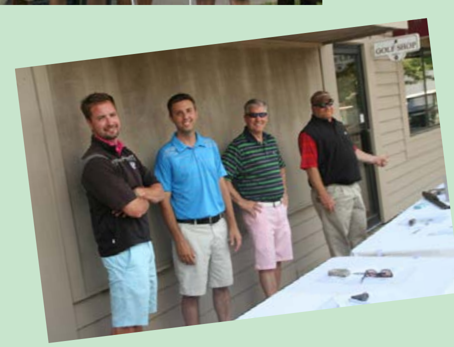
The 2014

Thank You Dellwood CC

Scramble

C and Eric Peterson



MDA Initiates Regulation Compliance Program Specific for Golf Courses

I am excited to work as the Minnesota Department of Agriculture's (MDA) golf course compliance assistant to the Minnesota golf course industry. My name is Corinne du Preez, and in this role I will provide you with education regarding pesticide use, handling, and storage. This is a new outreach effort working with Jack MacKenzie that will involve various activities, including a series of bulletins published through the MGCSA Hole Notes starting this season. This is the first bulletin in 2014 and it provides an introduction to the MDA's authority for inspection, an inspection overview, and future topics.

Authority for Inspection:
Inspection and investigations are conducted by the MDA to document compliance under the authority of:

- Minnesota Statutes 18B; Pesticide Control
- Minnesota Statutes 18C; Minnesota Fertilizer, Soil Amendment, and Plant Amendment
- Minnesota Statutes 18D; Agricultural Chemical Liability

Authority for entry, inspection, and sampling is found in:

- Minnesota Statutes Section 18D.201

Minnesota Statutes and Rules can be found on the Minnesota Office of the Revisor of Statutes website: https://www.revisor.mn.gov/pubs/

Inspection Overview:

During an inspection, an Agricultural Chemical Investigator (ACI) observes business practices to document compliance with Statutes and Rules. The following are primary items an ACI will check:

1. Pesticide Applicator License & Category
2. Pesticide Container Disposal
3. Application Records
4. Pesticide & Fertilizer Mixing and Loading Area(s)
5. Pesticide Labels
6. Backflow Prevention Device(s) on Water Supply
7. Incident Response Plan/Release Response Plan

8. Pesticide Rinsate Use
9. Well Location(s)

Future Topics:

There are rules and regulations specific to golf courses. I will highlight one topic in each of the next five bulletins. The following topics were chosen based on compliance concerns documented by the MDA during inspections at golf courses.

1. Backflow Prevention
2. Pesticide and Fertilizer Storage
3. Incident Response Plan or Release Response Plan
4. Personal Protective Equipment (PPE)
5. Applicators' License and Use Categories

To read about MDA Pesticide and Fertilizer Management Division's events, programs, policies, regulations, and enforcement actions, follow this link to the current issue of the MDA Update: http://www.mda.state.mn.us/chemicals/mdaupdate.aspx.

The MDA and MGCSA will evaluate and perhaps modify how I approach this project. The goals are to develop better communication with you, improve compliance with our regulations, and make it easier for you to comply. As your MDA golf course compliance assistant, I'll be interested to hear your opinions, ideas, and questions about your golf course as it relates to requirements in Minnesota Statutes and/or Rules. Please contact me anytime at the number or email address below.

Thank You,

Corinne du Preez, Agricultural Advisor/ACI
Minnesota Department of Agriculture
Pesticide and Fertilizer Management Division
3555 9th St NW, Suite 350
Rochester, MN 55901
Office (507) 206-2883
Corinne.dupreez@state.mn.us


Corinne du Preez

Managing White Grubs In Irrigated Turf

Vera Krischik, Associate Professor, Department of Entomology
University of Minnesota, 612.625.7044, krisc001@umn.edu

Using insecticides preventively in an IPM program

There are many components to an IPM program, including scouting for pest activity, spot treating infested areas before the insect's spread, and establishing thresholds of the number of insects per unit area. Remember that beneficial insects are free and the less insecticide that is used the more beneficial insects will control your pest insects. Data shows that as long –lasting organophosphates are no longer used to control cutworms, beneficial insect numbers are increasing in turf and there are fewer problems with moth larvae. A primary target of IPM is to use cultural, sanitation, and biological control methods to suppress pest populations below the economic threshold. However, when you know a pest was a problem in the previous season, preventive insecticide applications may be preferred to the alternative of waiting for damage. Preventive materials are applied before a noticeable pest population develops. Curative materials are typically applied after populations reach a damaging level.

For example, the neonicotinoids and chlorantraniliprole (Acelepryn) provide preventive protection against white grubs and are much less toxic than the older organophosphate materials that were used for many years. There are few cultural practices or effective biological control agents available that provide reliable control of white grub populations. The only option for effective management of high populations of white grubs in this circumstance is preventive application with a neonicotinoid or chlorantraniliprole.

Management of newly hatched grubs requires insecticide application in May thru early June and again in late July thru August. Applications in September will kill grubs if the soil temperature remains above 50 degrees F for 2 weeks, but these grubs are larger and more difficult to kill.

Pheromone traps for Japanese beetles contain a synthetic pheromone of the beetle and a scent lure that smells like roses. Beetles are highly attractive to the traps and their use will only attract more beetles.

White grub (larval stage) management

White grubs are a general name for the larvae of various beetles in the family Scarabeidae. In Minnesota, there are 6 common species, but by far Japanese beetle adults that are attracted to lights and feed as adults are the most common white grub in turf. The adults of the Northern masked chafer (Cyclocephala borealis), are not attractive to lights and do not feed. The adults of the May/June beetle (Phyllophaga sp.) are also attracted to lights and feed as adults. The very small Aphodius and Ataenius beetles overwinter in woodlots, and in the spring the adults form mating balls on turf in early June. A second generation occurs in August. These beetles feed on rotting materials in soils and are not attracted to lights. An economic threshold for Japanese beetle is 7 grubs/ sg ft and for Ataenius is 50 grubs/sg ft.

adult Japanese beetle
Popillia japonica
Japanese beetles have two white rear tufts and five white lateral tufts of hair. Adults found on plants.

adult False Japanese beetle
Strigoderma arbicola
False Japanese beetles lack the five white hair tufts along wing margin. Adults rarely seen.

adult rose chafer
Macrodactylus subspinosus
Rose chafers are a light green tan color with long legs. Adults found on plants.

adult May/June beetle
Phyllophaga species
Adults found at lights.

adult masked chafer
Cyclocephala borealis
Adults do not feed so adults are not found at lights or on plants.

adult black turf grass Ataenius
Ataenius spretulus
The smallest species found in turf with high organic matter.

Figure 1. Adult stages of several white grub species.

Table 1. Insecticides currently available for adult and grub control of white grubs		
Insecticide	**Chemical Class/ (IRA number)***	**Timing**
Neonicotinoid Grub insecticides **It may take a few days to be absorbed systemically and moved throughout the grass, but are effective for weeks.**		
imidacloprid (Merit and many generic products)	Neonicotinoid (4A)	Preventive
chlothianidin (Arena)	Neonicotinoid (4A)	Preventive
thiamethoxam (Meridian)	Neonicotinoid (4A)	Preventive
dinotefuran (Zylam)	Neonicotinoid (4A) very water soluble, so can be diluted by irrigation	Preventive
Combination insecticide for grub (4A) and leaf feeder (3) **These insecticides contain less neonicotinoid AI (active ingredient) so if you have grub problems, use the single insecticide listed above.**		
Maxide (Meridian (thiamethoxam) and Scimitar (pyrethroid))	Neonicotinoid (4A) and Pyrethroid (3)	Preventive
Allectus (Merit (imidacloprid) and Talstar (bifenthrin))	Neonicotinoid (4A) and Pyrethroid (3)	Preventive
Aloft (chlothianidin and bifenthrin)	Neonicotinoid (4A) and Pyrethroid (3)	Preventive
Less toxic to pollinators and beneficial insects.		
chlorantraniliprole (Acelepryn, GrubEx)	Anthranilic Diamide, conserves bees	Preventive
halofenozide (Natural Guard Grub Control)	Diacylhydrazine	Preventive
Milky spore disease, *Bacillus popillia*, does not appear to be effective	Bacteria unknown MOA	Preventative
Spray on grass blades, does not penetrate deep into the roots where the grubs feed.		
carbaryl (Sevin)	Carbamate (1B)	Curative
trichlorfon (Dylox) break down at above 7.5 pH	Organophosphate (1A)	Curative
Cyfluthrin (Tempo)	Pyrethroid (3)	Curative

Table 2. Spray on foliage of ornamentals for managing Japanese beetle adults		
bifenthrin (Talstar)	Pyrethroid (3)	Curative
cyfluthrin (Tempo)	Pyrethroid (3)	Curative
lambda-cyhalothrin (Spectrazide, Scimitar)	Pyrethroid (3)	Curative
Carbaryl (Sevin)	Carbamate (1B)	Curative
Chlorpyrifos (Dursban)	Organophosphate (1A)	Curative
Imidacloprid (Merit)	Neonicotinoid (4A)	Curative
Triple Crown (bifenthrin (3), zeta-cypermethrin (3), and imidacloprid (4A)	Neonicotinoid (4A) and Pyrethroid (3)	Not for grubs, only adults

** The Insecticide Resistance Action Committee (IRAC) (www.irac-online.org) has assigned IRAC numbers for each chemical class of insecticide.*

The annual life cycle of each of these species is relatively similar as adults fly in early summer and lay eggs in late June to late July. Japanese beetle feeding is the most obvious, as they create damage to leaves of lindens, ivy, grapes, roses, and over 300 other plant species. Larvae feed on turf roots from early July through mid- autumn and again in the spring. Pupae are present in the soil for a week in mid -June to mid- July. The life cycles of the large May/June beetle Phyllophaga are a full 3 years and not an annual life cycle and starts about two weeks earlier than Japanese beetle.

Preventative treatments

There are four neonicotinoids currently available in turf. All of them are systemic and move from the roots and blades through the entire grass plant. Imidacloprid appears to remain active for several weeks, and even a few months in some cases.

Since 1990 when imidacloprid first appeared on the market, there has not been documentation of resistance to the neonicotinyl class of insecticides in grubs. How-

ever, imidacloprid does not appear to have as long a residual activity against grubs as it did back in the 1990's to 2006. Applications of imidacloprid made before early June may not provide level of control of the late summer grubs that was observed when it first appeared on the market. Recent field trials suggest that chlothianidin and thiamethoxam have longer residual activity than does imidacloprid. However, I would try the granular formulation of imidacloprid, which takes longer to dissolve than the flowable formulation and is less subject to runoff.

Neonicotinoids often take several days to start working, but remain active for several weeks or months. Imidacloprid is less water soluble than dinotefuran, thiamethoxam or clothianidin and has less chance of being washed off the grass by irrigation and rain. In my research, I find imidacloprid granular formulations (Merit 0.5%) that dissolve slowly compared to foliar sprays (Merit 2F), to be much more effective. A major issue with killing grubs is that imidacloprid can only be used 1 time in the season at the higher application rate for all formulations. If you apply imidacloprid in May at the maximum rate of 0.4lb/acre, then your second application in late July can be another neonicotinyl such as thiamethoxam (Meridian 0.33G, 25WG) or clothianidin (Aloft GCG, Arena .5G, 50 WDG).

Care should be taken when using any neonicotinoid to avoid applications when honeybees are foraging, such as when clover or Creeping Charlie is in bloom.

Environmentally friendly insecticides that do not kill predatory insects or bees, such as halofenozide (Natural Guard Grub Control) or chlorantraniliprole (Acelepryn) can be used in spring and repeated in mid -July thru Sept.

Curative treatments

In mid-June, grubs pupate and turn into adults so insecticide application is not effective. Most insecticides need to be applied before a grub problem develops, but curatively applications in late August can be made of trichlorfon (Dylox) and carbaryl (Sevin). Both break down quickly in alkaline water with a pH above 7.2, so you may need to buffer the pH of the water in the tank. Ordinarily trichlorfon will