**1. What is organic agriculture?**

There are many explanations and definitions for organic agriculture but all converge to state that it is a system that relies on ecosystem management rather than external agricultural inputs. It is a system that begins to consider potential environmental and social impacts by eliminating the use of synthetic inputs, such as synthetic fertilizers and pesticides, veterinary drugs, genetically modified seeds and breeds, preservatives, additives and irradiation. These are replaced with site-specific management practices that maintain and increase long-term soil fertility and prevent pest and diseases.

"Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system.

Organic agriculture systems and products are not always certified and are referred to as "non-certified organic agriculture or products". This excludes agriculture systems that do not use synthetic inputs by default (e.g. systems that lack soil building practices and degrade land). Three different driving forces can be identified for organic agriculture:

1. Consumer or market-driven organic agriculture. Products are clearly identified through certification and labelling. Consumers take a conscious decision on how their food is produced, processed, handled and marketed. The consumer therefore has a strong influence over organic production.

2. Service-driven organic agriculture. In countries such as in the European Union (EU), subsidies for organic agriculture are available to generate environmental goods and services, such as reducing groundwater pollution or creating a more biologically diverse landscape.

3. Farmer-driven organic agriculture. Some farmers believe that conventional agriculture is unsustainable and have developed alternative modes of production to improve their family health, farm economies and/or self-reliance. In many developing countries, organic agriculture is adopted as a method to improve household food security or to achieve a reduction of input costs. Produce is not necessarily sold on the market or is sold without a price distinction as it is not certified. In developed countries, small farmers are increasingly developing direct channels to deliver non-certified organic produce to consumers. In the United States of America (USA), farmers marketing small quantities of organic products are formally exempt from certification.

# **2. Why is organic food more expensive than conventional food?**

There are some significant, and very real reasons, why organics can be expensive.

**1. Time Requirements**

Much of organic pricing can be attributed to time issues. Time is money after all, and organic growers spend a lot more time on their crops than conventional growers. The Organic Farming Research Foundation notes that: "The organic price tag more closely reflects the true cost of growing the food [including] substituting labor and intensive management for chemicals, growing, harvesting, transportation, and storage."

Because organic growers don't use the [same amounts of harmful pesticides](https://www.liveabout.com/what-are-organochlorine-pesticides-2538275) on their crops, they have to look for other, often [manual methods](https://www.liveabout.com/what-is-cultivation-2538230) of controlling pests and diseases. These methods keep pesticides out of people and the environment, but they do cost more. There's also ongoing education for organic growers, the certification process, paperwork, inspections, planning and more that are factored into the organic grower's schedule.

Organic foods derived from animals cost more than their conventional counterparts for the same reasons. There is more hands-on care required for [organic livestock](https://www.liveabout.com/is-organic-livestock-production-more-humane-2538119). All this costs money, of course.

**2.** [**Organic Certification**](https://www.liveabout.com/before-you-transition-your-farm-to-certified-organic-2538059)

Organic certification, as noted above, is time-consuming, but it's also flat out expensive for many growers and handlers. Not only are first-time certification costs steep, averaging around $700 to $1,200 per operation, but there are other certification costs involved as well. Some of the major certification costs include renewal certification costs, education, suitable organic land, livestock from organic origins, organic seed, and special processing equipment.

**3. Special Facilities**

From growers to processors, most organic certified operations need special land and/or facilities before they can produce food. Organic land costs much more than conventional farmland because there's a long [list of qualities](https://www.liveabout.com/organic-farmland-requirements-2538086) that organic land must possess. This applies to organic land used for crops or livestock. On top of land issues, many organic operations are so small that they don't warrant a full-scope manufacturing facility of their own, which means either locating an organic operation with which they can share space or purchasing special equipment for a conventional facility. If an organic company shares space with a conventional company, more time must be spent making sure that products aren't mixed, or if they are mixed, that processing machines are properly cleaned before they're used for organics.

**4. Education**

When it comes to organic skills, many organic farmers and other organic business owners now spend time and money getting [degrees education costs in a related field](https://www.liveabout.com/organic-agriculture-college-programs-2538094). Plus, since the organic knowledge landscape is always changing (as is organic policy), keeping up to date is an important but often costly expense. Beyond self-education, organic business owners or companies must take the time to ensure that their employees also follow proper organic protocol. There's a lot of different skill-sets involved with organic production and handling practices, and employees must use organic practices in order for an operation to stay certified.

**5. Small Operations**

A majority of [organic farms are smaller](https://www.liveabout.com/where-small-farms-can-sell-organic-2538397) than their conventional counterparts. Small farms don't receive the same benefits from the economies of scale that large operations do. Additionally, it costs quite a bit more to grow and process small quantities of organic food, as opposed to large quantities. On top of added costs to process small amounts of food, it costs more to ship these items: [National Organic Program](https://www.liveabout.com/national-organic-program-regulations-2538351) (NOP) policy specifically mandates that you must segregate organic food items from conventional food items.

**6.** [**Small-Scale Marketing**](https://www.liveabout.com/where-small-farms-can-sell-organic-2538397)

With few exceptions, marketing a business effectively takes a significant amount of money and time. However, while large companies often have set marketing budgets and people who do the marketing work for them, smaller operations often do marketing on their own and on a very [low budget](https://www.liveabout.com/low-cost-marketing-ideas-2948325), which can take some considerable creativity.

Small companies with or without budgets still have to pay for [consumer education](https://www.liveabout.com/restaurants-go-organic-2538365), print ads, business websites and more.

**7. Cheap Synthetics**

Organic food producers don't use the same readily available cheap additives, flavors, and preservatives as conventional food producers do. There's a long list of known harmful ingredients [not allowed in organic food](https://www.liveabout.com/get-usda-organic-certification-2538057). This means organic producers must find other, less harmful but often less available and more [expensive ingredients](https://www.liveabout.com/how-do-i-locate-an-organic-certification-agency-2538033) instead. It obviously costs less to use synthetic food items, so conventional food companies get a real financial break that organic companies don't.

**8. Unfair Subsidies**

Food prices are often influenced by subsidies, and conventional, junk-minded food is subsidized far more often than organics and healthier crops.

In most cases, subsidies are very specifically geared towards large-scale [agribusiness](https://www.liveabout.com/what-is-agribusiness-2538209) operations, not smaller or even mid-sized organic farms. When a crop does receive a subsidy it lowers the cost consumers must pay for the end food item. Since conventional food gets the bulk of subsidies, organic prices seem higher than they are because conventional food prices are way lower than they should be.

Worse, most subsidies were used to finance commodity crops such as corn and soybeans that are often processed into food additives like high fructose corn syrup and vegetable oil and then used in junk food.

**9. Supply and Demand**

Economies of scale in consumer terms means the more you buy, the more a company will produce, and the more you produce, the lower prices will fall. Supply and demand is a huge issue. Though organics are gaining popularity each year, [organic food sales](https://www.liveabout.com/reasons-to-buy-organic-food-2538039) are nowhere near conventional food sales.

If [more consumers bought organics](https://www.liveabout.com/how-to-shop-for-real-organic-food-and-products-2538172), there would be more demand, enabling organic operations to scale up. That, in turn, would lower costs. But when consumers flock to cheap, toxic food, that's what companies want to produce.

You can see the impact that consumers have had over organic food, even in just the last decade. It used to be you couldn't even find decently priced basic organic foods like rice, apples, juice or milk. Now, because supply has gone up significantly, it's a snap to find affordable versions of all of these foods, and many other organic basics as well.

When even more consumers demand organic food, companies will deliver, and they'll deliver for lower prices than you're seeing now.

**10. The Missing Story**

At first glance, organic food appears to be more expensive than conventional. But consider that a very large piece of the story is missing, at least where the public is concerned. There's a lot of evidence that shows we do pay more for conventional food, it's just harder to see because we pay these costs indirectly.

Current conventional food costs fail to reflect some key points. For example, the cost of conventional food doesn't reflect the costs to the environment such as [land, soil and water pollution](https://www.liveabout.com/environmental-benefits-of-organic-farming-2538317). We pay for these costs through our tax dollars, not through our food budget.

Conventional food production also costs more for pesticide manufacturing and disposal. Pesticides, a known health risk, are abundant in conventional food, so when we eat pesticide-filled foods, we rack up bigger bills for medical expenses as well. Lastly, organics provide better animal welfare, promote rural development and help increase jobs — issues at which the conventional food production system fails miserably.

It's disheartening when you see a cheap jar of conventional peanut butter or bag of conventional apples sitting right next to their higher-priced organic versions, but once you look at the whole story, it's easy to see that organic food offer benefits and long-term money savings that conventional food never will.

**Certified organic food**. Certified organic products are generally more expensive than their conventional counterparts (for which prices have been declining) for a number of reasons:

1. Organic food supply is limited as compared to demand.

2. Production costs for organic foods are typically higher because of greater labor inputs per unit of output and because greater diversity of enterprises means economies of scale cannot be achieved;

3. Post-harvest handling of relatively small quantities of organic foods results in higher costs because of the mandatory segregation of organic and conventional produce, especially for processing and transportation;

4. Marketing and the distribution chain for organic products is relatively inefficient and costs are higher because of relatively small volumes.

As demand for organic food and products is increasing, technological innovations and economies of scale should reduce costs of production, processing, distribution and marketing for organic produce. Prices of organic foods include not only the cost of the food production itself, but also a range of other factors that are not captured in the price of conventional food

5. Environmental enhancement and protection (and avoidance of future expenses to mitigate pollution). For example, higher prices of organic cash crops compensate for low financial returns of rotational periods which are necessary to build soil fertility;

6. Higher standards for animal welfare;

7. Avoidance of health risks to farmers due to inappropriate handling of pesticides (and avoidance of future medical expenses);

8. Rural development by generating additional farm employment and assuring a fair and sufficient income to producers.

**3. The difference between chemical, organic farming**

|  |  |  |
| --- | --- | --- |
| No | **Organic Farming** | **Chemical Farming** |
| 1 | Uses insects and birds or healthy insecticides that do not harm the plant. | Chemical insecticides that can affect the plant |
| 2 | Animals are given organic and healthy food.  | Animals are given antibiotics, growth hormones and medications. |
| 3 | Is cheaper | more expensive |
| 4 | It is a natural substance. | It may be an artificial or natural substance. |
| 5 | Prepared in fields. | Prepared in factories |
| 6 | Provides humus to the soil. | Does not provide humus to the soil. |
| 7 | Less rich in plant nutrients. | Rich in plant nutrients. |
| 8 | Absorbed by plants slowly. Crops grow slower | Absorbed by plants quickly. Crops grow faster |
| 9 | It causes no harm to the organisms and improves soil quality. | It harms the organisms present in the soil and also causes health issues in people consuming the crop. |
| 10 | In it, the side effects of pests can be controlled by the help of the natural methods like birds, insects, and traps or by the use of the naturally-derived pest killers | In it, the attack or side effects of pests can be controlled by the help of the chemical pesticide or synthetic pest killers. |
| 11 | It does not cause any pollution. | It causes air, water, and soil pollution. |
| 12 | It always collaborates with nature. | It does not collaborate with nature instead appears as dominant |
| 13 | The requirements for irrigation are reduced. | The requirements for irrigation are needed. |
| 14 | It generally improves the ecosystem. | It generally has a severe impact on the ecosystem. |
| 15 | It causes the improvement of soil structure and fertility. | It causes the deterioration of soil structure and fertility. |
| 16 | It uses bio-fertilizers. | It uses chemical fertilizers. |
| 17 | Increases the microbial life | Blocks microbial life |
| 18 | Prevents soil erosion | Leads to erosion |
| 19 | Nutrients are available for longer period | Nutrients are available only for a short period |
| 20 | Different natural methods like hand weeding, mulching, tilling, and crop rotation is used to control the growth of the harmful weeds. | Different chemical or artificial methods are used to control the unwanted growth of the harmful weeds. |

## **4. Aims of Organic Farming**

Organic farming is a method of crop and livestock production that involves much more than choosing not to use pesticides, fertilizers, genetically modified organisms, antibiotics and growth hormones.

1. protect the environment, minimize soil degradation and erosion, decrease pollution, optimize biological productivity and promote a sound state of health maintain long-term soil fertility by optimizing conditions for biological activity within the soil maintain biological diversity within the system recycle materials and resources to the greatest extent possible within the enterprise provide attentive care that promotes the health and meets the behavioural needs of livestock prepare organic products, emphasizing careful processing, and handling methods in order to maintain the organic integrity and vital qualities of the products at all stages of production rely on renewable resources in locally organized agricultural systems

2. Organic farming promotes the use of crop rotations and cover crops, and encourages balanced host/predator relationships. Organic residues and nutrients produced on the farm are recycled back to the soil. Cover crops and composted manure are used to maintain soil organic matter and fertility. Preventative insect and disease control methods are practiced, including crop rotation, improved genetics and resistant varieties. Integrated pest and weed management, and soil conservation systems are valuable tools on an organic farm.

3. In order to re-establish previously damaged or destroyed ecological balance in nature, organic farming aims to correct unwanted results of wrong production practices by using; biological methods to control pests and diseases, to improve soil fertility, to contain environment and human friendly production systems, to ban the use of synthetic and chemical fertilizer and pesticides while encouraging organic and green fertilizing, crop rotation and soil conservation. From farm to table, organic farming has control methods for each and every farm practices and provides certificates for organic products and their producers.

4. Conserving environment and natural resources, re-establishing ecological balance, encouraging sustainable agriculture, improving soil fertility, conserving flora and fauna, increasing genetic diversity, and putting an end to chemical pollution and toxic residues. Responsible use of energy and natural resources. Maintain biodiversity and protect animal welfare. Conserve the regional ecological balance.

5. In addition to banning the use of every kind of synthetic and chemical pesticides and fertilizers, organic agriculture encourages practicing organic and green fertilization, crop rotation, soil conservation, improving plants resistance to pests and diseases, benefiting from parasites and predators.

6. The main goal of organic agriculture is not raising the quantity, but improving the quality of food products. Now, by practicing organic agriculture, it is possible to produce agricultural goods without polluting soil, water resources, and air while protecting environment, plant, animal, and human healths.

## **5. Organic fertilizers and soil improvement (Benefits of organic fertilizers to the soil)**

### **1. Balanced nutrient supply**

Organic fertilizers supply all essential crop nutrients (N, P, K, S, Ca, Mg, B, Cl, Cu, Fe, Mn, Mo, Ni and Zn) in balanced forms, including micronutrients. This is often not the case for any one inorganic fertilizer. Since all these nutrients make up the biomass of organic residues, they are released during the decomposition process into the soil. The downside to applying organic fertilizers alone is that they contain very minimal amounts of these nutrients and as such must be applied in bulky quantities to meet crop nutrient demands. Also, the fact that only a fraction of the nutrients in organic fertilizers can be released per season must be factored in when applying organic fertilizers. On the average, as a rule of thumb, only about 50% of nutrients in organic fertilizers are mineralized in the first season of application. Usually, the focal nutrient used to calculate the amount of organic fertilizer to apply is its nitrogen (N) concentration. To supply same amount of N through mineral fertilizer, a farmer would only need about 200 kg Urea, however, in organic applications, other nutrients are concurrently being applied. Since a large amount of DCM would supply the required N and other nutrients, it must be available to the farmer. Hence advocates of organic fertilizers must emphasize on ways to raise such large amounts of materials for application locally if sole organic production is desired.

### **2. Improving nutrient holding capacity**

Aside the balanced nutrient supply, organic fertilizers add organic matter to the soil if a long-term application is practiced. Organic matter improves the nutrient holding capacity of the soil because it contains organic acids that increase the H+ ions and surface charge of the soil, causing the soil’s cation exchange capacity to increase. Thus, the soil’s ability to hold more cations (nutrients) at exchange sites is increased and hence the nutrient holding capacity of the soil is also improved. Organic matter also improves the buffer capacity of the soil and increases the soil’s ability to resist a change in pH, which in turn affects nutrient loss or gain to the soil. Organic fertilizers increase microbial activity in the soil, causing increased nutrient mineralization rates for the benefit of crops. They stimulate the activities of aerobic and anaerobic bacteria and arbuscular mycorrhizae fungi that form networks of root extension for extensive nutrient availability to crops. Upon the lysis and decomposition of soil microbes, nutrients retained in their biomass are made available in the soil and to crops.

### **3. Improving water holding capacity**

Soil structure, texture, bulk density, and organic matter content are the controls on soil water holding capacity; therefore, any management practice that improves these soil properties, in turn, improves water holding capacity (WHC) of the soil. Soil moisture content is largely dependent on the specific surface area of the soil and the thickness of films of water surrounding the pores. The addition of organic matter through organic fertilizer application improves soil aggregation and increases the surface area of the soil, presenting the soil with more room for soil particles to be surrounded by films of water. As a result, the soil can hold more water against the pull of gravity which drains water from the soil.

While soil organic matter binds soil particles, it also stimulates the activity of soil microfauna whose movement create micro and macropores in the soil, creating extra room for water infiltration. Thus, soil water holding capacity can be improved by the addition of organic fertilizers. In the wake of climate change, where unexpected droughts may be imminent, improving the water holding capacities of the soil with the application of organic fertilizer is the way to go. The physical presence of organic materials on the soil serves as mulch that reduces evaporation and retains moisture in the soil. It also reduces the speed of runoff water and allows rain or irrigation water to infiltrate the soil at favorable speed, thereby reducing erosion, soil and nutrient loss.

### **4. Improving soil texture and structure**

The soil binding properties of organic matter and improvement in soil aggregation helps to improve soil structure. The addition of organic matter also improves soil texture and aeration. Soils with improved structure and texture allow easy air, water, and root movement to support healthy crop growth. Because of the organic matter present in organic fertilizer, soil structure is improved and as a result the soil’s ability to hold onto water and nutrients increases.

**5. Microbes Thrive**

Synthetic fertilizer consists of chemical molecules without carbon. These molecules can sometimes be disruptive and are not accessible to microbes. On the other hand, organic fertilizer is rich in organic matter, which helps microbes thrive. Organic fertilizer contains carbon as part of its chemical makeup; and it is the carbon, along with nitrogen, phosphorus and potassium that feeds microbes and enables them to make nutrients available for plants in a naturally occurring biological process.