

Sustainable Agriculture

Organic Pest and Disease Control

There are many ways to prevent and control disease and pest damage on an organic farm. Below are listed a number of methods proven to be effective over time and verified through on-farm research. I have broken them into three categories: cultural techniques, physical methods and biological and chemical controls.

Cultural Techniques: These are farming practices that either promote the general health of your farm or specifically discourage pest and/or disease problems. Ideally, some combination of all of these practices should be a part of all organic farm operations and plans.

1) Improve your soil health / use compost liberally

A healthy, living soil will physically protect crops from diseases in the soil.
Strong healthy plants can better resist both diseases and pests.
Test your soil to encourage a well-balanced nutrient and mineral base for plant growth.

2) Practice crop rotation

Both pests and diseases can winter over in soils & planting different crops from year to year can help to break pest and disease cycles on your farm.
Alternate crops in as many different ways as possible.
Put as many years as possible between plantings of crops from the same crop family.

3) Encourage beneficial insects and try companion planting

Plant crops to attract predatory insects into your crops - dill, cilantro and fennel are just a few crops that will attract beneficial insects; toads, birds and other animals can help, too.
Many strong scented plants can confuse or deter pests (fewer pests can slow the spread of many crop diseases as well).
Several plant relationships have been shown to promote crop growth.

4) Select resistant varieties

Many crop plants have been bred for disease resistance - check seed catalog descriptions.
Traditional, local varieties are often better adapted for local pests/diseases.
Some varieties are naturally less attractive to pests - experiment and check w/ extension.

5) Keep things clean

Keep your tools and equipment clean - disinfect in cases where disease spread is likely.
Be careful not to spread disease with your hands or clothing.
Do not purchase seedlings that look diseased or unhealthy - look for insects.
Clean up your fields when production is finished - remove plants (compost them if possible), till ground to expose soil pests to predators, plant a cover crop.
Learn about disease/pest carryover potential with saved seed - take precautions.

6) Reduce plant stress

Stressed plants are more susceptible to disease and pest problems.
Irrigate to avoid moisture stress; time your plantings to avoid heat stress.
Mulches help to retain water and to cool the soil - they can also confuse pests.

7) Cultivation can help

Cultivation to expose insect pests to predators can be an effective control.
Soil disturbance encourages biological activity which can help keep diseases in check.
Keeping weeds cleanly cultivated reduces plant stress, removes conditions that can encourage disease outbreaks and discourages many pests.

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8) Time your plantings for maximum benefit

Learn about pest life cycles - plant to avoid peak infestations.
Plant to avoid disease conditions when possible.

9) Spend time in your fields

The more you are in your fields, the better you'll be able to see pest or disease problems coming and take preventative action.

Take good records of what you see - pest appearances, crop health, weather conditions, disease outbreaks, etc. - these records will help you make wise decisions in the future (they are also required farm management tools for organic certification).

Physical Methods: These are ways to physically protect your crops from pests and diseases.

1) Hand pick pests from crops - squish or collect in can - labor intensive.

2) Physical barriers

Row covers (tobacco fabric) keep insects off your crops

Fencing can keep many larger pests away from your crops (electric, wire, etc.).

Products like Surround coat plant leaves to deter pests and disease.

3) Trapping

Sticky traps can trap many pests

Pheromone traps can warn you of upcoming pest infestations before they're bad.

Japanese beetle traps effectively lure many of these pests away from crops.

Trap crops can lure pests away from your cash crops.

4) Bug vacuums / Water sprays / Shaking plants

5) Shade cloth - can reduce the effects of heat stress on plants.

Biological and Chemical Controls

There are a number of products that are approved for organic production that are very effective against pests and diseases. Appalachian Sustainable Development in Abingdon, VA tries to keep a wide selection of these products on hand for use by farmers and gardeners in southwest Virginia and eastern Tennessee.

Pest control products include Bt's which are biological insecticides that target specific pests, Smothering agents which kill soft bodied insects like aphids, and Botanical poisons which kill almost anything (and should be used only as a last resort).

Disease control products include both biological fungicides/bactericides and a chemical fungicide/bactericide that works with hydrogen dioxide as an active agent. These are all best used as preventatives - apply before you see signs of disease, but when conditions are right for disease to form.