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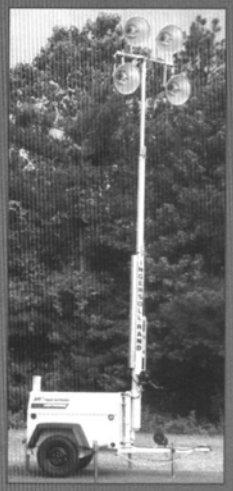

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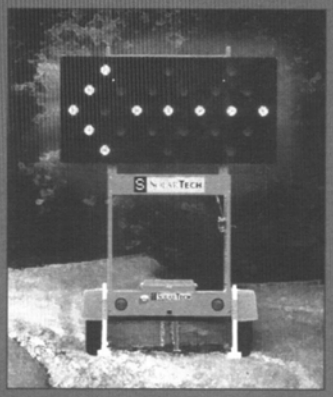

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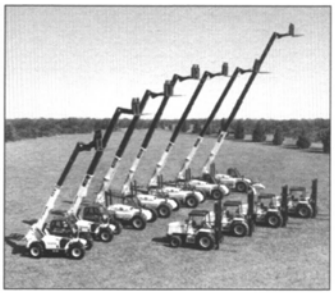

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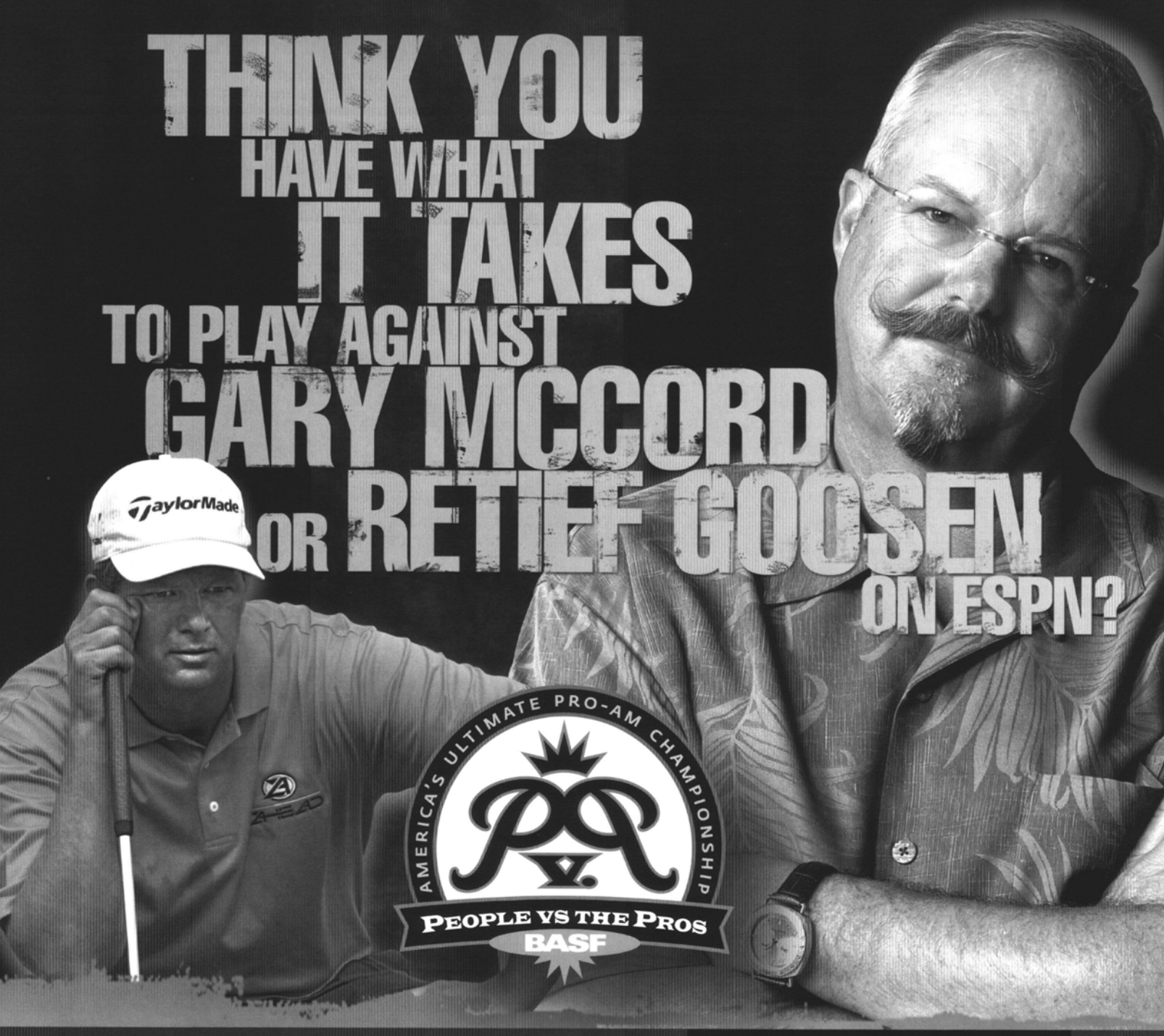

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The Rise and Likely Fall of PCNB

By Paul Koch, *Turfgrass Diagnostic Lab, University of Wisconsin-Madison*

Word travels quite quickly in the turfgrass industry, and by now I'm sure most of you have heard that the Environmental Protection Agency (EPA) has removed all turfgrass uses from the label on the re-registered pentachloronitrobenzene (PCNB). A 60 day public comment period is ongoing until October 2nd, and I urge those of you who have not yet made your opinion heard to do so. The easiest way is electronically, by going to the website www.regulations.gov and entering the ID number EPA-HQ-OPP-2004-0202 into the "Keyword or ID" field.

PCNB is from the organochlorine class of fungicides, and was first registered for use in 1964. It became widely used on a number of different crops, and has been a mainstay in turfgrass for an affordable and effective snow mold control program for decades. According to the Reregistration Eligibility Decision (RED) for PCNB recently released by the EPA, an estimated 250,000 to 500,000 pounds of PCNB active ingredient were applied to turfgrass in the past year. The only crop that rivals this amount is cotton, which uses an estimated 400,000 pounds of active ingredient in a given year and has also lost its PCNB label. Other crops make up very minor amounts, as total active ingredient applications are estimated to be around 1,000,000 pounds. The reasons for the large amounts applied to turfgrass are simple; it's cheap, it's effective, and chemical control is essential to controlling snow molds in northern climates.

But despite its benefits, it appears PCNB will lose its turfgrass label. A 1988 amendment to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requires that all pesticides registered prior to November 1st, 1984 require re-registration to ensure they meet current safety standards. The 1996 Food Quality Protection Act (FQPA) further mandated that all pesticides be reviewed every 15 years to further ensure human and ecological risks are minimized.

The EPA findings for PCNB risks were substantial, and can be looked at by going to the website http://cfpub.epa.gov/oppref/rereg/status.cfm?show=rereg and downloading the RED document for PCNB. The EPA found very little risk to humans, mammals, and birds as far as direct exposure to PCNB is concerned. The three major concerns cited by the EPA for the drastic decrease in PCNB usage are 1) PCNB's persistence in the environment, 2) bioaccumulation in the aquatic food chain, and 3) long-range atmospheric transport due to volatility.

Persistence is beneficial in the sense that it provides protection for turfgrass for long periods of time, which is essential in snow mold control. But it becomes very problematic in an environmental sense, because this product breaks down very slowly and provides for extended periods of exposure. Bioaccumulation is the ability of the concentration of the chemical to increase in fatty tissue as it moves up the food chain, especially the aquatic food chain. With humans at the top of the food chain, this could pose a health risk. Long-range transport of any chemical is dangerous, and could pose health and environmental health risks miles away from its application site.

Figure 1: The left side of the fairway was sprayed with PCNB, while the right side was not. This shows one clear drawback of using PCNB... the possible phytotoxic effects.

These are all concerns rightly highlighted by the EPA. In making their final decision, they also cited university snow mold fungicide trials to show that there are other effective products available for controlling snow molds. On top of that, they list the possible phytotoxic effects of PCNB as another reason its turfgrass label was stripped (Figure 1). Our snow mold trials at the University of Wisconsin clearly show that PCNB by itself does not hold up well under heavy disease pressure as the sole application, but it is a very cheap and effective product to tank-mix with another fungicide.

What the EPA failed to take into account was the affordability issue, which is of paramount concern with ever-tightening budgets and flat or decreasing revenues. A table provided by Dave Green of Chemtura Corporation shows a cost analysis of using PCNB by itself and in tank mixes with other products

Table 1:

Options for snow mold control in Northern Michigan
Based on MSY Snow Mold trials located at The Jones Course @ Treetops Resort, Gaylord Michigan

Option	Cost/Acre	Cost/30 Acres	% chang
1- Turfcide 400 @ 12 oz/M	$122.34	$3610.20	- 0 - %
2- Turfcide 400 @ 3 oz/M early Oct + 12 oz late	$152.93	$4587.90	+ 27 %
3- Turfcide 400@3 oz/M early Oct + 12 oz late + Daconil Ultrex @ 10 lb/A	$252.12	$7563.60	+ 209 %
4 - Turfcide 400 @ 6 0z/M +Daconil Ultrex @ 10 lb/A Chipco GT 26 @ 4 oz/M	$328.92	$9867.60	+ 273 %
5- Turfcide 400 @ 3 oz early + 12 oz Late October Plus 4 oz Chipco 26GT	$420.68	$12,630.40	+ 349 %
6- Cleary 26/36 @ 4oz/M plus Daconil @ 5.5 oz/M	$493.80	$14,814.00	+ 410 %
7- Instrada – 5.5 oz/M times two applications	$523.36	$15,700.80	+ 435 %
8- Compass twice @ .25 oz/M plus 8 oz/M Chipco 26GT	$943.12	$28,293.60	+ 783 %
9- Medallion @ .5 oz/M, Heritage @ 2 oz/M And 5.5 Oz Daconil/M	$1112.99	$33,389.70	+ 925%

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compared to other common products used for snow mold control (Table 1). The table clearly shows the increase in expense when using other products, and this eats away at profits and undoubtedly takes funds away from other important areas of the golf course. Failure to take into account this financial aspect puts hundreds of golf courses in northern climates with modest budgets in a dilemma. Do they raise green fees? Do they only spray putting greens? Do they hire fewer workers? The money has to come from somewhere, and it will have an adverse effect on the operation of the club.

While the loss of PCNB is frustrating and upsetting, it is by no means the light at the end of the tunnel. Pesticides will continue to be re-evaluated with more sophisticated techniques, and more important turfgrass protectants will likely be deemed too much of a risk. The schedule for re-evaluation by the EPA over the next four years has been posted at the EPA's website http://www.epa.gov/oppsrrd1/registration_review/draft_schedule.htm, and it includes some products you're familiar with. Among the more notable active ingredients listed for re-evaluation in year one is fenarimol, fenoxyprop, and paclobutrazol. Year two's list includes flutolonil, fosetyl-Al, and quinclorac. Year three and four have imidacloprid, glyphosate, deltamethrin, bifenthrin, and cyfluthrin on the list to be evaluated.

One way to help to prevent the loss of more products is to become involved in the legislative process. I'm sure any of the board members with the Wisconsin GCSA or Wisconsin Turfgrass Association would be more than willing to help you get started. The larger issue though may be public perception, and that is not something that is changed overnight. Public perception of the environmental benefits of turfgrass is fair at best, and every effort must be made to emphasize the benefits everyone, not just golfers, receive from healthy and properly maintained turfgrass.

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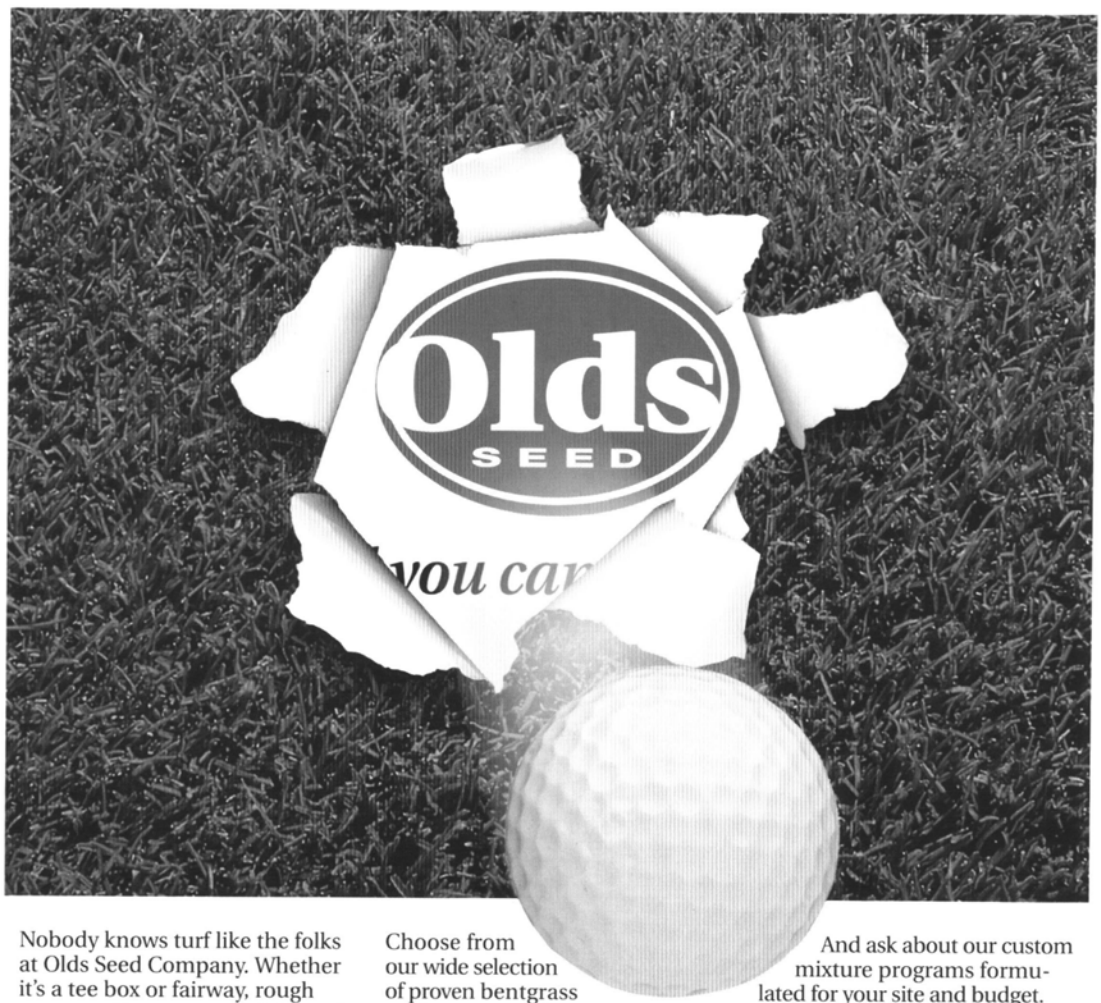

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Emerald Ash Borer: Too Close for Comfort!

By Dr. R. Chris Williamson, *Department of Entomology, University of Wisconsin-Madison*

The Emerald Ash Borer (EAB), *Agrilus planipennis* Fairmaire, is an exotic (non-native) beetle that was first discovered in the United States in southeastern Michigan near Detroit in the summer of 2002. Since then it has been found in Windsor, Ontario Canada, Ohio, and Indiana. Most recently (early June 2006), EAB was discovered in Kane county Illinois (St. Charles), less than 40 miles from the Wisconsin state line (Walworth county) as well as it was found in mid-June in South Bend, Indiana.

The larval (immature) stage is the damaging life stage of this pest; it feeds on the inner bark of ash trees, disrupting the tree's ability to transport water and nutrients. It is suggested that EAB likely arrived in the United States on solid wood packing material carried over 10 years previously in cargo ships or airplanes originating in its native Asia. In Michigan it has only been found in ash trees (Fraxinus spp.) including green, white, blue, and black ash species. All ash trees, regardless of location (urban landscape or woodlot) or condition (health) may be affected.

Since its discovery, EAB has killed in upwards of 17 million trees in Michigan, Ohio and Indiana, most devastation occurring in southeastern Michigan. In response to this insect pest, respective state regulatory agencies have established quarantines of all ash materials (nursery stock, firewood, felled trees, mulch, etc.) to prevent the movement of EAB. The Michigan Department of Agriculture has adopted and implemented an EAB eradication program as recommended by the United States Department of Agriculture. The EAB eradication program consists of conducting a delineation survey of ash trees within a

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