

Introduction: Pest Management in the Carolinas

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The climate of the Carolinas lends itself to significant pressure from insect pests, noxious weeds and fungal diseases on many crops (collectively referred to as “pests” throughout this document). Unchecked, pests can lead to devastating economic loss in high-value fruit and vegetable production. Organic growers, without the option of using synthetic inputs, must depart from the standard agricultural approach of reacting to pests only after they become problematic. Rather, *organic pest management requires forward thinking and making proactive choices to prevent pest outbreak*. National Organic Program (NOP) approved pest control inputs should be considered as an option only after other measures of prevention prove unsuccessful.

Nutrient Management and Crop Rotation Practices

These are first tier, essential components of pest management according to the NOP Final Rule. Enhancing the quality of your soil is one of the most important ways you can lower your crops’ vulnerability to pests. Healthy crops grown in a nutrient balanced, biologically active soil have stronger immune functions and are less susceptible to pest attack. Insect pests and disease are often more attracted to plants that suffer from nutrient deficiencies or excesses. Furthermore, a diverse crop rotation makes it more difficult for pests to access host crops and proliferate from season to season.

Pest Scouting and Identification

Organic growers must be active observers who regularly devote time to scouting for pest issues. There is no substitute for dedicated study of the identification and lifecycles of insect, weed and disease pests that are prevalent in your region. Spend some time researching what resources are available and most helpful to your operation—it could be nearby farmers, Extension Service staff, regional agriculture conferences or any number of publications available online.

Here are two Carolina-based sites that list useful resources for pest identification:

Clemson Cooperative Extension: *Selected Pest Identification Sites*
http://www.clemson.edu/extension/pest_ed/safety_ed_prog/pstident.html

North Carolina Cooperative Extension: *Weed Identification Guides*
<http://www.ces.ncsu.edu/chatham/ag/commhort/WeedID.html>

Cultural Practices

The NOP Final Rule highlights the need to establish “cultural practices that enhance crop health” to manage pests, weeds and diseases. This term encompasses a number of practices, such as variety selection, timing of planting, field and equipment sanitation, irrigation methods, trellising, planting sacrifice crops, etc.

- Think about which crops might be the most vulnerable targets to pests and when.
- Identify crops that have serious regional pest challenges in the absence of pesticides and consider not growing them at all or seeking resistant varieties of susceptible crops.
- Time crop plantings so that they have a lower risk of pest damage due to population fluctuation or seasonal conditions. For example, Mexican bean beetles are the most damaging to early crops of snap bean when larvae first emerge. Delaying your plantings until later in the summer can significantly reduce their prevalence. On the other hand, cucurbits are far less afflicted by powdery mildew in the early summer, a disease that typically peaks in the late summer and early fall.

Here a few excellent resources that outline many more specific cultural practices for pest management on fruit and vegetable crops:

North Carolina Cooperative Extension, AG 295:

Insects and Related Pests of Vegetables: Important, common and potential pests in southeastern US

<http://ipm.ncsu.edu/ag295/html/index.htm>

Cornell University Cooperative Extension: *Organic Production Guides*

http://nysipm.cornell.edu/organic_guide/

Beneficial Insects

Many insect pest populations are capable of rapid growth because there are insufficient natural predators present to feed on them. This natural imbalance can be shifted with practices to encourage the enemies of pests. Farmscaping is a whole-farm approach to managing pests where beneficial insect habitats (and other needed resources) are established in close proximity to crop fields. To supplement your own efforts in building attractive natural areas for beneficial insect, a variety of pest predators and parasites are commercially available to target particular pest species.

This resource provides excellent detail on many natural parasitoids, pathogens and predators of insect pest:

Cornell University: *Biological Control: A Guide to Natural Enemies in North America*

<http://www.biocontrol.entomology.cornell.edu/predators.html>

Approved Pesticides as a Last Resort

When pest populations increase to a level where damage to the crop is greatly reducing yields, it may be time to consider pest control inputs. As discussed in the *Allowed and Prohibited Substance* section of this handbook, it is important to reference the NOP Final Rule and the Organic Materials Review Institute (OMRI) listing to know what your options and limitations are for using various pesticides. The conditions that warrant your use of these inputs must be a part of your Organic System Plan (OSP). Be

sure to let your certifying agent know whenever you are considering applying a new product to get approval and to update your OSP BEFORE your being using it.

In the search for products that are effective at controlling a pest, try to consult multiple sources for information about the product. Below are two resources that provide a wealth of information on active ingredients and beneficial organisms for controlling specific pest issues:

Cornell University: *Resources Guide for Organic Insect and Disease Management*
<http://web.pppmb.cals.cornell.edu/resourceguide/index.php>

ATTRA: *Biorationals: Ecological Pest Management Database*
<https://attra.ncat.org/attra-pub/biorationals/>

From the NOP

Following is an excerpt from the NOP Final Rule regarding pest management standards:

§ 205.206 Crop pest, weed, and disease management practice standard.

(a) The producer must use management practices to prevent crop pests, weeds, and diseases including but not limited to:

- (1) Crop rotation and soil and crop nutrient management practices, as provided for in §§ 205.203 and 205.205;
- (2) Sanitation measures to remove disease vectors, weed seeds, and habitat for pest organisms; and
- 3) Cultural practices that enhance crop health, including selection of plant species and varieties with regard to suitability to site-specific conditions and resistance to prevalent pests, weeds, and diseases.

(b) Pest problems may be controlled through mechanical or physical methods including but not limited to:

- (1) Augmentation or introduction of predators or parasites of the pest species;
- (2) Development of habitat for natural enemies of pests;
- (3) Nonsynthetic controls such as lures, traps, and repellents.

(c) Weed problems may be controlled through:

- (1) Mulching with fully biodegradable materials;
- (2) Mowing;
- (3) Livestock grazing;

(4) Hand weeding and mechanical cultivation;

(5) Flame, heat, or electrical means; or

(6) Plastic or other synthetic mulches: Provided, That, they are removed from the field at the end of the growing or harvest season.

(d) Disease problems may be controlled through:

(1) Management practices which suppress the spread of disease organisms; or

(2) Application of nonsynthetic biological, botanical, or mineral inputs.

(e) When the practices provided for in paragraphs (a) through (d) of this section are insufficient to prevent or control crop pests, weeds, and diseases, a biological or botanical substance or a substance included on the National List of synthetic substances allowed for use in organic crop production may be applied to prevent, suppress, or control pests, weeds, or diseases: Provided, That, the conditions for using the substance are documented in the organic system plan.

(f) The producer must not use lumber treated with arsenate or other prohibited materials for new installations or replacement purposes in contact with soil or livestock.