organic, research on the use of glyphosate-based herbicides (GBHs) provides an important framework for measuring whether inputs like these fit into a sustainable system. According to researchers, “[W]hether or not GBHs are viewed as essential or unessential to contemporary agriculture, and notwithstanding their role in non-tillage agriculture, this study shows that glyphosate-based herbicides do not reach the bar of agricultural sustainability, with respect to humans and the environment, making the system they are part of unsustainable.” Applying these findings more broadly, this research suggests that many self-identifying their practices as “regenerative agriculture” are not sustainable, unless they adhere to organic methods.

Organic is continually improving and being challenged. A summary of a lawsuit is included in this section about USDA allowing certain hydroponic systems to be labeled organic. To many, if not most, among the early adopters and pioneers in organic, it is counterintuitive to call a soil-less system organic, no matter what materials are used. That is not to say, that these hydroponic systems do not have value.

However, because the soil system and goal of enhancing biodiversity are central to the underlying values and principles of organic, a different label seems warranted. If nothing else, existing hydroponic crops that display the organic seal should be fully transparent with supplemental labeling so that consumers can make informed choices in the marketplace.

Organic standard setting was envisioned as providing for continuous improvement, democratic input, and full transparency. There are important opportunities for the public to engage with the organic rulemaking process to ensure that the National Organic Standards Board and the USDA National Organic Program uphold the values and principles of organic. Visit Beyond Pesticides’ *Keeping Organic Strong* webpage at [bp-dc.org/keepingorganicstrong](http://bp-dc.org/keepingorganicstrong) to plug into the issues before the Board.

With ongoing developments, such as new research on nontoxic methods to manage fungus, as referenced in this section, and given the existential crises on the horizon, EPA must evaluate the reasonableness of using toxic chemicals and fossil fuel-based materials when evaluating pesticide registrations. EPA can evaluate systems in which pesticides are used and with the available science determine whether there is an unreasonable built-in pesticide dependency resulting in adverse health and environmental effects that can be replaced by an organic system without the harm.

## Researchers Find Nontoxic Method Kills a Problematic Fungus When It Least Expects It

**MARCH 17, 2021** | Ultraviolet radiation (UV-C) applied at night can successfully kill powdery mildew in farm fields, providing a potential route to significantly reduce the use of toxic fungicides, new research published in the [Plant Disease](#)

finds. “UV treatments applied once or twice weekly were as effective as the best available fungicides applied on similar schedules for control of strawberry powdery mildew,” study author Natalia Peres, PhD, of the University of Florida, said. “It’s not a one-time fluke.” The results are encouraging and have the potential of reducing fungal pressure through nontoxic means, but like all pest management tools should be



used as part of a system that focuses first and foremost on fostering healthy soils and biodiversity.

Powdery mildew is a fungal pathogen that can infect a range of plants, from cucurbits to grapes, apples, onions, and cannabis. For the study, the primarily Florida-based researchers focus on the state's \$300 million strawberry industry. Powdery mildew is often facilitated by high humidity and can be exacerbated when crops are grown in tunnels or other enclosed areas due to lack of airflow and poor ventilation. The fungus presents as a white powder on the surface of plant leaves and can spread through the production of asexual spores. There is a range of methods currently in use to fight powdery mildew. Conventional



fields are more likely to apply synthetic fungicides such as [myclobutanil](#), [quinoxifen](#), or [azoxystrobin](#). Organic growers often use softer, less hazardous products like horticultural oils and [bicarbonates](#). All growers are generally encouraged to plant cultivars that have been bred to be more resistant to powdery mildew. Although small scale farmers and gardeners have a better opportunity to practice mechanical and cultural controls, such as removing diseased leaves and thinning out susceptible plants, these approaches can be more difficult to implement on a larger scale.

Researchers tested the efficacy of UV-C light by affixing a series of light panels to a platform that was pulled behind a tractor over rows of strawberry plants. The light applications took place at night, because powdery mildew evolved to withstand the UV

rays within natural sunlight. However, it seems as though that adaptation also made the pathogen more susceptible to UV light at night. [Onofre, Rodrigo et al. Use of Ultraviolet Light to Suppress Powdery Mildew in Strawberry Fruit Production Fields. *Plant Disease*. 105(9):2402-2409, 2021.]

## Court Rules Soil-Less Hydroponics Allowed under Organic Standards, Organic Farmers/Consumers Say No

**MARCH 26, 2021** | Certified organic, soil-based growers were dealt a blow on March 22 when a [U.S. District Court](#) in San Francisco ruled that soil-less hydroponic growing operations can continue to be eligible for USDA (U.S. Department of Agriculture) organic certification within the National Organic Program (NOP). According to the [Center for Food Safety](#) (CFS), the judge ruled that USDA's exemption of hydroponics from the "soil fertility requirement mandatory for all soil-based crop producers was permissible because the *Organic Foods Production Act* did not specifically prohibit hydroponic operations." The litigation was brought by eight organic producers and asked that the court prevent USDA from allowing hydroponically grown crops to be sold under the USDA certified organic label. Beyond Pesticides has advocated against allowing [soil-less crop production](#) to be certified as organic under NOP because doing so "undermines the authenticity of organic farming, and creates unequal competition, market instability, and consumer distrust in organic certification." The coalition of plaintiffs in the suit includes some long-standing U.S. organic farms, such as Swanton Berry Farm, Full Belly Farm, Durst Organic Growers, Terra Firma Farm, Jacobs Farm del Cabo, and Long Wind Farm, in addition to organic stakeholder organizations, such as organic certifier OneCert and the Maine Organic Farmers and Gardeners Association.



Basic definitions are in order: USDA's [National Organic Program](#) is the federal program that develops and enforces standards for organically produced agricultural products. The [National Organic Standards Board](#) (NOSB), a committee appointed by the Secretary of Agriculture, is tasked with helping develop standards for what can and cannot be used in organic production, and to advise the Secretary of Agriculture on implementation of the [Organic Foods Production Act](#) (OFPA). The National Organic Standards (NOS) are those developed by NOSB to regulate certified organic production practices. OFPA is the statute that authorizes both the NOP and NOSB. Also: hydroponic "farming" systems grow plants in water-based nutrients rather than in soil. Aquaponic systems combine hydroponics and aquaculture (fish/shellfish farming) in a symbiotic system in which plants are fed, in part, the aquatic animals' waste.

The [District Court's ruling](#) by Chief Judge Richard Seeborg means that USDA can continue its permitting of organic certification of hydroponically produced crops. The question of hydroponic and aquaponic eligibility for organic certification has been very controversial, and centers on the very definition of organic production, which recognizes the foundational role of regenerative practices that improve soil health and promote ecological balance. Advocates for soil-based organic agriculture decry soil-less farming as violative of not only the dictates of the National Organic Standards, but also, the long-acknowledged principles of the organic movement.



## Glyphosate-Based Herbicides and Sustainable Agriculture Do Not Mix!

**APRIL 29, 2021** | Glyphosate-based herbicides (GBHs) are incompatible with sustainable agriculture goals, according to a recent scientific literature analysis in *Sustainability* by scientists at Tufts University. Glyphosate is the most commonly used pesticide active ingredient worldwide, appearing in many herbicide formulas, including Bayer's (formerly Monsanto) Roundup™. The use of this chemical has been increasing since the inception of crops genetically modified to tolerate glyphosate. However, studies demonstrate glyphosate is the main contributor to human, biotic, and ecosystem harms as toxicities from herbicides are now double what it was in 2004. The National Academy of Sciences identifies four goals of sustainable agriculture—productivity, economics, environment, and social well-being for future generations. However, pesticides like **glyphosate** are ubiquitous in the environment, putting the health, economy, and food/resources for future generations at risk. Therefore, research like this is vital to understanding how chemical use can undermine sustainable agriculture goals to protect humans, animals, and environmental health.

Researchers note, “[W]hether or not GBHs are viewed as essential or unessential to contemporary agriculture, and notwithstanding their role in non-tillage agriculture, this study shows that glyphosate-based herbicides do not reach the bar of agricultural sustainability, with respect to humans and the environment, making the system they are part of unsustainable.”

Researchers thoroughly examined ~3,000 scholarly sources to analyze whether GBHs meet sustainable agriculture goal standards. Scientists noted any impacts

GBHs applications have on human health, non-tillage agriculture, soil quality, aquatic ecosystems, and beneficial/non-target species. Researchers used various viewpoints on agricultural sustainability as a guide for sustainability standards:

- “Promoting agroecology [ecological processes in agriculture systems].
- Protecting the resource base of natural systems for future generations, including and especially the soil.
- Protecting biodiversity.
- Enhancing the quality of life and health of farmers, farmworkers, and society as a whole.”

This paper finds that GBHs do not contribute positively to sustainability, violating enough criteria to make conventional agricultural systems using GBHs unsustainable. Studies regarding “glyphosate toxicology” have been increasing since 2005. According to the International Agency for Research on Cancer (IARC), glyphosate is “probably carcinogenic in humans,” therefore, GBH use decreases the quality and health of farmworkers and society. Although studies demonstrate the starkest example of GBH toxicity among animals, indicating a risk to humans, many *in vitro* studies provide evidence that GBHs are toxic to human cells. Further, the review finds ingredients in Roundup™ are just as toxic as glyphosate itself, causing DNA damage at low concentrations. Thus, various formulas of GBHs can have devastating effects on human health. [Krimsky, Sheldon. Can Glyphosate-Based Herbicides Contribute to Sustainable Agriculture? *Sustainability*. 13(4):2337, 2021.]



## Conventional Meats Contaminated with Multidrug Resistant Bacteria at Significantly Higher Rates than Organic Meats

**MAY 18, 2021** | Organic meat is far less likely to be adulterated with multidrug resistant bacteria (MDRB) than conventional meat, according to a study in [Environmental Health Perspectives](#). The research by experts at Johns Hopkins Bloomberg School of Public Health is the latest news on the health and safety benefits of choosing organic, which prohibits the regular use of risky antibiotics, for one's food purchases. Scientists indicate that contaminated foods pose serious dangers for consumers, public health, and the economy at large. "The presence of pathogenic bacteria is worrisome in and of itself, considering the possible increased risk of contracting foodborne illness," senior author [Meghan Davis, PhD](#), associate professor at the Bloomberg School said. "If infections turn out to be multidrug resistant, they can be more deadly and more costly to treat." To determine the level of contamination in various packaged meats, scientists turned to the National Antimicrobial Resistance Monitoring System (NARMS), a collaborative program between the U.S. Centers for Disease Control and Prevention, the U.S. Food and Drug Administration (FDA), and the U.S. Department of Agriculture. For a five-year period spanning 2012–2017, NARMS collected meat products (chicken breast, ground beef,

ground turkey, and pork chops) from 19 different U.S. states. Within each state, NARMS selected a random food retailer within 50 miles of their lab and collected 40 samples each month. In sum, 39,349 meat samples were analyzed for the study, encompassing 216 conventional meat processors, 123 processors that split their operations between organic and conventional, and 3 fully organic processing facilities. Roughly 8% of tested samples were organic, while the rest were conventional. Of the nearly 40,000 samples analyzed, 1,422 (3.6%) were contaminated with MDRB. Organic meats had 29 of their 3,235 samples contaminated (.9%), while with conventional produce 1,393 out of 36,114 samples (3.9%) contained dangerous antibiotic resistant bacteria. This translates to organic certified meats being 56% less likely to be contaminated with MDRB. A deeper look into the data shows overall contamination lower at facilities that split conventional with organic production, when compared to those that only process conventional meats. Conventional meats from pure conventional facilities were likely to be contaminated with pathogenic bacteria roughly a third of the time (34.1%), while conventional meats from split facilities only had a roughly one in four chance (24.1%). "The required disinfection of equipment between processing batches of organic and conventional meats may explain our findings of reduced bacterial contamination on products from facilities that process both types of meats," Dr. Davis notes. Organic is not safer by chance, but by design. Organic standards, governed by the [Organic Foods Production Act of 1990](#), were crafted with the goal of protecting public health and ecosystem services. Organic standards prohibit the use of antibiotics in poultry after their first day of life. Antibiotics for the purpose of stimulating the growth or production of organic livestock are prohibited. If an antibiotic is used to restore an animal to health, that animal cannot be used for organic production or be sold, labeled or represented as organic. (Livestock in herds newly converted

to organic management may have been treated up to the third trimester.) Organic certified meats are also required to follow a stricter processing protocol, and in split operations organic meats cannot be processed on the same equipment as conventional meats without first undergoing cleaning and disinfecting. [Innes, Gabriel et al. Contamination of Retail Meat Samples with Multidrug-Resistant Organisms in Relation to Organic and Conventional Production and Processing: A Cross-Sectional Analysis of Data from the United States National Antimicrobial Resistance Monitoring System, 2012–2017. *Environmental Health Perspectives*. 129(5), 2021.]



## Coffee Leaf Rust Hits Hawai'i, Emergency Fungicide Approved, Hyperparasite Biocontrol Possible

**MAY 26, 2021** | Coffee leaf rust, caused by a fungus that can devastate fields of coffee plants, and the coffee industry of entire countries, was recently detected on the Hawaiian Islands for the first time. The U.S. Environmental Protection Agency (EPA) acted quickly to approve the emergency use of a [synthetic fungicide](#), but [new research](#) conducted in the fungus's home range shows the promise of a hyperparasite biocontrol. Caused by the fungus *Hemileia vastatrix*, [coffee leaf rust](#) was first documented in its home range of Africa in the 1860s. By the later part of that decade, it had spread to Sri Lanka, and destroyed the country's monoculture coffee plantations, which were subsequently replaced with tea cultivation. The disease has now

been found in every coffee producing country, but up until late last year, it had never been seen on the Hawaiian Islands.

Thus, Hawaiian coffee farmers are rightly concerned about the disease. In response, EPA permitted the use of a product called *Priaxor Xemium*, a fungicide consisting of the active ingredients fluxapyroxad and [pyraclostrobin](#), which has been linked to birth and developmental effects, and presents significant hazards to birds and aquatic organisms. “Hawai’i coffee growers now have an added method to combat the coffee leaf rust, which is extremely difficult to manage,” said Phyllis Shimabukuro-Geiser, chairperson of the Hawai’i Board of Agriculture. But while conventional chemical growers may opt to spray hazardous pesticides, organic farmers will look toward less toxic methods of management.

A new study published by researchers from Sweden and Ethiopia in [Agriculture, Ecosystems & Environment](#) identifies a potential biological control of *H. vastatrix* in Southwestern Ethiopia, the home range of Arabica coffee and its fungal disease. Sixty sites, consisting of 50 by 50m (164 x 164 ft) plots, were analyzed in the region over the course of three years. The sites varied in the level of management intensity, amount of shade provided the coffee plants, and the ecological characteristics surrounding the farmland. Researchers aimed to catalog the interaction between *H. vastatrix* and another fungus known as *Lecanicillium lecanii*. *L. lecanii* is considered a “hyperparasite,” in that it is a parasite that attacks another parasite. Scientists know that the hyperparasite controls the rust fungus, but are not aware how widespread it is distributed, the conditions in which it thrives, and whether it may be able to play a role in suppressing the rust in commercial production. [Zewdie, Beyene et al. Temporal dynamics and biocontrol potential of a hyperparasite on coffee leaf rust across a landscape in Arabica coffee’s native range, *Agriculture, Ecosystems & Environment*, Volume 311:107297, 2021.]



## Kids Who Eat Organic Food Score Higher on Cognitive Tests, Study Finds

**JULY 7, 2021** | Organic food consumption among children is associated with higher scores on tests measuring fluid intelligence and working memory, research published in the [Environmental Pollution](#) finds. The study, conducted by Spanish researchers based at the Barcelona Institute for Global Health, took an exposome approach to environmental exposures, looking at a totality of all environmental hazards that children encounter, rather than investigating individual lifestyle factors one by one. As study coauthor Jordi Júlvez, PhD, notes, “Healthy diets, including organic diets, are richer than fast food diets in nutrients necessary for the brain, such as fatty acids, vitamins and antioxidants, which together may enhance cognitive function in childhood.”

Researchers began their study by selecting mother-child pairs enrolled in the [Human Early-Life Exposome \(HELIX\) Project](#), a pan-European study with projects in multiple European countries. Nearly 1,300 healthy children aged 6–11 were included in the study, as researchers already had pregnancy data and urine samples stored on the participants. To determine other environmental exposures, home addresses were evaluated for their level of pollution and proximity to natural spaces, and children and their mothers were given tests that included a questionnaire on lifestyle factors, including parents smoking and alcohol use, the indoor environment, the child’s diet, physical activity, and other habits. Both computer and clinical tests were conducted to determine fluid intelligence, attention function, and working memory, scored together as cognition.

Researchers find that children who eat organic food display higher scores measuring fluid intelligence and working memory. Lower scores on fluid intelligence tests were associated with children’s fast food intake, house crowding, and exposure to tobacco smoke. Lower scores on working memory tests were associated with exposure to poor indoor air quality. [Julvez, Jord et al. Early life multiple exposures and child cognitive function: A multi-centric birth cohort study in six European countries, *Environmental Pollution*, 284:117404, 2021.]



## Multi-Crop (Mixed Culture) Farming Practices Promote More Fruitful Farmland than Single-Crop (Monoculture)

**JULY 15, 2021** | A study published in *Nature Plants* finds multi-crop (mixed culture) farmlands, which include a diverse array of crops, produce higher biomass and seed yields than single-crop farms (monocultures). Monocultures are most prevalent among arable farmland, as commercial industrial farming uses this practice to increase sowing, managing, and harvesting efficiency for higher yields. However, lower crop diversity leads to higher, more intensive pesticide use as [pests favor](#) the consistent food availability monocultures provide. An increase in toxic chemical use threatens human, animal, and environmental health, as well as food security. Ecological research already finds a positive association between plant diversity and biomass productivity in grasslands and meadows. In addition, a University of California, Santa Barbara study demonstrates that crop diversity in commercial agriculture is just as essential to supporting a stable biological system as plant diversity on non-commercial landscapes (i.e., [grasslands/meadows](#)). Therefore, this research highlights the need to develop policies that help farmers and global leaders make more knowledgeable decisions regarding crop diversity to sustain yield without toxic pesticides. The researchers note, "While crop diversification provides a sustainable

## Researchers Develop Pesticide-Free, Mosquito-Proof Clothing

**JULY 27, 2021** | Researchers at North Carolina State University reported in a study in *Insects* that they have developed pesticide-free clothing able to prevent 100% of mosquito bites for the wearer, and published proof of the garment's effectiveness. If able to be scaled at a commercial level, the fabrics have the potential to transform personal protective measures for mosquitoes, which often includes well-meaning consumers spraying toxic pesticides like [DEET](#) and [permethrin](#) on their body and clothing. "The fabric is proven to work—that's the great thing we discovered," said study coauthor Andre West, associate professor of fashion and textile design at NC State and director of Zeis Textiles Extension for Economic Development, in a [press release](#). "To me, that's



revolutionary. We found we can prevent the mosquito from pushing through the fabric, while others were thick enough to prevent it from reaching the skin." To create the mosquito-proof fabric, scientists turned to physics and mathematical models, rather than looking for new killer chemistries. "Our premise here is: why do we need an insecticide-treated textile when you can do it, now that you know a mathematical formula, without chemistry?" said Michael Roe, PhD, an N.C. State professor of entomology, to the *News and Record*. Scientists analyzed the mosquito's morphology, looking for weaknesses that could be addressed by various textiles. Measurements were taken on the mosquito's head, antenna, proboscis, and other mouth parts. Then, textile models with differing pore sizes and thicknesses were developed to address different aspects of the mosquito's morphology. One had pores small enough to stop the proboscis from entering the skin, another stopped the mosquito from getting its head close enough to the skin, and the third had larger pores but was thick enough to stop skin contact.

Scientists then developed three fabrics based on the models to test in the real world. One was a superfine knit, another was knit, double layered and bonded, and the last fabric was a knit three-dimensional fabric, and thus thicker than the other two. Lab testing found that the fabrics developed by researchers provided bite resistance of 95% or greater. Scientists then compared the success of their model textiles to the use of permethrin-treated clothing, a common insecticide that, despite being classified as having suggestive evidence of [carcinogenicity](#), is often impregnated in or sprayed on to clothing in an attempt to ward off mosquitoes. Results show that while the pesticide-free woven textiles maintain bite resistance to 95%, permethrin treated clothing's bite resistance was as low as 80%. Although more mosquitoes landed on the woven clothing, fewer were able to penetrate and reach the skin. [Luan, Kum et al. Mosquito-Textile Physics: A Mathematical Roadmap to Insecticide-Free, Bite-Proof Clothing for Everyday Life. *Insects*. 12(7):636, 2021.]

measure of agricultural intensification, the use of currently available cultivars [(plant varieties for selective breeding)] may compromise larger gains in seed yield. We, therefore, advocate regional breeding [programs] for crop varieties to be used in mixtures that should exploit complementarity [(harmonization)] among crop species.”

It is critical for plants to allocate resources for reproduction or seed-bearing. This allocation of resources for reproduction is a trait known as the harvest index in the agricultural context, which determines how plant biomass converts to seed yield. Hence, this study aimed to assess seed yield and biomass differences between monoculture and mixed culture farming. To do this, researchers replicated a general garden experiment in Switzerland and Spain at two soil fertility levels (unfertilized and fertilized) and four plant diversity levels. Researchers tested eight annual grain crop species: wheat, oat, quinoa, lentil, blue lupin, camelina, linseed, and coriander. The seeds of each crop were planted in alternating, parallel rows 12 centimeters apart and grown without pesticides. Researchers compared the results of 24 different two-species and 16 different four-species mixed cultures to monocultures and a singular, isolated plant. Overall, the results demonstrate that mixed cultures produce higher yields than monoculture farming. In mixtures of two crops, seed yields increase by 3.4 percent in Spain and 21.4 percent in Switzerland. In four-species combinations, seed yield increases 12.7 percent and 44.3 percent in Spain and Switzerland, respectively. Although seed yield was lower than expected relative to vegetative biomass in Spain, seed production remains higher among mixed cultures. [Chen, Jianguo et al. Diversity increases yield but reduces harvest index in crop mixtures. *Nature Plants*. 7: 893–898, 2021.]



## Nematodes Show Promise as Biological Control Agent for Non-native Fire Ants

**AUGUST 3, 2021** | Research published in *iScience* outlines a promising, pesticide-free approach to manage non-native fire ants that have invaded many coastal communities along the eastern U.S. As unabated climate change rapidly warms the planet, shifting wildlife habitat, and increasing the rate of intense storms and other natural disasters, pest insects like the fire ant are finding favorable conditions for their expansion into new areas. With pressure growing on land managers to resort to highly toxic pesticides to manage stinging and biting pests, it is increasingly important to invest in and emphasize new biological-based approaches. Scientists from the University of Maine focused in on a strain of fire ants known as *Myrmica rubra*, native to Europe and Asia and commonly known as the European fire ant. The ant is highly aggressive, attacking humans or other animals when disturbed, and boasts a powerful sting. In Europe, the ant plays an ecological role in conserving an endangered species of *Maculinea sp.* butterflies. The butterfly larvae send out chemical signals that mimic a queen ant, and the fire ants take the larvae into their nest. There, the larvae are protected from predators, and often are provisioned by or feed on ants in the colony. However, in the U.S., there is no similar ecological role for the ants to play, making them a troubling hazard for

those wishing to enjoy the outdoors peacefully. *M. rubra* fire ants were first discovered in the U.S. in the early 1900s, but have increased significantly over the last 100 years, and rapidly over the last two decades as climate change creates more favorable habitat conditions.

During surveys of ant populations along the Maine coast, researchers noticed that many of the dead ants dissected in the lab contained a nematode known as *Pristionchus entomophagus*. *P. entomophagus* is a necromenic nematode—it enters its host while the host is alive, and then remains in stasis until the host dies, at which time it begins its reproductive cycle. While scientists indicate *P. entomophagus* nematodes may be trending toward parasitism from an evolutionary standpoint, they currently feed on a range of bacteria and are not specifically selecting for bacteria that would kill off the ants. Thus, scientists see value in exploring nematode transmission of bacteria as a biocontrol agent for fire ant management. [Ishaq, Suzanne et al. Bacterial transfer from *Pristionchus entomophagus* nematodes to the invasive ant *Myrmica rubra* and the potential for colony mortality in coastal Maine, *iScience*. 24(6): 102663, 2021.]

## Socioeconomic and Environmental Benefits in Organic Farming Exceed Chemical Practices

**AUGUST 24, 2021** | Organic agriculture provides multiple ecosystem functions and services at greater economic benefit to farmers than conventional, chemical-intensive cropping systems, according to research published in *Science Advances*. The study, conducted by a team of scientists based in Switzerland, goes beyond farming evaluations based solely on ecosystem services to include socioeconomic elements. “We did this because agroecosystems also have a socioeconomic dimension for producers and policy makers,” the authors note. While it is unsurprising based on prior research that organic practices provide greater



environmental and economic benefits, the study lays bare the true cost of policies that myopically focus on yield, while ignoring other factors.

Researchers conducted their study using data derived from a long-running Farming System and Tillage Experiment (FAST) based in Switzerland. FAST tracked four types of cropping systems: conventional intensive tillage, conventional no tillage, organic intensive tillage, and organic reduced tillage. Cropping systems were evaluated based on four broad categories, including provisioning (i.e., food production), regulating (i.e., water, air, and soil management), and supporting (i.e., biodiversity and soil health) ecosystem services, as well as socioeconomic well-being. These categories were subsequently broken down into nine assessments: soil health preservation, erosion control, biodiversity conservation, water and air pollution control, food production, income, work efficiency, and financial autonomy. Organic farming significantly increased soil health preservation and erosion control when compared to intensively tilled conventional systems.

These benefits are primarily seen in the organic reduced tillage approach, highlighting the benefits of that practice. Researchers find that yields drop from conventional to organic systems, although differences are seen between particular crops—with less pronounced disparities between legume crops compared to corn. Organic systems also result in higher income, due to the higher price organic products command in the marketplace. [Wittwer, Raphael et al. Organic and conservation agriculture promote ecosystem multifunctionality. *Science Advances*. 7(14), 2021.]

## Slugs and Snails Controlled With Bread Dough, Really

**AUGUST 25, 2021** | Extension Service scientists at Oregon State University (OSU) have found a highly effective bait for slugs and snails: bread dough. Although not quite as exciting as the slug-liquefying nematodes, the OSU research team published data showing that bread dough has the potential to revamp mollusk management, particularly in developing countries where resources are limited. “Bread dough is a nontoxic, generic, and effective tool that could be used in the detection and management of gastropods worldwide,” said study lead author Rory McDonnell, PhD in the journal *Insects*. “It represents a tool to aid in managing pest gastropod infestations, either using baited traps or in attract-and-kill approaches. It could also be incorporated into existing baits to improve their attractiveness.”

Critically, bread dough was found to be a more effective bait than commercial attractants like the product Deadline® M-Ps™, which contains the hazardous compound metaldehyde. To test effectiveness, researchers began by making the bread dough using a combination of flour, water, and yeast. In a lab setting, slugs were starved for 24 hrs, and then given the option of either bread dough or water. (Water was used as a control to test if the slugs were simply attracted to humidity.) Researchers determined through this trial that slugs are most attracted to bread dough aged between 2 and 8 days. A similar setup compared the attractiveness of bread dough against Deadline® M-Ps™, using the common garden snail *C. aspersum*. Of 20 slugs tested, 14 went for the dough, three went for the commercial bait, while three were unresponsive. Field trials were then established to determine real world efficacy. The traps employed, including the Snailer, which allows entry but bars exist, as well as a simple Petri dish, were loaded with bread dough, and a liquid form of metaldehyde was added



to the bottom. A control using water and liquid metaldehyde was also used. Slugs and snails overwhelmingly chose to feed on the bread dough baited traps. At one site, on mining reclamation land infested with the land snail *X. obvia*, researchers were able to trap over 18,000 over the course of two days. Only roughly 850 snails were collected in control bait.

“We gave them a choice of food and they consistently went for the bread dough,” Dr. Mc Donnell said. “They really, really like it. They went bonkers for it. Bread dough outperformed everything.” Although researchers used toxic metaldehyde to kill slugs when they got to the bait, discretely located traps can ensure that a pesticide is not used in a broadcast manner and disposed of properly. However, many traps and baits, such as the Snailer, will work with bread dough and water without the need for additional pesticide, as they bar pests from exiting and cause the slug or snail to drown. Use of metaldehyde should generally be discouraged as the chemical is a suggestive carcinogen, with evidence of neurotoxicity, kidney and liver damage, and reproductive harm. Although the National Organic Program permits the use of the iron phosphate in slug and snail control, its efficacy relies on a synergy between iron phosphate and a so-called “inert” ingredient known as EDTA. In 2014, Beyond Pesticides called on the National Organic Standards Board to delist iron phosphate slug products due to the risks EDTA poses to soil organisms, as well its ability to contaminant soil, sediment and local waterways. [Veasey,

## Study Finds Packaged Organic Foods Are Healthier Than Conventional Products

**SEPTEMBER 21, 2021** | Processed organic foods are healthier than their conventional, chemical-intensive counterparts in important ways, according to a peer-reviewed study published in *Nutrients* and led by scientists at the Environmental Working Group. While a steady diet of whole, unprocessed foods is ideal, packaged foods are ubiquitous in U.S. supermarkets and often unavoidable. In addition to eliminating concerns over highly toxic pesticide use, according to this new research, choosing packaged organic is an effective means of avoiding highly processed ingredients associated with adverse health outcomes. Researchers began with a food product dataset including over 72,000 conventional and 8,000 organic packaged foods, representing 85% of all food products sold to U.S. consumers. These products and their ingredients were then classified into four groups corresponding with the amount of processing, with one being unprocessed or minimally processed and four being ultra-processed. A statistical analysis was then conducted on a range of product variables to differentiate various health concerns between

organic and conventional products. Results show that organic packaged foods present far fewer health concerns than conventional products. Processed organic products were likely to have lower amounts of salt, saturated fat, sugar and added sugar. According to the analysis conducted by researchers, for every ultra-processed ingredient in a product, the

likelihood of that product being organic declined by 32%. The same held for a range of concerning factors—the odds of a product being organic likewise decreased as sugar, salt, and trans fats were added to conventional foods. On the other hand, organic products are associated with higher amounts of potassium in processed foods. “Here, with the finding that the odds of being labeled organic decreased as the ultra-processed ingredient number or cosmetic additive number increased, we show that organic product certification can be a proxy for less ultra-processed and thus more healthful products,” the study reads. These conclusions appear to line up with research published in November 2020, finding that eating organic food lowers risk of developing type 2 diabetes. While there is ample evidence to relate this finding to the use of toxic, endocrine-disrupting pesticides in conventional agriculture, the present study shows that the ingredient label is also playing an important role. [Meadow, Aurora et al. Packaged Foods Labeled as Organic Have a More Healthful Profile Than Their Conventional Counterparts, According to Analysis of Products Sold in the U.S. in 2019–2020. *Nutrients*. 13(9);3020, 2021.]



Robin et al. Fermenting Bread Dough as a Cheap, Effective, Nontoxic, and Generic Attractant for Pest Snails and Slug. *Insects*. 12:328, 2021.]

## Unless You Go Organic, Switching to “Healthier” Mediterranean Diet Increases Pesticide Exposure Threefold



**NOVEMBER 9, 2021** | Replacing a modern, “western” diet of highly processed foods with a Mediterranean diet filled with conventional, chemically-grown fruits and vegetables triples exposure to toxic pesticides, according to research in *The American Journal of Clinical Nutrition*. However, this disturbing change can be eliminated by eating a Mediterranean diet consisting entirely of organic food, which is not treated with synthetic pesticides. The advantages of the Mediterranean diet, often ranked as the “best diet” and emphasized by medical practitioners for its health benefits, now appear to depend on the production practices involved in the meals an individual eats. “There is growing evidence from observational studies that the health benefits of increasing fruit, vegetables and wholegrain consumption are partially diminished by the higher pesticide exposure associated with these foods,” said study coauthor Per Ole Iversen, MD. “Our study demonstrates that consumption of organic foods allows consumers to change to a healthier diet, without an increased intake of pesticides.” Researchers conducted a randomized

trial consisting of 27 adults, all of whom were postgraduate foreign student volunteers in a study abroad course in Greece. The experiment lasted a total of five weeks, including a two-week intervention in the middle, where the students' "western" food diet was switched for a defined Mediterranean diet. Before the intervention, students ate their normal "western" diet, which includes all conventional foods. For a typical "western" diet, think burger and French fries, while researchers served for instance, a Greek salad, sweet and sour chicken and vegetables, and whole grain rice for the Mediterranean diet. The study finds that switching from a "western" to a Mediterranean diet increases pesticide levels in urine by three-fold. For organophosphate insecticides in particular, levels increased nearly 4x (from 7 to 25  $\mu\text{g}/\text{d}$ ). Between the organic and conventional Mediterranean diet, individuals who eat organic have 91% lower pesticide residue than those consuming foods only produced through conventional chemical farming practices. Researchers find that pesticide residues primarily come from chemically grown fruit, vegetables, and whole grain cereals. As the study authors note, such major disparities could have significant impacts on health. "Many of the synthetic pesticides detected in both food and urine samples in this study are confirmed or suspected endocrine-disrupting chemicals (EDC)," noted study coauthor Carlo Leifert, PhD. [Rempelos. Leonidas et al. Diet and food type affect urinary pesticide residue excretion profiles in healthy individuals: results of a randomized controlled dietary intervention trial. *The American Journal of Clinical Nutrition*. October 2021.]

## Organic Takes on Existential Health and Environmental Crises, while Some Critics Lack Context (Response to New Yorker piece)

**NOVEMBER 12, 2021** | Omnivorous readers may have encountered an article, in the November 15 issue of *The*

*New Yorker* magazine, titled—at best misleadingly, and certainly sensationally—"The Great Organic-Food Fraud." The subhead comports with the tone of the headline: "There's no way to confirm that a crop was grown organically. Randy Constant exploited our trust in the labels—and made a fortune." The piece, by Ian Parker, tells a complex tale of the machinations of dishonest and greedy people who saw, in the commerce in organic grains, an opportunity to misrepresent nonorganic crops as organic and make a boatload of money in doing so. What the article fails to do is render any comprehensive picture of how National Organic Program [certification](#) and [inspection](#) work, and the underlying principles, values, and standards in federal law (the *Organic Foods Production Act*), nor does it review either the benefits of organic agriculture broadly or the massive harmful impacts of conventional, chemical-intensive agriculture in the U.S. Beyond Pesticides provides ballast, in its Daily News Blog article, to the failings of *The New Yorker* article and the damage it might do to the organic movement. It is worth noting that Mr. Parker seems to cast a slightly jaundiced eye on the whole organic enterprise, as evidenced by his comment: "In 2000, organic sales in ordinary supermarkets exceeded, for the first time, sales in patchouli-scented health-food stores. During the next five years, domestic sales of organic food nearly doubled, to \$13.8 billion annually. The figure is now around sixty billion dollars, and the industry is defined as much by large industrial dairy farms, and by frozen organic lasagna, as it is by the environmentalism and the irregularly shaped vegetables of the organic movement's pioneers."

Although Mr. Parker's article seems to imply that the nefarious activity of Randy Constant, the primary "bad guy" in his story, is somehow a function of the organic sector itself, this is a claim without context. There are plenty of examples of greed, malfeasance, and shady business dealings to go around; these are hardly confined to the organic food system.



As Beyond Pesticides Executive Director Jay Feldman points out, "This [article] is a piece about scammers and greedy people who knew they were violating the law. But is that any different than in conventional agriculture, or in other areas of society? Yes, we can strengthen inspections, recordkeeping, and enforcement, but as with all law and policy, there will be people who care more about their profits than about the intention and purposes of the laws they are violating. For perspective, the author should have given readers a true sense of the conventional chemical-intensive side of agriculture—all the contamination and poisoning that go on, and the undercurrent of fraud and abuse. Were we to consider just litigation that Beyond Pesticides has brought, which is only a tip of the iceberg—against General Mills, TruGreen, Sargento, and others—we would find companies that have been forced to change their fraudulent misrepresentation of their products as safe or natural. And those are just about corporate advertising!"

## Researchers Find Nonchemical Biological Control when "Tree of Heaven" Is Being Managed

**DECEMBER 22, 2021** | A promising new biocontrol agent for the tree of heaven (*Ailanthus altissima*)—considered an invasive species in the U.S. and Europe

by some—was recently discovered by French-based scientists at the U.S. Department of Agriculture. The finding centers on a small mite of the Eriophyidae family, *Aculus mosoniensis*, which has been found to feed on tree of heaven. The finding, published in *Phytoparasitica*, is encouraging for the future management of this species in conjunction with balanced ecosystems. “In Europe, this Eriophyid mite is considered one of the most promising biological control agents of tree-of-heaven,” said Javid Kashefi, senior support scientist at the European Biological Control Laboratory (EBCL) in France. “This finding provides encouraging evidence that the geographic occurrence of this species is expanding in the continent.” Tree of heaven is a fast-growing deciduous tree native to Asia that has spread throughout Europe and North America. First introduced in the 1700s as a shade tree, it was appreciated for its quick growing ability and low propensity for insect damage and is often labeled as “invasive.” Researchers analyzed mite infested leaves on tree of heaven found in France in mid- to late-2020, after first finding presence of the insect farther east in Hungary and Italy near the end of the last decade. Positive identification based on various characteristics confirmed the presence of *Aculus mosoniensis*, an herbivorous mite native to tree of heaven’s home range that forms dense populations on the underside of young plant leaves. Affected trees experience leaf curl, yellowing, and premature leaf loss. Heavily infested trees also experience limb drying. These findings represented the first evidence for the presence of this mite in France, and scientists see this insect as a potential biocontrol agent to replace toxic chemical use. The mite’s ability to expand geographically and close association with its target plant covers two important characteristics of a potential biocontrol: wide dispersal and host-specificity. [Kashefi, Javid et al. Occurrence of *Aculus mosoniensis* (Ripka, 2014) (Acari; Prostigmata; Eriophyoidea) on tree of heaven (*Ailanthus altissima* Mill.) is expanding across Europe. First record in France confirmed by Barcoding. *Phytoparasitica*. November 2021.]



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### USDA Must Complete Rulemaking Initiated by the National Organic Standards Board

**MAY 10, 2021** | USDA is dragging its heels in completing rulemaking recommended by the National Organic Standards Board (NOSB)—including recommendations passed as early as 2001 and including those concerning both materials and organic practices. This threatens organic integrity and public trust in the process governing the USDA organic label. When the *Organic Foods Production Act* (OFPA) was passed in 1990, supporters had grave mistrust of the commitment of the U.S. Department of Agriculture (USDA)—a department that had embraced chemical-intensive agriculture and promoted the dependence on pesticides and chemical fertilizers. Therefore, Congress built into the law protections by assigning a major role to the NOSB—an advisory board comprised of representatives of all the stakeholders including producers, processors, retailers, certifiers, consumers, scientists, and environmentalists. Not only must the NOSB vote on allowed synthetic materials used in organic production, but USDA must also consult with the NOSB on all aspects of the National Organic Program (NOP).

### Tell USDA that NOSB recommendations must be proposed as regulations.

Crucial to organic practices, and written into OFPA, is the concept of continuous improvement. The importance of this concept is most apparent in materials review, which includes a sunset provision that requires all synthetic materials used in crop and livestock production and non-organic ingredients used in processing to be reconsidered every five years. If organic producers no longer need those materials or new issues of concern have been identified, they should no longer be allowed. However, continuous improvement extends to all aspects of the organic program, including regulations governing organic practices.

USDA has had difficulty with the concept of continuous improvement because it requires flexibility that is unusual in regulatory programs across government. The biggest obstacle, according to USDA, is the Office of Management and the Budget (OMB). Ever since the Reagan administration, regulatory review by the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and the Budget (OMB) has prevented agencies from promulgating new regulations based on new science and technologies that are more protective of health and the environment—the argument being that it causes economic dislocation for the regulated industry. OIRA acts as a gatekeeper to new regulations and has generally resisted changes to the status quo—even in regulations designed to adapt to new science and technology.

Immediately following his inauguration, President Biden issued an Executive Order (EO) directing the heads of all executive departments and agencies to produce recommendations for improving and modernizing regulatory review, with the goal of promoting public health and safety, economic growth, social welfare, racial justice, environmental stewardship, human dignity, equity, and the interests of future generations. This Executive Order reverses the historical trend of status-quo regulatory reviews required



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by the White House Office of Management and Budget (OMB) that typically support vested economic interests of polluters (e.g., petroleum-based pesticide and fertilizer manufacturers). Instead, the President's EO, [Modernizing Regulatory Review](#), sets the stage for the adoption of agency policy across government to seriously and with urgency confront the climate crisis, biodiversity collapse, and disproportionate harm to people of color communities (environmental racism). It allows—even promotes—the policy of continuous improvement.

### Ensure Regenerative Agriculture Incorporates Organic Standards in Order to Fight Climate Change

**MAY 24, 2021** | 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 greenhouse gas (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.

“Regenerative” agriculture is [widely considered to be a solution](#) for reducing or even reversing these impacts. 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.

**Regenerative agriculture must be organic. Organic agriculture practices reduce greenhouse gas (GHG) emissions.**

**Reducing Emissions of Nitrogen Oxides.** Excessive use of nitrogen fertilizers in chemical-intensive agriculture is driving global [nitrous oxide \(N<sub>2</sub>O\) emissions](#) higher

than any projected scenario, putting the world at greater risk of a climate catastrophe. According to research published by an international team of scientists in the journal [Nature](#), failure to adequately address nitrous oxide emissions has the potential to impede the ability for the world to keep warming below the 2°C target established under the Paris Climate Agreement, necessitating further cuts in other greenhouse gases.

A [2018 study](#) from the University of Virginia and The Organic Center found that “reactive” nitrogen, in the form readily available to be taken up by plants, is conserved in organic systems. Jessica Shade, PhD of The Organic Center noted that the research was “significant and timely because its findings show that many common organic farming practices—like composting and the use of manure fertilization in place of synthetic fertilizers—can recycle reactive nitrogen that is already in the global system, rather than introducing new reactive nitrogen into the environment, and thus have a much smaller environmental impact.”

**Organic practices sequester carbon.** Organic systems sequester significant amounts of carbon from the atmosphere into on-farm soil carbon. A report from the [Rodale Institute](#) expounds on these benefits. It reads, “Simply put, recent data from farming systems and pasture trials around the globe show that we could sequester more than 100% of current annual CO<sub>2</sub> emissions with a switch to widely available and inexpensive organic management practices, which we term “regenerative organic agriculture.” These practices work to maximize carbon fixation while minimizing the loss of that carbon once returned to the soil, reversing the greenhouse effect.”

**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, as required by § 205.200 of the regulations and per the § 205.2 definition of Natural resources of the operation.”

It is crucial, as we move forward with a plan to harness agriculture in the fight against climate change, that we not be misled into promoting the same practices that have created the problem. As aptly stated by Jeff Moyer of the [Rodale Institute](#), “We believe that in order to be regenerative, you have to start by being organic. It’s a little disingenuous to say you can regenerate soil health and sequester

carbon and still use nitrogen fertilizers and synthetic pesticides. What you're really saying is equivalent to saying 'I want to be healthy as a person, but I still want to smoke cigarettes.'" **Tell EPA and USDA that "regenerative" agriculture must be organic.**

### **Tell Home Depot and Lowe's to Promote Herbicide Alternatives; Organic Is Focus of June 8 Forum**

**JUNE 7, 2021** | Beyond Pesticides and Friends of the Earth (FOE) collaborated to analyze herbicide products at two of the most popular home and garden retailers, Home Depot and Lowe's. This new [Commercial Herbicide Analysis](#) highlights the adverse health and environmental effects of widely available toxic pesticides while encouraging retailers to expand on—and consumers to use—safer, least/nontoxic pesticide approaches.

**Tell Home Depot and Lowe's to remove toxic herbicides from their shelves and replace them with products that promote least-toxic practices.**

According to Akayla Bracey, Beyond Pesticides' science and regulatory manager and lead researcher on the review, "People generally aren't aware that the pesticides widely available in garden retailers like Home Depot and Lowe's are a threat to health and the environment, and that there are safer approaches that are available and used in organic land management."

### **Are Big Dairies Undercutting Organic Milk Producers and Organic Integrity—and What Can We Do About It?**

**JULY 6, 2021** | ACT NOW: Public Comment Period Ends July 12, 11:59pm (eastern). A new proposed rule on the "origin of livestock" is intended to undo nearly two decades of regulatory failure by the USDA. Organic dairy producers have suffered economic harm and many organic milk consumers have been drinking substandard milk, while the National Organic Program (NOP) failed to promulgate a Final Rule on the issue of transitioning non-organically certified dairy bovine animals to organic production. The public comment period on this rule closes on July 12, 2021 at 11:59pm (eastern). We all have a stake in growing the organic marketplace by supporting the transition from conventional chemical-intensive practices to clearly defined sustainable and regenerative practices that support family farmers and a production system that confronts the climate crisis, biodiversity decline, and rising public health threats. We do this by supporting transition and then continually

improving standards to ensure a robust and healthful organic sector. The issues challenging organic dairy production are a part of the continuous efforts of Beyond Pesticides to ensure organic integrity, while growing the organic market.

**Tell NOP to adopt an origin of livestock rule that protects dairy farmers and consumers.**

When the organic rules were first issued, there were no organic animals, so there had to be a way for organic dairies to get started. The National Organic Program (NOP) made an allowance for farmers to convert, over a year with organic management, a distinct conventional herd to organic milk production. This enables farmers to get started in organic dairy by converting from their existing herds. However, over the years some operations, principally large dairies, have used a lack of specificity in the rule to continually bring transitioned conventional animals onto their farms as replacement animals or for expansion. This undercuts dairy farmers who operate with integrity, raising their baby calves from birth organically, and threatens consumers who depend on the wholesomeness of organic milk.

### **Take Action: Schools Must Provide and Encourage Organic Food**

**JULY 19, 2021** | As yet another study, "Early life multiple exposures and child cognitive function: A multi-centric birth cohort study in six European countries," draws attention to the benefits of organic food for the learning young mind, it is important that schools provide organic food to students. The study, conducted by Spanish researchers based at the Barcelona Institute for Global Health, looks at a totality of all environmental hazards that children encounter, rather than individual lifestyle factors. As study coauthor Jordi Júlvez, PhD notes, "Healthy diets, including organic diets, are richer than fast food diets in nutrients necessary for the brain, such as fatty acids, vitamins and antioxidants, which together may enhance cognitive function in childhood."

**Tell your governor and USDA/Food and Nutrition Service to provide organic school lunches and information for parents.** Researchers find that children who eat organic food display higher scores measuring fluid intelligence and working memory. Lower scores on fluid intelligence tests are associated with children's fast food intake, house crowding, and exposure to tobacco smoke. Lower scores on working memory tests are associated with exposure to poor indoor air quality. This study adds to prior research findings that eating a conventional, chemical-intensive diet increases the presence of pesticides and their



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metabolites in an individual's urine, including higher pesticide body burden from eating foods grown in chemical-intensive systems. In fact, because of their smaller size, children carry higher levels of glyphosate and other toxic pesticides in their body.

### Tell USDA to Ensure that Organic Farming Protects Ecosystems!

**AUGUST 2, 2021** | One reason to eat organic food is to join with a crucial national and global campaign to eliminate toxic, petroleum-based pesticides and fertilizers and protect ecosystems in the urgent fight to curtail the climate crisis and biodiversity decline—in addition to local and immediate health and environmental benefits. Despite an important and timely vote by the National Organic Standards Board (NOSB) in 2018 to protect native ecosystems as a critical tool in sequestering carbon and improving environmental resiliency, and despite the Biden administration's stated commitment to fighting the climate crisis, the U.S. Department of Agriculture and its National Organic Program (NOP) have not acted to put this recommendation in force. As our understanding of the connection between protecting intact ecosystems and combating climate change has grown, the urgency to implement this recommendation cannot be overstated. We must act now!

**Sign the petition to tell the National Organic Program (NOP) to take action to finalize the National Organic Standards Board (NOSB) recommended rulemaking that will protect Native Ecosystems and thereby preserve the integrity of the organic seal, help reverse the biodiversity crisis, and reduce global climate change. Sign by September 20, 2021.**

### Last Chance to Protect Organic this Fall— Submit Comments by September 30!

**SEPTEMBER 27 2021** | The National Organic Standards Board (NOSB) is receiving written comments from the public through September 30. This precedes the upcoming public comment webinar on October 13-14 and online meeting October 19-21—in which the NOSB deliberates on issues concerning how organic food is produced. Written comments must be submitted through [Regulations.gov](https://www.regulations.gov). As always, there are many important issues on the NOSB agenda this Fall. For a complete discussion, see [Keeping Organic Strong](#) (KOS) and the Fall 2021 issues page. In the spirit of "continuous improvement," we urge you to

submit comments (please feel free to use our comments on the KOS page) that contribute to an increasingly improved organic production system. The *Organic Foods Production Act* (OFPA) requires that all synthetic materials used in organic production be approved by the NOSB, included on the National List, and reassessed every five years. Among the issues up for consideration at this meeting is a material that the National Organic Program (NOP) has taken off the NOSB's sunset agenda for several years—sodium nitrate. There are also issues affecting organic integrity that need to be addressed—systemic fraud and plastic—as well as decisions about other materials that are described on the Fall 2021 issues page. We earlier conducted an action on priority issues.

### Save Organic Dairy, Family Farms and Consumer Support for Organic!

**SEPTEMBER 7, 2021** | If regulations concerning "origin of organic livestock" and "access to pasture" seem beyond your comprehension as an organic consumer, think again. Lacking enforcement of strong regulations on these topics, organic dairy is in imminent danger. Multinational food conglomerate Danone, owner of Horizon Organic, has just sent notice to 89 organic milk producers in Maine, Vermont, New Hampshire and at least three counties (Clinton, Franklin and Saint Lawrence) in New York that it is cancelling their contracts. While this action is devastating to the affected farms and the economies of those states, it has much broader implications. Why is Danone cancelling contracts as organic milk production in the Northeast is increasing? In Danone's words, the company "will be supporting new partners that better align with our manufacturing footprint." Ed Maltby, executive director of the Northeast Organic Dairy Producers, explains this "footprint," with reference to low cost, ultra-pasteurized milk that is easily transported and warehoused, which has become a staple on the organic shelf. More importantly for the future of organic dairy is the expectation that USDA will promulgate a weak regulation on origin of livestock—that "will allow the massive loophole of being able to sell or transfer transitioned animals as certified organic." Such a regulation, in combination with the continued failure to enforce rules requiring organic livestock to have access to pasture, makes it profitable to produce "organic" milk in industrial confined animal feeding operations (CAFOs), where cows are fed cheap imported "organic" grain instead of pasture. Organic consumers do not want CAFO [concentrated animal feeding operation] milk, but

many will have no other choice without strong regulations.

**Tell USDA that strong regulations are essential to protect organic dairy and consumer support for organic.**

## Organic Must Lead the Way in Environmental and Health Protection

**SEPTEMBER 13, 2021** | The National Organic Standards Board (NOSB) is receiving written comments from the public through September 30. This precedes the upcoming public comment webinar on October 13-14 and online meeting October 19-21—in which the NOSB deliberates on issues concerning how organic food is produced. Written comments must be submitted through [Regulations.gov](https://www.regulations.gov). As always, there are many important issues on the NOSB agenda this Fall. For a complete discussion, see [Keeping Organic Strong \(KOS\)](#) and the [Fall 2021 issues page](#). In the spirit of “continuous improvement,” we urge you to submit comments (please feel free to use our comments on the KOS page) that contribute to an increasingly improved organic production system.

The *Organic Foods Production Act* (OFPA) requires that all synthetic materials used in organic production be approved by the NOSB, included on the National List, and reassessed every five years. Among those up for sunset review this Fall are some controversial materials—copper sulfate, carrageenan, and list 3 “inerts.” In addition, the NOSB is once more considering a petition to allow the antibiotic kasugamycin in fruit production.

**Copper sulfate** is used in organic rice production to control algae and an invertebrate known as tadpole shrimp. It poses health threats, particularly to workers—including damage to the gastrointestinal tract, liver, kidneys, and the immune system resulting from inhalation exposure. Respiratory effects have been seen in animals exposed to copper sulfate aerosols (such as might be experienced by workers). Copper is considered the etiologic agent in the occupational disease referred to as “vineyard sprayer’s lung.” Copper sulfate is also a reproductive toxicant. Copper sulfate is hazardous to aquatic plants, animals, and aquatic ecosystems. This is particularly important in rice production, where rice paddies replace natural wetlands and provide alternative habitat for animals threatened by the loss of wetlands. For example, one animal inhabiting rice paddies is the western toad (*Bufo boreas*). Tadpoles of the western toad feed on filamentous algae, detritus, and may even

scavenge carrion. Application rates of copper sulfate exceed levels that are lethal to tadpoles of *Bufo boreas* by up to two orders of magnitude. Other amphibians at risk are the bullfrog and Pacific treefrog, whose tadpoles consume algae, organic debris, and small aquatic invertebrates. The negative impacts on amphibians found in rice fields not only have a negative impact on biodiversity, but they also reduce possibilities for biological control of algae and tadpole shrimp. Thus, the use of copper sulfate in an aquatic environment like a rice field is inconsistent with a system of organic and sustainable agriculture. In addition, since copper sulfate is water soluble, when the fields are drained, it is released through drainage ditches to streams, and ultimately, the ocean.

The NOSB has previously discussed alternative growing systems that would eliminate the need for copper sulfate and made such alternatives a research priority. Most of the world transplants rice seedlings into paddies. Dryland rice is also grown. Neither of these systems requires killing algae and tadpole shrimp—in fact tadpole shrimp are regarded as a biological control for algae. It is time to eliminate the use of copper sulfate, bringing organic rice production in line with organic principles.

**List 3 “inerts”** (of “unknown toxicity”) should be removed from the National List. One of the most egregious failures of the National Organic Program (NOP) has been its repeated lack of action on so-called “inert” ingredients. Because of that failure, every sunset brings to a new NOSB a listing that has not been changed in response to over a decade of NOSB recommendations. Fifteen years ago, EPA stopped updating the “inerts” lists upon which the NOP relies. Ever since EPA’s action in 2006, the NOSB has been recommending the review of individual “inert” ingredients, but has instead been given the option by NOP of relisting the outdated lists.

In 2012, the NOSB has already recommended an expiration date for these chemicals, but NOP refused—in violation of the law—to codify this recommendation. The NOSB identified the “inerts” formerly on List 3 that were covered by this listing. They are BHT (antioxidant), 2-Hydroxy-4-n-octyloxybenzophenone (UV absorber), and 2-(2-Hydroxy-3-tert-butyl-5-methylphenyl)-chlorobenzotriazole (UV stabilizer). In addition to the three List 3 “inerts” identified in 2012, a fourth chemical formerly on List 3 has been identified as being in use in passive pheromone dispensers in organic production—benzaldehyde, CAS #100-52-7. Benzaldehyde is not approved for food use. It is approved for nonfood use and as a fragrance in



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nonfood uses. The addition of another chemical to the known List 3 “inerts” used in organic production shows a hazard of delaying the review of these chemicals as recommended by the NOSB. The NOSB must insist that List 3 “inerts” be delisted and that the individual chemicals be specifically reviewed.

**Carrageenan** is a controversial food additive that most organic processors have removed from their products. The NOSB voted in 2016 to remove carrageenan from the National List. In 2018, NOP announced that it was refusing to remove carrageenan. The *Organic Foods Production Act* (OFPA) §6517(d)(1) requires that, “The National List established by the Secretary shall be based upon a proposed national list or proposed amendments to the National List developed by the National Organic Standards Board.” The National List is not “based on” the recommendations of the NOSB if it is directly contradictory to those recommendations. NOP based its decision on testimony received by the NOSB and should not be second-guessing the advisory board for which establishing the National List is an expressly stated statutory responsibility. The NOSB should insist that carrageenan be removed from the National List. The evidence summarized by the 2015 Technical Review came up with a verdict of mixed results on virtually every issue regarding food grade (high molecular weight) carrageenan. However, there is widespread agreement that poligeenan, which contaminates food grade carrageenan at unknown and uncontrollable levels, does cause adverse effects, including cancer. The production causes adverse environmental impacts. And it is not necessary—organic processors have been [moving away](#) from the use of carrageenan because of consumer pressure since it was last considered for sunset. This is made more urgent by the fact that NOP ignored the recommendation of the NOSB in spring of 2012 to remove carrageenan from infant foods, as well as the 2016 recommendation to remove carrageenan from the National List altogether.

**Kasugamycin** is an antibiotic used in fruit production. The NOSB is considering a petition to allow it to be used in organic apple and pear production. Earlier NOSB members struggled long and hard to erase the stigma of antibiotic use in organic fruit production—something that was left over from the transition of so many chemical-intensive fruit orchards after the Alar “scare” in which apple and apple products were contaminated with the cancer-causing plant growth regulator daminozide. Do we now want to step on that treadmill again? The reasons for rejecting the kasugamycin petition are the same as the reasons for

eliminating the antibiotics streptomycin and tetracycline in crop production.

Now that we have learned what a pandemic looks and feels like, with the astounding levels of infection, hospitalization, and death from Covid-19, we must take serious steps to prevent another pandemic on the horizon—this one tied to bacterial resistance to antibiotics. An important article in *The Lancet* points to a “looming potential pandemic” resulting from a “rise in multidrug-resistant bacterial infections that are undetected, underdiagnosed, and increasingly untreatable, [which] threatens the health of people in the USA and globally.”

When streptomycin and tetracycline were presented for their final votes by the Crops Subcommittee, the committee was unanimous that the antibiotics needed to go—the question was how fast. How fast could growers of these crops get over their dependence on these antibiotics that pose threats to human health and the environment and are unpopular with organic consumers? Streptomycin and tetracycline are gone, and we do not need another antibiotic. We said “No!” to antibiotics in organic fruit, and now we must affirm that we mean it. Kasugamycin does not meet any of the OFPA criteria for the National List—it poses health and environmental dangers, is not necessary, and is incompatible with organic practices.

**UPDATE:** While the NOSB rejected the petition to allow the antibiotic kasugamycin, it allowed the continued use of copper sulfate, reversed an earlier 2016 decision to remove the food additive carrageenan (which many food manufacturers have stopped using), and did not make progress on the list 3 inert ingredients in pest control products.

### Stopping the Use of Toxic Pesticides in State Parks and Transition to Organic Land Management

**OCTOBER 18, 2021** | The most recent science on pesticides raises serious health and environmental effects associated with pesticide use for lawn and landscape management. While the data is often not assembled in one place, updated factsheets bring together the science on the 40 commonly used pesticides used for conventional landscape management. Governors have the authority to stop the use of these hazardous materials that are used on parks and playgrounds, either by executive order or through their work with their state legislature, and transition land management to organic practices. **Tell your governor to stop hazardous pesticide use on state lands and transition to organic land management.**

## Call on USDA to Provide Organic School Lunches to Fight Childhood Obesity

**NOVEMBER 15, 2021** | A recent hearing in the U.S. Senate Agriculture Subcommittee on Food and Nutrition, Specialty Crops, Organics, and Research, subcommittee chair Senator Cory Booker (D-NJ) stressed the failures of the U.S. Department of Agriculture's (USDA) food and nutrition programs, saying, "Our food system is not a "free market," we are picking winners and losers, and it's consumers, family farmers, and food workers who are losing." **Tell USDA's Food and Nutrition Service to require organic school lunches.**

## Keep Antibiotics Out of Organic—Keep Organic Strong on Range of Issues; Comment by April 5

**MARCH 22, 2021** | The National Organic Standards Board (NOSB) is receiving written comments from the public through April 5. This precedes the upcoming public hearing on April 20 and 22—concerning how organic food is produced. Also, by April 5, sign up to speak (3 minutes) at the virtual NOSB hearing. Written comments must be submitted through Regulations.gov. As always, there are many important issues on the NOSB agenda this Spring. For a complete discussion, see Keeping Organic Strong and the Spring 2021 issues page. The National Organic Standards Board (NOSB) is considering a petition to allow the antibiotic kasugamycin to be used in organic apple and pear production. Earlier NOSB members struggled long and hard to erase the stigma of antibiotic use in organic fruit production—something that was left over from the transition of so many chemical-intensive fruit orchards after the Alar "scare" in which apples and apple products were contaminated with the cancer-causing plant growth regulator daminozide. Do we now want to step on that treadmill again? The reasons for rejecting the kasugamycin petition are the same as the reasons for eliminating the antibiotics streptomycin and tetracycline in crop production. Now that we have learned what a pandemic looks and feels like, with the astounding levels of infection, hospitalization, and death from Covid-19, we must take serious steps to prevent another pandemic on the horizon—this one tied to bacterial resistance to antibiotics. An important article in *The Lancet* points to a "looming potential pandemic" resulting from a "rise in multidrug-resistant bacterial infections that are undetected, underdiagnosed, and increasingly untreatable, [which] threatens the health of people in the USA and globally."

**Biodegradable Biobased Mulch Film (BBMF)** was approved by the NOSB for use in organic production in October 2012, and the listing was finalized September 30, 2014 as "Biodegradable biobased mulch film as defined in §205.2. Must be produced without organisms or feedstock derived from excluded methods." The definition required that BBMF meet specific requirements for compostability, biodegradation, and biobased content. Subsequently, the Organic Material Research Institute (OMRI) found that there are no products meeting all of the requirements set by the board. The NOSB is now considering a proposal to change the definition to allow BBMF that is not 100% biobased. BBMF is not removed from the field by the grower, but is tilled into the soil. The tillage process purposefully creates microplastics, with the intention that the action of soil organisms will degrade these small particles. However, as reported in OMRI's 2016 Supplemental Technical Review, many growers report that fragments persist in the soil. OMRI reports research showing that the BBMFs do not completely degrade and may degrade more slowly when tilled under the surface, that they contain components that may be hazardous, and particles may adsorb persistent toxicants. Microplastics may be incorporated into plant and animal tissues. Organic mulches have always been a central aspect of organic production, and reliance on synthetic mulches for functions that can be performed by organic mulch is not compatible with organic production. The NOSB should not redefine BBMF in a way that encourages microplastic contamination of the soil.

**Ion exchange** is a reaction in which an element from the treated substance is removed and replaced by a different element. Although the most familiar example of ion exchange is water softening, in which the "hard" minerals calcium and magnesium are replaced with sodium, the technology is widely used in food processing. Food processors run liquids, such as sugar cane juice, through a column of plastic beads charged with a substance that replaces an undesirable substance in the liquid with a different chemical. Ion exchange produces a chemical change in the food, which can subsequently only be regarded as synthetic under organic rules—and, therefore, be limited to less than 5% in food labeled "organic." Products treated with ion exchange must be treated as synthetic substances. Resins and recharge chemicals must be on the product label.

**UPDATE:** The Board allowed biodegradable Biobased Mulch Film with allowable residues in the soil, and required ion exchanges materials to be subject to National List review as a synthetic process.