

# AGRICULTURAL ALTERNATIVES

## Organic Vegetable Production

There are many reasons to consider growing organic vegetables. Organic production is a system that lends itself well to small-scale and part-time farming operations. Additionally, although the cost of certification and the time and labor involved in managing the system are high, returns have the potential to be high where markets are well developed for organic products.

Producing organic vegetables will require detailed record-keeping and working very closely with a certifying agency. You may use the certifying agency's recordkeeping example or develop your own, if it is accepted by your agency. Before using any product, check with your certifying agency to make sure the product is suitable for organic production (especially if it is not on the certifying agency's list).

Consumer demand for organic produce is high and production has expanded significantly in recent years. There are almost 13,000 certified organic farms in the United States with a sales value of over \$3.1 billion. In the northeastern United States, more than 3,200 farms are certified organic and have a sales value of over \$300 million. If you are considering organic vegetable production, however, you should carefully evaluate the market regional demand for organic products and then decide which marketing channels will best meet the needs of your consumers. Marketing organic vegetables involves significant transportation and labor costs because most of your potential consumers are likely to be located in higher-income urban and suburban areas, which may be a considerable distance from your farm.

The U.S. Department of Agriculture (USDA) regulates the use of the term "organic." In order to become certified organic, a grower uses production and handling practices in accordance with the National Organic Program (NOP) and becomes certified by a USDA-accredited certifying agency.

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Growers whose gross income from organic production is \$5,000 or less are exempt from this rule. In this case, production and handling practices in accordance with the NOP are still used and other restrictions regarding labeling and combination with other organic products apply. It takes a minimum of three years to transition from nonorganic production to certified organic production. During this period products cannot be labeled as organic and may not command the higher prices usually associated with organic products. Growing organic requires detailed recordkeeping and more management and planning time than other production systems.

The organic regulations can be found at <http://goo.gl/h5mcB0>. The following summarizes the portions of the regulations that apply to vegetable production.

### Organic Certification Process

Organic certification is a process where a third party accredited by the USDA ensures or certifies that vegetables were grown following the production and handling practices required by the NOP.

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1. Select an accredited certifying agency and request an application packet.
2. Develop an Organic System Plan (OSP) for areas where organic vegetables will be grown and implement the plan each year during the three-year transition period.
3. Submit the application packet to the certification agency in the third year of the transition.
4. Schedule an inspection of the field(s) where certification is requested.
5. Wait for a review of the inspection records by the certification staff.
6. Receive notification of organic certification or information on why certification was denied.

Certification lasts for one year, after which time you must become recertified (repeat steps 2–6). The amount of paperwork required generally decreases after the first year because the OSP is already developed and just needs to be updated.

## Accredited Certifying Agencies

Any certifying agency accredited with the USDA is authorized to award organic certification to any grower. As of 2014, 82 certifying agencies were accredited worldwide: 49 in the United States and 33 abroad. A list of accredited agencies is available on the NOP website at <http://goo.gl/5j7KVg>. Certified organic growers in Pennsylvania use various agencies (see table below).

Considerations for selecting a certifying agency can include the fees associated with certification, accreditation to standards for export, if needed, and additional services. Costs for becoming certified vary depending on the certifying

### Certifying Agencies Used by Certified Organic Vegetable and Herb Growers in Pennsylvania

Certifying Agency	Web Address
Ecocert ICO, LLC (ICO)	<a href="http://www.ecocertico.com">www.ecocertico.com</a>
Global Organic Alliance, Inc. (GOA)	<a href="http://www.goa-online.org">www.goa-online.org</a>
Midwest Organic Services Association, Inc. (MOSA)	<a href="http://mosaorganic.org">mosaorganic.org</a>
Northeast Organic Farming Association of New York Certified Organic, LLC (NOFA-NY)	<a href="http://www.nofany.org/organic-certification">www.nofany.org/organic-certification</a>
Ohio Ecological Food and Farm Association (OEFFA)	<a href="http://www.oeffa.org">www.oeffa.org</a>
Organic Crop Improvement Association (OCIA)	<a href="http://www.ocia.org">www.ocia.org</a>
Pennsylvania Certified Organic (PCO)	<a href="http://www.paorganic.org">www.paorganic.org</a>
Pro-Cert Organic Systems Ltd. (PRO)	<a href="http://www.pro-cert.org">www.pro-cert.org</a>
Quality Certification Services (QCS)	<a href="http://www.qcsinfo.org">www.qcsinfo.org</a>
Stellar Certification Services (STEL)	<a href="http://www.demeter-usa.org/stellar-certification">www.demeter-usa.org/stellar-certification</a>

agency and generally include certification fees, the cost of inspection, administrative fees, and additional assessments. The USDA currently funds a cost-share program administered by the Pennsylvania Department of Agriculture (PDA), which provides 75 percent of applicable certification costs up to \$750 (more information can be obtained from certifying agencies or through the PDA at <http://goo.gl/VmnMTh>). When producing an organic crop for export, it is important to verify that the accreditation extends to the importing country. Additional services can include educational events and materials and membership benefits.

## Organic System Plan

An Organic System Plan (OSP) is a thorough record describing the practices and procedures used on the farm to achieve and maintain the requirements of the NOP. An OSP is unique to a particular operation. Many certifying agencies have templates for developing an OSP, or you can develop your own. The National Sustainable Agriculture Information Service published a document containing a template including all the required information at <http://goo.gl/3RjZNx>.

An OSP contains six elements:

1. A description of practices and procedures, including frequency of use.
2. A list of each substance, including composition and commercial availability, to be used in the operation and where it will be used.
3. A description of monitoring techniques, including frequency of use.
4. A description of the recordkeeping system. The records must be maintained for a minimum of five years and made available during business hours for inspection.
5. A description of the establishment and management of physical barriers or buffer zones on operations with both organic and nonorganic components. In addition, methods to avoid commingling of organic and nonorganic products and prevent contact with prohibited substances must be described.
6. Other information deemed necessary by the certifying agency to determine compliance with the NOP.

It is important to discuss practices and procedures (especially inputs) you plan on using with your certifying agency to verify that they are certifiable.

## Production Practices

### Plant Selection

The use of genetically modified organisms (GMOs) is prohibited in certified organic production. Seed, transplants, and other planting stock must be organically produced. Exceptions can be made when an “equivalent variety” of organic seed or planting stock is not commercially available in an organic form for a particular crop. Before these options or exceptions apply, you must have evidence that

a minimum of three seed or planting stock sources were checked for organic forms.

The first exception allows you to use untreated, nonorganic seed and planting stock, except for the production of edible sprouts. If untreated, conventionally produced seed or planting stock is not commercially available, seeds or planting stock treated with substances allowed according to the National List can be used. The National List catalogs allowable and prohibited substances in certified organic production and can be found at <http://goo.gl/1w9AKg>. Seed, transplants, and planting stock that have been treated with prohibited substances can be used to produce an organic crop when the application of the substance is a requirement of federal or state phytosanitary regulations. A temporary variance can also be obtained for use of nonorganic transplants when an unavoidable event, such as a fire, flood, or frost, has occurred. In addition, conventional planting stock that is used to produce perennial crops can be sold as organic after it has been managed using certified organic practices for a minimum of one year. Work closely with your certifying agency to ensure that exceptions and variances can be made without compromising your organic certification.

In addition to following the NOP criteria, select cultivars with good market characteristics. Also, consider cultivars with resistance or tolerance to insect and disease pests common in your area or field. When using transplants and other planting stock, buy certified disease-free stock when possible and only purchase from reputable suppliers.

## Treated Lumber

Organic growers cannot use lumber treated with arsenate or other prohibited substances for new installations or as replacement for lumber in contact with soil or livestock.

## Soil Fertility

The goal of soil fertility management is to maintain or improve the condition of the soil and minimize soil erosion. This is done by using sound crop rotations, green manures and cover crops, plant and animal matter, and fertilizers or soil amendments allowable according to the National List. Soil testing should be used to determine pH and levels of phosphorus, potassium, calcium, and magnesium. Penn State soil test kits are available through local extension offices or from the Agricultural Analytical Services Laboratory website at [agsci.psu.edu/aasl](http://agsci.psu.edu/aasl). Kits can also be obtained from other soil testing laboratories. The nutrient levels in the soil will indicate the amount of additional nutrients needed for optimal vegetable crop growth and development.

## Plant and Animal Materials

Composted or uncomposted plant and animal materials not treated with prohibited substances can be applied to the soil. Composted plant materials can be incorporated into the soil as needed. Composted plant and animal materials can be incorporated into the soil as needed, provided the compost

meets carbon-to-nitrogen (C:N) ratio and temperature requirements. Compost used must have an initial C:N ratio between 25:1 and 40:1. In addition, when using an in-vessel or static aerated pile composting system, the pile must reach temperatures between 131 and 170°F for a minimum of 3 days. If using a windrow composting system, the pile temperature must be maintained between 131 and 170°F for a minimum of 15 days and turned a minimum of five times during that time. Temperatures and turning must be documented.

Composted materials can be tested to determine their nutrient content (kits are available through local extension offices). The amount of nitrogen, phosphate, and potash in various types of uncomposted manures and green manures can be found in *Commercial Vegetable Production Recommendations for Pennsylvania* (available at [pubs.cas.psu.edu/FreePubs/PDFs/AGRS028.pdf](http://pubs.cas.psu.edu/FreePubs/PDFs/AGRS028.pdf)). Additionally, the publication *Using Organic Nutrient Sources* (available at [extension.psu.edu/plants/vegetable-fruit/fact-sheets](http://extension.psu.edu/plants/vegetable-fruit/fact-sheets)) contains guidance on using compost and uncomposted materials.

Uncomposted plant materials can also be used as needed in certified organic production.

Uncomposted animal manure can be used only:

- On fields with crops not to be consumed by humans.
- If it is incorporated into the soil a minimum of 90 days before harvest, provided that the edible portion of the crop does not contact the soil.
- If it is incorporated into the soil a minimum of 120 days before harvest for a product that does come into contact with the soil.

Be aware that the regulations for using raw manure will likely be affected by the Food Safety Modernization Act.

Using municipal sewage sludge is prohibited in certified organic production.

## Fertilizers and Soil Amendments

Fertilizers and soil amendments allowable according to the National List are available to complement other fertility practices. In addition, mined materials of low solubility can be used to supply plant nutrients. Plant or animal ashes can also be used to improve soil fertility as long as they have not been combined or treated with a prohibited substance and are not themselves a prohibited substance. Be aware that some fertilizers and soil amendments labeled as “natural” or “organic” may not be allowed in organic production. Check with your certifying agency before applying any material to your fields.

One of the limitations to using organic fertilizers is that allowable fertilizers are sometimes difficult to find commercially, although this is improving as the industry grows. In addition, allowable fertilizers generally cost considerably more than synthetic fertilizers. They tend to be low in the amount of nutrients they supply and therefore may need to be applied in large amounts that can be difficult to manage. Lastly, organic fertilizers can be difficult to blend. It is best to use them to complement other fertility practices such as compost, cover crops, and animal manures.

## Pest Management

Pests must be managed primarily using various management tactics to avoid them rather than pesticides to kill them. Preventive pest management options include use of cultural techniques, physical barriers, and biological controls. It is helpful to determine common pests of particular vegetable crops before planting. Cultural techniques, physical barriers, and/or biological controls can then be selected that manage potential pests.

Cultural techniques include good site and cultivar selection, proper moisture and nutrient management, sanitation, rouging, vector management, manipulating harvest schedules, crop rotation, using cover crops and green manures, mechanical cultivation, hand weeding, using trap crops, encouraging beneficial insects, mulching, and livestock grazing. Physical barriers include plastic or organic mulches and row covers. When using plastic mulches, they must be removed at the end of the growing or harvest season. Burning of crop residues is prohibited except when used for disease management or to promote seed germination.

If these strategies fail, allowable pesticides can be used. More information on management practices for key pests for vegetable crop groups including the efficacy of organic pesticides based on research can be found in the book *Resource Guide for Organic Insect and Disease Management* at [web.pppmb.cals.cornell.edu/resourceguide](http://web.pppmb.cals.cornell.edu/resourceguide).

## For More Information

Organic Production Information for Specific Vegetables Science-based guides for producing various organic vegetable crops are available on the web. Two websites that are noteworthy for having a large library of organic vegetable guides are:

- National Sustainable Information Service at <https://attra.ncat.org/organic.html#vegetable>. Organic production information for brassicas, garlic, herbs, alliums, greenhouse vegetables, tomatoes, transplants, sweet corn, and sweet potato available for free or at a low cost.
- Cornell University's Organic Guides for Vegetables at [nysipm.cornell.edu/organic\\_guide/veg\\_org\\_guide.asp](http://nysipm.cornell.edu/organic_guide/veg_org_guide.asp). Organic production information for beans, carrots, cole crops, cucumbers and squash, lettuce, peas, potatoes, and spinach is available for free.

## Websites

Organic Materials Review Institute (OMRI)  
[www.omri.org/omri-lists](http://www.omri.org/omri-lists)

United States Department of Agriculture National Organic Program  
[www.ams.usda.gov/AMSV1.0/NOPOrganicStandards](http://www.ams.usda.gov/AMSV1.0/NOPOrganicStandards)

United States Department of Agriculture Organic Agriculture  
[www.usda.gov/wps/portal/usda/usdahome?navid=organic-agriculture](http://www.usda.gov/wps/portal/usda/usdahome?navid=organic-agriculture)

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