

# Residential Turfgrass IPM Definitions

Revised May, 2002

Edited by Curtis E. Young

Contributing Authors: Michael Boehm (Plant Pathology), David Gardener (Horticulture & Crop Science), Joseph Rimelspach (Plant Pathology), David Shetlar (Entomology), and John Street (Horticulture & Crop Science)

Reviewed by: Joseph Boggs (Southwest Horticulture District Specialist/ Hamilton County Horticulture Extension Agent)

The purpose of this document is to consolidate current Ohio information on integrated approaches to pest management. One of the intended results is to form a general working definition (practices) of Integrated Pest Management (IPM) for turfgrass production and maintenance. Secondly, to develop a system of assessing how far along the IPM continuum from not practicing any IPM processes to complete adoption of the IPM process turfgrass managers are, and if their operation has adopted enough core practices to qualify them as "IPM Practitioners" under these guidelines.

Turfgrass managers should use this document and its five sub-headings (Educational, Pre-plant, At-plant, Growing season & Dormant season) as a checklist of possible IPM practices. There is a point value associated with every IPM practice; the higher the number the more important the practice. Turfgrass managers should only count the points of activities they perform on turfgrass. The goal is to accumulate 80% of the points in each of the five areas and/or 80% of the total points available, which is the sum of the scores from each section (comprehensive).

This document is intended to help Turfgrass managers identify areas in their operations that possess strong IPM qualities and also point out areas for improvement. Turfgrass managers should attempt to incorporate the majority of these specific techniques into their usual production and maintenance practices, especially in areas where they fall short of the 80% goal.

Major Pests of Ohio Turfgrass - Primary concerns are insects, diseases, weeds

<b>Diseases</b>	<b>Insects</b>	<b>Vertebrates</b>	<b>Weeds</b>
Primary Pests:	Primary Pests:	Geese	Annual Grasses
Dollar Spot	Bluegrass Billbug	Moles	Annual Broadleaf Weeds
Fairy Rings	Chinch Bug	Skunks	Biennial Weeds
Necrotic Ring	Common Armyworm	Raccoons	Perennial Weeds

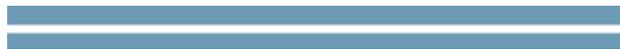
Spot/Fusarium Blight			
Pythium Blight	Sod Webworms		
Pythium Root Rot	White Grubs		
Red Thread	Black Cutworm		
Rhizoctonia Blight/ Brown Patch	Bronze Cutworm		
Summer Patch/Fusarium Blight			
<b>Secondary Pests:</b>	Clover Mites		
Anthracnose	Fall Armyworm		
Gray Snow Mold/Typhula Blight	Greenbugs (Aphids)		
Leafspot/Blight/Melting Out	Variegated Cutworm		
Nematodes	Winter Grain Mites		
Pink Patch	<b>Nuisance Pests:</b>		
Pink Snow Mold/ Fusarium Patch	Ants		
Red Leaf Spot	Slug and Snail		
Stripe Smut			
Take-all Patch			
Yellow Patch			
Yellow Tuft/Downy Mildew			
<b>Nuisance Pests:</b>			
Algae			
Powdery Mildew			
Rust			
Slime Mold			

## Section I - Educational IPM Considerations

Education	Activity	Points
	Join local or state grower associations that deal with turf.	5
	Attend the Ohio Turfgrass Foundation (OTF) Conference annually to meet and exchange information with other turfgrass managers. Attend current pest management informational / research presentations.	10
	Attend Ohio State University Short Courses (e.g., OSU Nursery Short Course - Turf Day, OSU Professional Lawn Care Short Course) to learn about disease, insect and weed identification and management.	10
	Attend the Ohio State University County or Regional sponsored "Green Industry" meetings to meet and exchange information with other turfgrass managers. Attend current pest management informational / research presentations.	10
	Attend Ohio Lawn Care Association Summer Field Day to learn about disease, insect and weed identification and management.	10
	Attend Ohio State University Turfgrass Research Field Day to learn about disease, insect and weed identification and management.	10
	Obtain current edition of OSU Extension Bulletins L-187, 271 and 546, and other fact sheets and guides for turfgrass management.	10
	Earn a pesticide applicator's license and regularly attend Ohio Pesticide Applicator Re-certification Conferences.	10
	Subscribe to The P.E.S.T. Newsletter by Dr. David Shetler	10
	Gain access to e-mail or fax for weekly BYGL newsletter updates on disease, insect, and weed development and management during the growing season.	10
	Access Regional Turf Education Program (RTEP) Web Page at: <a href="http://www.ag.ohio-state.edu/~plantdoc/RTEP/">http://www.ag.ohio-state.edu/~plantdoc/RTEP/</a>	5
	Visit and observe regional turfgrass education plots	5
	Implement an IPM practice currently not used in your turfgrass management program on limited acreage and gauge its success.	10

**Marginal adoption**

0 pts



92 pts  
Goal



**Full adoption**

115 pts

If your turfgrass management activities DO NOT normally include turfgrass installation, seeding, sodding, and/or renovation, go to Section IV- In-season IPM Considerations and continue.

## Section II - Pre-plant IPM Considerations

Management	Activity	Points
Weed	Control perennial weeds if present.	10
	Remove existing sod.	10
	Practice weed seed exclusion tactics such as high pressure washing machinery between lawn preparation sites.	15
Site	Prepare lawn area as recommended in OSU Extension Bulletin 546.	15
	Modify soil if existing soil is not satisfactory. Add topsoil, organic matter (especially active composts) or sand if necessary.	15
	Remove stones, wood and other debris.	10
	Provide for good surface drainage.	15
Fertility	Soil test; amend soil with fertilizer according to guidelines.	15
	Desired soil pH is 6.0-6.8, add lime only if recommended based on soil test.	15
Seed or Sod	Seed used should be free of weed seed and of high quality and germination.	15
	Select turfgrass cultivars based on National Turfgrass Evaluation Program (NTEP) results (overall quality rankings, disease resistance, etc.). <a href="http://www.NTEP.org">http://www.NTEP.org</a>	15
	Select turfgrass species/cultivars containing endophytic fungi for "natural" insect pest resistance.	15
	Only use good quality, pest free sod from reputable dealers.	5
Equipment	Calibrate spreaders; check drop rate for seed, fertilizer and lime.	15
	Calibrate sprayer; check flow rates and nozzles for fungicide, herbicide, and insecticide use. Select drift guard nozzles.	15

**Marginal adoption**

0 pts



160 pts  
Goal



**Full adoption**

100 pts

### Section III - At-planting IPM Considerations

Management	Activity	Points
Fertility	Apply starter fertilizer (only count if using products specifically labeled as "Starter Fertilizer" not general use fertilizers)	10
Seed	Seed lawn during the recommended time of year for the best possible lawn establishment.	15
	Follow seeding rate recommendation for selected turf species and distribute seed as evenly as possible.	15
	If establishing a new lawn, apply a mulch after seeding to ensure optimum moisture conditions and reduce erosion.	10
	If renovating or rejuvenating an established lawn, use a slit seeder to ensure seed to soil contact.	10
	Irrigate lawn to keep soil surface moist while seeds are germinating and seedlings are first establishing.	10
Sod	Soil should be moist when sod is transplanted.	10
	Irrigate sod to a depth of 6 inches immediately after transplanting and regularly afterward until roots are established.	10

**Marginal adoption**

0 pts



72 pts  
Goal

**Full adoption**



90 pts

## Section IV - Established Lawn In-season IPM Considerations

Management	Activity	Points
Site	Prepare a map of the site noting: 1. areas that may require differing management "needs" (i.e., shade vs. sunny, high traffic areas, etc.) 2. turf species or blends 3. current weed complex 4. any insect or mite activity or damage 5. disease expression	15
	Copies of map are made on which to keep records and notes of activities, changes and applications of products (i.e., fertilizers, pesticides, etc.), and pest and other problem developments <b>and</b> to give to customer.	10
	Provide lawn owner a beginning-of-the-season report of turf density and color, thatch thickness, insect and weed pressure.	10
	Evaluate condition of lawn to determine the need for complete renovation or continued maintenance of current turf.	10
Equipment	Calibrate spreaders; check drop rate for fertilizer.	15
	Calibrate sprayer; check flow rates and nozzles for fungicide, herbicide, and insecticide use. Select drift guard or shower-type nozzles.	15
	Check, tune and repair lawn cutting and trimming equipment (i.e., check for oil or fuel leaks, sharpen blades, check and tighten wheels, pulleys and belts, etc.).	15
Soil	Minimize soil compaction by limiting foot and equipment traffic when soil is overly wet, rotating mowing patterns, and using flotation tires on heavy equipment.	10
	Minimize soil compaction by periodic top-dressing and/or core aerating.	10
Fertility	Soil test at least every five years for potassium, phosphorus and pH, and correct deficiencies when needed.	15
	Annually apply nitrogen containing fertilizers to the turf grass.	15
	Fertilizers are applied over several applications rather than one single heavy application.	10
	When fertilizers are applied, they are watered into the soil to reduce potential for movement off site.	10
	At least 35% of total annual nitrogen is in a slow release form to reduce pest flare ups associated with flushes of growth due to sudden high nitrogen uptake.	10
	At least one fertilizer application should be a fertilizer containing nitrogen, phosphorus and potassium (N-P-K) in a ratio of 3-1-2, 4-1-2 or 5-1-2. If only one fertilization is of this type, it should be	10

	the late Fall application.	
	Excess fertilizer is removed from sidewalks, driveways and other hard surfaces to reduce the chance of fertilizer run off into surface waters.	10
	On an annual basis, apply no more than 3.5 lb. nitrogen per 1000 sq ft to tall fescue and perennial ryegrass turf, and 4-5 lb nitrogen per 1000 sq ft to Kentucky bluegrass turf.	10
Mowing	Turfgrass is mown on an "as needed" basis, not on a set schedule.	10
	At each mowing, 1/3 or less of leaf tissue is removed.	10
	Mowing height is set as high as practical to enhance root development, to maximize shading, to avoid scalping, to reduce water stress and to compete with weeds (mowing height adjusted according to weather conditions, growth rate of and the variety of turfgrass).	10
	Grass clippings are generally not removed. If grass clippings are wet and clumped, then re-mow or remove and compost.	10
	Thatch accumulation is monitored and corrected if greater than 3/4 inch.	5
	If lawn owner performs mowing, has the owner: 1. Been given educational materials on correct height and mowing interval? 2. Had their mower "conditioned" for the season (started to see if it runs smoothly, blade sharpened for season, set at correct height)? 3. Been given educational materials on returning-the-clippings or composting?	10
Irrigation	Allow cool-season turfgrass to go dormant during the summer, the most stressful part of season.	10
	Irrigation is scheduled according to need and anticipated weather, not on a routine or scheduled basis.	10
	Irrigation is applied in sufficient quantity to wet the entire root zone to reduce shallow rooting. Irrigation event may need to be split to avoid pond formation and runoff.	10
	Irrigation events are modified in accordance with potential disease cycles/pressures through the growing season.	10
	For in-ground irrigation systems, perform a water audit on an annual basis	10
	Check in-ground irrigation system on a regular basis to see if it is using a schedule appropriate for the current seasonal conditions	10
General Pest Management	Develop a pest spectrum and target calendar.	15
	Determine which management approach, preventive, curative	15

	and/or tolerance, will be taken for each pest that may occur throughout the season.	
	Track weather conditions to help predict possible pest outbreaks.	15
	Track Day-degree accumulation to predict possible pest outbreaks for which day-degree models have been developed and soil temperature to predict weed seed germination.	15
	Scout turfgrass at least every two months during growing season for developing problems <b>AND</b> record observations.	5
	Scout turfgrass more frequently during critical periods of possible pest activity.	10
	Pest insect and mite populations are sampled using appropriate methods <b>BEFORE</b> controls are applied (flotation, soapy water drench, traps, etc.)	15
	Identify pest species (diseases, insects, mites, vertebrates and weeds).	10
	Beneficial species are distinguished from pest species.	10
	Employ the C. Wayne Ellett Plant and Pest Diagnostic Clinic (CWEPPDC) to verify initial identifications or to identify possible pest specimens that are too difficult to identify or to verify in the field.	15
	Predetermined action thresholds for pest species are employed.	15
	When pest problems occur, contributing factors are identified and corrected.	15
	Tolerate low pest populations.	15
	Use rescue spot treatments.	15
	When a pesticide is the management tool of choice, choose one based on efficacy to target pest, safety to the applicator, homeowner and environment, and cost.	10
	Maintain accurate and complete pesticide application records.	15
	If available, rely on a biological control agent to manage a pest population.	15
	Practice weed seed and disease exclusion tactics such as washing mowers between lawns.	10
Vertebrate Pest Management	Follow all laws associated with wildlife management.	15
	Reduce raccoon and skunk damage to turf by using an insecticide rescue treatment when needed to remove food resource attracting the animals.	10
	Reduce mole populations using mechanical traps.	10
	Discourage geese from taking up residence near turf by employing legal methods only (e.g., trained dogs). Check with local wildlife officer before taking action.	10

Re-seed or Renovation	Identify and correct factors causing thinning of turfgrass and bare soil patches. Repair and re-seed as soon as possible.	10
	When re-seeding or renovating, plant new turf or seed mixtures selected to address site-specific growing conditions.	10
Evaluation	Evaluate pest control program(s) before any products or actions are applied. Is the control program focusing mainly on a few primary pests or are multiple targets being consider, primary and secondary? Have acceptable levels of damage been determined?	10
	Evaluate effectiveness of controls implemented. Has damage of target pest been held at or below acceptable levels? Have secondary pest problems developed as a result of actions taken?	10
	Make adjustments to pest control program(s) as determined by evaluations.	10
	Provide lawn owner an end-of-the-season report of turf density and color, thatch thickness, insect and weed pressure.	10

**Marginal adoption**

0 pts



516 pts  
Goal



**Full adoption**

645  
pts

## Section V - Post-season and Pre-winter IPM Considerations

Management	Activity	Points
Site	Update site map with changes in sun exposure, soil test results, pest activity foci, etc.	15
	Evaluate turfgrass condition, note areas that may need renovation or special attention the following growing season.	10
Cultural	Mulch leaves into turfgrass or rake heavy layers of leaves off the top of turfgrass and compost them.	10
	Core aerate lawn using hollow tines at least 3 inches long and when soil moisture is adequate to pull cores but dry enough to avoid ruts and compaction from equipment.	10
	Core aeration is timed to avoid periods when heavy seeding weeds (e.g., crabgrass, dandelions, etc.) are germinating or setting seed.	10
	Use snow fences or other barriers to control traffic and snow drifting across turfgrass during the winter.	5
Fertility	Apply late season fertilizer of 1-2 pounds nitrogen per 1000 sq. ft. to promote root, rhizome and tiller growth.	10
Equipment	Clean, repair and prepare all lawn maintenance equipment for winter storage.	10

**Marginal adoption**

0 pts



64 pts  
Goal



**Full adoption**

80 pts

### Comprehensive IPM Score

(Add scores of all sections)

For turfgrass managers that DO NOT normally install new turfgrass, add the scores from Sections I, IV, and V to calculate your Comprehensive IPM Score.

**Marginal adoption**

0 pts



672 pts  
Goal



**Full adoption**

840 pts

For turfgrass managers that DO normally install new turfgrass, add the scores from all Sections to calculate your Comprehensive IPM Score.

**Marginal adoption**

0 pts



904 pts  
Goal



**Full adoption**

1130 pts