



# OEFFA Organic Certification Fact Sheet

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## Crop Rotation

The how and why of making and using a crop rotation plan on your organic farm.

**A** crop rotation plan that improves the health of the soil and management of pests and nutrients is required by the NOP and can have real advantages for the productivity and profitability of your farm. The plan needn't be complicated to create or use and the rule does not prescribe a specific way to comply with this requirement.

### Definition & NOP Citation

Crop rotation is the practice of growing a series of different crops sequentially in the same location to achieve various benefits. NOP § 205.205 states that a producer must implement a crop rotation including but not limited to sod, cover crops, green manure crops, and catch crops that provide the following functions that are applicable to the operation:

- Maintain or improve soil organic matter content;
- Provide for pest management in annual and perennial crops;
- Manage deficient or excess plant nutrients; and
- Provide erosion control.

A crop rotation plan is required as part of your Organic System Plan (OSP).

### Developing & Implementing your Plan

Each certified organic grower needs to develop a plan for rotating crops on their farm whether they grow field crops, vegetables, hay, cover crops, or all of the above. Longer-term 3 to 7 year rotations provide the most benefit, but shorter systems may also be compliant. While crop rotation is part of the rule and is an integral part of the OSP (which is considered incomplete without a plan), there is no one right way to create a compliant and successful crop rotation plan.

The NOP rule does not contain specific requirements such as a legume is to follow corn or language that prohibits planting the same crop two years in a row. Sometimes environmental, economic, personal, or other circumstances do not allow the ideal plan to be followed in a given year. We recognize this and do our best to integrate these practical issues with the requirements of the NOP.

The organic program's overall emphasis is on maintaining or improving soil health. If your crop rotation does this, you can consider it in line with the NOP.

### Cover Crops

Cover crops can be an excellent and easy way to diversify your cropping system. Different cover crops provide different benefits which can include contribution of organic matter, weed suppression, and erosion control. Planting a cover crop between two plantings of an annual crop in a given field can meet the NOP requirement if done properly. Keep in mind that seeds and all other input products used for cover crops must meet the same standards as those for your main crop.

### Permanent Pasture/Hay

Growers who maintain pasture or perennial hay for many successive years in a given location can meet the rule's requirements. Although this practice is not a year-by-year rotation, proper management can achieve all the functions of crop rotation delineated in the rule (a-d, at left). Records for any management (seeding, weeding, mowing, grazing, etc.) of these must be maintained as they would for any other part of the operation.



### Crop Rotation for Vegetable Producers

Crop rotations are equally important for growers of annual produce. Often in produce operations, the same land is used to produce the same mix of crops year after year. Although crop diversity is present each season, it may take some planning to achieve an adequate rotation of crops across or within fields to meet the NOP requirement. Using cover crops, as described above, or moving families planted in each field or rows/areas within the field can greatly improve pest management and manage soil organic matter and fertility.

## Some Benefits of Crop Rotation

### 1. Nutrient Management

Cash crops generally reduce soil fertility. This loss of nutrients can be balanced by the contribution of nutrients from other crops in the rotation. Forage legumes such as sweet clover, red clover, and alfalfa can provide as much as 100 – 150 lbs. /acre of available nitrogen to following crops. Forage legumes are much more efficient fixers of nitrogen than soybeans, which contribute 30 – 50 lbs. /acre of available nitrogen after the beans are harvested.

Different crops also use different nutrients located at different levels in the soil. Deep rooted forage legumes, such as alfalfa, utilize nutrients such as calcium and potassium from deep in the soil profile, making them more available to subsequent crops.

Growers should also consider the contribution of crop residue to the soil organic matter when planning a rotation. Researchers at the Ohio Agricultural Research and Development Center (OARDC) have demonstrated that incorporating organic matter in the form of crop residue can increase the availability of nutrients in organic farming systems.

### 2. Decreased Weed Pressure

Field tillage, cultivation, and residue management practices all impact the types and density of weeds that are present in a field. When these practices are performed at the same time each year, certain weed species are favored, become established, and are increasingly difficult to control.

Consider an example of a six year rotation for corn-belt organic grains. Corn – beans – corn – small grain – hay – hay. Perennial weed pressure can be reduced during the first three years of the rotation when annual cash crops are being aggressively cultivated. Annual weed pressure is reduced by competition from the hay crop and from the repeated cutting of the hay. Adding a cereal rye cover crop following the second year of hay to this rotation might further improve weed management through the allelopathic qualities of the rye plowdown

### 3. Conservation of Topsoil

In 1987, Reganold, Elliott, and Unger published “Long-term Effects of Organic and Conventional Farming on Soil Erosion”. In this study, they looked at how organic farm management practices impact the rate of soil erosion over nearly 40 years (1948 – 1985) of continuous organic production. They studied two farms, one organic farm, and one conventional farm. They found that the organic farm lost 5 cm of topsoil over that time period, while the conventionally managed farm lost 21 cm of topsoil. The authors determined that, “The difference in erosion rates between the organic and conventional farms was most probably

due to their different crop rotation systems. Only the organic farm included a green manure legume crop in the third year of rotation, and it had fewer tillage operations.”

### 4. Increased Profitability

Some forage legumes have the additional benefit of providing multiple marketing options. Alfalfa, for example, can be fed to livestock as haylage, sold as dry hay, or harvested for seed production. Also, the increased organic matter and availability of nutrients that cover crops can provide create the potential for healthier and more productive main crops under a wider range of conditions.

### 5. Other Benefits

- Biodiversity of crops and wildlife
- Reduced impact of other pests such as insects and pathogens
- Distributed economic risk
- Distributed workload
- Improved on-farm resource utilization
- Decreased negative environmental impact



### Resources

Building Soils for Better Crops, Fred Magdoff and Harold van Es, Sustainable Agriculture Network handbook series book 4, 2000. To order, call: (301) 374-9696.

Crop Rotation on Organic Farms: A Planning Manual, Natural Resource, Agriculture and Engineering Service, 2009. To order, call: (301) 374-9696.

Forage Legumes for Temporary Soil Cover, OSU Extension, AGF-007-90, Columbus, Ohio. Available through your County OSU Extension office.

Managing Cover Crops Profitably, Sustainable Agriculture Network handbook series book 3, 1998. To order, call: (301) 374-9696.

Organic Field Crop Handbook, second edition, Canadian Organic Growers Inc., edited by Janet Wallace, Ontario, 2001.