Ontario Turfgrass Symposium, Session M2, 9:30-10:00
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Turf Disease Research Update: Sugar with your tea & canola?

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Talk Schedule
- Turf disease home remedies sugars, compost teas, peroxide, brassica residues
- What are Compost Teas?
- Compost Tea & Sugar field tests, 2004
- Snow mold control with brassica residues
- Update on snow mold biocontrol agent *Typhula phacorrhiza*

Organic control of grass diseases
- becomes more important as synthetic pesticide use becomes more restricted
- healthy lawns, healthy environments
- turf & lawns contain more than grass
- soil & micro-organisms

Turf Disease Home Remedies
- affect competitor microorganisms?
- direct effects on turf growth?
- direct effects on disease-causing organism?
  - sugars (molasses) stimulate competitors & turf?
  - peroxides surface sterilize?
  - compost teas with microbial and N effects?
  - brassica residues release fungicides?

Summer 2004 Treatments
- Hydrogen peroxide (1% and 3%) lightly sterilizing foliar surfaces
- Molasses (1% and 5%) food for antagonists (enemies) to fungal diseases
- These were applied at 2 different rates weekly from June through September 2004 to test their efficacy against dollar spot development in field plots at the GTI pathology greens

Compost Teas
- diluted in 2-fold water and aerated constantly
- microbial counts made daily 1 to 8 days
- tea applied to field turf from June through Sept
- plots inoculated with dollar spot monthly and assessed weekly

Compost Teas - Microbial Counts & Field Test Results
- molasses and peroxide showed lowest levels of suppression
- all compost teas showed significant suppression of dollar spot compared to control plots (inoculated but untreated) e.g. 86% suppression by mushroom compost meant 11 spots / 0.25 m2 plot vs. 71 spots for the inoculated control plots (4 replications)
- observed on Sept 30, when Daconil trmts in adjacent plots showed ~ 10 spots

Future Work
- more concentrated molasses?
- commercial formulations of peroxide (e.g. hydrogen dioxide suppose to be more stable and more active)?
- more work with mushroom composts?
- better fermentation procedures (times and temperatures)?
- mechanism of suppression?

Organic control of snow molds

- the mustard family (Brassicaceae) contains glucosinolates
- glucosinolates degrade to isothiocyanates and organic cyanides which are fungicidal
- mustards have been used as green manures to reduce pest populations
- isothiocyanates rapid release and volatile

Winter 2004 Treatments

- canola meal, canola stubble, fungicide, all inoculated with pink & gray snow molds
- GTI creeping bentgrass pathology greens
- plots 0.5 m by 0.5 m with four replications
- treated Nov 24, 2003 and rated March 8 2004
- canola meal was effective in suppressing winter injury in all trials compared to the inoculated control, and was as effective as the fungicide control in all cases. Canola stubble was not as effective as canola meal in winter injury suppression (see 2003 GTI Annual Research Report http://www.uoguelph.ca/GTI/research_index.html)

Future Work

- canola has been bred to contain low levels of isothiocyanates
- other Brassicaceae (=Crucifers) have much higher levels (e.g. wild mustards)
- we will test other crucifers for their ability to suppress snow mold
- will not fall under Pest Control Products Act if no claims regarding pest control

Snow mold biocontrol update

- a fungus called *Typhula phacorrhiza* (TP) is antagonistic to gray and pink snow mold
- this fungus is common all over the world
- it lives on dead plant tissues (corn fields)

Snow mold biocontrol funding

- 1994-1998 Canadian Turfgrass Research Foundation & Ontario Ministry of Education
- 1998-2004 CTRF, Nu-Gro Corporation, Natural Sciences and Engineering Research Council of Canada

Summary of Results

- 32 trials across Canada from 1999 to 2004
  - in 14 trials, insufficient disease pressure or too much abiotic (climate) winter injury
  - in 12 trials, the biocontrol agent suppressed snow molds as well as or better than fungicides ?
  - in 6 trials, the biocontrol did not suppress snow molds as well as the fungicides

Current Status of snow mold biocontrol project with *Typhula phacorrhiza*

- mass production issues
- product registration issues

Funding for the tea & canola studies provided by the Ontario Turfgrass Research Foundation ?

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Web version: www.uoguelph.ca/~thsiang/present/2005ots1.pdf