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GUIDANCE FOR ORGANIC PEST AND WEED MANAGEMENT



GUIDE PREPARED BY:

CAROLINA FARM STEWARDSHIP ASSOCIATION (CFSA)

United States Department of Agriculture
Agricultural Marketing Service
National Organic Program
Transition to Organic Partnership Program



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The Carolina Farm Stewardship Association logo consists of a stylized orange circle with a green leaf-like shape inside, and a white circular element within the green shape.

Introduction

Organic and transitioning-to-organic farmers face persistent challenges in managing weeds and pests without the synthetic inputs commonly used in conventional agriculture. Under the USDA's National Organic Program (NOP), organic certification prohibits synthetic herbicides and restricts pesticide use, requiring farmers to adopt ecologically based practices. However, these methods are often labor-intensive, unfamiliar to many conventional growers, and underfunded in research and extension. These burdens are especially acute in the humid subtropical climate of the Southeastern U.S., where year-round weed pressure, high pest reproduction cycles, and disease pressure from humidity intensify the challenge. This guide outlines organic weed and pest management strategies and proposes specific policy interventions to support adoption and scaling across North Carolina, South Carolina, Georgia, and Florida.

Best Practices for Organic Weed Management

As with organic production in general, weed pressure in organic systems needs to be managed through a holistic systems approach. Rather than aiming for total eradication, the goal should be to maintain weed populations below economically damaging thresholds. Cultural and mechanical controls such as crop rotation, cultivation, and flame weeding disrupt weed life cycles. Mechanical tools like tine weeders and rotary hoes are widely used, and the stale seedbed method helps reduce seedbanks by encouraging weed germination before planting, followed by light flaming or cultivation to destroy the emergent weeds.

When approaching weed management:

1. Identify the Weeds

In the same way that fruits have vastly different growth characteristics, so different species of weeds. Knowing what weeds are present is the first step in effective management, as different weeds experience different growth habits, lifecycles and responses to control. Start by identifying the most problematic and persistent weeds.

2. Learn What the Weeds Are Saying About the Soil

Different species of weeds prefer various soil conditions and will change as soil health declines or improves. Some weeds are opportunistic and will show up as indicators of soil conditions, such as low pH, poor soil structure, too much moisture, or lack of specific micronutrients. For example, broadleaf plantain show up in turf areas with high vehicular or foot traffic, so its presence can indicate the need to manage for compaction.

3. Implement Weed-Specific Strategies for Control

Soil sample results can be compared to the presence of various weed species to know what amendments will best enhance soil quality for crops and combat problematic weeds. For instance, Johnsongrass thrives in poor soils with low humus, low calcium and poor drainage, and is both an annual and perennial. The first step in controlling Johnsongrass is to prevent the plant from going to seed, whether through mowing, tarping or tilling. The second is the destruction of the rhizome where the plant's energy is stored. An application of compost will feed the soil microbes and energize the good bacteria to combat the rhizome.

In the Southeast, long growing seasons, frequent rainfall, and warm winters mean weed species such as pigweed, morning glory, nutsedge, and crabgrass flourish almost year-round.

Mulching and cover cropping are critical. Organic mulches such as straw, bark, or compost block light and suppress weed growth, while living mulches like clover or cowpeas compete with weeds for space and nutrients. Cover crops like buckwheat, sorghum-sudangrass and sunn hemp are effective in the Southeast as fast-growing and heat-tolerant options; mow or crimp at peak biomass before weed seeds or cover crop seeds mature.

Soil solarization, which uses plastic sheeting to trap solar heat, is especially effective in Florida and coastal Georgia, where summer soil temperatures can exceed 140°F under clear plastic. Farm sanitation practices—such as cleaning equipment, composting manure, and removing weeds before seed set—are vital to prevent rapid weed spread, especially in high-tunnel and year-round production systems.

Flame weeding and timely cultivation can be effective, but mechanical control becomes more difficult in wet conditions. Additionally, aggressive perennial weeds like bermudagrass can quickly re-establish from rhizomes, making repeated interventions necessary.

Best Practices for Organic Pest Management

The Southeast faces some of the highest pest pressure in the country due to mild winters and overlapping insect generations. Armyworms, aphids, flea beetles, cucumber beetles, squash vine borers, and stink bugs are persistent threats. Moreover, fungal and bacterial pathogens thrive in the humidity, with downy mildew, powdery mildew, early blight, and bacterial spot posing threats to high-value organic vegetables.

Cultural controls such as *crop rotation, roguing of diseased plants, and timing of planting* are labor-intensive but central. In the Southeast, rotating brassicas (collards, kale, broccoli) with summer cover crops like sorghum-sudangrass can be particularly effective against soil pests. For roguing, scout regularly - ideally twice per week - especially during hot, humid periods.

Physical barriers like *floating row covers* are highly effective against insects like flea beetles and cabbage worms, but growers note challenges with airflow in the heat and humidity. Mesh covers are preferred over plastic in the summer months. They can be laid loosely over the crops (either directly on the ground or supported by low hoops) to create a physical barrier to keep pests away during crops' most vulnerable stages. Covers must be removed during flowering if crops require insect pollination; monitor for pest pressure post-uncovering.

Biological control methods are increasingly being used in the region. Encouraging beneficial insect habitat with flowering hedgerows or native perennials is gaining traction through Natural Resource Conservation Service initiatives. Farms in Georgia and the Carolinas are experimenting with trap crops such as Blue Hubbard squash for vine borers and sunflowers for stink bugs.

When other strategies are insufficient, organic producers can turn to approved biopesticides as a last resort, but only after demonstrating that preventive measures were implemented, and these products must be listed in the farm's Organic Systems Plan and approved by the certifier. Common biopesticides include *Bacillus thuringiensis* (Bt) for caterpillars, neem oil for soft-bodied insects, and Spinosad for thrips and beetles. All are naturally derived and degrade quickly in the environment, but still require careful application to avoid harming beneficials.

Where is Additional Support Needed?

Improved Technical Assistance. Even where proactive weed/pest management strategies exist, farmers often lack access to expertise or on-farm technical support. Expanded capacity of extension services and Natural Resources Conservation Service staff would be a boon for organic and transitioning producers.

Continue Funding Regionally Adapted Research. Support SARE and land-grant university trials that focus on cover crops, allelopathy, and biocontrols in humid, subtropical zones. Prioritize breeding programs for pest- and weed-suppressive traits in heat-adapted vegetable and grain varieties.

Organic Incentive Structures. Existing farm subsidies often favor high-input commodity systems. Targeted federal policy can bolster the critical Organic Certification Cost Share Program (OCCSP), adjust disaster relief programs to explicitly accommodate organic systems, and potentially offer financial support to offset the lack of premiums during the three-year transition period.

Summary

Southeastern growers are innovating at the intersection of ecological stewardship and market opportunity. With the proper technical, financial, and infrastructural support, organic weed and pest management can become not only viable but a key part of regional agricultural resilience.

Investment in place-based solutions, guided by growers, will pay dividends in soil health, public health, and long-term farm profitability.

Citations

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