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A PATCH of GREEN

Official Publication of the
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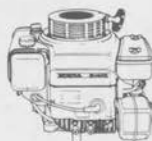
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3.5	GV150	A1			X	3 5/32 x 7/8 DIA. TAPPED 3/8 24 UNF				3600	X		X	SD	2.12	28.7	
	GV150	A2			X	2 7/16 x 7/8 DIA. TAPPED 3/8 24 UNF				3600	X		X	SD	2.12	28.7	
	G150	Q	AF	X		2 7/16 x 3/4 DIA. TAPPED 5/16 24 UNF			X	4000	X		X	OB	2.64	29.8	
	G150	PE	AF	X		2 7/16 x 5/8 THREADED			X	4000	X		X	OB	2.64	29.8	
	G150	HQ	AF	X		2 3/4 x 3/4 DIA.	X		X	4000	X		X	OB	2.64	37.1	
5	GV200	(1)	N40		X	3 5/32 x 1 DIA. TAPPED 3/8 24 UNF			X	3200	X			X	DE	2.01	37.5
	GV200	(2)	N50		X	1 13/16 x 1 DIA. TAPPED 7/16 20 UNF			X	3200	X			X	DE	2.01	37.5
	GV200	(3)	N4C		X	3 5/32 x 1 DIA. TAPPED 3/8 24 UNF			X	3700	X		X	DE	OPT.	35.3	
	G200	Q	AF	X		2 7/16 x 3/4 DIA. TAPPED 5/16 24 UNF			X	4000	X		X	OB	3.68	33.1	
	G200	V	A5	X		2 53/64 x 0.755 DIA. TAPER 2 1/4 PER FT.			X	4000	X		X	OB	3.68	33.1	
	G200	PE	AF	X		2 7/16 x 5/8 THREADED			X	4000	X		X	OB	3.68	33.1	
	G200	S	AG	X		2 3/64 x 22 mm DIA.		X	X	4000	X		X	OB	3.68	46.5	
7	G300	HQ	AF	X		2 3/64 x 3/4 DIA.	X		X	4000	X		X	OB	3.68	41.5	
	G300	Q	B6	X		3 31/64 x 1 DIA. TAPPED 7/16 20 UNF			X	4000	X			X	DE	6.36	48.5
	G300	V	B6	X		4 11/64 x 7/8 DIA. TAPER 2 1/4 PER FT.			X	4000	X			X	DE	6.36	48.5
	G300	S	B7	X		2 3/32 x 22 mm DIA.		X	X	4000	X			X	DE	6.36	63.5
	G300	HQ	B6	X		3 7/32 x 1 DIA. TAPPED 7/16 20 UNF	X		X	4000	X			X	DE	6.36	59.0
	G300	Q	J0	X		3 31/64 x 1 DIA. TAPPED 7/16 20 UNF			X	4000	OPT.	X		X	DE	6.36	59.0
10	G400	Q	B6	X		3 31/64 x 1 DIA. TAPPED 7/16 20 UNF			X	4000	X			X	DE	6.36	66.1
	G400	V	B6	X		4 11/64 x 7/8 DIA. TAPER 2 1/4 PER FT.			X	4000	X			X	DE	6.36	66.1
	G400	Q	J0	X		3 31/64 x 1 DIA. TAPPED 7/16 20 UNF			X	4000	OPT.	X		X	DE	6.36	76.0
11	GV400	(4)	AA		X	3 5/32 x 1.0 DIA. TAPPED 7/16 20 UNF			X	3550	X		X	DE	2.44	61.7	
	GV400	(5)	AB		X	3 5/32 x 1.0 DIA. TAPPED 7/16 20 UNF			X	3550	X		X	DE	OPT.	61.7	
	GV400	(6)	JB		X	3 5/32 x 1.0 DIA. TAPPED 7/16 20 UNF			X	3550	X	X	X	DE	OPT.	68.4	
	GV400	(7)	JD		X	3 5/32 x 1.0 DIA. TAPPED 7/16 20 UNF			X	3550	OPT.	X	X	DE	OPT.	66.2	

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Mr. Superintendent - Are You An "Endangered Species"?

*By Stan Frederiksen
Manager - Turf Products
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Mr. Golf Course Superintendent - is your future as a career turf manager "clouded"? Perhaps much more than you think. Let's take a look at some very ominous considerations you will have to face in the very near future.

Back in the early '60's, Miss Rachel Carson's book *Silent Spring* was published. It had an everlasting impact upon the world of growing things, including your "thing," highly maintained fine turf. Undoubtedly its original purpose was a truly noble one - to focus public attention upon the indiscriminate use of chemical pesticides and the adverse effect this could have on man and his world, not to mention the Earth's millions of other living inhabitants.

However, the overreaction by federal, state and local government officials was startling. Federal agencies, armed with powers delegated to them by Congress, began removing from the marketplace pesticides they found had caused some kind of harm, either to people or the "environment." They also began removing pesticides they felt "might," even under the remotest possible circumstances cause some sort of problem, whether there had ever been such problem reported in connection with those pesticides or not. Further, the "possibility" of potential harm was not limited to that associated with people. The new phrases "balance of nature" and "endangered species" and others began to appear. One group or another began worrying whether in the next 15 or 20 years the "purple-crested-thing-a-mabob" would become extinct because of the impact in the "environment" of chemical pesticides. Strangely enough, some of these groups paid little attention to the very basic question -

"Should the world be made safe and adaptable for people? - or for 'endangered species'?"

Let's make some observations as to what has happened since *Silent Spring* to bring us to where we are at present, with respect to pesticides and their use.

1. Gone from the market place are many of the important pesticides that helped farmers grow plentiful good crops that you could buy inexpensively. The same pesticides helped you grow beautiful fine turf. Few of these ever caused problems, but (found some government agencies), they "just might" cause problems, and so they were banned.

2. Gone is the incentive on the part of the chemical companies to develop new pesticides to help your career. Why should they? There's now only one chance in several thousand that any new compound could ever become commercially available as a pesticide.

3. Gone is the source of many of your turf pesticides - that source being pesticides originally researched and developed for food crops. Because turf is such a small segment of the agriculture market, very few, if any, companies would ever embark on a program of research to develop a pesticide just for turf when the chance for its commercial success is so slim. With pesticides for food crops in jeopardy, you can imagine how remote is the possibility of new pesticides for turf.

4. Just after *Silent Spring* appeared, the food pesticides people found their warehouses filled with pesticide compounds that the government had banned for food crop use. When a magazine writer said that, "A \$14 million market has opened up for fungicides on

Continued Page 16

ACID RAIN: Something Else to Worry About?

*By Fred P. Miller
Soil and Water Resource Specialist
University of Maryland College Park,
Md 20742*

In both the popular press and scientific media, articles are appearing with increased frequency about a 20th Century weather phenomenon - acid rain.

The acidity of precipitation has gradually increased in certain areas of the U.S. over the last three decades. This acidity problem was associated primarily with the industrial air pollution in the northeastern U.S. and in the industrial sectors of Europe during the mid-1950's. The problem has since expanded to other regions.

By 1972, precipitation in most areas east of the Mississippi River was more acidic than normal. Rainfall is naturally acidic (pH 5.6) as small amounts of carbon dioxide are dissolved in the

water, producing a mild concentration of carbonic acid. But as the atmosphere is loaded with sulfate and nitrate pollutants, the strength of the resulting sulfuric and nitric acids increases. The pH of individual rain events has been recorded at values between 2.1 and 3.0 in various locations. (1).

The effects of this acid precipitation on soils, vegetation, water, and aquatic organisms is not well researched.

Scientists in Oregon (1) have simulated acid rain experiments on sugar maple ecosystems and compared their results with the conditions found under normal rainfall. Under acid rainfall, calcium, magnesium, and sulfate

Continued Page 14

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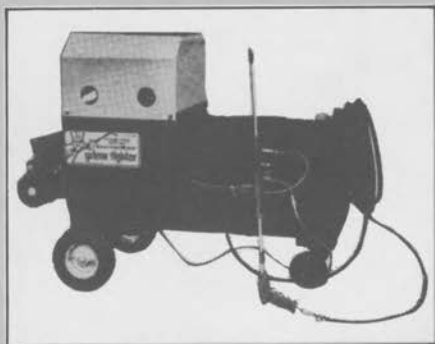
Panelists (Left to Right) Dick Morey, President and Publisher Brantwood Publications, Dave O'Brien, Vice President Marketing, L.R. Nelson Corporation, Ed Shoemaker, Director Turf Marketing, Rain Bird, Dr. John Kaufman, Professor Michigan State University, and Ernie Hodas, President of Century Rain-Aid field questions from the audience during one of the Century Rain-Aid seminar sessions. The three day program, February 24-26, was held at the Bay Pointe Golf Club, West Bloomfield, Michigan.

Attending were more than 300

sprinkler irrigation installers, golf course superintendents, landscapers, landscape architects and municipalities personnel. "Planning and Managing Sprinkler Irrigation in the 80's" was the theme which covered trends, products, technology, business management and servicing.

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Continued Page 13

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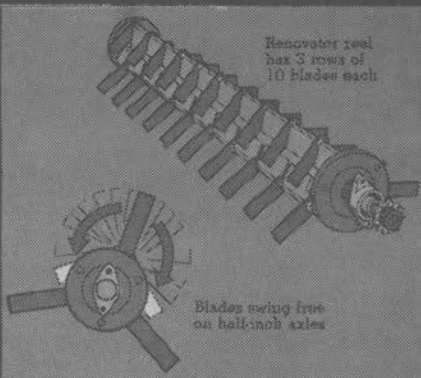
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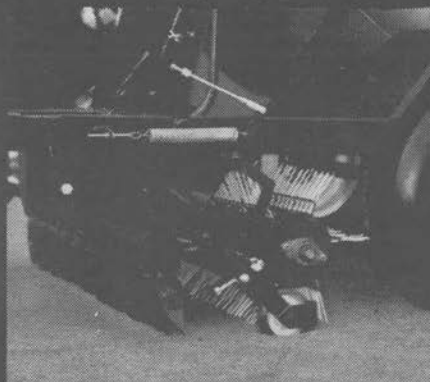


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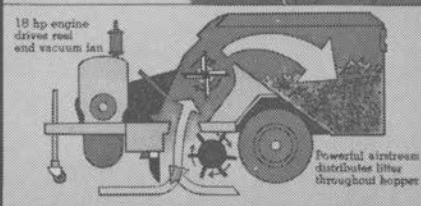


SHOCK-ABSORBING blades, pivoted to reduce damage, swing into action as reel rotates. Renovator reel is an accessory to the basic machine, and is interchangeable with rake (see below) or sweeper reel (next page). Reels raise for high-speed transport.

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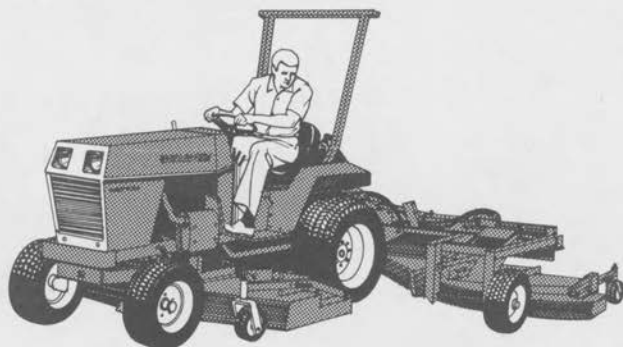


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Editorial Tips, cont.

and types of ads you will run. Sit down with your printer and figure your costs for each page. If you will offer special services such as color, those costs will have to be figured as well. The price of an advertisement should reflect your publication costs as well as any profit you hope to make, although you may want to give a frequency discount to encourage repeat advertising.

Next, you should print a rate card for your advertisers. It does not have to be complicated, but it should carry as much information as possible. It should include the rates for various sizes of ads and special services, a deadline, or closing date, for each issue, and a name and address for your advertisers to contact. You might also want to include a paragraph of information about the size, frequency and readership of your publication.

Remember that your rate card represents your magazine to a prospective advertiser just as surely as your publication represents your association to your readers. It should be neat, attract-

ive and easy to read.

Mail a rate card and a copy of your publication, along with a cover letter, to each prospective advertiser. Make sure he has enough information about your publication. Keep him informed about your plans for special issues, stories or projects.

Above all, keep your rate card current. If your printer tells you he is raising your rates, you will want to pass that information along to your advertisers as soon as possible to help them with their planning.

NEXT ISSUE: LAYOUT AND DESIGN

FORE FRONT is published bimonthly by the Golf Course Superintendents Association of America, 1617 St. Andrews Drive, Lawrence, Kansas 66044.

Executive Director
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Acid Rain, cont.

ions were leached from the soil in higher concentrations than under normal conditions. An increase in the input of hydrogen and sulfate ions was noted in the water passing from the forest litter to the soil. There was also an increase in the removal of calcium from the leaf litter (1).

Other research results in cool, temperate regions of the northeastern U.S., Canada, Norway, Sweden, and Germany (2) indicate that one of the most dramatic effects of acid precipitation is the increased aluminum mobilization in soils. Aluminum is derived principally from rock weathering. Its solubility increases drastically in the pH range from 7 to 5.

The increased acidity of the percolating water carries the dissolved aluminum deeper into the soil profile than normal, often transporting it to streams and lakes. Studies in New York's Adirondacks (2) showed that aluminum concentrations in acidified lakes were 10 to 50 times higher than normal. Similar results in Scandinavia indicated increased aluminum transport to both streams and lakes.

But these types of studies have been carried out on predominantly upstream waters where the aluminum solubility plays a major role in their chemical composition. The effect of the acid precipitation downstream becomes less as normal soil weathering reactions dominate the composition of downstream waters (3).

Chemical data from other watersheds (3) in the northeastern U.S. show that the neutralization of acid rain is rapidly and largely (about 75%) accomplished in the upper soil or substrata by reaction with basic aluminum salts and organic matter. The remaining acid is neutralized by chemical weathering reactions within the soil parent material.

Thus, the presence of high concentrations of aluminum reported in water draining areas subject to acid rain is confined mainly to the upper portions of the watershed. This aluminum enrichment will be especially noticeable in alpine and upland lakes where small streams drain watersheds composed of igneous and metamorphic bedrock.

Continued on Next Page

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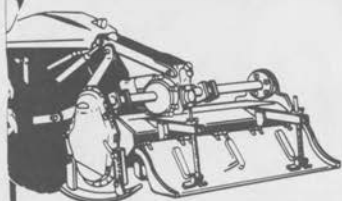
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Downstream water quality in major streams will not be likely to exhibit any acidifying effect (3). This additional soil acidity can be managed for agricultural systems by current liming programs.

The agricultural impact of acid rain is both a blessing and a curse. The sulfur added through air pollution is often adequate to sustain crop needs without amendments, thus saving the farmer the expense of such additions. But the implications of acid rain on soil pH, aluminum release, plant communities, long term soil formation processes, and other systems are only just beginning to be uncovered.

As air pollution is brought under control, the impact of acid rain should lessen. In the meantime, the problem is worthy of watching, but seems to pose no immediate threat to agriculture and the soil resource base. We should not, however, wait for problems to appear before cleaning up the source.

1. Acid rain. Sport Fisheries Institute Bull. No. 304, May 1979. p.p. 5-6.

2. Cronan, C.S. and Scholfield, C.L. 1979. Aluminum leaching response to acid precipitation: Effects on high-elevation watersheds in the Northeast. Science. 204: 304-306.

3. Johnson, N. M. 1979. Acid rain: Neutralization within the Hubbard Brook ecosystem and regional implications. Science. 204: 497-499.

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Endangered Species?, cont.

golf course turf," you can bet the food pesticides manufacturers started moving their erstwhile unsaleable (for food crop use) fungicides over into the turf market, rightly reasoning that "very few people eat grass." It was at this time (mid 1960's) that you saw entry into the turf fungicides markets, by firms which had never participated in such markets before.

5. Right after "Silent Spring," Monsanto published a resounding rebuttal to the book. To discover what the world would be like without pesticides, read the October, 1962 issue of Monsanto Magazine article entitled "The Desolate Year." It depicts a world without pesticides, overrun with insects and other pests, and presents a frightening picture of how tenuous is the thread that holds civilization together. Without pesticides, the human race could literally be eliminated. The grim fact is that all the pesticides we've ever had could only hold antagonistic pests in check. In no way could all of them be eliminated. Witness even today in your continuing battle against turf pests how many insects and fungi have already adapted to pesticides and/or have become entirely resistant to many of them. To reinforce yourself on this particular point, be sure to see the motion picture "The Helstrom Chronicle," which shows that practically all insects can adapt to just about any pesticide - and that it may not be too far in the future when insects, not humans, will rule the world! That is, unless mankind can continue its pressure on the pest world through much more pesticide research and a constant flow to the marketplace of more new pesticides.

6. Is pesticide research dead? Maybe not quite, but it's rapidly approaching that state. Dr. John Shred, the famous Connecticut entomologist, told me at a turf conference a couple of years ago that at that time of the year just 12 months before he had, in the first quarter of the year, screened hundreds of chemical compounds for insect control activity. During the current quarter, he told me he'd received candidate insecticide compounds from only two companies.

7. Over-reaction has also shown up at the state and local levels. More and more states, because of pressure from environmentalist groups, are placing their own bans on many pesticides, whether there's any real basis for such action or not, and they are imposing almost intolerable regulations and conditions. An example is California where anyone who even recommends the use of a pesticide must have a permit or license. In the original legislation, a license was needed not only for the state itself, but also for every county of the state in which that pesticide was to be sold and/or recommendations for its use made! It's just about enough to turn off anyone and let the pests take over by default.

8. Another part of the untenable present pesticide situation is the practically impossible maze of registration procedures. Whereas formerly a good pesticide could attain registration in a few weeks, it may now require years - and lots of money. New obstacles have been thrown up, including such things as "feeding studies," "residue stud-

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ies," "environmental impact studies" and the like. Some companies have received pesticide applications back from the EPA no less than five or six times for "more data" the "dotting of i's," "the crossing of T's," etc. Do you wonder about the increasing prices of pesticides? You shouldn't when you begin to realize the tremendous costs involved just in registration, including the horrendous work involved, the numerous trips to Washington, etc.

9. The crunching halt to pesticide research was mentioned earlier. The true extent of this literally jumps at you when you hear that many companies are completely abolishing their pesticide research facilities and terminating their people. Many experiment stations, formerly strong in agricultural and turf pesticide research, have either cut back or eliminated this from their programs.

10. Again, a persistent reason given for removing long-standing well-and-safely used pesticides from the market is that they "might" (not "will") result in malignancies or "get into the food

chain" (another favorite phrase of the environmentalists), or otherwise adversely affect the "ecological balance." It's likely true that indiscriminate airplane spraying of toxic substances over wide areas could pose health problems. But this is far different (for instance) from a qualified turf manager spraying a few ounces of a mercurial fungicide on a tiny (relatively, in area) putting green, where there's proof that it can only move downward (never laterally), and will tie up into insoluble and therefore innocuous soil compounds that can never contaminate or pollute.

So-o-o-o - Where does all this leave us? Some obvious conclusions:

1. Expect to see very few new pesticides in the foreseeable future.
2. Be ready to get by with far fewer pesticides than you've ever had before. You'll have to take what you can get, and be satisfied. It won't matter that what's available to you just might not work.
3. Watch for alternate methods of pest control. Close at hand may be the era of biological controls - or even the control of pests with sophisticated electronic devices not yet even dreamed of.
4. Pests could increase their activity to where, perhaps, intolerable conditions for the public may force changes in government thinking to the point where the bureaucrats will really have to decide whether to control pests or choose the only other alternative and let the pests overwhelm the people.

If the average turf manager must choose between eliminating some of the management "tools" he now has to work with, it has been determined that the very last thing he'll give up is his store of good pesticides. He simply cannot maintain five turf, especially putting greens, without good pesticides - at least as of now.

What's to be done? That's mostly up to you. You can either endure the restrictions and regulations, or you can do something about it! Write to your Congressman! Write to your Senator! Work through your association and its fine membership, and let the government know that its actions are jeopardizing your career. In order to manage

Continued on Next Page

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fine turf properly you need good tools - especially good pesticides! Just because something "might," at a future time, cause a problem is no reason to ban it if it has never caused a problem before. Mercurial fungicides are a good example. For over 50 years - one-fourth the entire history of the United States - mercurial fungicides have served golf course superintendents well. They are without peer in performance and low in cost-in-use. In all those 50 years there has never been a documented case of injury with these materials when used as directed. And yet there is the threat of a denial of registration of these mercurials. Why? No one really knows. It happens that a number of routine items of commerce, readily available over-the-counter to anyone of any age appear to be far more dangerous than mercurial turf fungicides, used as per their labels. It has been said, for example, that ordinary aspirin causes more deaths every year than all pesti-

cides combined - of any type - and designed for whatever purpose!

What man can do to pollute the Earth is infinitesimal compared to what the Earth does to itself. A recent article claimed that when Mount Krakatoa, the volcano, exploded and sank into the Pacific back in 1880's, that single explosion threw into the atmosphere more particulate pollutants than has all of Mankind since the world began! By the way, the title of the article is, "The Earth Is Its Own Worst Polluter."

Why is it that you are the key to the future of good pesticides? Because you are the only one government officials will listen to - because you are the one most adversely affected when important pesticides are no more. Thus it is imperative that you let your voice be heard - individually and through your associations. If you don't it might just be you, the Golf Course Superintendent who becomes the endangered species.



"I said, 'spray the broadleaf, stupid!
— not the broads!!'"

CREDIT—Central Illinois, 1975



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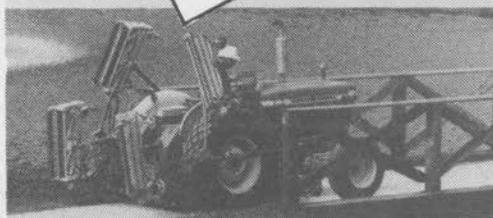


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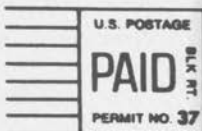
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