



Ornamentals and Turf

Department of Entomology Insect Note

NC STATE UNIVERSITY North Carolina Cooperative Extension

Organic and Sustainable Pest Management for Home Lawns

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CAUTION: This information was developed for North Carolina and may not apply to other areas.

Introduction

The most important aspect of arthropod pest management in a lawn is maintaining healthy turf in the first place. Grasses that are stressed or not growing under optimal conditions may be more attractive to pests or be more susceptible to their damage. It may take more initial work and planning than traditional lawn care methods, but if your goal is reduced chemical usage, it is an achievable goal. Unnecessary use of chemicals can also remove enough of the beneficial organisms such that a pest may rebound to more severe levels than before treatment.

A simplified list of environmental factors important to a healthy lawn is:

1. nutrients- not too much or too little fertilizer
2. pH- soil acidity can affect turf nutrient uptake and growth. It can also preferentially determine weed species.
3. water- too little or too much can stress lawns
4. light- most grasses require good light exposure. Many lawns are underexposed.
5. temperature- temperature cannot be controlled directly, but grasses do not grow the same at all temperatures

Producing an Unstressed Lawn

Soil testing- [The NC Dept. of Agriculture and Consumer Science](#) can instruct you on how to take soil samples and where to have them analyzed. Fertilizer and lime can then be applied in accordance with the findings.

Varietal choice- Choose one adapted to your area and conditions. Some turf varieties, are green in summer, some are green in spring and fall. Some are tall and some are short. Some are dense and some are more open. Some require more sun than others. Choose the type you desire, or in an established lawn, learn the characteristics of your plant. Check to see if there is a turf variety that is resistant to the locally common problems. Certain varieties contain symbiotic fungi (endophytes) that are detrimental to caterpillars that feed on their foliage. Your county Cooperative Extension center can help you determine [which turfgrasses grow best in your area](#).

Timing- Fertilizing at the wrong time can cause a plant to grow when it should be dormant, encourage diseases, kill the plant, or be a waste of time and money. It may also benefit the insect more than the plant. Mowing at the wrong time or height can also stress plants, cause thinning or dieback and promote weeds. Mowing before weeds bloom can greatly reduce their spread by seed. Watering at the wrong time can cause plants to continue growing when they should be dormant or promote disease.

Thatch Management- Heavy thatch can reduce light that reaches the soil or bases of the plants. It can keep soils too moist, reduce air movement and promote disease and insects. It can also bind to chemicals reducing their efficacy. Clippings can be collected and composted, or if you prefer to return the organic matter to the soil, mow often enough such that clippings do not clump, are not too large to breakdown quickly and will not smother grass or soil.

Organic fertilizer- When organic fertilizers such as composted cow manure are used, follow the instructions on the bag and fertilize properly with regard to timing and your soil test analysis. Raw organic fertilizers can take longer to release nutrients and are harder to control their distribution. Poultry litter is more apt to burn turf if not applied correctly. Many organic fertilizers also introduce weed seeds. They may also encourage white grubs by increasing attractiveness for beetle egg laying. Waste treatment plant sludge fertilizers are not without drawbacks and should be studied carefully before being used. They may contain compounds that are not compatible with the goals many organic lawn producers share.

Diversity- In general, maintenance increases proportionally to the size of a planting. A natural environment has diversity. Huge expanses of the same plant are difficult to maintain since it is not environmentally balanced. Consider options to large expanses of turf. Use natural areas and a diversity of trees and shrubs that give shelter and differing bloom dates to provide pollen sources to beneficial insects. Choose plants that are low maintenance and will not require heavy pesticide usage.

Realistic Expectations- Organically maintained turf might not match the lawns on television commercials. There may be other plants mixed with your turf choice. A weed is only a weed if you don't like it. Some unwanted plants may be picked by hand or individually treated. Do not try to grow turf where turf does not thrive. Shady areas are difficult to maintain turf. Turf and trees compete with each other for water and nutrients.

Beneficial Insects Found in Turf

Healthy turf may (and should) contain a variety of beneficial or neutral (neither pest nor beneficial) insects. Some of the beneficial insects include ground beetles, rove beetles, predatory and parasitic wasps, nonpest ants. Some insects may be beneficial and prey upon harmful ones or just be neutral to the turf environment. Predatory beetles and some small flies can be predatory on turf-consuming caterpillars. Unnecessary pesticide use may reduce the insects that are actually suppressing the pest caterpillars.

Scouting

Homeowners often fear that the presence of a pest insect requires treatment. However, insect pests are often found in a lawn at population levels below what would produce damage or be worth treating. If turf pests are found in a lawn, examine other areas in the lawn to determine if the insects are evenly distributed or localized in one spot. Make counts to determine if they exceed treatment thresholds.

Turf Pest Identification

Knowing which insect is causing a problem is crucial to knowing what to do about it. Some pests may not be present in large enough numbers to do damage. Even when certain pests are present, knowing something about them will determine the timing, method or the practicality of treatment. Help in [identifying turf pests](#) can be found at your local Cooperative Extension office and at the following links:

- Insects and Other Pests Associated With Turf. Baker, James. NC Cooperative Extension Service Publication AG-268. <http://ipm.ncsu.edu/AG268/html/contents.html>
- NCSU Insect Notes <http://www.ces.ncsu.edu/depts/ent/notes/O&T/lawn/index.html>
- NCSU Plant Disease and Insect Clinic <http://www.cals.ncsu.edu/plantpath/extension/clinic/>
- TurfFiles Publications <http://www.turf-files.ncsu.edu/>

Some Low Impact Pest Controls

Product	Insect	Comments
Resistant varieties of grass	Chinch bugs, ground pearls, mites	

Endophyte-enhanced turfgrass	Armyworms, cutworms, billbugs, chinch bugs, sod webworm	
<i>Bacillus thuringiensis (Bt)</i> Bacterial insecticide DiPel Pro, Javelin, Crymax, Cutlass	Armyworms, cutworms, sod webworm	Best applied to small larvae
<i>Paenibacillus popilliae</i> (Milky spore) bacteria	Japanese beetle grubs only	Very limited reduction of grubs.
<i>Beauveria bassiana</i> (fungus) Botanigard, Naturalis T (current hold in NC)	Chinch bug, mole crickets, ataenius, various caterpillars, white grubs, mealybugs	
<i>Metarhizium anisopliae</i> (fungus)		Not commercially available in US
Parasitic Nematodes <i>Steinernema carpocapsae</i> and <i>S. Glaseri</i>	Annual bluegrass weevil <ul style="list-style-type: none">• Bluegrass billbug• Hunting billbug• Black cutworm• Dog/cat flea larvae• European crane fly• Armyworms• Sod webworms	Choose correct nematode product for the pest. Must follow application instructions exactly. May not be compatible with some chemicals at time of application. Check label.
Parasitic Nematodes <i>Steinernema riobravae</i> <i>Steinernema scapterisci</i>	Southern Mole Cricket Tawny Mole Cricket	Must follow application instructions exactly. May not be compatible with some chemicals at time of application. Check label.
Parasitic Nematodes <i>Herteorhabditis baceriophora</i>	Black turfgrass ataenius <ul style="list-style-type: none">• European chafer• Green June beetle• Japanese beetle May/June beetles• Masked chafers	Must follow application instructions exactly. May not be compatible with some chemicals at time of application. Check label.
Insecticidal soaps M-pede, other	Armyworms, cutworms, sod webworms, mites	Only effective on contact with caterpillar
Azadirachtin (neem extracts) Ornazin, Azatrol	Armyworms, cutworms, sod webworms	Growth and feeding regulator. Best applied to small larvae.
Diatomaceous earth	Armyworms, cutworms	Abrades and desiccates. Questionable value in moist environment
Traps (for monitoring adults)	Japanese beetles & White grubs	Pheromone and light traps have not shown to be effective at reducing larval populations significantly.
Abamectin baits (Black Flag Fire Ant,	Fire ants	Growth regulators

Ascend, Affirm) Spinosad mound treatments: (Entrust, Safer Brand Ant Bait, Ortho Ecosense Brand Fire Ant Killer Granules, Fertilome Come n Get It, Payback, Conserve, Greenlight Fire Ant Control with Conserve and Green Light Fire Ant Killer with Spinosad 2) Methoprene bait (Extinguish) Citrus oil d-limonene compound for mound drench (Orange Guard, Safer Brand Fire Ant Killer)		IGR lemon oil base contact drench
Spinosad (Conserve)	Armyworm, sod webworm, cutworms, fleas, ataeneous adults	Growth regulator

More on fire ants-

If fire ants are a problem, chemical baits with low impact on non-target organisms and which work on the physiology of the ant may be considered. In addition, with limited infestations, mounds may be drenched with a high volume of boiling-hot water (be careful) or excavated with a shovel and dropped into a bucket of soapy water. A little talc powder will help prevent ants from climbing up a shovel handle. Mound drenches with d-limonene (Safer Fire Ant Killer) are reasonably effective.

Baits- Award, Logic (fenoxycarb); Amdro, Siege (hydromethylon); Firestar (fipronil); Extinguish (methoprene); Distance (pyriproxofen); Justice(OMRI), Ortho Fire Ant Killer Bait, Fertilome Come and Get It(spinosad)

Useful references:

- Organic Lawn Care. Bruneau, Art, et. al. 1997. NC Cooperative Extension Service Publication AG-562. 32pp. http://ipm.ncsu.edu/urban/horticulture/organic_lawn_care/olc.htm
- Insect Parasitic Nematodes for Turfgrass http://www2.oardc.ohio-state.edu/nematodes/turfgrass_pest_management.htm
- Carolina Lawns http://ipm.ncsu.edu/urban/horticulture/carolina_lawns/contents.html
- An Organic Two-step Method for Imported Fire Ant Control fireant.tamu.edu/materials/factsheets/fapfs039_2002rev.pdf
- OMRI "Organic" chemicals list http://www.omri.org/crops_alpha.pdf
- Sustainable Turf Care <http://attra.ncat.org/attra-pub/turfcare.html#Least-ToxicTurfcarePractices>

Other Resources

- [Return to Turffiles](#)
- [Back to Insect Notes](#)
- [Horticulture Information Leaflets\(HILs\)](#)
- [Plant Disease Notes](#)
- [North Carolina Agricultural Chemicals Manual](#)
- [North Carolina Cooperative Extension Service](#)

Because environmental conditions, methods of application by growers, and performance of the chemicals

may vary widely, control results may also vary.

Recommendations for the use of chemicals are included in this publication as a convenience to the reader. The use of brand names and any mention or listing of commercial products or services in this publication does not imply endorsement by the North Carolina Cooperative Extension Service nor discrimination against similar products or services not mentioned. Individuals who use chemicals are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Be sure to obtain current information about usage and examine a current product label before applying any chemical.

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ENT/ort-95 May 2003. This publication replaces a publication originally dated December 1993.

Web page last reviewed January, 2010 by the [webperson](#)