A Look At ...

FORCE OF NATURE — THE WHOLE TRUTH FROM AN INDEPENDENT PERSPECTIVE from
National Organization Responding Against HUJE that seek to harm the Green Space Industry (NORAHG)

Snow Molds

A Look At Turfgrass Disease Management

Degradation of Fungicides

January 18th, 2012

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[State of Wisconsin]

Selected and adapted excerpts

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Jim Kerns is Assistant Professor of Plant Pathology and Extension Specialist in Turfgrass Pathology at University of Wisconsin–Madison, Department of Plant Pathology. Kerns' program focuses on etiology, epidemiology, and management of turfgrass diseases. He conducts research in laboratory, greenhouse, growth chamber, and field environments focusing on, but limited to, three important diseases of turfgrasses in Wisconsin — Dollar Spot, Anthracnose, and Snow Molds. Current projects include the degradation of Snow Mold fungicides in response to snow cover, determination of the optimal infection temperatures for the Dollar Spot pathogen, and screening native grasses for resistance to Pink and Gray Snow Molds.

Snow Molds

- **Unseasonably warm winter prompts many inquiries about the PERSISTENCE OF FUNGICIDES applied for Snow Mold suppression.**

- **As long as soil temperatures remain below 0°C (32°F), fungicide concentration DOES NOT SEEM TO DEGRADE regardless of snow cover.**

- **Fungicides like chlorothalonil and iprodione are DEGRADED BY MICROBES, or through HYDROLYSIS, but we do not know which process is more important.**

- **If mowing has not occurred in MID–WINTER, RE–APPLY a fungicide if it makes you sleep better.**

- **Our experience with granular fungicides is they work better when watered in.**

- **Snow cover did NOT seem to affect chlorothalonil concentrations.**

- **The problem with WINTER RE–APPLICATIONS is you will need access to water no matter what formulation of fungicide you choose.**

- **With WINTER RE–APPLICATION, the weight of the sprayer would do more harm than good.**

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Snow Molds

Measuring the degradation of snow mold fungicides chlorothalonil and iprodione in response to snow cover and temperature

Unseasonably warm winter prompts many inquiries about the PERSISTENCE OF FUNGICIDES applied for Snow Mold suppression.

We have an experiment that is evaluating the persistence of two commonly used Snow Mold fungicides, iprodione and chlorothalonil.

Basically, we applied the fungicides to plots that we keep FREE OF SNOW COVER and ones that were kept UNDER SNOW COVER for the duration of the experiment.

We took two cup cutter samples from each plot.

One was used to determine the concentration of the fungicides using commercially available ELISA kits for iprodione and chlorothalonil developed by Horiba LTD.

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As long as soil temperatures remain below 0°C (32°F), fungicide concentration does not seem to degrade regardless of snow cover

Effect of Temperature

The other core was used in a bioassay where we inoculate the plants with a solution of (Microdochium Patch a.k.a. Pink Snow Mold) and measure disease development.

From this research, we have learned that as long as soil temperatures remain below 0 degree Celsius (32 degrees Fahrenheit), fungicide concentration DOES NOT SEEM TO DEGRADE regardless of snow cover.

However, once soil temperatures consistently eclipsed 0 degree Celsius (32 degrees Fahrenheit), then we observed a RAPID DECLINE in fungicide concentration and consequently a RAPID INCREASE in disease severity in our bioassay.

The chlorothalonil kits have not performed as well as the iprodione kits, but we still have bioassay results.

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Snow cover did NOT seem to affect chlorothalonil concentrations

Effect of Snow Cover

From the bioassay, we observed that SNOW COVER DID NOT SEEM TO AFFECT CHLOROTHALONIL CONCENTRATIONS because disease severity was similar in the snow covered and non–snow covered plots treated with chlorothalonil.

We do not have the exact concentrations for chlorothalonil, but we can infer that PHOTO–DEGRADATION does NOT play a major role in determining chlorothalonil persistence.

We also think PHOTO–DEGRADATION plays a MINOR ROLE in the persistence of iprodione.

From our research, TEMPERATURES govern degradation of these two fungicides.

This likely means that these fungicides are DEGRADED BY MICROBES OR THROUGH HYDROLYSIS.

Both of these processes are governed by TEMPERATURE, but we do not know which process is more important.

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Chlorothalonil and iprodione are degraded by microbes or through hydrolysis, but we do not know which process is more important

Do I Re-Apply Or Not ?

Knowing is not important right now as the question remains ... do I RE-APPLY or not ?

The answer to this question is complicated.

Currently, we are running our degradation experiment, and we have observed SOME degradation, but the concentrations are still adequate to protect against Microdochium Patch.

At least in our climate, I DO NOT THINK IT IS NECESSARY TO RE-TREAT.

Moving further south, the temperatures are warmer, and yet, the answer is still complicated.

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Snow Molds

If winter mowing has not occurred,
RE-APPLY if it makes you sleep better

Do I Re-Apply Or Not ? (continued)

I have heard that some golf course superintendents have had to MOW TEES ... if that is the case then I suggest a WINTER RE–APPLICATION.

If mowing has not occurred, my suggestion is to RE–APPLY if it makes you sleep better.

Why do I say this ?

Well, based on our inoculation work and work done by Phil Dwyer when he was a student of Joe Vargas, Microdochium Patch takes a long time to develop when temperatures are below 4 degrees Celsius (40 degrees Fahrenheit).

However, once temperatures exceed consistently 4 degrees Celsius (40 degrees Fahrenheit), and humidity is high, then the disease can develop quickly.

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Snow Molds

With WINTER RE-APPLICATION, the weight of the sprayer would do more harm than good

Do I Re-Apply Or Not ? (continued)

The problem with WINTER RE–APPLICATION S is you will need access to water no matter what formulation of fungicide you choose.

Our experience with granular fungicides is they work better when watered in.

Unfortunately we do not have a good answer concerning WINTER RE–APPLICATION.

I am hesitant to suggest a WINTER RE–APPLICATION because I am afraid the weight of the sprayer would do more harm than good.

This might be an unfounded concern, and, if it please, tell me otherwise.

What I am encouraging is to be ready once things warm up in the spring, whenever that maybe.

I do think with the weather conditions experienced throughout the Northern regions, we will likely see outbreaks of Microdochium Patch, so be ready to spray when those conditions come.

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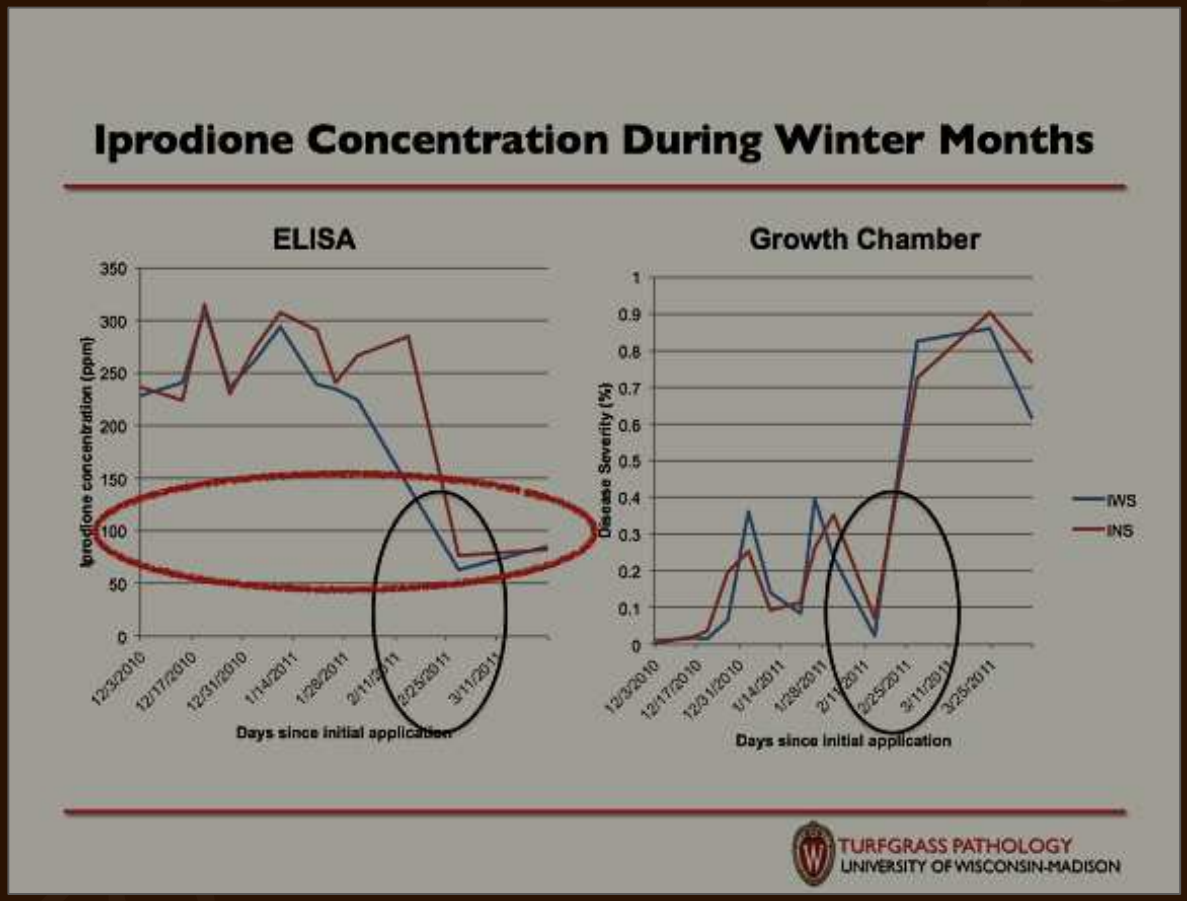
Iprodione Concentration During Winter Months
ELISA
Iprodione concentration (ppm)
350
300
250
200
150
100
50
0
12/3/2010
12/17/2010
12/31/2010
1/14/2011
1/28/2011
2/11/2011
2/25/2011
3/11/2011
Days since initial application
Growth Chamber
Disease Severity (%)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
12/3/2010
12/17/2010
12/31/2010
1/14/2011
1/28/2011
2/11/2011
2/25/2011
3/11/2011
3/25/2011
Days since initial application
IWS
INS
TURFGRASS PATHOLOGY
UNIVERSITY OF WISCONSIN-MADISON

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A Look At ...

NORAHG is National Organization Responding Against HUJE that seek to harm the Green Space Industry.

NORAHG is a NATIONAL NON PROFIT NON PARTISAN organization dedicated to reporting the work of RESPECTED and HIGHLY RATED EXPERTS who promote PESTICIDE REALISM and PESTICIDE TRUTHS.

Scientific research PROVES that pest control products cause NO HARM and can be USED SAFELY.

NORAHG produces A LOOK AT, a series of reports providing TECHNICAL INFORMATION on issues such as Career Management, Golf Course Maintenance, Green Alternatives, Summer Stress, Turfgrass Pests, and Turfgrass Species.

A LOOK AT is destined for the green space industry, nationwide across Canada, the United States, and overseas.

A LOOK AT is committed to SOUND SCIENCE, as well as ground breaking original reporting that informs, entertains, and creates real change.

NORAHG also produces FORCE OF NATURE, reports that present THE WHOLE TRUTH FROM AN INDEPENDENT PERSPECTIVE about environmental issues, including anti pesticide terrorism.

NORAHG also manages the Library Computer Access and Retrieval System for all anti pesticide terrorist acts of subversion.

The NORAHG Library Computer Access and Retrieval System is a VAST ARCHIVE of DOCUMENTS, AUDIO CLIPS, and VIDEOS on ALL anti pesticide activities — it has been made AVAILABLE to anyone interested in litigation.

These ARCHIVES contain names, statements, activities, and affiliations of ALL anti pesticide vermin, including government officials, as well as charitable prohibition terrorist organizations that DO NOT DESERVE ANY tax exempt status.

All information, excerpts, and pictures contained in A LOOK AT were retrieved from the Internet, and may be considered in the public domain.

The information presented in A LOOK AT is for preliminary planning only.

Before making a final decision, the turf manager is expected to obtain trusted expert advice from extension specialists, local distributors and/or agronomists.

All decisions must take into account the prevailing growing conditions, the time of year, and the established management practices.

All products mentioned in A LOOK AT should be used in accordance with the manufacturer's directions, and according to provincial, state, or federal law.

For the official advantages, benefits, features, precautions, and restrictions concerning any product, the turf manager must rely only on the information furnished by the manufacturer.

The mention of trade names does not constitute a guarantee or a warranty.

A LOOK AT, and their various incarnations, was the brainchild of William H. Gathercole (now retired) and his colleagues.

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Here is a brief summary of Mr. Gathercole's career —

Fields of study — Horticulture/Agriculture, Mathematics, Physics

Alma mater — McGill University • University of Guelph • the first person ever to obtain university degrees and contribute to both the professional lawn care and golf maintenance industries

Expertise in — environmental issues and anti pesticide terrorism • turf and ornamental maintenance and troubleshooting • history of the industry • sales and distribution of seeds, chemicals, fertilizers, and equipment • fertilizer manufacturing and distribution

Notable activities — worked in virtually all aspects of the green space industry, including golf, professional lawn care, distribution, environmental compliance, government negotiations, public affairs, and workplace safety • supervisor, consultant, and, programmer for the successful execution of hundreds of thousands of management operations in the golf and urban landscape, as well as millions of pest control applications • advisor, instructor, and trainer for thousands of turf and ornamental managers and technicians • pesticide certification instructor for thousands of industry workers • founder of the modern professional lawn care industry • prolific writer for industry publications and e–newsletters • first to confirm the invasion of European Chafer insect in both the Montreal region and the Vancouver / Fraser Valley region • with Dr. Peter Dernoeden, confirmed the presence of Take All Patch as a disease of turf in Eastern Canada • with Dr. David Shetlar, confirmed the presence of Kentucky Bluegrass Scale as an insect pest in South Western Ontario, and later, in the Montreal and Vancouver regions

Special contributions — creator of the exception status that has allowed the golf industry to avoid being subjected to anti pesticide prohibition • creator of the signs that are now used for posting after application • co–founder of annual winter convention for Quebec golf course superintendents • the major influence in the decision by Canadian Cancer Society to stop selling for profit pesticide treated daffodils • the only true reliable witness of the events of anti pesticide prohibition in the town of Hudson, Quebec • retired founder of A LOOK AT and FORCE OF NATURE reports

Notable award — the very first man of the year for contributions leading to the successful founding of Quebec professional lawn care industry, which served as a beach–head against anti pesticide activists in the 1980s and 1990s

Legacy — Mr. Gathercole and his colleagues … designed and implemented strategies that reined anti pesticide activists to provide peace and prosperity for the entire modern green space industry across Canada • orchestrated legal action against anti pesticide activists in the town of Hudson, Quebec • launched the largest founding professional lawn care business in Canada • quadrupled the business revenues of one of the largest suppliers in Canada

Mr. Gathercole is now retired, although his name continues to appear as founder of A LOOK AT and FORCE OF NATURE reports.