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Agency Issues General Permit for ASTs

On November 16, 1992, the Minnesota Pollution Control Agency (MPCA) issued a general permit to owners of aboveground storage tanks (ASTs). All registered tank owners received a copy of this permit in the mail. For most tank owners, this general permit will satisfy the MPCA's permit requirements without further paperwork from tank owners or reviews by the MPCA.

The general permit identifies three categories of tanks:

Category 1 — Tanks over 1,100 gallons capacity.

Category 2 — Tanks 1,100 gallons capacity and less beyond 500 feet of surface water.

Category 3 — Tanks 1,100 gallons capacity and less within 500 feet of surface water.

The permit outlines two basic qualifications for this general permit. They are:

1. Tanks must be registered with the MPCA (if tanks are already registered, this doesn't have to be done again);

2a. Category 1 and 3 tanks must have secondary containment (generally a diked or bermed, reasonably impervious area under and around the tank, which is large enough to hold the contents of the tank plus additional room for rain and snow);

2b. Category 2 tanks must take reasonable safeguards (e.g., good spill plan, location of tank, curbed pad) to protect the environment from any leaks or spills from the tank.

The permit requirement for ASTs is not new. Permits, including submittal of site plans and fees to the MPCA, have been required for 28 years. The MPCA will no longer charge

a permit fee or require submitting of site plans as part of its new general permit program.

What does this mean for tank owners?

A tank owner whose tanks are registered (required since June 1, 1990, for most petroleum and chemical tanks) with good secondary containment is in full compliance with MPCA rules and will not need to do anything more at this time.

A tank owner whose tanks are not registered, but has good secondary containment, must register the tanks immediately. When the tanks are registered, the tank owner will have a permit and will not need to do anything more for now.

A tank owner whose tanks are registered but lack good secondary containment does not have a permit under this plan. This tank owner should be seriously planning secondary containment. Once the secondary containment is installed or upgraded, this tank owner will have a permit.

A tank owner whose tanks are not registered and has no secondary containment does not have a permit under this plan. This tank owner should **immediately register** all tanks and begin planning for providing secondary containment.

Registration of tanks

Most aboveground tanks (except those listed above)

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Iowa Medical School Selected for Golf Course Pesticides Study

The University of Iowa's College of Medicine has been selected by a major golf foundation to conduct an important new study of occupational pesticide exposure among golf course superintendents.

The foundation, GCSAA Scholarship & Research, announced that Iowa's Dr. Burton Kross will lead the first-ever independent examination of cancer and illness trends among superintendents.

Dr. Kross and his team will conduct a thorough study of causes of death among superintendents over the past 23 years. They will attempt to determine whether superintendents have higher-than-average rates of cancers or other illnesses that could have been caused by long-term occupational exposure to pesticides.

"This is an important first step in our association's commitment to addressing concerns about our use of pesticides," said Randy Nichols, CGCS, head of the foundation and president of GCSAA. "We feel we have an obligation to our members and to the golf community to document the safety of our practices."

The initial study will focus on superintendents, the individuals who manage golf courses, because they are typically exposed to both concentrated and diluted (applied) pesticides throughout the course of their careers. Based on the results of this project, later studies may examine health

trends among living superintendents, course workers and even players.

"The results of this first study will give us an idea of the worst case scenario," said Nichols. He explained that the superintendents in the mortality sample were much less likely to have taken the safety precautions that are standard now and that today's pesticides are better tested and commonly considered to be less hazardous than products used in the past.

The University of Iowa study should be complete early next year. Plans call for preliminary findings to be presented at the GCSAA International Golf Course Conference in Dallas next February. The study, which will cost an estimated \$80,000, will be funded by GCSAA S&R thanks to donations from golf clubs, individual superintendents and state and local superintendents associations. According to Nichols, the foundation is still seeking direct contributions to offset the costs of the current study and to support future follow-up research. To make a contribution, contact the GCSAA development department at 913/841-2240.

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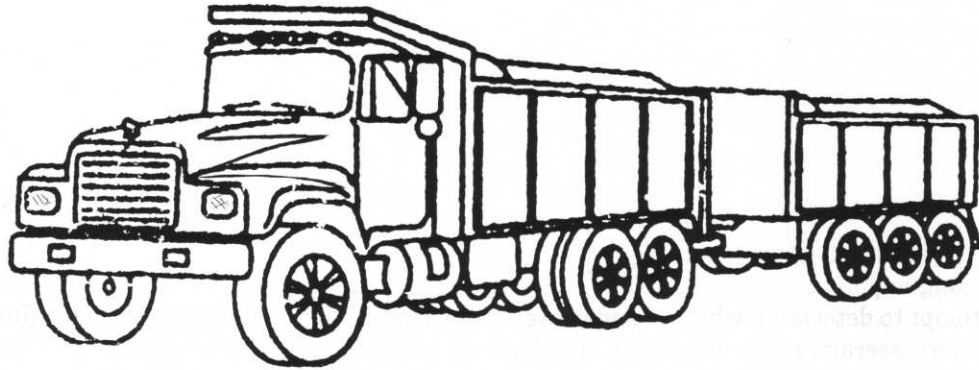
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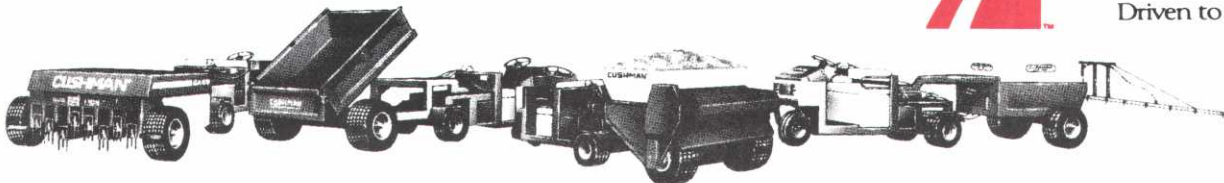
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The Superintendent Fit

So just what is the superintendent fit? How does the superintendent fit? How do you as a superintendent fit into the management team at your golf club? Do you and your staff get the respect of everybody at your golf course? Or, are you taken for granted by your golfers and not accorded the treatment that a professional deserves? Indeed, do your superiors view your work as that of a professional? Do you, as a golf course manager, view yourself as a true professional?

These may be some pretty heavy questions, but, in my opinion, are questions that we should all ask ourselves from time to time.

How should the golf course superintendent be viewed by the golfers, fellow staff, BOD, owners, municipal officials or whomever? If you, as a superintendent, have any smarts whatsoever, you will insure, through your job performance, that everybody views you and your staff

with a sense of respect, even awe, in light of what they experience every day out on your magnificent golf course.

Remember, golfers generally have a very poor idea of how it is that the golf course looks and plays so great on a daily basis. There is a bit of mystery involved in the looks of a well-maintained golf course, at least in their minds. It serves notice that course managers are highly trained and experienced professionals.

Each and every superintendent must carve out a niche and enhance it whenever possible. Mainly, it's carved out through the performance of your responsibilities, which should result in a finely conditioned golf course complex. This results in a strong superintendent fit.

Recognition can also come from professional involvement in turfgrass associations, involvement in church or civic groups, other business in-

volvement, or simply by playing the game of golf. Like it or not, non-golfers, a golfing superintendent, for some reason, is perceived to understand the game just a little bit better.

Golf course conditioning has changed dramatically even since the '70s when I was in high school. Heck, we didn't even realize that there was a difference between our golf course and any other, except for those mythically perfect private clubs up in Madison. I still clearly remember hearing about those courses and their plushness. I also remember that nobody seemed to know why they were so perfect. It was assumed that they'd always been that nice without any special care.

Today, we are seeing the ultra-high quality golf course becoming commonplace. As the demand for good course conditioning has risen, so too has the stature of the golf course

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Research Advisory Committee Convenes At GCSAA HQ

A panel of golf course superintendents, golf industry officials and university researchers met recently at the headquarters of the Golf Course Superintendents Association of America (GCSAA).

The committee met April 28-29, 1993, to identify and prioritize key research projects for GCSAA's Scholarship and Research (S&R) foundation to undertake over the next five to ten years.

Some of the projects the committee listed as priorities for GCSAA S&R included a national study of the economic impact of golf courses and golf course maintenance, bird and wildlife studies that would document the impact of golf course maintenance practices on animals, risk assessment studies that would document the actual pesticide exposure workers and golfers could encounter on golf courses, and water usage studies that would document actual water usage rates on golf courses around the country and compare them to other agricultural and industrial uses.

GCSAA Director Paul S. McGinnis, CGCS, chairman of GCSAA S&R, and GCSAA Director George E. Renault III, CGCS, vice chairman, represented the association's board of directors on the committee.

Other participants on the advisory committee included Dr. John Cisar, Research & Education Center, University of Florida; James T. Snow, national director, United States Golf Association Green Section; David Stone, golf course superintendent, The Honors Course, Chattanooga, Tenn.; Mike Waldron, director of tournament services, Ladies Professional Golf Association and Dr. Dave Wehner, Horticulture Department, University of Illinois. One member of the committee, Dr. Gail Schumann, Pathology Department, University of Massachusetts, was unable to attend the meeting, but provided a video presentation of her assessment of research priorities.

GCSAA staff members serving on the committee included Pat Jones, director of development; Kirk Kahler, government relations manager, Dr. Jeff Nus, technical editor and Carol Robertson, communications manager.



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To Know Thy Soil, Heed Thy Weeds

Weeds may be ugly. They obviously lack social skills, because they're always showing up where they're not wanted. But they are not dumb. They can communicate with each other and they can give us some clues about the general nature of our soil if we know how to listen.

Biodynamic farmer Ehrenfried E. Pfeiffer, author of *Weeds and What They Tell*, has classified weeds into three major groups according to the soil they thrive in: acid, hardpan or compacted soils. Five minor groups indicate sandy, salty, alkaline, limestone and poorly drained soils.

- **Acid Soil.** Clinquefoil, dock, hawkweed, horsetail, knapweed, lady's thumb sorrel.

- **Hardpan or Compacted Soils.** Chamomile, field mustard, horse nettle, morning glory, pennycress, pineapple weed, quack grass.

- **Disturbed or Cultivated Soils.** Amaranth, buttercup, carpet weed, chickweed, dandelion, horehound, lamb's-quarters, mallows, nettle, plantain, prickly lettuce, prostrate knotweed.

- **Sandy Soil.** Asters, most goldenrods, yellow toadflax.

- **Salty Soil.** Russian thistle, sea aster.

- **Alkaline Soil.** Sagebrush, woody aster.

- **Limestone.** Field madder, pennycress, peppergrass and wormseed.

- **Poor Drainage.** Hedge bindweed, Joe-Pye weed, meadow-pink, mild water pepper, smartweed, swampy horsetail, white avens.

Stuart Hill, a soil ecologist at the Macdonald campus of McGill University in Ste-Anne-de-Bellevue, Quebec, has made similar observations. For instance, if fertility is poor, deep rooted weeds—ragweed, daisy, mullein, Queen-Anne's-Lace, mugwort, dandelion, wild radish and wild carrot—will thrive. "These weeds penetrate deep into the earth looking for nutrients," he told *Canadian Gardening*. "The dandelions, it means the soil on the surface lacks nutrients such as calcium. The solution is to improve fertility, not zap the lawn with herbicides."

Improving fertility doesn't mean a weedless plot. Healthier soil welcomes other messengers—hallowrooted weeds like chickweed, chicory, common groundsel and lamb's-quarters. "If these weeds start to appear in your garden after you've added humus and compost, it means the fertility is improving," Hill said.

Hill says weeds can also indicate what's missing in the soil. For example, a heavy growth of clover, vetch or other leguminous weeds often indicates a soil deficient in nitrogen, at least under natural conditions. In his book *Designing and Maintaining Your Edible Landscape Naturally*, Robert Kourik observes: "Legumes also grow in nitrogen-rich soils, as you can prove by growing beans in your garden."

Legumes fall into a category of plants that accumulate a mineral even in soils that have a low concentration of that mineral. A second group of plants, Kourik writes, "thrive in soils with high concentrations of certain minerals or send their roots down to layers where the nutrients are in abundance. The concentration of minerals in their tissues is related more to the soil than to their powers as accumulators. These plants tolerate conditions in the soil that might be toxic to other plants."

Kourik compiled the following list of accumulator weeds from his own observations and those of other researchers. Grown in or around the landscape, these weeds can correct soil nutrient problems. Because plants hoard the substances they accumulate for the next generation, the weeds need to be tilled under at the end of the growing season:

- **Boron.** Spurge.

- **Calcium.** Chicory, coltfoot, corn chamomile, creeping thistle, dock, German chamomile, garden sorrel, horsetail, lamb's-quarters, plantain, purslane, redroot pigweed, sheep sorrel, shepherd's-purse, silverweed, stinging nettle, toadflax, watercress.

- **Cobalt.** Eastern bracken, horse-tail, vetch.

- **Copper.** Coltsfoot, dandelion, eastern bracken, plantain, purslane,

silverweed, sow thistle, stinging nettle, vetch.

- **Fluorine.** Garlic, watercress.

- **Iodine.** Bladderwrack, burdock, Canada thistle, coltsfoot, creeping thistle, dandelion, devil'sbit, dock, eastern bracken, nodding thistle, plantain, redroot pigweed, Russian thistle, stinging nettle, toadflax, watercress.

- **Magnesium.** Bladderwrack, coltsfoot, dandelion, devil'sbit, horse-tail, sow thistle, toadflax, watercress.

- **Manganese.** Chickweed, eastern bracken, lamb's-quarters.

- **Nitrogen.** Cattail, lamb's-quarters, stinging nettle.

- **Phosphorus.** Chickweed, clover, dandelion, dock, eastern bracken, garden sorrel, garlic, German chamomile, lamb's-quarters, purslane, redroot pigweed, sheep sorrel, vetch, watercress.

- **Potassium.** Chickweed, chicory, coltsfoot, corn chamomile, creeping thistle, dandelion, dock, eastern bracken, German chamomile, lamb's-quarters, plantain, redroot pigweed, silverweed, sow thistle, stinging nettle, tansy, vetch, watercress.

- **Silica.** Dandelion, horsetail, plantain, valerian.

- **Sodium.** Dandelion, garden sorrel, sheep sorrel, stinging nettle, shepherd's-purse, watercress.

- **Sulfur.** Coltsfoot, garlic, plantain, shepherd's-purse, stinging nettle, watercress.

Before looking to your weeds as divining rods, remember that, in Kourik's words, "one individual plant says nothing." Others who have studied weeds and their relationships to the soil echo his observation that individual plants can grow in atypical situations and many species tolerate a wide range of soil conditions. If your weeds are sickly and undersized, they're probably not growing in a favorable habitat.

But healthy, lush plant communities—more than one plant of a single species along with other indicator plants—may be a useful signal of soil type, Kourik says. "It's

(Continued on Page 28)